June 17, 2016

Ron Holcomb
Central Valley Regional Water Quality Control Water Board
1685 E Street
Fresno, California 93706

RE: Order Pursuant to California Water Code Section 13267, issued to Chevron U.S.A. Inc. ("Chevron"), dated April 27, 2016 ("Order")

Dear Mr. Holcomb:

The above-referenced Order issued by the Central Valley Regional Water Quality Control Board ("Regional Board") requires Chevron to submit a technical report containing (1) the volume of produced water provided for irrigation since January 1, 2014, and (2) "a list of all chemicals and additives used in petroleum production, treatment, and transportation processes that generate produced water that is used for irrigation of crops (i.e. all chemicals ‘used in the field’).” As to the second item, the Regional Board has also requested information on the purpose and how each chemical is used, the frequency of use, and the volumes used on a quarterly basis since January 1, 2014. This letter and the enclosed documentation constitute the technical report.

The Order contained a due date of June 13, 2016. However, as indicated in the attached email, Clay Rodgers, Assistant Executive Officer for the Regional Board, agreed to extend the deadline for Chevron’s submittal until June 17, 2016 in part to allow Chevron to accommodate a June 13, 2016 facility tour requested by Regional Board staff.

Volume of Produced Water Provided to Cawelo Water District for Irrigation

The enclosed table contains the volumes of produced water provided to the Cawelo Water District ("Cawelo") that is used for agricultural irrigation from Chevron’s operations at Kern River Field on a quarterly basis from January 1, 2014 through March 31, 2016. This volume data is from the same data source used to populate the required volume submittals (monthly maximums and averages) under the Waste Discharge Requirements Order R5-2012-0058. The volumes are provided in barrels and also converted to acre-feet and gallons for ease of reference.

Chemical Data

On August 11, 2015, Chevron voluntarily provided information to the Regional Board regarding chemical usage within the Kern River Field in response to a verbal request from Mr. Rodgers. Information clarifying some minor differences in the enclosed summary tables from Chevron’s prior submittal is contained in notations on each summary table and relate primarily to the fact that the previous submittal was a snapshot in time that included items approved for use but that
were not actually used during the specified time period contained in the Order or what Chevron understood to be the scope of Mr. Rodgers’ verbal request that was clarified in the Order. In addition, a new summary table has been added based on the expanded and clarified scope of information requested by the Order.

Enclosed are five separate summary tables: (1) Water Treatment Facility, (2) Satellite Facilities, (3) Kern River Drilling, (4) Production Operations, and (5) Underground Injection Control (“UIC”) Testing. Each Summary Table identifies the product name, product number (if available), supplier, product purpose, product use, frequency of use, units of measure, and volumes/quantities used on a quarterly basis from January 1, 2014 through March 31, 2016 for that chemical. The volumes/quantities are rounded to whole numbers given the scale involved. The Safety Data Sheets for each chemical listed in the summary tables are also enclosed. Additional information regarding each of these summary tables is provided below.

**Water Treatment Facility**

The water treatment facility (Station 36) is where the oil and water produced within the Kern River Field are physically separated and produced water is treated prior to it being reused in the field or provided to Cawelo. As indicated on the Water Treatment Facility Summary Table, there were 10 chemicals used during the time period of January 1, 2014 through March 31, 2016 in the process of separating the oil from the water.

**Satellite Facilities**

Within the 20 square miles that constitute the Kern River Field, there are multiple satellite facilities utilized to measure produced fluids during the journey of the fluids from the individual wells to the water treatment facility. The Satellite Facilities Summary Table contains a list of the 9 chemicals that were used at these facilities from January 1, 2014 to March 31, 2016 to aid in the transportation of the produced fluids within the field.

**Kern River Drilling**

The Kern River Drilling Summary Table contains a list of the 16 products actually used in the process of drilling wells in the Kern River Field during the time period of January 1, 2014 to March 31, 2016. In contrast, the Drilling Summary Table submitted by Chevron to the Regional Board on August 11, 2015 included 58 chemicals approved for use as needed at that time for drilling wells in the Kern River Field, whether or not such chemicals were actually used.

This list of products collectively constitutes what is referred to as “drilling mud”. The drilling mud is made up of various combinations of the products listed in the summary table as needed to address conditions encountered in each well drilled. Drilling mud is generally recaptured as part of the drilling process and reused as part of the drilling of subsequent wells and therefore is not part of the produced fluids.

During drilling, the drilling mud is continuously circulated into the wellbore. On occasion, conditions encountered while drilling may cause the drilling mud to flow into the formation.
This is referred to as “lost circulation”. Lost circulation is not generally recaptured as part of the drilling process and may be produced once the well is put on production.

In this summary table, the drilling mud quantities are approximated based on incidents of lost circulation during the time period of January 1, 2014 through March 31, 2016. Only the estimated quantity of drilling mud lost to the formation has been included in the summary table.

It is important to note that the product quantities on this summary table are the total dry quantities of these products in pounds. When these products are used, they are diluted with water thereby significantly reducing the concentration of the chemicals in the drilling mud. The exact dilution ratio varies depending on the needs of the well.

Over the time period of January 1, 2014 through March 31, 2016, there were a total of 201 instances of lost circulation in the Kern River Field. During that same time period, 812 wells were drilled or re-drilled in the Kern River Field.

Production Operations

The Production Operations Summary Table contains a list of the 12 chemicals that were used in maintenance operations on wells within the Kern River Field or to address flow issues in production gathering lines during the time period from January 1, 2014 to March 31, 2016.

Underground Injection Control Testing

The Order includes the following clarifying statement:

“As clarification, any chemicals used in enhanced oil recovery wells (i.e., such as water flood or steam injection wells) that could be captured by oil recovery wells that supply produced water for irrigation must also be reported.”

This clarifying language is what led to the inclusion of the UIC Testing Summary Table. As part of the UIC program administered by the Division of Oil, Gas and Geothermal Resources, mechanical integrity testing is required to demonstrate confinement of injection fluids to the injection zone. See 14 California Code of Regulations §1724.10(j). Tracer surveys are a testing method approved by the DOGGR to demonstrate confinement. See 14 California Code of Regulations §1954. In the Kern River Field, tracers are used to demonstrate confinement/containment in injection wells. Data regarding the 3 tracers used is contained in the UIC Testing Summary Table.

Volume Comparison

Submittal of this data does not mean that the chemicals listed are actually present in the blended produced water distributed to Cawelo and ultimately used by farmers for irrigation from Cawelo. This data does not account for (1) constituents that are removed from the water; (2) constituents that remain with non-water portions of the produced fluids; (3) constituents that may be retained in the formation; and (4) the blending with surface and ground water that occurs in Cawelo’s
facilities before the water is delivered for use in irrigation. Further, taken alone, this raw data does not account for the dilution provided by the total produced water volumes from the Kern River Field. For illustration and as an extremely conservative assumption, even if the total volume of chemicals used (1,078,871 gallons) over the requested timeframe was assumed to be 100% contained in produced water (which it is not), this equates to only six hundred-thousandths (0.00006) of the total water (17,593,158,062 gallons) produced from the Kern River Field over the time period from January 1, 2014 to March 31, 2016. The total quantity of drilling mud lost to the formation (10,192,897 pounds) equates to only seven hundred-thousandths (0.00007) of the total water produced (17,593,158,062 gallons equals 146,823,281,721 pounds). Even using these overly conservative assumptions, the chemical use within the field is extremely small compared to the overall volume of water produced.

If you need any additional information, please contact Abby Auffant at (661) 392-2869.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,
Chevron U.S.A. Inc.

By: [Signature]
Gary Piron
Kern River Field Area Manager

Enclosures:
- 6/3/2016 email
- Summary Tables
- Safety Data Sheets

Cc with enclosures:
- Julie Macedo, Office of Enforcement, State Water Resources Control Board, Sacramento
- David Ansolabehere, Cawelo Water District
Clay,

This email is a follow up to our telephone conversation this afternoon regarding the deadline to respond to the 13267 order issued to Chevron for chemical usage information from Chevron’s operations at Kern River Field. The current deadline for the response to the 13267 order is June 13, 2016. As discussed, this is the same date set for the field tour for the members of the Food Safety Panel that I will be conducting. In our conversation, you agreed to allow Chevron an extension of time to respond to the 13267 order to June 17, 2016.

Thank you for your consideration in this matter.

Sincerely,

Abby Auffant
UIC / Water Regulatory Coordinator
San Joaquin Valley Business Unit
Chevron North America Exploration and Production Company
(a Chevron U.S.A. Inc. division)
1546 China Grade Loop, D14
Bakersfield, CA 93308
Tel  661 392 2869
Fax 661 392 2897
AMAuffant@chevron.com

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### Volumes of Produced Water Provided to Cawelo Water District for Irrigation

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Volumes (barrels)</th>
<th>Volumes (acre-feet)</th>
<th>Volumes (gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 2014</td>
<td>44,995,181</td>
<td>5,800</td>
<td>1,889,797,621</td>
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<tr>
<td>Q2 2014</td>
<td>46,720,979</td>
<td>6,022</td>
<td>1,962,281,118</td>
</tr>
<tr>
<td>Q3 2014</td>
<td>49,408,331</td>
<td>6,368</td>
<td>2,075,149,902</td>
</tr>
<tr>
<td>Q4 2014</td>
<td>46,716,724</td>
<td>6,021</td>
<td>1,962,102,408</td>
</tr>
<tr>
<td>Q1 2015</td>
<td>46,042,558</td>
<td>5,935</td>
<td>1,933,787,436</td>
</tr>
<tr>
<td>Q2 2015</td>
<td>45,726,160</td>
<td>5,894</td>
<td>1,920,498,720</td>
</tr>
<tr>
<td>Q3 2015</td>
<td>46,558,616</td>
<td>6,001</td>
<td>1,955,461,885</td>
</tr>
<tr>
<td>Q4 2015</td>
<td>45,950,848</td>
<td>5,923</td>
<td>1,929,935,616</td>
</tr>
<tr>
<td>Q1 2016</td>
<td>46,765,318</td>
<td>6,028</td>
<td>1,964,143,356</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>418,884,716</strong></td>
<td><strong>53,991</strong></td>
<td><strong>17,593,158,062</strong></td>
</tr>
</tbody>
</table>
## Water Treatment Facility

### Summary Table

<table>
<thead>
<tr>
<th>#</th>
<th>Product Name</th>
<th>Product Number</th>
<th>Supplier</th>
<th>Product Purpose</th>
<th>Product Use</th>
<th>Frequency of Use</th>
<th>Units of Measure</th>
<th>1Q 2014</th>
<th>2Q 2014</th>
<th>3Q 2014</th>
<th>4Q 2014</th>
<th>1Q 2015</th>
<th>2Q 2015</th>
<th>3Q 2015</th>
<th>4Q 2015</th>
<th>1Q 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BPB 99480</td>
<td>BPB99480</td>
<td>Baker Hughes Company</td>
<td>Prevent corrosion of internal heat exchange equipment within oil holding tanks.</td>
<td>Baker Water Treatment.</td>
<td>Continuous</td>
<td>Gallons</td>
<td>860</td>
<td>1,190</td>
<td>265</td>
<td>6</td>
<td>365</td>
<td>228</td>
<td>1,035</td>
<td>375</td>
<td>32</td>
</tr>
<tr>
<td>2</td>
<td>CLO64 CLEANER</td>
<td>CLO64</td>
<td>Baker Hughes Company</td>
<td>Remove oil coating on oil separators to improve performance of oil separators.</td>
<td>Cleaner</td>
<td>Batch</td>
<td>Gallons</td>
<td>805</td>
<td>915</td>
<td>960</td>
<td>1,057</td>
<td>406</td>
<td>644</td>
<td>1,019</td>
<td>1,361</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>CLW3075 CLEANER *</td>
<td>CLW3075</td>
<td>Baker Hughes Company</td>
<td>Remove oil coating on oil separators to improve performance of oil separators.</td>
<td>Cleaner</td>
<td>Batch</td>
<td>Gallons</td>
<td>5</td>
<td>185</td>
<td>80</td>
<td>160</td>
<td>291</td>
<td>25</td>
<td>80</td>
<td>172</td>
<td>165</td>
</tr>
<tr>
<td>4</td>
<td>OSW5200 OXYGEN SCAVENGER</td>
<td>OSW5200</td>
<td>Baker Hughes Company</td>
<td>Remove dissolved oxygen from lease water. Protects piping against corrosion.</td>
<td>Oxygen Scavenger</td>
<td>Continuous</td>
<td>Gallons</td>
<td>2,115</td>
<td>2,110</td>
<td>935</td>
<td>1,200</td>
<td>1,641</td>
<td>1,755</td>
<td>2,232</td>
<td>1,833</td>
<td>1,699</td>
</tr>
<tr>
<td>5</td>
<td>TECHNI-HIB 3743 **</td>
<td>CRW3743</td>
<td>Baker Hughes Company</td>
<td>Prevent corrosion of carbon steel piping</td>
<td>Corrosion Inhibitor</td>
<td>Continuous</td>
<td>Gallons</td>
<td>8,851</td>
<td>5,624</td>
<td>7,317</td>
<td>7,740</td>
<td>6,782</td>
<td>7,200</td>
<td>8,431</td>
<td>4,428</td>
<td>3,838</td>
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<tr>
<td>6</td>
<td>TRETOLITE™ FLW163 FLOTATION AID</td>
<td>FLW163</td>
<td>Baker Hughes Company</td>
<td>Improves water quality by removing oil and suspended solids from water</td>
<td>Floation Aid</td>
<td>Continuous</td>
<td>Gallons</td>
<td>2,795</td>
<td>2,850</td>
<td>3,855</td>
<td>3,390</td>
<td>2,928</td>
<td>3,372</td>
<td>2,228</td>
<td>2,827</td>
<td>2,052</td>
</tr>
<tr>
<td>7</td>
<td>TRETOLITE™ RBW517 WATER CLARIFIER</td>
<td>RBW517</td>
<td>Baker Hughes Company</td>
<td>Improves water quality by removing oil from water</td>
<td>Water Clarifier</td>
<td>Continuous</td>
<td>Gallons</td>
<td>9</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td>N/A</td>
<td>5</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>TRETOLITE™ RBW811 WATER CLARIFIER</td>
<td>RBW811</td>
<td>Baker Hughes Company</td>
<td>Improves water quality by removing oil from water</td>
<td>Water Clarifier</td>
<td>Continuous</td>
<td>Gallons</td>
<td>40</td>
<td>45</td>
<td>40</td>
<td>26</td>
<td>9</td>
<td>6</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>TRETOLITE™ RBW777W WATER CLARIFIER</td>
<td>RBW777W</td>
<td>Baker Hughes Company</td>
<td>Improves water quality by removing oil from water</td>
<td>Water Clarifier</td>
<td>Continuous</td>
<td>Gallons</td>
<td>105</td>
<td>55</td>
<td>135</td>
<td>360</td>
<td>129</td>
<td>500</td>
<td>30</td>
<td>N/A</td>
<td>59</td>
</tr>
<tr>
<td>10</td>
<td>WAW4000 WETTING AGENT</td>
<td>WAW4000</td>
<td>Baker Hughes Company</td>
<td>Allows continuous water contact on the surface of highly sensitive light detectors to allow equipment to function as designed to measure oil and water for monitoring of water quality specifications</td>
<td>Wetting Agent</td>
<td>Continuous</td>
<td>Gallons</td>
<td>2,405</td>
<td>2,345</td>
<td>2,075</td>
<td>2,100</td>
<td>2,043</td>
<td>2,533</td>
<td>2,312</td>
<td>1,757</td>
<td>2,071</td>
</tr>
</tbody>
</table>

* CLW3075 was included in the 8/11/2015 submittal in the summary table for the Satellite Facilities. It should have been included in the summary table for the Water Treatment Facility.

** CRW3743 was included in the 8/11/2015 submittal in the summary table for the Satellite Facilities. However, this product is also used at the Water Treatment Facility and is now identified on both summary tables.
| #  | Product Name          | Product Number | Supplier                          | Purpose                                                                 | Product Use | Units of Measure | 1Q 2014 | 2Q 2014 | 3Q 2014 | 4Q 2014 | 1Q 2015 | 2Q 2015 | 3Q 2015 | 4Q 2015 | 1Q 2016 |
|----|----------------------|----------------|-----------------------------------|-------------------------------------------------------------------------|-------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1  | DFO91 DEFOAMER       | DFO91          | Baker Petrolite                   | Water Treatment Facility to prevent liquid carryover into vapor recovery system | Defoamer    | Gallons          | 4,238   | 4,490   | 4,395   | 4,835   | 4,904   | 5,055   | 5,194   | 3,855   | 3,934   |
| 2  | PAO3857Y PARAFFIN DISPERSANT * | PAO3857Y | Baker Hughes Company              | Disperse oil in water to prevent plugging in pipelines                  | Paraffin Dispensant | Gallons    | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | 100      | N/A     | N/A     |
| 3  | PAW4H4 ASPHALTIC CRUDE EMULSIFIER | PAW4H4 | Baker Petrolite                   | Disperse oil in water to prevent plugging in pipelines                  | Emulsifier  | Gallons          | 6,472   | 5,914   | 6,419   | 5,852   | 6,106   | 5,097   | 4,122   | 3,942   |         |
| 4  | RE8869DMO EMULSIFIER  | RE8869DMO      | Baker Petrolite                   | Improves oil quality by removing water from oil                         | Emulsifier  | Gallons          | 3,578   | 4,709   | 4,438   | 3,574   | 2,564   | 2,316   | 2,547   |         |         |
| 5  | TRETOLITE™ RBW213 WATER CLARIFIER | RBW213 | Baker Petrolite                   | Prevent corrosion of carbon steel piping                                | Corrosion Inhibitor | Gallons    | 7,508   | 8,366   | 8,915   | 8,805   | 9,037   | 9,219   | 4,278   | 3,376   |         |
| 6  | TRETOLITE™ RBW301X WATER CLARIFIER | RBW301X | Baker Petrolite                   | Improves water quality by removing oil from water                       | Water Clarifier | Gallons    | 100     | 15      | N/A     | N/A     | 31      | 396     | N/A      | N/A     |         |
| 7  | WCC3020 COMBINATION INHIBITOR | WCC3020 | Baker Petrolite                   | Serves two purposes: (1) improves water quality by removing oil from water, and (2) prevents corrosion of carbon steel piping | Water clarifier | Gallons    | 14,782  | 14,808  | 14,085  | 14,102  | 14,782  | 12,790  | 12,474   | 10,968  | 8,178   | 9,338   |
| 8  | WCW4527 COMBINATION ASPHALTIC OIL EMULSIFIER/CORROSION INHIBITOR * | WCW4527 | Baker Petrolite                   | Serves two purposes: (1) improves water quality by removing oil from water, and (2) prevents corrosion of carbon steel piping | Emulsifier Corrosion inhibitor | Gallons    | N/A     | 475     | 350     | N/A     | 59      | 240     | 439     | 235     | 242     |

* PAO3857Y and WCW4527 were not included in 8/11/2015 submittal because these products were not in use at that time.
<table>
<thead>
<tr>
<th>#</th>
<th>Product Name</th>
<th>Product Number</th>
<th>Supplier</th>
<th>Product Purpose</th>
<th>Product Use</th>
<th>Frequency of Use</th>
<th>Units of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>8,800</td>
<td>10,800</td>
<td>8,300</td>
<td>10,000</td>
</tr>
<tr>
<td>2</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>41,600</td>
<td>71,654</td>
<td>23,840</td>
<td>N/A</td>
</tr>
<tr>
<td>3</td>
<td>Thickening agent that increases viscosity, provides material suspension and creates a temporary barrier to prevent flow into the reservoir</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>13,300</td>
<td>18,200</td>
<td>12,450</td>
<td>15,000</td>
</tr>
<tr>
<td>4</td>
<td>Thickening agent that increases viscosity, provides material suspension and creates a temporary barrier to prevent flow into the reservoir</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>941,485</td>
<td>512,908</td>
<td>105,350</td>
<td>N/A</td>
</tr>
<tr>
<td>5</td>
<td>Thickening agent that increases viscosity, provides material suspension and creates a temporary barrier to prevent flow into the reservoir</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>14,960</td>
<td>19,360</td>
<td>14,110</td>
<td>17,000</td>
</tr>
<tr>
<td>6</td>
<td>Thickening agent that increases viscosity, provides material suspension and creates a temporary barrier to prevent flow into the reservoir</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>13,200</td>
<td>16,200</td>
<td>12,450</td>
<td>15,000</td>
</tr>
<tr>
<td>7</td>
<td>Thickening agent that increases viscosity, provides material suspension and creates a temporary barrier to prevent flow into the reservoir</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>541,485</td>
<td>512,908</td>
<td>105,350</td>
<td>N/A</td>
</tr>
<tr>
<td>8</td>
<td>Thickening agent that increases viscosity, provides material suspension and creates a temporary barrier to prevent flow into the reservoir</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>13,200</td>
<td>16,200</td>
<td>12,450</td>
<td>15,000</td>
</tr>
<tr>
<td>9</td>
<td>Thickening agent that increases viscosity, provides material suspension and creates a temporary barrier to prevent flow into the reservoir</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>13,200</td>
<td>16,200</td>
<td>12,450</td>
<td>15,000</td>
</tr>
<tr>
<td>10</td>
<td>Thickening agent that increases viscosity and provides material suspension</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>10,400</td>
<td>17,916</td>
<td>9,760</td>
<td>13,717</td>
</tr>
<tr>
<td>11</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>112,800</td>
<td>189,980</td>
<td>91,100</td>
<td>111,712</td>
</tr>
<tr>
<td>12</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>60,800</td>
<td>100,380</td>
<td>38,100</td>
<td>10,000</td>
</tr>
<tr>
<td>13</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>112,800</td>
<td>189,980</td>
<td>91,100</td>
<td>111,712</td>
</tr>
<tr>
<td>14</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>5,200</td>
<td>8,958</td>
<td>4,430</td>
<td>6,357</td>
</tr>
<tr>
<td>15</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>61,984</td>
<td>58,618</td>
<td>16,372</td>
<td>43,596</td>
</tr>
<tr>
<td>16</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>22,560</td>
<td>22,560</td>
<td>22,560</td>
<td>22,560</td>
</tr>
<tr>
<td>17</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>22,560</td>
<td>22,560</td>
<td>22,560</td>
<td>22,560</td>
</tr>
<tr>
<td>18</td>
<td>Lost circulation material used during drilling operations. When circulating fluids are not being returned to the surface, the material is used as a plugging agent to seal off the formation in attempts to regain fluid circulation.</td>
<td>As needed during drilling</td>
<td>Lbs</td>
<td>18,480</td>
<td>22,680</td>
<td>17,430</td>
<td>21,000</td>
</tr>
</tbody>
</table>

* This list represents all of the products that were actually used during the time period of 1/1/2014 to 3/31/2016. The list submitted on 8/11/2015 represented products approved for use as needed in the process of drilling new wells at that time.

** DUAL-FLO and M-I GEL were not included in the 8/11/2015 submittal because the products were not in use at that time.

*** SAFE-CARB is a calcium carbonate based material. Calcium carbonate was disclosed in the 8/11/2015 submittal, but SAFE-CARB was not explicitly identified. SAFE-CARB has three different particle sizes in drilling operations. The different particle sizes are identified by the number after SAFE-CARB in lines 11, 12 and 13. However, the composition of the product is the same and only one Safety Data Sheet is provided.
<table>
<thead>
<tr>
<th>#</th>
<th>Product Name</th>
<th>Product Number</th>
<th>Supplier</th>
<th>Product Purpose</th>
<th>Product Use</th>
<th>Frequency of Use</th>
<th>Units of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Defoamer 40 AQXS</td>
<td>40AQXS</td>
<td>Argo Chemical, Inc.</td>
<td>Prevents wellwork operations foam returns from overfilling the return tank sprayed onto the foam in the return tanks to dissipate foam</td>
<td>Foam Control Agent</td>
<td>Individual Treatment</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>641</td>
<td>714</td>
</tr>
<tr>
<td>2</td>
<td>DF-10 Defoamer</td>
<td>DF-10 Defoamer</td>
<td>CHEMEX CHEMICALS, INC.</td>
<td>Prevents wellwork operations foam returns from overfilling the return tank sprayed onto the foam in the return tanks to dissipate foam</td>
<td>Anti-Foam Emulsion</td>
<td>Individual Treatment</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,025</td>
<td>2,132</td>
</tr>
<tr>
<td>3</td>
<td>EnviroSB FA</td>
<td>SB-0330</td>
<td>Enova Solutions Inc.</td>
<td>Consolidates sand to prevent fine sand from entering wellbores which can restrict flow</td>
<td>Sand Control</td>
<td>Individual Treatment</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>484</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>EnviroSB SCS</td>
<td>SB-1113</td>
<td>Enova Solutions Inc.</td>
<td>Consolidates sand to prevent fine sand from entering wellbores which can restrict flow</td>
<td>Sand Control</td>
<td>Individual Treatment</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>809</td>
<td>178</td>
</tr>
<tr>
<td>5</td>
<td>F-603 Foam Soap</td>
<td>F-603 Foam Soap</td>
<td>CHEMEX CHEMICALS, INC.</td>
<td>Carry agent to remove sand from the wellbore (sprayed downhole mixed with water and air to produce a foam to carry sand particles out of the wellbore)</td>
<td>Washing, Viscosizing, Treating Compound</td>
<td>Individual Treatment</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Baker Hughes Company</td>
<td></td>
<td></td>
<td>8,820</td>
<td>9,744</td>
</tr>
<tr>
<td>6</td>
<td>PAW4HF ASPHALTIC CRUDE EMULSIFIER</td>
<td>PAW4HF</td>
<td>Baker Hughes Company</td>
<td>Disperse oil in water to prevent plugging in pipelines</td>
<td>Emulsifier</td>
<td>Continuous</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23,565</td>
<td>34,896</td>
</tr>
<tr>
<td>7</td>
<td>EnovaSB selectively SCATTERED SCAVENGER</td>
<td>HSW700</td>
<td>Baker Hughes Company</td>
<td>Mist with water and periodically use during wellwork operations to absorb excess H2S in casing gas</td>
<td>Hydrogen Sulfide Scavenger</td>
<td>Individual Treatment</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>121</td>
<td>133</td>
</tr>
<tr>
<td>8</td>
<td>SURF-SOL</td>
<td>KL 6200-D</td>
<td>Enova Solutions Inc.</td>
<td>Prevents downhole flow restrictions due to solids deposition from oil</td>
<td>Work-Over Fluid</td>
<td>Individual Treatment</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,890</td>
<td>4,240</td>
</tr>
<tr>
<td>9</td>
<td>TECHNI-CHEK 3658</td>
<td>CRW2658</td>
<td>Baker Hughes Company</td>
<td>Prevent corrosion of carbon steel piping</td>
<td>Corrosion Inhibitor</td>
<td>Continuous</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>10</td>
<td>TECHNI-HIB 3743</td>
<td>CRW3743</td>
<td>Baker Hughes Company</td>
<td>Prevent corrosion of carbon steel piping</td>
<td>Corrosion Inhibitor</td>
<td>Continuous</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21,746</td>
<td>30,994</td>
</tr>
<tr>
<td>11</td>
<td>WCW9303 COMBINATION INHIBITOR</td>
<td>WCW9303</td>
<td>Baker Hughes Company</td>
<td>Disperse oil in water to prevent plugging in pipelines. Also prevents corrosion of carbon steel piping</td>
<td>Emulsifier: Corrosion inhibitor</td>
<td>Continuous</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
<td>4,927</td>
</tr>
<tr>
<td>12</td>
<td>WCW44527 COMBINATION INHIBITOR *</td>
<td>WCW44527</td>
<td>Baker Hughes Company</td>
<td>Disperse oil in water to prevent plugging in pipelines. Also prevents corrosion of carbon steel piping</td>
<td>Emulsifier: Corrosion inhibitor</td>
<td>Continuous</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10,553</td>
<td>11,761</td>
</tr>
</tbody>
</table>

* WCW44527 was not included in the 8/11/2015 submittal because it was not in use at that time.
** DM0146, DMW9990X, and PEP2 were included in the 8/11/2015 submittal but are not included here as these products were not actually used from 1/1/2014 to 3/31/2016.
<table>
<thead>
<tr>
<th>#</th>
<th>Product Name</th>
<th>Product Number</th>
<th>Supplier</th>
<th>Product Purpose</th>
<th>Product Use</th>
<th>Frequency of Use</th>
<th>Units of Measure</th>
<th>1Q 2014</th>
<th>2Q 2014</th>
<th>3Q 2014</th>
<th>4Q 2014</th>
<th>1Q 2015</th>
<th>2Q 2015</th>
<th>3Q 2015</th>
<th>4Q 2015</th>
<th>1Q 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sodium Iodide Iodine 131 Solution (I-131)</td>
<td>N/A</td>
<td>Nordion</td>
<td>Tracer to confirm how steam is distributed to oil-bearing zone(s) in steam injectors and to identify potential leaks</td>
<td>Injected into steam injectors; adheres to liquid phase of steam</td>
<td>As needed for compliance testing</td>
<td>Millicurie (mCi)</td>
<td>98</td>
<td>357</td>
<td>308</td>
<td>98</td>
<td>203</td>
<td>175</td>
<td>203</td>
<td>28</td>
<td>42</td>
</tr>
<tr>
<td>2</td>
<td>Xenon-133 (Xe-133)</td>
<td>N/A</td>
<td>Nordion</td>
<td>Tracer to confirm how steam is distributed to oil-bearing zone(s) in steam injectors and to identify potential leaks</td>
<td>Injected into steam injectors; adheres to vapor phase of steam</td>
<td>As needed for compliance testing</td>
<td>Millicurie (mCi)</td>
<td>5,450</td>
<td>18,350</td>
<td>15,750</td>
<td>4,100</td>
<td>8,800</td>
<td>8,700</td>
<td>11,000</td>
<td>1,500</td>
<td>2,100</td>
</tr>
<tr>
<td>3</td>
<td>Krypton-85 (Kr-85)</td>
<td>N/A</td>
<td>Varies</td>
<td>Tracer to confirm how steam is distributed to oil-bearing zone(s) in steam injectors and to identify potential leaks</td>
<td>Injected into steam injectors; adheres to vapor phase of steam</td>
<td>As needed for compliance testing</td>
<td>Millicurie (mCi)</td>
<td>2,400</td>
<td>5,200</td>
<td>4,800</td>
<td>1,950</td>
<td>6,500</td>
<td>5,100</td>
<td>3,800</td>
<td>800</td>
<td>700</td>
</tr>
</tbody>
</table>
OSHA Material Safety Data Sheet

Kern River Drilling Summary Table: #1

Section I - Manufacturer's Name

Producers Cotton Oil Co.
Address (Number, Street, City, State, and ZIP Code)
P.O. Box 1932
Fresno, CA 93717

Emergency Telephone Number
(209) 487-7920

Section II - Hazardous Ingredient/Identity Information

Hazardous Component (Special Chemical Identity, Common Name(s))
Cottonseed Hull Pellets

OSHA PEL ACGIH TLV Other Limits Recommended % (optional)

N/A

(15 mg/m³ total)*

(5 mg/m³ respirable)*

This is the OSHA PEL for "particulates not otherwise regulated" as found in Table 21 of 29 CFR 1910.1000.

Section III - Physical/Chemical Characteristics

Boiling Point N/A Specific Gravity (H₂O = 1) 1.2-1.6

Vapor Pressure (mm Hg) N/A Melting Point N/A

Vapor Density (Air = 1) N/A Evaporation Rate N/A

Solubility in Water insoluble

Appearance and Color

White fibers (amorphous solid), lignin seed hull

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used) N/A Flammable Limits N/A LEL 55gm/m³ UEL unknown

Extinguishing Media

Use water; carbon dioxide, foam or dry chemical.

Special Fire Fighting Procedures

Do not use direct hose stream if dust can be dispersed into air.

Dust dispersed by water stream in the presence of an ignition source could cause an explosion.

If improperly handled, stored and/or exposed to an ignition source, this material may burn. Airborne dust in sufficient concentrations, when confined and exposed to a sufficient ignition source, can explode.
### Incompatibility (Materials to Avoid)

<table>
<thead>
<tr>
<th>Stable</th>
<th>Unstable</th>
<th>Conditions to Avoid</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable</td>
<td>Unstable</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### Section VI — Health Hazard Data

| Route(s) of Entry: Inhalation? | Yes | No |  | Ingestion? | No |
|--------------------------------|-----|----|  |            |    |

**Health Hazards (Acute and Chronic):** Excessive inhalation may affect the respiratory system. Smokers have an increased risk to respiratory effects. Contact may cause irritation to eyes.

**Carcinogenicity:** NTP? No

**WRC Monograph?** No

**OSHA Regulated?** No

**Signs and Symptoms of Exposure:** Some persons may occasionally experience airway irritation and coughing.

**Medical Conditions Generally Aggravated by Exposure:** Allergies and respiratory ailments.

**Emergency and First Aid Procedures:** Remove from exposure. Seek medical attention if needed. Flush eyes with water.

### Section VII — Precautions for Safe Handling and Use

**Steps to Be Taken in Case Material is Released or Spilled:** Normal housekeeping adequate. Respiratory protection recommended where levels cannot be controlled below PEL.

**Waste Disposal Method:** No restrictions - dispose with other general plant non-toxic solid waste.

**Precautions to Be Taken in Handling and Storing:** Maintain dry storage, avoid dispersion in air, and avoid exposure to potential ignition sources.

**Other Precautions:** N/A

### Section VIII — Control Measures

**Respiratory Protection (Specify Type):** Air purifying dust respirators approved by NIOSH or MSHA where needed.

<table>
<thead>
<tr>
<th>Ventilation</th>
<th>Local Exhaust</th>
<th>N/A</th>
<th>Special</th>
<th>Other</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mechanical (General)</td>
<td>Where needed.</td>
<td></td>
<td>Other</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Protective Gloves:** N/A

**Protective Clothing or Equipment:** Eye Protection - Goggles if needed.

**Wash Hygiene Practices:** Remove from skin by washing with soap and water.
MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: DUAL-FLO*
Chemical Family: Polysaccharide
Product Use: Oil well drilling fluid additive.
Emergency Telephone (24 hr.): 281-561-1600

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com
Telephone Number: 281-561-1512
Prepared by: Product Safety Group

Revision Number: 4

HMIS Rating
Health: 1 Flammability: 1 Physical Hazard: 0 PPE: E

HMIS Key: 4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause mechanical irritation of eyes, skin and respiratory tract. Long term inhalation of particulates may cause lung damage.

Canadian Classification: Not regulated.
WHMIS Class: Not a controlled product.

Physical State: Powder, dust.
Odor: Slight
Color: Off-white

Potential Health Effects:

Acute Effects

Eye Contact: May cause mechanical irritation.
Skin Contact: May cause mechanical irritation.
Inhalation: May cause mechanical irritation.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects:
See Section 11 - Toxicological Information.

Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>100</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact: 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.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash Point: F (C): NA
Flammable Limits in Air - Lower (%): ND
Flammable Limits in Air - Upper (%): ND
Autoignition Temperature: F (C): ND
Flammability Class: NA
Other Flammable Properties: Particulate may accumulate static electricity. Dusts at sufficient concentrations can form explosive mixtures with air.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.


6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate surrounding area, if necessary. Wet product may create a slipping hazard. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only with adequate ventilation. Wash thoroughly after handling.

Storage: Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>100</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Notes
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Not normally necessary. If needed to minimize irritation: Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as: Nitrile. Neoprene.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: Off-white
Odor: Slight
Physical State: Powder, dust.
pH: 8.0 - 10.45 (4% solution)
Specific Gravity (H2O = 1): 1.5 - 1.6 at 68 F (20 C)
Solubility (Water): Soluble
Flash Point: F (C): NA
Melting/Freezing Point: ND
Boiling Point: ND
Viscosity: 150 - 250 (2% solution)
Vapor Pressure: NA
Vapor Density (Air=1): NA
Evaporation Rate: NA
Odor Threshold(s): ND
10. STABILITY AND REACTIVITY

- **Chemical Stability:** Stable
- **Conditions to Avoid:** Keep away from heat, sparks and flame.
- **Materials to Avoid:** Oxidizers.
- **Hazardous Decomposition Products:** For thermal decomposition products, see Section 5.
- **Hazardous Polymerization:** Will not occur

11. TOXICOLOGICAL INFORMATION

- **Component Toxicological Data:** Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

- **Product Toxicological Information:**
  Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis ("dusty lung"), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

12. ECOLOGICAL INFORMATION

- **Product Ecotoxicity Data:** Contact M-I Environmental Affairs Department for available product ecotoxicity data.

- **Biodegration:** ND
- **Bioaccumulation:** ND
- **Octanol/Water Partition Coefficient:** ND

13. DISPOSAL CONSIDERATIONS

- **Waste Classification:** ND

- **Waste Management:** Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

- **Disposal Method:** Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

- **U.S. DOT Shipping Description:** Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

- **Canada TDG Shipping Description:** Not regulated.
- **UN PIN No:** Not regulated.

- **IMDG Shipping Description:** Not regulated.

- **ICAO/IATA Shipping Description:** Not regulated.
15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Not a SARA 311/312 hazard.

SARA 302/304, 313; CERCLA RQ, California Proposition 65: Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: Not a controlled product.

16. OTHER INFORMATION

The following sections have been revised: 1, 2, 3, 9, 16

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

Disclaimer:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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 guaranttee 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: DUO-VIS* L
Chemical Family: Mixture
Product Use: Drilling fluid additive.

Supplied by:
M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.slb.com

Telephone Number:
281-561-1512
Emergency Telephone (24 hr.):
281-561-1600
Prepared by:
Product Safety Group

Revision No.
3

HMIS Rating
Health: 1  Flammability: 1  Physical Hazard: 0  PPE: J

4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview:
Caution! May cause eye irritation. May be harmful if absorbed through skin.

Canadian Classification:
UN PIN No: Not regulated.  WHMIS Class: D2B

Physical State: Liquid  Color: Cream  Odor: Ether.

Potential Health Effects:
Acute Effects
Eye Contact: May irritate eyes.
Skin Contact: May be harmful if absorbed through skin. Not expected to cause skin irritation under anticipated workplace exposures.
Inhalation: Not expected to be an inhalation hazard under anticipated workplace exposures. Overexposure to vapors and mists which may be released at high temperatures may cause central nervous system (CNS) effects and respiratory tract irritation.
Ingestion: May cause gastric distress, nausea and vomiting if ingested. Aspiration can be a hazard if this material is swallowed.

Carcinogenicity & Chronic Effects:
See Section 11 - Toxicological Information.

Routes of Exposure:
Eyes. Dermal (skin) contact. Dermal (skin) absorption. Inhalation.

Target Organs/Medical Conditions Aggravated by Overexposure:
3. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredient                          | CAS No.     | Wt. %  | Comments:
|-------------------------------------|-------------|--------|----------------
| Dipropylene glycol methyl ether     | 34590-94-8 | 30 - 60| No comments.   
| Xanthan gum                        | 11138-66-2 | 30 - 60| No comments.   

Composition Comments: Component LD50 and LC50 values are provided in Section 11, if available.

4. FIRST AID MEASURES

Eye Contact: Promptly wash eyes with lots of water while lifting eye lids. Look for and remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Do not induce vomiting. Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. Get immediate medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

Notes To Physician: Aspiration may cause severe lung damage. Evacuate stomach in a way which avoids aspiration.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash Point: F (C): 211F (99C)
Flash Point Method: PMCC
Flammable Limits in Air - Lower (%): ND
Flammable Limits in Air - Upper (%): ND
Autoignition Temperature: F (C): ND
Explosion Data - Sensitivity to Mechanical Impact: NA
Explosion Data - Sensitivity to Static Discharge: If applicable, information is provided in Section 5 Special Fire-Fighting Procedures, Other Flammable Properties and Section 6 Spill Procedures.

Flammability Class: IIIB
Extinguishing Media: Water fog, carbon dioxide, foam, dry chemical.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.

Conditions of Flammability: Products are classified as flammable/combustible based on flash point as defined in the Health Canada Controlled Products Regulations, U.S. Occupational Health and Safety Administration Hazard Communication Standard and transportation regulations. See Sections 1, 2, 5, 14 and 15 for flammable/combustible classification information. Flammable/combustible materials may ignite and burn if exposed to a flame or other sources of ignition.

Other Flammable Properties: ND

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate the spill area with the exception of the spill response team. Keep personnel removed and upwind of spill. Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Shut off leak if it can be done safely. Contain spilled material. Do not allow spilled material to enter sewers, storm drains or surface waters. Absorb in vermiculite, dry sand or earth. Place into containers for disposal.

Environmental Precautions: Waste must be disposed of in accordance with federal, state and local laws. In the U.S., for products with reportable quantity (RQ) components - if the RQ is exceeded, report to National Spill Response Office at 1 800 424 8802.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid breathing vapors or spray mists. Use only in a well ventilated area. Ground and bond containers when transferring material. Wash thoroughly after handling.

Storage: Store in dry, well-ventilated area. Keep container closed. Keep away from heat, sparks and flames. Store away from incompatibles.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other (ppm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td>34590-94-8</td>
<td>30 - 60</td>
<td>100 ppm</td>
<td>100 ppm</td>
<td>150 ppm STEL (NIOSH) (skin)</td>
<td></td>
</tr>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>30 - 60</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Notes
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).
(skin) Potential for cutaneous absorption.

Engineering Controls: Local exhaust ventilation as necessary to maintain exposures to within applicable limits.

Personal Protection Equipment
All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

**Eye/Face Protection:**
Wear chemical safety goggles.

**Skin Protection:**
Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as nitrile or neoprene.

**Respiratory Protection:**
All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne mist/aerosol of this product, use at least a NIOSH-approved N95 half-mask disposable or re-usable particulate respirator. In work environments containing oil mist/aerosol, use at least a NIOSH-approved P95 half-mask disposable or re-usable particulate respirator.

If exposed to vapors from this product use a NIOSH/MSHA-approved respirator with an Organic Vapor cartridge.

**General Hygiene Considerations:**
Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>Cream</td>
</tr>
<tr>
<td>Odor:</td>
<td>Ether.</td>
</tr>
<tr>
<td>Physical State:</td>
<td>Liquid</td>
</tr>
<tr>
<td>pH:</td>
<td>7.0 (1% solution)</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1):</td>
<td>1.1</td>
</tr>
<tr>
<td>Solubility (Water):</td>
<td>Soluble</td>
</tr>
<tr>
<td>Flash Point: F (C):</td>
<td>211F (99C)</td>
</tr>
<tr>
<td>Melting/Freezing Point:</td>
<td>&lt;-100C (-73C)</td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>&gt;300F (149C)</td>
</tr>
<tr>
<td>Vapor Pressure:</td>
<td>0.4 mm Hg at 77F (25C)</td>
</tr>
<tr>
<td>Vapor Density (Air=1):</td>
<td>5.1</td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>ND</td>
</tr>
<tr>
<td>Octanol/Water Partition Coefficient:</td>
<td>ND</td>
</tr>
<tr>
<td>Odor Threshold(s):</td>
<td>ND</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Stability:</td>
<td>Stable</td>
</tr>
<tr>
<td>Conditions to Avoid:</td>
<td>Keep away from heat, sparks and flame.</td>
</tr>
<tr>
<td>Materials to Avoid:</td>
<td>Oxidizers.</td>
</tr>
<tr>
<td>Conditions of Reactivity:</td>
<td>See Conditions and Materials to Avoid, if applicable.</td>
</tr>
<tr>
<td>Hazardous Decomposition Products:</td>
<td>For thermal decomposition products, see Section 5.</td>
</tr>
<tr>
<td>Hazardous Polymerization:</td>
<td>Will not occur</td>
</tr>
</tbody>
</table>
11. TOXICOLOGICAL INFORMATION

Acute Exposure Effects, Irritation and Sensitization: See Section 2.
Chronic, Carcinogenicity, Reproductive Toxicity, Teratogenicity, Embryotoxicity, Mutagenicity Effects: See Component Toxicological Summary and Product Toxicological Information, if available.
Synergistic Products/Effects: ND

Component Toxicological Data: Any adverse component toxicological effects and acute toxicity values (LD50s, LC50s) are listed below. If no effects or acute values are listed for components, no such data were identified.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Acute Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td>34590-94-8</td>
<td>Oral LD50 5.4 g/kg (rat); Dermal LD50 5.1 g/kg (rabbit); Inhalation LC50 &gt;400 ppm/7H (rat)</td>
</tr>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Oral LD50: &gt; 5,000 mg/kg (rat)</td>
</tr>
</tbody>
</table>

Product Toxicological Information: No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

Component Ecotoxicity Data: Component ecotoxicity data are listed below. If no data are listed, none were found in the component review.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td>34590-94-8</td>
<td>LC50 96H: 10,000 mg/l (fathead minnow); EC50 48H: 5000 mg/l (Daphnia)</td>
</tr>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>LC50 96H: 490 mg/l (rainbow trout); LC50 48H: 980 mg/l (Daphnia magna)</td>
</tr>
</tbody>
</table>

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.
Biodegradation: ND
Bioaccumulation: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: ND
Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION
MATERIAL SAFETY DATA SHEET
Trade Name: DUO-VIS* L

Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.
Canada TDG Shipping Description: Not regulated.
UN PIN No: Not regulated.
IMDG Shipping Description: Not regulated.
ICAO/IATA Shipping Description: Not regulated.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Immediate (acute) health hazard.

SARA 302/304, 313; CERCLA RQ, California Proposition 65: Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
New Zealand - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: D2B

16. OTHER INFORMATION

The following sections have been revised: 1, 2, 6, 9, 14, 15, 16. Format changes.

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

Disclaimer:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: DUO-VIS*
Chemical Family: Mixture
Product Use: Oil well drilling fluid additive.
Emergency Telephone (24 hr.): 281-561-1600

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com

Telephone Number: 281-561-1512
Prepared by: Product Safety Group

Revision Number: 4

HMIS Rating
Health: 2 Flammability: 1 Physical Hazard: 0 PPE: E

HMIS Key: 4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Warning! May cause eye, skin, and respiratory tract irritation. May cause skin sensitization, an allergic reaction, on repeated exposure. Long term inhalation of particulates may cause lung damage.

Canadian Classification:
UN PIN No: Not regulated. WHMIS Class: D2B

Physical State: Powder.
Odor: Slight Color: White to Tan

Potential Health Effects:

Acute Effects
Eye Contact: May irritate eyes.
Skin Contact: May be irritating to the skin. May cause skin sensitization, an allergic reaction, on repeated exposure.
Inhalation: May be irritating to the respiratory tract. Long term inhalation of particulate may cause lung damage.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects: See Section 11 - Toxicological Information.

Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>99 - 99.9</td>
<td>No comments.</td>
</tr>
<tr>
<td>Glyoxal</td>
<td>107-22-2</td>
<td>0.1 - 1</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact: 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.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash Point: F (C): NA
Flammable Limits in Air - Lower (%): ND
Flammable Limits in Air - Upper (%): ND
Autoignition Temperature: F (C): ND
Flammability Class: ND
Other Flammable Properties: Particulate may accumulate static electricity. Dusts at sufficient concentrations can form explosive mixtures with air.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.


6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate surrounding area, if necessary. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only with adequate ventilation. Wash thoroughly after handling.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>99 - 99.9</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
<tr>
<td>Glyoxal</td>
<td>107-22-2</td>
<td>0.1 - 1</td>
<td>0.1 mg/m³</td>
<td>NA</td>
<td>NA</td>
<td>None</td>
</tr>
</tbody>
</table>

Notes
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/ Face Protection: Dust resistant safety goggles.

Skin Protection: Wear appropriate clothing to prevent repeated or prolonged skin contact. Chemical resistant gloves recommended for prolonged or repeated contact. Use protective gloves made of: Neoprene. Nitrile.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

General Hygiene Considerations: Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>White to Tan</td>
</tr>
<tr>
<td>Odor:</td>
<td>Slight</td>
</tr>
<tr>
<td>Physical State:</td>
<td>Powder.</td>
</tr>
<tr>
<td>pH:</td>
<td>5.4 - 8.6</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1):</td>
<td>1.5 g/cc</td>
</tr>
<tr>
<td>Solubility (Water):</td>
<td>Soluble</td>
</tr>
<tr>
<td>Melting/Freezing Point:</td>
<td>ND</td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>ND</td>
</tr>
<tr>
<td>Vapor Pressure:</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Density (Air=1):</td>
<td>NA</td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>ND</td>
</tr>
<tr>
<td>Odor Threshold(s):</td>
<td>ND</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: Keep away from heat, sparks and flame.
Materials to Avoid: Strong oxidizing agents.
Hazardous Decomposition Products: For thermal decomposition products, see Section 5.
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Acute Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Oral LD50: &gt; 5,000 mg/kg (rat)</td>
</tr>
<tr>
<td>Glyoxal</td>
<td>107-22-2</td>
<td>Oral LD50: 200 mg/kg (rat); Dermal LD50: 10 ml/kg (rabbit)</td>
</tr>
</tbody>
</table>

Product Toxicological Information:
No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>LC50 96H: 490 mg/l (rainbow trout); LC50 48H: 980 mg/l (Daphnia magna)</td>
</tr>
<tr>
<td>Glyoxal</td>
<td>107-22-2</td>
<td>LC50 96H static: 215,000 ug/l (Pimephales promelas (fathead minnow)); EC50 96H static: 66,480 - 148,960 ug/l (Selenastrum capricornutum (green algae))</td>
</tr>
</tbody>
</table>

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.

Biodegration: ND
Bioaccumulation: ND
Octanol/Water Partition Coefficient: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: This product does not meet the criteria of a hazardous waste if discarded in its purchased form.

Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION
14. TRANSPORT INFORMATION

U.S. DOT Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

Canada TDG Shipping Description: Not regulated.
UN PIN No: Not regulated.

IMDG Shipping Description: Not regulated.

ICAO/IATA Shipping Description: Not regulated.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Immediate (acute) health hazard.
SARA 302/304, 313; CERCLA RQ, California Proposition 65: Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: D2B

16. OTHER INFORMATION

The following sections have been revised: 1, 2, 3, 8, 16

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

Disclaimer:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
MATERIAL SAFETY DATA SHEET

Product ID: 10341
Revision Date: 06/04/2002

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: MAGMA FIBER
Chemical Family: Mixture
Product Use: Oil well drilling fluid additive.
Emergency Telephone (24 hr.): 281-561-1600

Supplied by a Business Unit of: M-I L.L.C.
5950 North Course Dr.
Houston, TX 77072
Telephone: 281-561-1511
Fax: 281-561-7240

Contact Person: Catherine Miller, Occupational Health

Revision Number: 1

WHMIS Class: D2A
UN PIN No: Not regulated

HMIS Rating
Health: 1* Flammability: 0 Physical Hazard: 0 PPE: E

HMIS Key: 4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11.

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS NO:</th>
<th>Wt. %</th>
<th>Ingredient Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral fiber</td>
<td>NONE</td>
<td>60 - 100</td>
<td>No comments.</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>1 - 5</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause eye, skin, and respiratory tract irritation. Potential cancer hazard. Contains crystalline silica which may cause lung cancer. IARC Group 1 carcinogen. Risk of cancer depends on duration and level of exposure.

Potential Health Effects:

Acute Effects

Eye Contact: May irritate eyes.
Skin Contact: May be irritating to the skin.
Inhalation: May be irritating to the respiratory tract if inhaled.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Chronic Effects

Carcinogenicity:

Ingredient: Silica, crystalline, quartz 14808-60-7

IARC: Listed
OSHA: Listed
NTP: Listed
Cancer Comments: IARC Monographs, Vol. 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC Classification Group 1. Contains a component that is IARC 2B - Possibly carcinogenic to humans. Risk of cancer depends on duration and level of exposure. See Section 11 for additional information.

Routes of Exposure: Inhalation. Dermal (skin) contact. Eyes.
Medical Conditions Aggravated by Exposure: Respiratory and skin conditions.

4. FIRST AID MEASURES

Eye Contact: 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.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General Notes: Persons seeking medical attention should carry a copy of this MSDS with them.

Notes To Physician: None known.

5. FIRE FIGHTING MEASURES

Flammable Properties
Flash Point: °F Not applicable
Flash Point: °C Not applicable
Flash Point Method: Not applicable

Flammable Limits in Air - Lower (%): Not applicable
Flammable Limits in Air - Upper (%): Not applicable

Autoignition Temperature: °F Not applicable
Autoignition Temperature: °C Not applicable

Flammability Class: Not applicable
Other Flammable Properties: Not determined.
Extinguishing Media: Use extinguishing media appropriate for surrounding fire. This material is not combustible.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.

Hazardous Combustion Products: Not combustible
6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate surrounding area, if necessary. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Use only in a well ventilated area. Wash thoroughly after handling.

Storage: Store at room temperature in dry, well ventilated area. Keep in original container. Keep container closed. Store away from incompatibles.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS NO:</th>
<th>Wt. %</th>
<th>ACGIH TLV TWA</th>
<th>OSHA PEL TWA</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral fiber</td>
<td>NONE</td>
<td>60 - 100</td>
<td>Inhalable - 10 mg/m³; Respirable - 3 mg/m³</td>
<td>Total - 15 mg/m³; Respirable - 5 mg/m³</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>1 - 5</td>
<td>0.05 mg/m³</td>
<td>see Table Z-3</td>
<td></td>
<td>(R)</td>
</tr>
</tbody>
</table>

Notes: (R) Respirable fraction (ACGIH);
Table Z-3: PEL for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as nitrile, neoprene, natural rubber.

Respiratory Protection: Use at least a NIOSH-approved N95 half-mask disposable or reusable particulate respirator. In work environments containing oil mist/aerosol, use at least NIOSH-approved P95 half-mask disposable or reusable particulate respirator. For exposure exceeding 10 x PEL use a NIOSH-approved N100 Particulate Respirator.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: tan to grey
MATERIAL SAFETY DATA SHEET
Trade Name: MAGMA FIBER
10341
Revision Date: 06/04/2002

Odor: Odorless
Physical State: Powder
pH Value, Conc. Sol.: Not determined
pH Value Diluted Sol.: Not determined.
Vapor Pressure: Not applicable
Vapor Density (Air=1): Not determined
Boiling Point: Not determined
Melting/Freezing Point: 2401F (1316C)
Solubility Description: In water
Solubility: Insoluble
Density/Specific Gravity: 2.6 g/cm3 (68F(20C))
Evaporation Rate: Not applicable
Odor Threshold Lower: Not determined
Odor Threshold Upper: Not determined

10. STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: Not determined.
Materials to Avoid: Contact with acids.
Hazardous Decomposition Products: Contact with some acids may release hydrogen sulfide.
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Component Toxicological Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral fiber</td>
<td>Mineral fibers can release airborne respirable fibers during their use. The International Agency for Research on Cancer (IARC) has classified man-made mineral fibers such as glass wool, rock wool, slag wool and ceramic fibers as Group 2b carcinogens (possibly carcinogenic to humans based on animal sufficient data, insufficient data in humans).</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>Crystalline silica is the most widely occurring of all minerals. The most common form of silica is sand. One form of crystalline silica, respirable crystalline silica (RCS), is known to be a human carcinogen. This finding is based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to RCS and increased lung cancer rates in exposed workers (International Agency for Research on Cancer (IARC), 1997). According to IARC, the overall relative risk associated risk of developing cancer due to exposure to RCS is 1.3 to 1.5. This risk may be influenced by level and length of exposure. Long term inhalation of crystalline silica can also result in the lung disease, silicosis. Symptoms of this disease include coughing and shortness of breath. (NJ HSFS, January 1996)</td>
</tr>
</tbody>
</table>

Product Toxicological Information:
- No toxicological data is available for this product.
12. ECOLOGICAL INFORMATION

Component Ecotoxicity Data

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS NO:</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral fiber</td>
<td>NONE</td>
<td>Not determined</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

Product Ecotoxicity Data

Product Data: No ecotoxicity testing has been done on this product.

Chemical Fate Data

Biodegradation: Not determined
Bioaccumulation: Not determined
Octanol/Water Partition Coefficient: Not determined

13. DISPOSAL CONSIDERATIONS

Waste Classification: Not determined.

Waste Management: Under RCRA, it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty container retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT
Shipping Description: Not regulated

TDG (Canada):
Shipping Description: Not regulated
UN PIN No: Not regulated

IMDG:
Shipping Description: Not regulated

ICAO/IATA:
Shipping Description: Not regulated

15. REGULATORY INFORMATION

US Regulations

SARA 311/312:
SARA 311/312 Hazard Categories: Delayed (chronic) health hazard;
State Regulations:

State Comments: Proposition 65: This product contains chemical(s) considered by the State of California’s Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, which warnings are now required and are marked as “listed” above.

International Inventories

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS NO:</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>AICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral fiber</td>
<td>NONE</td>
<td>Listed</td>
<td>Listed</td>
<td>Not Listed</td>
<td>Listed</td>
<td>Listed</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>Listed</td>
<td>Listed</td>
<td>Not Listed</td>
<td>Listed</td>
<td>Listed</td>
</tr>
</tbody>
</table>

Canadian Regulations:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: D2A

16. OTHER INFORMATION

The following has been revised since the last issue of this MSDS:

All sections.

Disclaimer:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
MATERIAL SAFETY DATA SHEET

M-I GEL*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: M-I GEL*

Chemical Family: Mixture

Product Use: Drilling fluid additive.

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.slb.com

Telephone Number:
Emergency Telephone (24 hr.): 281-561-1509

Prepared by: Product Safety Group

Revision No. 7

HMIS Rating
Health: 1* Flammability: 0 Physical Hazard: 0 PPE: E

4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview:
Caution! May cause mechanical irritation of eyes, skin and respiratory tract. Long term inhalation of particulates may cause lung damage. Cancer hazard. Contains crystalline silica which may cause cancer.

Canadian Classification:

UN PIN No: Not regulated. WHMIS Class: D2A

Physical State: Powder Color: Tan to grey Odor: Odorless

Potential Health Effects:

Acute Effects
Eye Contact: May cause mechanical irritation
Skin Contact: May cause mechanical irritation. Long term contact can cause skin dryness.
Inhalation: May cause mechanical irritation.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects:
See Section 11 - Toxicological Information.

Routes of Exposure:
Eyes. Dermal (skin) contact. Inhalation.

Target Organs/Medical Conditions Aggravated by Overexposure:
Eyes. Skin. Respiratory System.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentonite</td>
<td>1302-78-9</td>
<td>80 - 95</td>
<td>No comments.</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>2 - 15</td>
<td>No comments.</td>
</tr>
<tr>
<td>Silica, crystalline, Tridymite</td>
<td>15468-32-3</td>
<td>0 - 1</td>
<td>No comments.</td>
</tr>
<tr>
<td>Gypsum (Calcium sulfate)</td>
<td>13397-24-5</td>
<td>0 - 1</td>
<td>CAS 7778-18-9 also applies.</td>
</tr>
</tbody>
</table>

Composition Comments: Component LD50 and LC50 values are provided in Section 11, if available.

4. FIRST AID MEASURES

**Eye Contact:** Promptly wash eyes with lots of water while lifting eye lids. Look for and remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

**Skin Contact:** Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

**Inhalation:** Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:** Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

**General notes:** Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

**Flammable Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point: F (C)</td>
<td>NA</td>
</tr>
<tr>
<td>Flammable Limits in Air - Lower (%)</td>
<td>NA</td>
</tr>
<tr>
<td>Flammable Limits in Air - Upper (%)</td>
<td>NA</td>
</tr>
<tr>
<td>Autoignition Temperature: F (C)</td>
<td>NA</td>
</tr>
<tr>
<td>Explosion Data - Sensitivity to Mechanical Impact</td>
<td>NA</td>
</tr>
<tr>
<td>Explosion Data - Sensitivity to Static Discharge</td>
<td>If applicable, information is provided in Section 5 Special Fire-Fighting Procedures, Other Flammable Properties and Section 6 Spill Procedures.</td>
</tr>
</tbody>
</table>

**Flammability Class:** NA

**Extinguishing Media:** This material is not combustible. Use extinguishing media appropriate for surrounding fire.

**Protection Of Fire-Fighters:**

**Special Fire-Fighting Procedures:** Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.

**Hazardous Combustion Products:** Not determined.
Conditions of Flammability: Products are classified as flammable/combustible based on flash point as defined in the Health Canada Controlled Products Regulations, U.S. Occupational Health and Safety Administration Hazard Communication Standard and transportation regulations. See Sections 1, 2, 5, 14 and 15 for flammable/combustible classification information. Flammable/combustible materials may ignite and burn if exposed to a flame or other sources of ignition.

Other Flammable Properties: ND

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate the spill area with the exception of the spill response team. Wet product may create a slipping hazard. Contain spilled material. Do not allow spilled material to enter sewers, storm drains or surface waters. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only in a well ventilated area. Wash thoroughly after handling.

Storage: Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentonite</td>
<td>1302-78-9</td>
<td>80 - 95</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>2 - 15</td>
<td>0.025 mg/m³</td>
<td>see Table Z-3</td>
<td>50 mg/m³ IDLH (NIOSH)</td>
<td>(R)</td>
</tr>
<tr>
<td>Silica, crystalline, Tridymite</td>
<td>15468-32-3</td>
<td>0 - 1</td>
<td>0.025 mg/m³</td>
<td>see Table Z-3</td>
<td>NA</td>
<td>(R)</td>
</tr>
<tr>
<td>Gypsum (Calcium sulfate)</td>
<td>13397-24-5</td>
<td>0 - 1</td>
<td>10 mg/m³</td>
<td>15 mg/m³ (total); 5 mg/m³ (respirable)</td>
<td>NA</td>
<td>None</td>
</tr>
</tbody>
</table>

Notes
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).
(R) Respirable fraction.
Table Z-3: PEL for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO2+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. 29 CFR 1910.1000.

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.
**Personal Protection Equipment**

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.

**Eye/Face Protection:** Dust resistant safety goggles.

**Skin Protection:** Wear appropriate clothing to prevent repeated or prolonged skin contact. Chemical resistant gloves recommended for prolonged or repeated contact. Use protective gloves made of: Nitrile. Neoprene.

**Respiratory Protection:** All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

**General Hygiene Considerations:** Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Tan to grey</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Physical State</td>
<td>Powder</td>
</tr>
<tr>
<td>pH</td>
<td>ND</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1)</td>
<td>2.3 - 2.6</td>
</tr>
<tr>
<td>Solubility (Water)</td>
<td>Insoluble.</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>ND</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>ND</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Density (Air=1)</td>
<td>NA</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>NA</td>
</tr>
<tr>
<td>Octanol/Water Partition Coefficient</td>
<td>ND</td>
</tr>
<tr>
<td>Odor Threshold(s)</td>
<td>ND</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Stability</td>
<td>Stable</td>
</tr>
<tr>
<td>Conditions to Avoid</td>
<td>Keep away from heat, sparks and flame.</td>
</tr>
<tr>
<td>Materials to Avoid</td>
<td>None known.</td>
</tr>
<tr>
<td>Conditions of Reactivity</td>
<td>See Conditions and Materials to Avoid, if applicable.</td>
</tr>
<tr>
<td>Hazardous Decomposition Products</td>
<td>For thermal decomposition products, see Section 5.</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>Will not occur</td>
</tr>
</tbody>
</table>
11. TOXICOLOGICAL INFORMATION

Acute Exposure Effects, Irritation and Sensitization: See Section 2.
Chronic, Carcinogenicity, Reproductive Toxicity, Teratogenicity, Embryotoxicity, Mutagenicity Effects: See Component Toxicological Summary and Product Toxicological Information, if available.
Synergistic Products/Effects: ND

Component Toxicological Data: Any adverse component toxicological effects and acute toxicity values (LD50s, LC50s) are listed below. If no effects or acute values are listed for components, no such data were identified.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Component Toxicological Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, crystalline, quartz</td>
<td>Crystalline silica is the most widely occurring of all minerals. The most common form of silica is sand. The International Agency for Research on Cancer (IARC) has designated crystalline silica in the form of quartz or cristobalite a Group 1 (carcinogenic to humans). This designation was based on an increased risk of lung cancer among crystalline silica exposed workers. IARC did note that carcinogenicity of crystalline silica in humans was not detected in all industrial circumstances studied. Further, carcinogenicity of crystalline silica may be dependent on inherent characteristics of the crystalline silica or external factors affecting its biological activity or distribution of polymorphs. (IARC Vol. 68, 1997, p. 41). The National Toxicology Program (NTP) classifies crystalline silica as “reasonably anticipated to cause cancer in humans” (6th Annual Report on Carcinogens, 1991). Long term inhalation of crystalline silica can also result in the lung disease, silicosis. Symptoms of this disease include coughing and shortness of breath. (NJ HSFS, January 1996)</td>
</tr>
</tbody>
</table>

Product Toxicological Information: Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis ("dusty lung"), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

12. ECOLOGICAL INFORMATION

Component Ecotoxicity Data: Component ecotoxicity data are listed below. If no data are listed, none were found in the component review.

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.
Biodegradation: ND
Bioaccumulation: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: ND
Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.
14. TRANSPORT INFORMATION

U.S. DOT
Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

Canada TDG Shipping Description: Not regulated.
UN PIN No: Not regulated.
IMDG Shipping Description: Not regulated.
ICAO/IATA Shipping Description: Not regulated.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Catagories: Delayed (chronic) health hazard.

SARA 302/304, 313; CERCLA RQ, California Proposition 65:
Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>SARA 302 / TPQs</th>
<th>SARA 313</th>
<th>CERCLA RQ</th>
<th>CA 65 Cancer</th>
<th>CA 65 Dev. Tox.</th>
<th>CA 65 Repro. F</th>
<th>CA 65 Repro. M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, crystalline, quartz</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>X</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Silica, crystalline, Tridymite</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>X</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

State Comments: Proposition 65: This product contains chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 to cause cancer and/or reproductive toxicity. See table under U.S. Federal and State Regulations for the specific chemicals.

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
New Zealand - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: D2A
16. OTHER INFORMATION

The following sections have been revised: 1, 2, 3, 8, 15, 16.

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

Disclaimer:
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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 guartantee 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: M-I SEAL*
Chemical Family: Vegetable, polymer fiber blend.
Product Use: Oil well drilling fluid additive. Lost circulation material. MSDS covers all grades.
Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.slb.com
Telephone Number: 281-561-1512
Emergency Telephone (24 hr.): 281-561-1600
Prepared by: Product Safety Group
Revision No. 5
HMIS Rating
Health: 2*
Flammability: 1
Physical Hazard: 0
PPE: E

HMIS Rating
4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause eye, skin, and respiratory tract irritation. Long term inhalation of particulates may cause lung damage. May cause skin and respiratory sensitization (allergic reaction) on repeated exposure. Cancer hazard. Contains wood dust which may cause respiratory tract cancer.

Canadian Classification:
UN PIN No: Not regulated.
WHMIS Class: D2A D2B

Potential Health Effects:
Acute Effects
Eye Contact: Dust may cause irritation and inflammation.
Skin Contact: Dust may cause skin irritation. May cause skin sensitization, an allergic reaction, on repeated exposure. Prolonged or repeated contact may cause defatting of the skin and/or dermatitis (inflammation).
Inhalation: Dust may be irritating to the respiratory tract. May cause respiratory sensitization, an allergic reaction, on repeated exposure.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects: See Section 11 - Toxicological Information.
Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
MATERIAL SAFETY DATA SHEET
Trade Name: M-I SEAL*

Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood dust, hard wood</td>
<td></td>
<td>45 - 65</td>
<td>No comments.</td>
</tr>
<tr>
<td>Blend of cellulose fibers</td>
<td></td>
<td>35 - 55</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

Composition Comments: Component LD50 and LC50 values are provided in Section 11, if available.

4. FIRST AID MEASURES

Eye Contact: Promptly wash eyes with lots of water while lifting eye lids. Look for and remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash Point: F (C): NA
Flammable Limits in Air - Lower (%): ND
Flammable Limits in Air - Upper (%): ND
Autoignition Temperature: F (C): NA
Explosion Data - Sensitivity to Mechanical Impact: If applicable, information is provided in Section 5 Special Fire-Fighting Procedures, Other Flammable Properties and Section 6 Spill Procedures.
Explosion Data - Sensitivity to Static Discharge: NA

Flammability Class: NA
Extinguishing Media: Water fog, carbon dioxide, foam, dry chemical.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.

Conditions of Flammability: Products are classified as flammable/combustible based on flash point as defined in the Health Canada Controlled Products Regulations, U.S. Occupational Health and Safety Administration Hazard Communication Standard and transportation regulations. See Sections 1, 2, 5, 14 and 15 for flammable/combustible classification information. Flammable/combustible materials may ignite and burn if exposed to a flame or other sources of ignition.

Other Flammable Properties: Particulate may accumulate static electricity. Dusts at sufficient concentrations can form explosive mixtures with air.

---

### 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Use personal protective equipment identified in Section 8.

**Spill Procedures:** Evacuate the spill area with the exception of the spill response team. Contain spilled material. Do not allow spilled material to enter sewers, storm drains or surface waters. Keep incompatible materials away from spill. Avoid the generation of dust. Wet product may create a slipping hazard. Sweep, vacuum, or shovel and place into closable container for disposal.

**Environmental Precautions:** Waste must be disposed of in accordance with federal, state and local laws. In the U.S., for products with reportable quantity (RQ) components - if the RQ is exceeded, report to National Spill Response Office at 1 800 424 8802.

---

### 7. HANDLING AND STORAGE

**Handling:** Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only with adequate ventilation. Wash thoroughly after handling.

**Storage:** Store in well ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

---

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Limits (TLV & PEL - 8H TWA):**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood dust, hard wood</td>
<td></td>
<td>45 - 65</td>
<td>1 mg/m³ (hardwoods such as beech, oak); 5 mg/m³ (softwoods)</td>
<td>15 mg/m³ (total); 5 mg/m³ (respirable)</td>
<td>1 mg/m³ (NIOSH)</td>
<td>A1</td>
</tr>
<tr>
<td>Blend of cellulose fibers</td>
<td></td>
<td>35 - 55</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
</tbody>
</table>

**Notes**
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

ACGIH A1 - Confirmed Human Carcinogen.

**Engineering Controls:** Local exhaust ventilation as necessary to maintain exposures to within applicable limits.
Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as: Neoprene. Nitrile.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Yellow to Brown</td>
</tr>
<tr>
<td>Odor</td>
<td>Woody</td>
</tr>
<tr>
<td>Physical State</td>
<td>Blend of flake, fibrous and granular materials.</td>
</tr>
<tr>
<td>pH</td>
<td>NA</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1)</td>
<td>0.9 - 1.2 (68F)</td>
</tr>
<tr>
<td>Solubility (Water)</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>NA</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Density (Air=1)</td>
<td>NA</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>NA</td>
</tr>
<tr>
<td>Octanol/Water Partition Coefficient</td>
<td>ND</td>
</tr>
<tr>
<td>Odor Threshold(s)</td>
<td>ND</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Stability</td>
<td>Stable</td>
</tr>
<tr>
<td>Conditions to Avoid</td>
<td>Keep away from heat, sparks and flame.</td>
</tr>
<tr>
<td>Materials to Avoid</td>
<td>Oxidizers. Drying oils.</td>
</tr>
<tr>
<td>Conditions of Reactivity</td>
<td>See Conditions and Materials to Avoid, if applicable.</td>
</tr>
<tr>
<td>Hazardous Decomposition</td>
<td>For thermal decomposition products, see Section 5.</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>Will not occur</td>
</tr>
</tbody>
</table>

11. TOXICOLOGICAL INFORMATION
Acute Exposure Effects, Irritation and Sensitization: See Section 2.
Chronic, Carcinogenicity, Reproductive Toxicity, Teratogenicity, Embryotoxicity, Mutagenicity Effects: See Component Toxicological Summary and Product Toxicological Information, if available.
Synergistic Products/Effects: ND

Component Toxicological Data: Any adverse component toxicological effects and acute toxicity values (LD50s, LC50s) are listed below. If no effects or acute values are listed for components, no such data were identified.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Component Toxicological Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood dust, hard wood</td>
<td>This component has been classified by the International Agency for Research on Cancer (IARC) as a Group 1 carcinogen (sufficient evidence of causing cancer in humans). Studies of woodworkers suggested that occupational exposure to wood dust may increase the risk of cancer of the respiratory tract, particularly the nasal cavities and paranasal sinuses. The National Toxicology Program (NTP) has classified wood dust as known to be a human carcinogen (Report on Carcinogens 11th edition). The U.S. Occupational Safety and Health Administration (OSHA) reported an increased incidence of lung, nasal and stomach cancers; leukemia and Hodgkin's disease in workers exposed to wood dust (OSHA comments from the January 19, 1989 Final Rule on Air Contaminants Project).</td>
</tr>
</tbody>
</table>

Product Toxicological Information: Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis ("dusty lung"), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

12. ECOLOGICAL INFORMATION

Component Ecotoxicity Data: Component ecotoxicity data are listed below. If no data are listed, none were found in the component review.

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.

Biodegradation: ND

Bioaccumulation: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: ND

Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION
15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Immediate (acute) health hazard. Delayed (chronic) health hazard.

SARA 302/304, 313; CERCLA RQ, California Proposition 65: Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Contains a component that is not listed.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Contains a component that is not listed.
Korea TCCL ECL - Contains a component that is not listed.
New Zealand - Components are listed or exempt from listing.
Philippine PICCS - Contains a component that is not listed.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: D2A D2B

16. OTHER INFORMATION

The following sections have been revised: 1, 4, 6, 8, 11, 15, 16.

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

Disclaimer:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
# MATERIAL SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Trade Name:</th>
<th>M-I-X* II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Family:</td>
<td>Cellulose</td>
</tr>
<tr>
<td>Product Use:</td>
<td>Oil well drilling fluid additive. Lost circulation material.</td>
</tr>
<tr>
<td>Emergency Telephone (24 hr.):</td>
<td>281-561-1600</td>
</tr>
</tbody>
</table>

**Supplied by:**

M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com

**Telephone Number:**

281-561-1511

**Prepared by:**

Product Safety Group

**Revision Number:**

7

**HMIS Rating**

- **Health:** 1*
- **Flammability:** 1
- **Physical Hazard:** 0
- **PPE:** E

**HMIS Key:** 4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

## 2. HAZARDS IDENTIFICATION

**Emergency Overview:**

Caution! May cause eye, skin and respiratory tract irritation. Long term inhalation of particulates may cause lung damage. Cancer hazard. Contains crystalline silica which may cause cancer.

**Canadian Classification:**

- **UN PIN No:** Not regulated.
- **WHMIS Class:** D2A
- **Physical State:** Powder, dust.
- **Odor:** Mild (or faint)
- **Color:** Tan

**Potential Health Effects:**

**Acute Effects**

- **Eye Contact:** May cause mechanical irritation
- **Skin Contact:** May cause mechanical irritation. Long term contact can cause skin dryness.
- **Inhalation:** May cause mechanical irritation.
- **Ingestion:** May cause gastric distress, nausea and vomiting if ingested.

**Carcinogenicity & Chronic Effects:**

See Section 11 - Toxicological Information.

**Routes of Exposure:**

Eyes. Dermal (skin) contact. Inhalation.

**Target Organs/Medical Conditions Aggravated by Overexposure:**

Respiratory System. Skin. Eyes.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulose</td>
<td>9004-34-6</td>
<td>99 - 100</td>
<td>No comments.</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>0.5 - 1.5</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact: 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.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties
- Flash Point: F (C): NA
- Flammable Limits in Air - Lower (%): ND
- Flammable Limits in Air - Upper (%): ND
- Autoignition Temperature: F (C): ND
- Flammability Class: NA
- Other Flammable Properties: Particulate may accumulate static electricity. Dusts at sufficient concentrations can form explosive mixtures with air. Palleted bags of some fine cellulosic materials have been reported to smolder under certain conditions. See Section 7 Handling and Storage.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Protection Of Fire-Fighters:
- Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate surrounding area, if necessary. Wet product may create a slipping hazard. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only in a well ventilated area. Wash thoroughly after handling.
Storage:
Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking. Palleted bags of some fine cellulosic materials have been reported to smolder. To minimize the risk of smoldering: 1. Minimize fines in the product. 2. Minimize moisture. 3. If shrink wrapped: a. Minimize dust on bags as being stacked prior to shrink wrapping. b. Allow to sit for at least 24 hours before loading. Observe for smoldering. c. Practice care if heat gun is used to seal shrink wrap. Avoid generation of sparks.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulose</td>
<td>9004-34-6</td>
<td>99 - 100</td>
<td>10 mg/m³</td>
<td>15 mg/m³ (Total); 5 mg/m³ (Respirable)</td>
<td>NA</td>
<td>None</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>0.5 - 1.5</td>
<td>0.025 mg/m³</td>
<td>see Table Z-3</td>
<td>NIOSH: 0.05 mg/m³ TWA (10H day/40H wk) (R)</td>
<td></td>
</tr>
</tbody>
</table>

Notes
(R) Respirable fraction (ACGIH);
Table Z-3: PEL for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO2+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Wear appropriate clothing to prevent repeated or prolonged skin contact. Chemical resistant gloves recommended for prolonged or repeated contact. Use protective gloves made of: Neoprene. Nitrile.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.
9. PHYSICAL AND CHEMICAL PROPERTIES

- **Color:** Tan
- **Odor:** Mild (or faint)
- **Physical State:** Powder, dust.
- **pH:** ND
- **Specific Gravity (H2O = 1):** 1.4 - 1.65 at 68 F (20 C)
- **Solubility (Water):** Insoluble
- **Flash Point:** F (C): NA
- **Melting/Freezing Point:** ND
- **Boiling Point:** ND
- **Vapor Pressure:** NA
- **Vapor Density (Air=1):** NA
- **Evaporation Rate:** NA
- **Odor Threshold(s):** ND

10. STABILITY AND REACTIVITY

- **Chemical Stability:** Stable
- **Conditions to Avoid:** Keep away from heat, sparks and flame. See Section 7 also.
- **Materials to Avoid:** Oxidizers.
- **Hazardous Decomposition Products:** For thermal decomposition products, see Section 5.
- **Hazardous Polymerization:** Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Acute Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulose</td>
<td>9004-34-6</td>
<td>Oral LD50: &gt;5000 mg/kg (rat); Dermal LD50: &gt;2000 mg/kg (rabbit); Inhalation LC50: &gt;5800 mg/m³/4H (rat)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Component Toxicological Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulose</td>
<td>Long term inhalation exposure to this particulate may cause a benign pneumoconiosis (irritation caused by dust inhalation which may lead to fibrosis (formation of fibrous tissue)). (NIOSH, HazardText)</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>Crystalline silica is the most widely occurring of all minerals. The most common form of silica is sand. The International Agency for Research on Cancer (IARC) has designated crystalline silica in the form of quartz or cristobalite a Group 1 (carcinogenic to humans). This designation was based on an increased risk of lung cancer among crystalline silica exposed workers. IARC did note that carcinogenicity of crystalline silica in humans was not detected in all industrial circumstances studied. Further, carcinogenicity of crystalline silica may be dependent on inherent characteristics of the crystalline silica or external factors affecting its biological activity or distribution of polymorphs. (IARC Vol. 68, 1997, p. 41). The National Toxicology Program (NTP) classifies crystalline silica as &quot;reasonably anticipated to cause cancer in humans&quot; (6th Annual Report on Carcinogens, 1991). Long term inhalation of crystalline silica can also result in the lung disease, silicosis. Symptoms of this disease include coughing and shortness of breath. (NJ HSFS, January 1996)</td>
</tr>
</tbody>
</table>

Product Toxicological Information:
Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis ("dusty lung"), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.
12. ECOLOGICAL INFORMATION

Component Ecotoxicity Data: No data available.

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.

Biodegradation: ND
Bioaccumulation: ND
Octanol/Water Partition Coefficient: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: ND

Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

Canada TDG Shipping Description: Not regulated.
UN PIN No: Not regulated.

IMDG Shipping Description: Not regulated.
ICAO/IATA Shipping Description: Not regulated.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Delayed (chronic) health hazard.

SARA 302/304, 313; CERCLA RQ, California Proposition 65: Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>SARA 302 / TPQs</th>
<th>SARA 313 RQ</th>
<th>CERCLA RQ</th>
<th>CA 65 Cancer</th>
<th>CA 65 Dev. Tox.</th>
<th>CA 65 Repro. F</th>
<th>CA 65 Repro. M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, crystalline, quartz</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>X</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

International Chemical Inventories
Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: D2A

16. OTHER INFORMATION

The following sections have been revised: 1, 3, 16

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

Disclaimer:
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: POLYPAC* UL
Chemical Family: Polysaccharide
Product Use: Oil well drilling fluid additive. Fluid loss reducer.
Emergency Telephone (24 hr.): 281-561-1600

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com
Telephone Number: 281-561-1512

Prepared by: Product Safety Group
Revision Number: 5

HMIS Rating
Health: 4 Flammability: 3 Physical Hazard: 0 PPE: E

HMIS Key: 4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause mechanical irritation of eyes, skin and respiratory tract. Long term inhalation of particulates may cause lung damage.

Canadian Classification: Not regulated.
UN PIN No: WHMIS Class: Not a controlled product.

Physical State: Powder, dust. Odor: Odorless or no characteristic odor. Color: White

Potential Health Effects:

Acute Effects

Eye Contact: May cause mechanical irritation
Skin Contact: May cause mechanical irritation.
Inhalation: May cause mechanical irritation.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects:
See Section 11 - Toxicological Information.

Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose sodium salt</td>
<td>9004-32-4</td>
<td>100</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact: 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.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties

- Flash Point: F (C): NA
- Flammable Limits in Air - Lower (%): ND
- Flammable Limits in Air - Upper (%): ND
- Autoignition Temperature: F (C): ND
- Flammability Class: NA
- Other Flammable Properties: Particulate may accumulate static electricity. Dusts at sufficient concentrations can form explosive mixtures with air.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.


6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate surrounding area, if necessary. Wet product may create a slipping hazard. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only with adequate ventilation. Wash thoroughly after handling.
Trade Name: POLYPAC* UL

Storage:
Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose sodium salt</td>
<td>9004-32-4</td>
<td>100</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Notes
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Not normally necessary. If needed to minimize irritation: Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as: Nitrile. Neoprene.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne mist/aerosol of this product, use at least a NIOSH-approved N95 half-mask disposable or re-usable particulate respirator. In work environments containing oil mist/aerosol, use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator.

If exposed to vapors from this product use a NIOSH/MSHA-approved respirator with an Organic Vapor cartridge.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>White</td>
</tr>
<tr>
<td>Odor:</td>
<td>Odorless or no characteristic odor.</td>
</tr>
<tr>
<td>Physical State:</td>
<td>Powder, dust.</td>
</tr>
<tr>
<td>pH:</td>
<td>6.5-8.0 at (1% solution)</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1):</td>
<td>1.5-1.6 at 68 F (20 F)</td>
</tr>
<tr>
<td>Solubility (Water):</td>
<td>Soluble</td>
</tr>
<tr>
<td>Flash Point: F (C):</td>
<td>NA</td>
</tr>
<tr>
<td>Melting/Freezing Point:</td>
<td>ND</td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>ND</td>
</tr>
</tbody>
</table>
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapor Pressure:</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Density (Air=1):</td>
<td>NA</td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>NA</td>
</tr>
<tr>
<td>Odor Threshold(s):</td>
<td>ND</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Stability</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Stability:</td>
<td>Stable</td>
</tr>
<tr>
<td>Conditions to Avoid:</td>
<td>Keep away from heat, sparks and flame.</td>
</tr>
<tr>
<td>Materials to Avoid:</td>
<td>Oxidizers.</td>
</tr>
<tr>
<td>Hazardous Decomposition Products:</td>
<td>For thermal decomposition products, see Section 5.</td>
</tr>
<tr>
<td>Hazardous Polymerization:</td>
<td>Will not occur</td>
</tr>
</tbody>
</table>

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Acute Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose sodium salt</td>
<td>9004-32-4</td>
<td>Oral LD50: 27000 mg/kg (rat); Dermal LD50: &gt;2000 mg/kg (rabbit); LC50: &gt;5800 mg/m³/4H (rat)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Component Toxicological Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxymethylcellulose sodium salt</td>
<td>Rats fed diets containing 2.5, 5 and 10% of this component for 3 months demonstrated some kidney effects. Effects were believed to be related to high sodium content of diet. (Food Chem. Toxicol.)</td>
</tr>
</tbody>
</table>

Product Toxicological Information:
Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis ("dusty lung"), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

12. ECOLOGICAL INFORMATION

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.

Biodegradation: ND
Bioaccumulation: ND
Octanol/Water Partition Coefficient: ND

13. DISPOSAL CONSIDERATIONS

<table>
<thead>
<tr>
<th>Classification:</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Classification:</td>
<td>ND</td>
</tr>
</tbody>
</table>

Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.
Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

Canada TDG Shipping Description: Not regulated.
UN PIN No: Not regulated.
IMDG Shipping Description: Not regulated.
ICAO/IATA Shipping Description: Not regulated.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Not a SARA 311/312 hazard.

SARA 302/304, 313; CERCLA RQ: Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

California Proposition 65:

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: Not a controlled product.

16. OTHER INFORMATION

The following sections have been revised: 1, 2, 3, 8, 16

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.*
The text content is already provided as plain text.
# Kern River Drilling Summary Table: #9

## MATERIAL SAFETY DATA SHEET – POTASH

### SECTION I – PRODUCT AND COMPANY IDENTIFICATION

![Moab Potash Logo]

P.O. Box 1208
Moab, Utah 84532
Office 435-259-7171
Fax 435-259-7100

**Health**

Health Directors: Contact your local poison center.

**Specific Hazard:**

NPPA Code

**Resin:**

Number

Common name: Potash

Formula: KCl

Synonym: Muriate of Potash

Use: Fertilizer

### SECTION II – COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name(s)</th>
<th>CAS No.</th>
<th>OSHA PEL</th>
<th>TLV - TWA</th>
<th>STEL</th>
<th>CEIL</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium Chloride</td>
<td>7447-47-7</td>
<td>10mg/m³</td>
<td>10mg/m³</td>
<td></td>
<td></td>
<td>95-99.5</td>
</tr>
<tr>
<td>Sodium Chloride</td>
<td>7647-14-5</td>
<td>10mg/m³</td>
<td>10mg/m³</td>
<td></td>
<td></td>
<td>0.1-4</td>
</tr>
</tbody>
</table>

May contain up to 0.25% base lubrication oil and/or 0.05% neutralized primary aliphatic amines.

*Based on AO381 tolerance dust limits.

### SECTION III – HAZARD IDENTIFICATION

**Potential Acute Health Effects:**

- May cause irritation.

**Eyes and Skin:**

- Mild irritation, especially in open wounds.

**Inhalation:**

- Exposure to high dust concentrations may cause irritation of mucous membranes.

**Ingestion:**

- A large body load may cause vomiting, diarrhea, cramps, tingling in hands and feet, weak pulse, and circulatory disturbances.

**Potential Chronic Health Effects:**

- Lung Symptoms

**Carcinogenicity:**

- IARC Monograph: No
- MTP: No
- OSHA: No

### SECTION IV – FIRST AID MEASURES

**Eyes:**

- Flush with water, including under upper & lower lids, for at least 15 minutes. Get medical attention if pain and irritation persist.

**Skin:**

- Wash thoroughly with water. Obtain advice if rash develops.

**Ingestion:**

- Administer water if patient is conscious. Ingesting potash will usually cause purging of the stomach by vomiting. Get medical attention.

**Inhalation:**

- Remove to fresh air. If discomfort persists, get medical attention.

### SECTION V – FIRE FIGHTING MEASURES

**Flash Point:**

- None

**Auto-Ignition Temperature:**

- Not Applicable

**Lower Explosive Limit:**

- Not Applicable

**Upper Explosive Limit:**

- Not Applicable

**Unusual Fire and Explosion Hazards:**

- When subjected to extremely high temperatures, it may release small quantities of chlorine gas.

**Extinguishing Media:**

- As required for surrounding fire. Potash is non-flammable and does not support combustion.

**Special Firefighting Procedures and Equipment:**

- Wear full protective clothing and self-contained breathing apparatus.
SECTION VI - ACCIDENTAL RELEASE MEASURES

Small Spill: Sweep up and use an fertilizer if non-contaminated.

Large Spill: Collect with appropriate equipment. If on a hard surface, sweep up residue with brooms. If on soil, remove and call the local 911 cmd.

Release Notes: Potash is highly soluble and can be quickly diluted below the toxic level by relatively large amounts of water. Potash which has entered a small non-permanent pond should be removed by pumping the pond dry. If spill could potentially enter any waterway, including intermittent dry creeks, contact the local authorities. If in the U.S., contact the US COAST GUARD NATIONAL RESPONSE CENTER for free number, 800-424-8802. In case of accident or large spill notify CHEMTREC in USA at 800-424-9300; CAN/TEC in Canada at 613-995-8885 CHEMTREC in other countries at (International code)+1-703-527-3887.

Comments: See Section XIII for disposal information and Section XV for regulatory requirements. Large and small spills may lead to high being dependent on the user’s handling system. Therefore, the spill category must be defined at the point of release by technically qualified personnel.

SECTION VII - HANDLING AND STORAGE

Ventilation: Local exhaust to reduce dust concentrations below recommended levels.

Handling: Avoid generating dust by excessive or unnecessary movement.

Storage: Store in a dry location. Avoid contact with aluminum or carbon steel to minimize corrosion.

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering: May be necessary to minimize dust levels.

Controls: None

Personal Protection:

Eye Protection: Wear tight-fitting safety goggles in areas of high dust concentration.

Protective Clothing: Gloves, long sleeve shirts and long pants. Launder work clothing regularly.

Respiratory: NIOSH approved dust respirators until engineering controls are implemented.

Protection: Other Protective Clothing or Equipment: Optional

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Color/Odor: White to red solid, fine to 4mm size, granules which may have a slight oily odor.

Melting Point/Range: 77°C

Solubility in Water: 367 g/L at 25°C

Specific Gravity: 2.0 (H2O = 1)

Vapor Density: Not Applicable

Built Density: 1.98 g/ml

pH: 8 – 9 (solution)

Viscosity: Not applicable

Boiling Point: 1500°C (sublimes)

Boiling Point/Range: 1420-1600°C

Vapor Pressure (mmHg): Not Applicable

Molecular Weight: 74

% Volatilities: < 0.5

Evaporation Rate: Not Applicable
SECTION X - STABILITY AND REACTIVITY

Stability: Stable
Hazardous: Will not occur
Polymerization: None
Conditions to Avoid: None
Materials to Avoid (Incompatibilities): Contact with strong acid may produce hydrogen chloride gas; contact with hot nitric acid may produce toxic nitrosyl chloride.
Hazardous Decomposition Products: None

SECTION XI - TOXICOLOGICAL INFORMATION

Significant Routes: Eyes, skin, inhalation, ingestion
Exposure Toxicity to Animals: Oral LD50 (mouse, rat): 1500 - 2600 mg/kg
Special Remarks: Based on toxicity data for another salt compound (i.e. potassium nitrate). Not expected to be toxic by dermal exposure as defined by OSHA.
On Toxicity to animals: None known.
Other Effects on Humans:
Special Remarks: Not reported to be carcinogenic, mutagenic, teratogenic or allergenic.
On Chronic Effects on Humans:
Special Remarks: None
On other Effects on Humans:

SECTION XII - ECOLOGICAL INFORMATION

Ecotoxicity: 96 hour LC50 (rainbow trout) 2010mg/L
12 hour TLM (aquatic plants) 1337 mg/L
NEOL (aquatic plants) 0.8 g/L
48 hour TLM (daphnia) 337 mg/L
72 hour EC50 (aquatic plants) 2800 mg/L
Environmental Fate: Dissolves in water and dissociates into K and Cl ions. Will remain in solution until solubility product.
Toxicity: Non-toxic to aquatic organisms as defined by USEPA
Degradation: Chloride and potassium ions.

SECTION XIII - DISPOSAL CONSIDERATIONS

Product Disposal: Uncontaminated product may be used as fertilizer. Otherwise, dispose according to Federal State or Provincial regulations in a landfill approved to receive potash.
General Comments: Because of its solubility, potash should not be disposed of in a location where run-off will escape.
SECTION XIV – TRANSPORTATION INFORMATION

<table>
<thead>
<tr>
<th>Proper Shipping Name:</th>
<th>USDOT</th>
<th>TDG - Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Regulated</td>
<td>Not Regulated</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazard Class:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Identification Number:</th>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Packing Group (Technical Name)</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labeling/Marking:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Authorized Packaging:</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>European Transportation:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION XV – REGULATORY INFORMATION

UNITED STATES:

SARA Hazard Category: This product has been reviewed according to the EPA Hazard Categories promulgated under Section 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

<table>
<thead>
<tr>
<th>Fire</th>
<th>Pressure Generating</th>
<th>Reactivity</th>
<th>Acute</th>
<th>Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

40 CFR Part 373 – Extremely Hazardous Substances:

40 CFR Part 377 – Hazardous Chemical Reporting:

All intentional ingredients listed on the TSCA Inventory.

SARA Title III Information: This product contains the following substances subject to the reporting requirements of Title III (EPCRA) of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS No.</th>
<th>Percent by Weight</th>
<th>CERCLA RQ (lbs.)</th>
<th>SARA (1986) Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium Chloride</td>
<td>7447-40-7</td>
<td>95-99.8%</td>
<td>NA</td>
<td>311 312 313</td>
</tr>
<tr>
<td>Sodium Chloride</td>
<td>7647-14-5</td>
<td>0.1%</td>
<td>NA</td>
<td>311 312 313</td>
</tr>
</tbody>
</table>

CERCLA/Superfund:

If this product contains components subject to substances designated a CERCLA Reportable Quantity (RQ) Substances, it will be designated in the above table with the RQ value in pounds. If there is a release of RQ Substance to the environment, notification to the National Response Center, Washington D.C. (1-800-424-8802) is required.

CANADA:

WHMIS Hazard Symbol and Classification: Not controlled

Ingredient Disclosure List: This product does not contain ingredient(s) on this list.

Environmental Protection: All intentional ingredients are listed on the CBSL (Domestic Substance List).

SECTION XVI – OTHER INFORMATION

NFPA Hazard Rating:

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
<th>Special Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

Comments: None

Section(s) changed since last revision: All, New Format and new ecotoxicity information.

Although the information contained is offered in good faith, SUCH INFORMATION IS EXPRESSLY GIVEN WITHOUT ANY WARRANTY (EXPRESS OR IMPLIED) OR ANY GUARANTEE OF ITS ACCURACY OR SUFICIENCY and is taken at the user's sole risk. User is solely responsible for determining the suitability of use in each particular situation. Mabat Polymers, LLC specifically DISCLAIMS ANY LIABILITY WHATSOEVER FOR THE USE OF SUCH INFORMATION, including without limitation any recommendation which user may construe and attempts to apply which may infringe or violate valid patents, licenses, and/or copyright.

(Revision Date 4/02)
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: POWERVIS* L  
Chemical Family: Mixture  
Product Use: Completion fluid additive. Viscosifier.  
Supplied by: M-I L.L.C.  
P.O. Box 42842  
Houston, TX 77242  
www.miswaco.slb.com  
Telephone Number: 281-561-1509  
Emergency Telephone (24 hr.): 281-561-1600  
Prepared by: Product Safety Group  
Revision No. 1  
HMIS Rating  
Health: 1  
Flammability: 2  
Physical Hazard: 0  
PPE: J  

4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! Combustible liquid and vapor. May cause eye irritation. May be harmful if absorbed through skin.

Canadian Classification:  
UN PIN No: Not regulated.  
WHMIS Class: B3 D2B  
Physical State: Slurry Liquid  
Color: White to tan  
Odor: Ether.

Potential Health Effects:  
Acute Effects  
Eye Contact: May irritate eyes.  
Skin Contact: May be harmful if absorbed through skin. Not expected to cause skin irritation under anticipated workplace exposures.  
Inhalation: Not expected to be an inhalation hazard under anticipated workplace exposures. Overexposure to vapors and mists which may be released at high temperatures may cause central nervous system (CNS) effects and respiratory tract irritation.  
Ingestion: May cause gastric distress, nausea and vomiting if ingested. Aspiration can be a hazard if this material is swallowed.

Carcinogenicity & Chronic Effects: See Section 11 - Toxicological Information.  
Routes of Exposure: Eyes. Dermal (skin) contact. Dermal (skin) absorption. Inhalation.  
Aggravated by Overexposure:
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td>34590-94-8</td>
<td>60 - 100</td>
<td>No comments.</td>
</tr>
<tr>
<td>Biopolymer</td>
<td></td>
<td>10 - 30</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

Composition Comments: Component LD50 and LC50 values are provided in Section 11, if available.

4. FIRST AID MEASURES

Eye Contact: Promptly wash eyes with lots of water while lifting eye lids. Look for and remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Do not induce vomiting. Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. Get immediate medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

Notes To Physician: Aspiration may cause severe lung damage. Evacuate stomach in a way which avoids aspiration.

5. FIRE FIGHTING MEASURES

Flammable Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point: F (C):</td>
<td>144F (62C)</td>
</tr>
<tr>
<td>Flash Point Method:</td>
<td>PMCC</td>
</tr>
<tr>
<td>Flammable Limits in Air - Lower (%)</td>
<td>ND</td>
</tr>
<tr>
<td>Flammable Limits in Air - Upper (%)</td>
<td>ND</td>
</tr>
<tr>
<td>Autoignition Temperature: F (C):</td>
<td>ND</td>
</tr>
<tr>
<td>Explosion Data - Sensitivity to Mechanical Impact:</td>
<td>NA</td>
</tr>
<tr>
<td>Explosion Data - Sensitivity to Static Discharge:</td>
<td>If applicable, information is provided in Section 5 Special Fire-Fighting Procedures, Other Flammable Properties and Section 6 Spill Procedures.</td>
</tr>
</tbody>
</table>

Flammability Class: IIIA
Extinguishing Media: Water fog, carbon dioxide, foam, dry chemical.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways. Note that flammable vapors may form an ignitable mixture with air. Vapors may travel considerable distances and flash back if ignited.

Conditions of Flammability: Products are classified as flammable/combustible based on flash point as defined in the Health Canada Controlled Products Regulations, U.S. Occupational Health and Safety Administration Hazard Communication Standard and transportation regulations. See Sections 1, 2, 5, 14 and 15 for flammable/combustible classification information. Flammable/combustible materials may ignite and burn if exposed to a flame or other sources of ignition.

Other Flammable Properties: ND

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate the spill area with the exception of the spill response team. Keep personnel removed and upwind of spill. Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Shut off leak if it can be done safely. Contain spilled material. Do not allow spilled material to enter sewers, storm drains or surface waters. Absorb in vermiculite, dry sand or earth. Place into containers for disposal. Note that flammable/combustible vapors may form an ignitable mixture with air. Vapors may travel considerable distances from spill and flash back, if ignited.

Environmental Precautions: Waste must be disposed of in accordance with federal, state and local laws. In the U.S., for products with reportable quantity (RQ) components - if the RQ is exceeded, report to National Spill Response Office at 1 800 424 8802.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid breathing vapors or spray mists. Use only in a well ventilated area. Ground and bond containers when transferring material. Wash thoroughly after handling.

Storage: Store in dry, well-ventilated area. Keep container closed. Keep away from heat, sparks and flames. Store away from incompatibles.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td>34590-94-8</td>
<td>60 - 100</td>
<td>100 ppm</td>
<td>100 ppm</td>
<td>150 ppm</td>
<td>STEL (NIOSH)</td>
</tr>
<tr>
<td>Biopolymer</td>
<td></td>
<td>10 - 30</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Notes
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Skin - Potential for cutaneous absorption.

Engineering Controls: Local exhaust ventilation as necessary to maintain exposures to within applicable limits.

Personal Protection Equipment
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.

Eye/Face Protection: Wear chemical safety goggles.

Skin Protection: Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as nitrile or neoprene.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne mist/aerosol of this product, use an organic vapor cartridge with a P-95 pre-filter attached. In work environments containing oil mist/aerosol, use an organic vapor cartridge with a P-95 pre-filter attached.

If exposed to vapors from this product, use a NIOSH/MSHA-approved respirator with an organic vapor cartridge.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>White to tan</td>
</tr>
<tr>
<td>Odor</td>
<td>Ether</td>
</tr>
<tr>
<td>Physical State</td>
<td>Slurry Liquid</td>
</tr>
<tr>
<td>pH</td>
<td>7.0 (1% solution)</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1)</td>
<td>1.1</td>
</tr>
<tr>
<td>Solubility (Water)</td>
<td>Soluble</td>
</tr>
<tr>
<td>Flash Point: F (C)</td>
<td>144F (62C)</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>&lt;-100F (-73C)</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>&gt;300F (149C)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>0.4 mm Hg at 77F (25C)</td>
</tr>
<tr>
<td>Vapor Density (Air=1)</td>
<td>5.1</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>ND</td>
</tr>
<tr>
<td>Octanol/Water Partition Coefficient</td>
<td>ND</td>
</tr>
<tr>
<td>Odor Threshold(s)</td>
<td>ND</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

- **Chemical Stability:** Stable
- **Conditions to Avoid:** Keep away from heat, sparks and flame.
- **Materials to Avoid:** Oxidizers.
- **Conditions of Reactivity:** See Conditions and Materials to Avoid, if applicable.
- **Hazardous Decomposition:** For thermal decomposition products, see Section 5.
- **Hazardous Polymerization:** Will not occur

### 11. TOXICOLOGICAL INFORMATION
Acute Exposure Effects, Irritation and Sensitization: See Section 2.
Chronic, Carcinogenicity, Reproductive Toxicity, Teratogenicity, Embryotoxicity, Mutagenicity Effects: See Component Toxicological Summary and Product Toxicological Information, if available.
Synergistic Products/Effects: ND

Component Toxicological Data: Any adverse component toxicological effects and acute toxicity values (LD50s, LC50s) are listed below. If no effects or acute values are listed for components, no such data were identified.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Acute Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td>34590-94-8</td>
<td>Oral LD50 5.4 g/kg (rat); Dermal LD50 5.1 g/kg (rabbit); Inhalation LC50 &gt;400 ppm/7H (rat)</td>
</tr>
<tr>
<td>Biopolymer</td>
<td></td>
<td>Oral LD50: &gt;5000 mg/kg (rat); Inhalation LC50: &gt;5 mg/l/4H (rat)</td>
</tr>
</tbody>
</table>

Product Toxicological Information: No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

Component Ecotoxicity Data: Component ecotoxicity data are listed below. If no data are listed, none were found in the component review.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td>34590-94-8</td>
<td>LC50 96H: 10,000 mg/l (fathead minnow); EC50 48H: 5000 mg/l (Daphnia)</td>
</tr>
<tr>
<td>Biopolymer</td>
<td></td>
<td>LC50 96H: &gt;100 mg/l (rainbow trout); EC50 72H: &gt;100 mg/l (Scenedesmus subspicatus); EC50 48H: &gt;100 mg/l (Daphnia magna); Aerobic Aqueous Medium 28D: 95% degradation</td>
</tr>
</tbody>
</table>

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.

Biodegradation: ND
Bioaccumulation: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: ND
Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.
Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT
Shipping Description: Not regulated under TDG, IMDG, ICAO/IATA. Not regulated for U.S. ground transport in non-bulk containers (<119 gallons). When shipped in U.S. in bulk containers, NA1993, Combustible liquid, n.o.s. (contains glycol ether), PG III.
15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Catagories: Immediate (acute) health hazard.

SARA 302/304, 313; CERCLA RQ, California Proposition 65: Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Contains a component that is not listed.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Contains a component that is not listed.
Korea TCCL ECL - Components are listed or exempt from listing.
New Zealand - Components are listed or exempt from listing.
Philippine PICCS - Contains a component that is not listed.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - Diutan gum is subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: B3 D2B

16. OTHER INFORMATION

The following sections have been revised: 1, 15, 16.

NA - Not Applicable, ND - Not Determined.

* A mark of M-I L.L.C.

Disclaimer:
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: POWERVIS*
Chemical Family: Viscosifier
Product Use: Drilling fluid additive.

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com

Telephone Number: 281-561-1512
Emergency Telephone (24 hr.): 281-561-1600

Prepared by: Product Safety Group

Revision No. 0

HMIS Rating
Health: 1 Flammability: 1 Physical Hazard: 0 PPE: E

4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause mechanical irritation of eyes, skin and respiratory tract. Long term inhalation of particulates may cause lung damage.

Canadian Classification:
UN PIN No: Not regulated. WHMIS Class: Not a controlled product.


Potential Health Effects:
Acute Effects
Eye Contact: May cause mechanical irritation
Skin Contact: May cause mechanical irritation.
Inhalation: May cause mechanical irritation.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects:
See Section 11 - Toxicological Information.

Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Powder, dust. Physical Hazard: 0
Color: White to tan Odor: Slight

Revision Date: 04/27/2010
MSDS No. 13392
4. FIRST AID MEASURES

Eye Contact: Promptly wash eyes with lots of water while lifting eye lids. Look for and remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash Point: F (C): NA
Flammable Limits in Air - Lower (%): ND
Flammable Limits in Air - Upper (%): ND
Autoignition Temperature: F (C): ND
Flammability Class: NA
Other Flammable Properties: Particulate may accumulate static electricity. Dusts at sufficient concentrations can form explosive mixtures with air.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.


6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate the spill area with the exception of the spill response team. Wet product may create a slipping hazard. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE
Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only with adequate ventilation. Wash thoroughly after handling.

Storage: Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>60-100</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Notes
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Not normally necessary. If needed to minimize irritation: Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as: Nitrile. Neoprene.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: White to tan
Odor: Slight
Physical State: Powder, dust.
pH: ND
Specific Gravity (H₂O = 1): ND
Solubility (Water): Soluble
10. STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: ND
Materials to Avoid: Oxidizers.
Hazardous Decomposition: For thermal decomposition products, see Section 5.
Products:
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

Product Toxicological Information:
Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis ("dusty lung"), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

12. ECOLOGICAL INFORMATION

Component Ecotoxicity Data: Component ecotoxicity data are listed below. If no data are listed, none were found in the component review.

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.
Biodegradation: ND
Bioaccumulation: ND
Octanol/Water Partition Coefficient: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: ND
Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.
Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT
Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

Canada TDG Shipping Description: Not regulated.
UN PIN No: Not regulated.
IMDG Shipping Description: Not regulated.
ICAO/IATA Shipping Description: Not regulated.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Not a SARA 311/312 hazard.
SARA 302/304, 313; CERCLA RQ, Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.
California Proposition 65:

International Chemical Inventories
Australia AICS - Contains a component that is not listed.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Contains a component that is not listed.
Korea TCCL ECL - Components are listed or exempt from listing.
New Zealand - Contains a component that is not listed.
Philippine PICCS - Contains a component that is not listed.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:
Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: Not a controlled product.

16. OTHER INFORMATION
The following sections have been revised: New issue

NA - Not Applicable, ND - Not Determined.
Disclaimer:
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: SAFE-CARB*
Chemical Family: Mixture
Product Use: Oil well drilling fluid additive. MSDS covers all grades.
Emergency Telephone (24 hr.): 281-561-1600

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com

Telephone Number: 281-561-1512
Contact Person: Joanne Galvan, Sr. Product Safety Specialist

Revision Number: 3

HMIS Rating
Health: 1* Flammability: 0 Physical Hazard: 0 PPE: E

HMIS Key: 4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause mechanical irritation of eyes, skin and respiratory tract. Long term inhalation of particulates may cause lung damage. Cancer hazard. Contains crystalline silica which may cause cancer.

Canadian Classification:
UN PIN No: Not regulated. WHMIS Class: D2A


Potential Health Effects:

Acute Effects
Eye Contact: May cause mechanical irritation
Skin Contact: May cause mechanical irritation.
Inhalation: May cause mechanical irritation.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects:
Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.

See Section 11 - Toxicological Information.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>60-100</td>
<td>CAS 1317-65-3 also applies.</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>1-5</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

**Eye Contact:** 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.

**Skin Contact:** Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

**Inhalation:** Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:** Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

**General notes:** Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

**Flammable Properties**

- **Flash Point:** F (C): NA
- **Flammable Limits in Air - Lower (%):** ND
- **Flammable Limits in Air - Upper (%):** ND
- **Autoignition Temperature:** F (C): ND
- **Flammability Class:** NA
- **Other Flammable Properties:** ND
- **Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Protection Of Fire-Fighters:**

**Special Fire-Fighting Procedures:** Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.

**Hazardous Combustion Products:** Oxides of: Carbon. Calcium.

6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Use personal protective equipment identified in Section 8.

**Spill Procedures:** Evacuate surrounding area, if necessary. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

**Environmental Precautions:** Waste must be disposed of in accordance with federal, state and local laws. Do not allow to enter sewer or surface and subsurface waters.

7. HANDLING AND STORAGE

**Handling:** Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Use only in a well ventilated area. Wash thoroughly after handling.

**Storage:** Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>60-100</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>1-5</td>
<td>0.025 mg/m³</td>
<td>see Table Z-3</td>
<td>NIOSH: 0.05 mg/m³ TWA (10H day/40H wk)</td>
<td>(R)</td>
</tr>
</tbody>
</table>

Notes

(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

(R) Respirable fraction (ACGIH);

Table Z-3: PEL for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂ + 2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Wear appropriate clothing to prevent repeated or prolonged skin contact. Chemical resistant gloves recommended for prolonged or repeated contact. Use protective gloves made of: Nitrile. Neoprene.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>White</td>
</tr>
<tr>
<td>Odor:</td>
<td>Odorless</td>
</tr>
<tr>
<td>Physical State:</td>
<td>Powder.</td>
</tr>
<tr>
<td>pH:</td>
<td>ND</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1):</td>
<td>2.7 - 2.8</td>
</tr>
<tr>
<td>Solubility (Water):</td>
<td>Slightly.</td>
</tr>
<tr>
<td>Melting/Freezing Point:</td>
<td>ND</td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>ND</td>
</tr>
<tr>
<td>Vapor Pressure:</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Density (Air=1):</td>
<td>NA</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: Keep away from heat, sparks and flame.

Hazardous Decomposition Products: For thermal decomposition products, see Section 5.
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Acute Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>Oral LD50: 6450 mg/kg (rat)</td>
</tr>
</tbody>
</table>

Component Toxicological Summary:
Silica, crystalline, quartz
Crystalline silica is the most widely occurring of all minerals. The most common form of silica is sand. The International Agency for Research on Cancer (IARC) has designated crystalline silica in the form of quartz or cristobalite a Group 1 (carcinogenic to humans). This designation was based on an increased risk of lung cancer among crystalline silica exposed workers. IARC did note that carcinogenicity of crystalline silica in humans was not detected in all industrial circumstances studied. Further, carcinogenicity of crystalline silica may be dependent on inherent characteristics of the crystalline silica or external factors affecting its biological activity or distribution of polymorphs. (IARC Vol. 68, 1997, p. 41). The National Toxicology Program (NTP) classifies crystalline silica as "reasonably anticipated to cause cancer in humans" (6th Annual Report on Carcinogens, 1991). Long term inhalation of crystalline silica can also result in the lung disease, silicosis. Symptoms of this disease include coughing and shortness of breath. (NJ HSFS, January 1996)

Product Toxicological Information:
Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis ("dusty lung"), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

12. ECOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>LC50 48H static: 56 g/l (Gambusia affinis (western mosquito fish))</td>
</tr>
</tbody>
</table>

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.

Biodegradation: ND
Bioaccumulation: ND
Octanol/Water Partition Coefficient: ND
13. DISPOSAL CONSIDERATIONS

Waste Classification: ND

Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

Canada TDG Shipping Description: Not regulated.

UN PIN No: Not regulated.

IMDG Shipping Description: Not regulated.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Delayed (chronic) health hazard.

SARA 302/304, 313; CERCLA RQ, Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

California Proposition 65:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>SARA 302 / TPQs</th>
<th>SARA 313</th>
<th>CERCLA RQ</th>
<th>CA 65 Cancer</th>
<th>CA 65 Dev. Tox.</th>
<th>CA 65 Repro. F</th>
<th>CA 65 Repro. M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, crystalline, quartz</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>X</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: D2A
The following sections have been revised: 1, 2, 3, 8, 16

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

Disclaimer:
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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 guaranttee 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
MATERIAL SAFETY DATA SHEET
Soda Ash

Date: November 4, 2005

I  Company Identification

Company Name: BHS Marketing / Western Briquette
Mailing Address: P.O. Box 27955 SLC, UT 84127-0955
Physical Address: 2320 West Indiana Ave. SLC, UT 84104
Telephone: (801) 973-8232
Fax: (801) 973-8838
Emergency Number: PERS (800) 633-8253

II  Product Identification

Product Name: Soda Ash
Product Class: 55
Chemical Description: Sodium Carbonate, anhydrous, is a white odorless, granular material, free of contamination. Meets federal specification O-S-571 G, Type II. Meets AWWA Std.
Cas Number: 497-19-8

III  Typical Physical Properties

Physical Appearance: White granules solid
Odor: Odorless
Molecular Weight: 105.99
pH: 11.3 at 1wt/wt%
Boiling Point: Decomposes at 1800 F
Melting Point: 851 Deg C (1564 F)
Specific Gravity: 2.53 at (68F)
Solubility in Water: Soluble 7wt/wt% at (77 F)
IV Reactivity Data

Chemical Stability: This material is stable under normal handling and storage conditions.
Conditions to Avoid: Extreme Heat.
Materials to Avoid: Aluminum, Fluorine, Humid Air, Moisture, Sulfuric Acid, Acids, Magnesium, Phosphorus Pentoxide.

Hazardous Decomposition Products: Carbon Dioxide.
Hazardous Polymerization: Will not occur.


V Toxicological Information and Interpretation

Acute
Eye irritation: Eye-Eye irritation, 50 mg Rabbit. Severely irritating.
Skin Irritation: Skin-Skin irritation, Rabbit. Mildly irritating.
Dermal Toxicity: No test data found for Product.
Respiratory Irritation: No test data found for Product.
Acute Inhalation Toxicity: LC50-Lethal concentration. 50% of Test Species, 2300 mg/cu m/2hrs, rat.
Acute Oral Toxicity: LD50-Lethal Dose. 50% of Test Species, 4090 mg/kg, rat.
Chronic Toxicity: This product does not contain any substances that are considered by OSHA, NTP, IARC or ACGIH to be “probable” or “suspected” human carcinogens.

VII Fire and Explosion Hazard Data

Effects of Overexposure:
Acute
Eye Contact: Causes Irritation.
Skin Contact: May cause redness, swelling.
Ingestion: Low acute oral toxicity. May cause nausea, vomiting, diarrhea, irritation, corrosion.
Inhalation: May cause upper respiratory tract irritation, lung irritation.

Chronic Effects: This product does not contain any ingredient designated by IARC, NTP, ACGIH, OSHA as probable or suspected human carcinogens.
## VIII Recommended First Aid Measures

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Exposure:</td>
<td>Hold eyelids open and flush with a steady, gentle stream of water for at least 15 mins. Seek immediate medical attention.</td>
</tr>
<tr>
<td>Skin Exposure:</td>
<td>In case of contact, immediately wash with plenty of soap and water for at least 5 mins. Seek medical attention if irritation develops or persists. Remove contaminated clothing and shoes. Clean contaminated clothing and shoes before re-use.</td>
</tr>
<tr>
<td>Inhalation Exposure</td>
<td>Remove and assure that the victim is breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardio-pulmonary resuscitation). Seek immediate medical attention.</td>
</tr>
<tr>
<td>Ingestion Exposure:</td>
<td>If victim is conscious and alert, give 1-2 glasses of water to drink. Do not give anything by mouth to an unconscious person. Seek immediate medical attention. Do not leave victim unattended. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. Vomiting may occur spontaneously. If vomiting occurs and the victim is conscious, give water to further dilute the chemical.</td>
</tr>
</tbody>
</table>

### Medical conditions possible aggravated by exposure:

Inhalation of product may aggravate existing chronic respiratory problems such as asthma emphysema or bronchitis. Skin contact may aggravate existing skin disease.

### Notes to Physician:

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
**IX Fire Fighting Measures**

Extinguishing Media: Not combustible. Use extinguishing methods suitable for surrounding fire.

Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Dike area top prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazard: Not combustible

**X Accidental Release Measures**


Containment of Spills: Follow Procedure described below under Cleanup and Disposal of spill

Environmental & Regulatory Reporting: Do not flush to drain. If spilled on the ground, the affected area should be scraped clean placed in an appropriate container for disposal. Prevent material from entering public sewer system or any waterway. Large spills should be handled according to a predetermined plan. For assistance in developing a plan contact with the Technical Service Department using the Product Information phone number.

**XI Handling & Storage**

Handling: Do not get in eyes. Do not breath dusts. Avoid direct or prolonged contact with skin.

Storage: Store in area that is cool, dry, well-ventilated.
XII Exposure Controls/ Personal Protection

Appropriate
Hygienic Practices: As part of good industrial, personal hygiene and safety procedure, prompt avoid all unnecessary exposure to the product and ensure removal from eyes, skin and clothing. Maintain good housekeeping to control dust accumulations.

Personal Protection Equipment
Eye Protection: Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.

Skin Protection: Skin contact should be minimized through use of gloves and suitable long-sleeved clothing (i.e. shirts and pants.) Consideration must be give both to durability as well as permeation resistance.

XIII Ecological Information

Acute Ecotoxicity: Crustaceans, Daphnia magna, EC\textsubscript{50}, 48 hours, 265 mg/l
Fishes, Lepomis macrochirus, LC\textsubscript{50}, 96 hours, 300 mg/l
Algae, Nitzschia linearis, EC\textsubscript{50}, 5 day(s), 242 mg/l

Chronic Ecotoxicity: Phytoplankton, EC biomass, 7 day(s), 14 mg/l

Mobility: Considerable solubility and mobility

Degradation Abiotic: Water, hydrolysis. Degradation products: carbonate (pH 10)/bicarbonate (pH 6-10)/carbonic acid/carbon dioxide (ph<6))
Soil-result: N/A

Biotic: N/A
Potential for Bioaccumulation: Log Po/w: Result- N/A
Other Adverse Effects/ Comments: Observed effects are related to alkaline properties of product. Product is not significantly hazardous for the environment.
**XIV Disposal Consideration**

Waste Treatment: Sodium Carbonate is not a listed hazardous waste under 40 CFR 261. However, state and local regulations for waste disposal may be more restrictive. Spilled product should be disposed of in an EPA-approved disposal facility in accordance with applicable national, state and local environmental laws and regulations.

Packing Treatment: Use dedicated containers where possible

Rinse the empty containers and treat the effluent in the same way as waste

Consult current federal, state and local regulations regarding the proper disposal of emptied containers.

RCRA Hazardous Waste: Not listed

**XV Transport Information**

<table>
<thead>
<tr>
<th>Mode</th>
<th>DOT</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN Number</td>
<td>Not a regulated hazardous material</td>
<td>Not a regulated hazardous material</td>
<td>Not a regulated hazardous material</td>
</tr>
<tr>
<td>Other</td>
<td>It is not recommended that ERG guide #111 be used for all non-DOT-regulated material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STCC#</td>
<td>28-123-22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**XVI Regulatory Information**

National Regulations (US)

TSCA Inventory 8(b): Yes

SARA Title III Sec. 302/303 Extremely Hazardous Substances (40 CFR 355): No

SARA Title III Sec 311/312 (40 CFR 370): Hazard Category: Acute health hazard; Chronic health hazard. Threshold planning quantity: 10,000 lbs

SARA Title III Sec 313 Toxic Chemical Emissions Reporting (40 CFR 372): No

CERCLA Hazardous Substance (40 CFR Part 302) Listed: No Unlisted Substance: No Characteristic: N/A

State Component Listing: None identified

National Regulations (Canada)

Canadian DSL Registration: DSL
WHMIS Classifications: D2B—Material causing other toxic effects
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations, and the SDS contains all the information required by the Controlled Products Regulations.

EEC Labeling: Name of dangerous product- sodium carbonate
Symbols: Xi  Irritant
Phrases R: 36  Irritating to eyes
Phrases S: (2)  Keep out of reach of children
22  Do not breathe dust.
26  In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

Labeling “Dangerous for the environment.” Not dangerous.

Provisions classification of WG from EU-DGXI-1/3-04-98

**XVII Other Information**

Ratings:
NFPA (National Fire Protection Association)
Health = 2  Flammability = 0  Instability = 0  Special = None

HMIS (Hazardous Material Information system)
Health = 2  Fire = 0  Reactivity = 0  PPE = Supplied by User; dependent on local conditions

**XVIII Additional Information**

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding its correctness.

The conditions or methods of handling, storage, use and disposal are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use or disposal of the product.

*n/a= Not Applicable
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: SP-101*
Chemical Family: Polymer
Product Use: Oil well drilling fluid additive. Fluid loss reducer.
Emergency Telephone (24 hr.): 281-561-1600

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com

Telephone Number: 281-561-1511
Contact Person: Karsten Fontenot, Product Safety Specialist

Revision Number: 3

HMIS Rating
Health: 1 Flammability: 1 Physical Hazard: 0 PPE: E

HMIS Key: 4=Severe, 3=Serious, 2= Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause mechanical irritation of eyes, skin and respiratory tract. Long term inhalation of particulates may cause lung damage.

Canadian Classification:
UN PIN No: Not regulated. WHMIS Class: Not a controlled product.

Physical State: Powder, dust.
Odor: None Color: Off-white

Potential Health Effects:

Acute Effects

Eye Contact: May cause mechanical irritation
Skin Contact: May cause mechanical irritation.
Inhalation: May cause mechanical irritation.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Acute Effects Note: This product may release ammonia or amines when heated or exposed to high pH. Ammonia is a severe eye, skin and respiratory irritant. Ammonia has a very strong odor and can be detected at levels as low as 5 ppm. Many amines are also eye, skin and respiratory irritants.

Carcinogenicity & Chronic Effects:
See Section 11 - Toxicological Information.

Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anionic acrylamide copolymer</td>
<td>100</td>
<td>100</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

**Eye Contact:** 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.

**Skin Contact:** Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

**Inhalation:** Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:** Dilute with 2-3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

**General Notes:** Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

**Flammable Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point: F (C):</td>
<td>NA</td>
</tr>
<tr>
<td>Flammable Limits in Air - Lower %:</td>
<td>ND</td>
</tr>
<tr>
<td>Flammable Limits in Air - Upper %:</td>
<td>ND</td>
</tr>
<tr>
<td>Autoignition Temperature: F (C):</td>
<td>ND</td>
</tr>
<tr>
<td>Flammability Class:</td>
<td>NA</td>
</tr>
<tr>
<td>Other Flammable Properties:</td>
<td>Particulate may accumulate static electricity. Dusts at sufficient concentrations can form explosive mixtures with air.</td>
</tr>
</tbody>
</table>

**Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Protection Of Fire-Fighters:**

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.


6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Use personal protective equipment identified in Section 8.

**Spill Procedures:** Evacuate surrounding area, if necessary. Wet product may create a slipping hazard. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

**Environmental Precautions:** Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

**Handling:** Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only with adequate ventilation. Wash thoroughly after handling.

**Storage:** Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anionic acrylamide copolymer</td>
<td>100</td>
<td>100</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1) (6)</td>
</tr>
</tbody>
</table>

Notes

(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

(6) Ammonia or amines may be released when this component is heated or exposed to high pH. The recommended exposure limits for ammonia are ACGIH TLV 25 ppm and OSHA PEL 50 ppm. No general recommended exposure limit is available for amines. A NIOSH/MSHA approved respirator with ammonia/methylamine cartridges should be used to protect against ammonia or amine inhalation exposure.

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Not normally necessary. If needed to minimize irritation: Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as: Nitrile. Neoprene.

Respiratory Protection: If exposed to particulates/aerosols:
Use at least a NIOSH-approved N95 half-mask disposable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reuseable particulate respirator.
If exposed to organic vapors:
Use a NIOSH/MSHA-approved organic vapor respirator. CCROV: CCR with organic vapor cartridge.

A NIOSH/MSHA approved respirator with ammonia/methylamine cartridges should be used to protect against ammonia or amine inhalation exposure.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: Off-white
Odor: None
Physical State: Powder, dust.
pH: 7.0 (1% in water)
Specific Gravity (H2O = 1): 0.7 - 0.8
Solubility (Water): Soluble
Flash Point: F (C): NA
Melting/Freezing Point: ND
Boiling Point: ND
Vapor Pressure: NA
10. STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: ND
Materials to Avoid: Oxidizers.
Hazardous Decomposition Products: For thermal decomposition products, see Section 5.
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Acute Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anionic acrylamide copolymer</td>
<td></td>
<td>Oral LD50: Estimated &gt;2000 mg/kg (rat)</td>
</tr>
</tbody>
</table>

Product Toxicological Information:
Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis (“dusty lung”), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

Do Not Use. Use TXINF019. This product may contain trace amounts (<0.1%) of acrylamide. The International Agency for Research on Cancer (IARC) has designated acrylamide a Group 2A (probably carcinogenic to humans). This designation was based on sufficient evidence in experimental animals for the carcinogenicity of acrylamide (IARC Vol. 60, 1994, p. 389).
The National Toxicology Program (NTP) classifies acrylamide as "reasonably anticipated to be a human carcinogen" based on sufficient evidence of carcinogenicity in experimental animals (10th Annual Report on Carcinogens, 2002). Acrylamide is a possible mutagen (promotes a mutation in chemistry of a gene) (IARC Vol. 60, 1994, p. 389).

12. ECOLOGICAL INFORMATION

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.

Biodegradation: ND
Bioaccumulation: ND
Octanol/Water Partition Coefficient: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: ND

Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.
14. TRANSPORT INFORMATION

U.S. DOT Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

Canada TDG Shipping Description: Not regulated.
UN PIN No: Not regulated.
IMDG Shipping Description: Not regulated.
ICAO/IATA Shipping Description: Not regulated.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Not a SARA 311/312 hazard.

SARA 302/304, 313; CERCLA RQ, California Proposition 65: Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Contains a component that is not listed.
Korea TCCL ECL - Components are listed or exempt from listing.
Philippine PICCS - Contains a component that is not listed.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: Not a controlled product.

16. OTHER INFORMATION

The following sections have been revised: 1, 2, 3, 9, 15, 16

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

Disclaimer:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: THRUCARB*
Chemical Family: Mixture
Product Use: Oil well drilling fluid additive.
Emergency Telephone (24 hr.): 281-561-1600

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com

Telephone Number: 281-561-1512
Prepared by: Product Safety Group

Revision Number: 1

HMIS Rating
Health: 1*  Flammability: 0  Physical Hazard: 0  PPE: E

HMIS Key: 4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause mechanical irritation of eyes, skin and respiratory tract. Long term inhalation of particulates may cause lung damage. Cancer hazard. Contains crystalline silica which may cause cancer.

Canadian Classification: 
UN PIN No: Not regulated. WHMIS Class: D2A


Potential Health Effects:

Acute Effects

Eye Contact: May cause mechanical irritation
Skin Contact: May cause mechanical irritation. Prolonged contact with moist skin may cause irritation.
Inhalation: May cause mechanical irritation.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects: See Section 11 - Toxicological Information.

Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>90 - 100</td>
<td>CAS 1317-65-3 also applies.</td>
</tr>
<tr>
<td>Stearic acid</td>
<td>57-11-4</td>
<td>1 - 5</td>
<td>No comments.</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>0.1 - 10</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact: 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.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point: F (C):</td>
<td>NA</td>
</tr>
<tr>
<td>Flammable Limits in Air - Lower (%):</td>
<td>ND</td>
</tr>
<tr>
<td>Flammable Limits in Air - Upper (%):</td>
<td>ND</td>
</tr>
<tr>
<td>Autoignition Temperature: F (C):</td>
<td>ND</td>
</tr>
<tr>
<td>Flammability Class:</td>
<td>NA</td>
</tr>
<tr>
<td>Other Flammable Properties:</td>
<td>ND</td>
</tr>
<tr>
<td>Extinguishing Media:</td>
<td>This material is not combustible. Use extinguishing media appropriate for surrounding fire.</td>
</tr>
</tbody>
</table>

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.


6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate surrounding area, if necessary. Contain spilled material. Wet product may create a slipping hazard. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only in a well ventilated area. Wash thoroughly after handling.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>90 - 100</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
<tr>
<td>Stearic acid</td>
<td>57-11-4</td>
<td>1 - 5</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>0.1 - 10</td>
<td>0.025 mg/m³</td>
<td>see Table Z-3</td>
<td>NIOSH: 0.05 mg/m³ TWA (10H day/40H wk)</td>
<td>(R)</td>
</tr>
</tbody>
</table>

Notes:
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).
(R) Respirable fraction (ACGIH);
Table Z-3: PEL for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO2+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Wear appropriate clothing to prevent repeated or prolonged skin contact. Chemical resistant gloves recommended for prolonged or repeated contact. Use protective gloves made of: Neoprene. Nitrile.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

General Hygiene Considerations: Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: White
Odor: Slight tallow-like
Physical State: Powder.
P H: ND
Specific Gravity (H2O = 1): 2.5 - 2.8
Solubility (Water): Insoluble
9. PHYSICAL AND CHEMICAL PROPERTIES

- Flash Point: F (C): NA
- Melting/Freezing Point: ND
- Boiling Point: ND
- Vapor Pressure: NA
- Vapor Density (Air=1): NA
- Evaporation Rate: NA
- Odor Threshold(s): ND

10. STABILITY AND REACTIVITY

- Chemical Stability: Stable
- Conditions to Avoid: Keep away from heat, sparks and flame.
- Hazardous Decomposition: For thermal decomposition products, see Section 5.
- Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Acute Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>Oral LD50: 6450 mg/kg (rat)</td>
</tr>
<tr>
<td>Stearic acid</td>
<td>57-11-4</td>
<td>Oral LD50: 4640 mg/kg (rat); Dermal LD50: &gt;5000 mg/kg (rabbit)</td>
</tr>
</tbody>
</table>

Silica, crystalline, quartz

Crystalline silica is the most widely occurring of all minerals. The most common form of silica is sand. The International Agency for Research on Cancer (IARC) has designated crystalline silica in the form of quartz or cristobalite a Group 1 (carcinogenic to humans). This designation was based on an increased risk of lung cancer among crystalline silica exposed workers. IARC did note that carcinogenicity of crystalline silica in humans was not detected in all industrial circumstances studied. Further, carcinogenicity of crystalline silica may be dependent on inherent characteristics of the crystalline silica or external factors affecting its biological activity or distribution of polymorphs. (IARC Vol. 68, 1997, p. 41).

The National Toxicology Program (NTP) classifies crystalline silica as "reasonably anticipated to cause cancer in humans" (6th Annual Report on Carcinogens, 1991). Long term inhalation of crystalline silica can also result in the lung disease, silicosis. Symptoms of this disease include coughing and shortness of breath. (NJ HSFS, January 1996)

Product Toxicological Information:
Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis ("dusty lung"), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

12. ECOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td>LC50 48H static: 56 g/l (Gambusia affinis (western mosquito fish))</td>
</tr>
</tbody>
</table>

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.
Biodegradation: Not biodegradable.

Bioaccumulation: Not expected to bioaccumulate.

Octanol/Water Partition Coefficient: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: This product does not meet the criteria of a hazardous waste if discarded in its purchased form.

Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

Canada TDG Shipping Description: Not regulated.

UN PIN No: Not regulated.

IMDG Shipping Description: Not regulated.

ICAO/IATA Shipping Description: Not regulated.

15. REGULATORY INFORMATION

SARA 311/312 Hazard Categories: Delayed (chronic) health hazard.

SARA 302/304, 313; CERCLA RQ, Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>SARA 302 / TPQs</th>
<th>SARA 313</th>
<th>CERCLA RQ</th>
<th>CA 65 Cancer</th>
<th>CA 65 Dev. Tox.</th>
<th>CA 65 Repro. F</th>
<th>CA 65 Repro. M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, crystalline, quartz</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>X</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

International Chemical Inventories
Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

**Canadian Classification:**

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

**WHMIS Class:**

D2A

**16. OTHER INFORMATION**

The following sections have been revised: 1, 3, 16

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

**Disclaimer:**
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: THRUTROL*
Chemical Family: Polysaccharide
Product Use: Oil well drilling fluid additive.
Emergency Telephone (24 hr.): 281-561-1600

Supplied by: M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.com

Telephone Number: 281-561-1512
Contact Person: Joanne Galvan, Product Safety Specialist

Revision Number: 0

HMIS Rating

Health: 1 Flammability: 1 Physical Hazard: 0 PPE: E

HMIS Key: 4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause mechanical irritation of eyes, skin and respiratory tract. Long term inhalation of particulates may cause lung damage.

Canadian Classification:
UN PIN No: Not regulated. WHMIS Class: Not a controlled product.

Physical State: Powder, dust.
Odor: Slight
Color: Off-white

Potential Health Effects:

Acute Effects

Eye Contact: May cause mechanical irritation.
Skin Contact: May cause mechanical irritation.
Inhalation: May cause mechanical irritation.
Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects:

See Section 11 - Toxicological Information.

Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
Target Organs/Medical Conditions Aggravated by Overexposure: Eyes. Skin. Respiratory System.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>100</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact: 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.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General Notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties:

- Flash Point: F (°C): NA
- Flammable Limits in Air - Lower (%): ND
- Flammable Limits in Air - Upper (%): ND
- Autoignition Temperature: F (°C): ND
- Flammability Class: NA
- Other Flammable Properties: Particulate may accumulate static electricity. Dusts at sufficient concentrations can form explosive mixtures with air.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.


6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate surrounding area, if necessary. Wet product may create a slipping hazard. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only with adequate ventilation. Wash thoroughly after handling.

Storage: Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>100</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Notes
(1) Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazards present and the risk of exposure to those hazards. The PPE recommendations below are based on our assessment of the chemical hazards associated with this product. The risk of exposure and need for respiratory protection will vary from workplace to workplace and should be assessed by the user.

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Not normally necessary. If needed to minimize irritation: Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear chemical resistant gloves such as: Nitrile. Neoprene.

Respiratory Protection: All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Off-white</td>
</tr>
<tr>
<td>Odor</td>
<td>Slight</td>
</tr>
<tr>
<td>Physical State</td>
<td>Powder, dust.</td>
</tr>
<tr>
<td>pH</td>
<td>9.0 - 10.5 at (4% solution)</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>0.48 - 0.64</td>
</tr>
<tr>
<td>Solubility (Water)</td>
<td>Soluble.</td>
</tr>
<tr>
<td>Flash Point (F (C))</td>
<td>NA</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>ND</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>ND</td>
</tr>
<tr>
<td>Viscosity</td>
<td>150 - 250 (2% solution)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Density (Air=1)</td>
<td>NA</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>NA</td>
</tr>
<tr>
<td>Odor Threshold(s)</td>
<td>ND</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: Keep away from heat, sparks and flame.
Materials to Avoid: Oxidizers.
Hazardous Decomposition Products: For thermal decomposition products, see Section 5.
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

Product Toxicological Information:
Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis (“dusty lung”), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

12. ECOLOGICAL INFORMATION

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.
Biodegradation: ND
Bioaccumulation: ND
Octanol/Water Partition Coefficient: ND

13. DISPOSAL CONSIDERATIONS

Waste Classification: ND
Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.
Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.
Canada TDG Shipping Description: Not regulated.
UN PIN No: Not regulated.
IMDG Shipping Description: Not regulated.
ICAO/IATA Shipping Description: Not regulated.

15. REGULATORY INFORMATION

U.S. Federal and State Regulations
SARA 311/312 Hazard Categories: Not a SARA 311/312 hazard.

SARA 302/304, 313; CERCLA RQ, Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

California Proposition 65:

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS/ELINCS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.

Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: Not a controlled product.

16. OTHER INFORMATION

The following sections have been revised: New issue

NA - Not Applicable, ND - Not Determined.

*A mark of M-I L.L.C.

Disclaimer:
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: WALNUT NUT PLUG®
Chemical Family: Cellulose
Product Use: Oil well drilling fluid additive. Lost circulation material.
Emergency Telephone (24 hr.): 281-561-1600

Supplied by: M-I L.L.C.
A Smith/Schlumberger Company
P.O. Box 42842
Houston, TX 77242

Telephone Number: 281-561-1511
Contact Person: Catherine Miller, Product Safety

Revision Number: 1

HMIS Rating
Health: 1*
Flammability: 1
Physical Hazard: 0
PPE: E

HMIS Key: 4=Severe, 3=Serious, 2=Moderate, 1=Slight, 0=Minimal Hazard. *Chronic effects - See Section 11. See Section 8 for Personal Protective Equipment recommendations.

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS NO:</th>
<th>Wt. %</th>
<th>Ingredient Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulose</td>
<td>9004-34-6</td>
<td>99 - 100</td>
<td>No comments.</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>0.1 - 1</td>
<td>No comments.</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview: Caution! May cause eye, skin, and respiratory tract irritation. Long term inhalation of particulates may cause lung damage. Cancer hazard. Contains crystalline silica which may cause cancer.

Canadian Classification:
UN PIN No: Not regulated
WHMIS Class: D2A

Physical State: Powder, dust.
Odor: Mild (or faint)
Color: Tan

Potential Health Effects:

Acute Effects
- Eye Contact: May cause mechanical irritation
- Skin Contact: May cause mechanical irritation. Long term contact can cause skin dryness.
- Inhalation: May cause mechanical irritation.
- Ingestion: May cause gastric distress, nausea and vomiting if ingested.

Carcinogenicity & Chronic Effects: See Section 11 - Toxicological Information.

Routes of Exposure: Eyes. Dermal (skin) contact. Inhalation.
4. FIRST AID MEASURES

Eye Contact: 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.

Skin Contact: Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if any discomfort continues.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Dilute with 2 - 3 glasses of water or milk, if conscious. Never give anything by mouth to an unconscious person. If signs of irritation or toxicity occur seek medical attention.

General Notes: Persons seeking medical attention should carry a copy of this MSDS with them.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash Point: F (C): NA
Flammable Limits in Air - Lower (%): ND
Flammable Limits in Air - Upper (%): ND
Autoignition Temperature: F(C) ND
Flammability Class: NA
Other Flammable Properties: Particulate may accumulate static electricity. Dusts at sufficient concentrations can form explosive mixtures with air. Palleted bags of some fine cellulosic materials have been reported to smolder under certain conditions. See Section 7 Handling and Storage.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Protection Of Fire-Fighters:

Special Fire-Fighting Procedures: Do not enter fire area without proper personal protective equipment, including NIOSH/MSHA approved self-contained breathing apparatus. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and waterways.


6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protective equipment identified in Section 8.

Spill Procedures: Evacuate surrounding area, if necessary. Wet product may create a slipping hazard. Contain spilled material. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.

Environmental Precautions: Do not allow to enter sewer or surface and subsurface waters. Waste must be disposed of in accordance with federal, state and local laws.

7. HANDLING AND STORAGE

Handling: Put on appropriate personal protective equipment. Avoid contact with skin and eyes. Avoid generating or breathing dust. Product is slippery if wet. Use only in a well ventilated area. Wash thoroughly after handling.
Storage:
Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking. Palleted bags of some fine cellulosic materials have been reported to smolder. To minimize the risk of smoldering: 1. Minimize fines in the product. 2. Minimize moisture. 3. If shrink wrapped: a. Minimize dust on bags as being stacked prior to shrink wrapping. b. Allow to sit for at least 24 hours before loading. Observe for smoldering. c. Practice care if heat gun is used to seal shrink wrap. Avoid generation of sparks.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (TLV & PEL - 8H TWA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS NO:</th>
<th>Wt. %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>Other</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulose</td>
<td>9004-34-6</td>
<td>99 - 100</td>
<td>10 mg/m³ (Total); 5 mg/m³ (Respirable)</td>
<td>15 mg/m³</td>
<td>NA</td>
<td>None</td>
</tr>
<tr>
<td>Silica, crystalline, quartz</td>
<td>14808-60-7</td>
<td>0.1 - 1</td>
<td>0.05 mg/m³</td>
<td>see Table Z-3</td>
<td>NIOSH: 0.05 mg/m³ TWA (10H day/40H wk)</td>
<td>(R)</td>
</tr>
</tbody>
</table>

Notes
(R) Respirable fraction (ACGIH);
Table Z-3: PEL for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

Engineering Controls: Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to ensure air contamination and keep workers exposure below the applicable limits.

Personal Protection Equipment

Eye/Face Protection: Dust resistant safety goggles.

Skin Protection: Wear appropriate clothing to prevent repeated or prolonged skin contact. Chemical resistant gloves recommended for prolonged or repeated contact. Use protective gloves made of: Neoprene. Nitrile.

Respiratory Protection: If exposed to particulates/aerosols:
Use at least a NIOSH-approved N95 half-mask disposable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator.
If exposed to organic vapors:
Use a NIOSH/MSHA-approved organic vapor respirator. CCROV: CCR with organic vapor cartridge.
A NIOSH/MSHA approved respirator with ammonia/methylamine cartridges should be used to protect against ammonia or amine inhalation exposure.

Refer to Exposure Limits table (Section 8) for component specific respiratory protection recommendations.

General Hygiene Considerations: Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded, if contaminated with product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: Tan
10. STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: Keep away from heat, sparks and flame. See Section 7 also.
Materials to Avoid: Oxidizers.
Hazardous Decomposition: For thermal decomposition products, see Section 5.
Products:
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Component Toxicological Data: Any adverse component toxicological effects are listed below. If no effects are listed, no such data were found.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS NO:</th>
<th>Acute Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulose</td>
<td>9004-34-6</td>
<td>Oral LD50: &gt;5000 mg/kg (rat); Dermal LD50: &gt;2000 mg/kg (rabbit); LC50: &gt;5800 mg/m3/4H (rat)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component Toxicological Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, crystalline, quartz</td>
</tr>
<tr>
<td>Crystalline silica is the most widely occurring of all minerals. The most common form of silica is sand. The International Agency for Research on Cancer (IARC) has designated crystalline silica in the form of quartz or cristobalite a Group 1 (carcinogenic to humans). This designation was based on an increased risk of lung cancer among crystalline silica exposed workers. IARC did note that carcinogenicity of crystalline silica in humans was not detected in all industrial circumstances studied. Further, carcinogenicity of crystalline silica may be dependent on inherent characteristics of the crystalline silica or external factors affecting its biological activity or distribution of polymorphs. (IARC Vol. 68, 1997, p. 41). The National Toxicology Program (NTP) classifies crystalline silica as &quot;reasonably anticipated to cause cancer in humans&quot; (6th Annual Report on Carcinogens, 1991). Long term inhalation of crystalline silica can also result in the lung disease, silicosis. Symptoms of this disease include coughing and shortness of breath. (NJ HSFS, January 1996)</td>
</tr>
</tbody>
</table>

Product Toxicological Information:
Long term inhalation of particulate can cause irritation, inflammation and/or permanent injury to the lungs. Illnesses such as pneumoconiosis ("dusty lung"), pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma may develop.

12. ECOLOGICAL INFORMATION

Component Ecotoxicity Data: No data available.

Product Ecotoxicity Data: Contact M-I Environmental Affairs Department for available product ecotoxicity data.
13. DISPOSAL CONSIDERATIONS

Waste Classification: ND

Waste Management: Under U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine at the time of disposal, whether the product meets RCRA criteria for the hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

Disposal Method: Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that the containers are empty by the RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT Shipping Description: Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA.

Canada TDG Shipping Description: Not regulated
UN PIN No: Not regulated
IMDG Shipping Description: Not regulated
ICAO/IATA Shipping Description: Not regulated

15. REGULATORY INFORMATION

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories: Delayed (chronic) health hazard.

SARA 302/304, 313; CERCLA RQ, Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>SARA 302 TPQs</th>
<th>SARA 313 RQ</th>
<th>CERCLA RQ</th>
<th>CA 65 Cancer</th>
<th>CA 65 Dev. Tox.</th>
<th>CA 65 Repro. F</th>
<th>CA 65 Repro. M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, crystalline, quartz</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>X</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

International Chemical Inventories

Australia AICS - Components are listed or exempt from listing.
Canada DSL - Components are listed or exempt from listing.
China Inventory - Components are listed or exempt from listing.
European Union EINECS - Components are listed or exempt from listing.
Japan METI ENCS - Components are listed or exempt from listing.
Korea TCCL ECL - Components are listed or exempt from listing.
Philippine PICCS - Components are listed or exempt from listing.
U.S. TSCA - Components are listed or exempt from listing.
U.S. TSCA - No components are subject to TSCA 12(b) export notification requirements.
Canadian Classification:

Controlled Products Regulations Statement: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Class: D2A

16. OTHER INFORMATION

The following sections have been revised: New issue

NA - Not Applicable, ND - Not Determined.

Disclaimer:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We can not make any assertions as to its reliability or completeness; therefore, 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. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
Section 1 – Identification;

Product Name: Defoamer 40 AQXS
Product Identifier: Defoamer
Chemical Family: Mixture
Recommended Use: Foam Control Agent

Manufacturer or Suppliers Details
Company Name: Argo Chemical, Inc.
Company Address: 30933 Imperial Street
Bakersfield, Ca. 93263
United States of America
Phone Number: (661) 322-2222

Emergency Response Telephone Number
Chemtrec (800) 424-9300

Section 2 – Hazard(s) Identification;

Hazard Classification: Eye Irritation, Category 2B
Hazard Statement(s): H320 Causes eye irritation.

Signal Word: Warning

Pictogram(s): Category 2B = No pictograms required

Precautionary Statements:

Prevention
P280 Wear protective gloves/protective clothing/eye protection/face protection

Response
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.

Disposal
P501 Dispose of contents/container in accordance with local/regional/national/international regulation.

Description of Hazards Not Otherwise Classified: No Additional Information
Section 3 – Composition/Information on Ingredients;

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>Concentration</th>
<th>GHS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>Silicon Emulsion Blend</td>
<td>NA</td>
<td>Non-Hazardous</td>
</tr>
</tbody>
</table>

All ingredients are non-hazardous and are not required to be listed per OSHA regulations or are below cut-off/concentration limits per UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS), table 1.5.1.

Section 4 – First-Aid Measures;

**General:** If irritation or other symptoms occur or persist from any route of exposure, remove the affected individual from the area: see a physician/get medical attention.

**P305+P351+P338**

*If in eyes:* Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

*Skin contact:* Wash the affected area thoroughly with plenty of soap and water. Get medical attention if symptoms occur.

*Ingestion:* Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse out the mouth with water. Get medical attention.

Protection of first aid responders: Wear proper personal protective clothing and equipment.

**Most important symptoms and effects, both acute and delayed:** See section 11 for additional information.

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

Section 5 – Fire-Fighting Measures;

**Extinguishing media:** Suitable extinguishing media: Water spray, dry chemical, foam, carbon dioxide.

**Unsuitable extinguishing media:** None known

**Specific hazards arising from the substance or mixture:**

Reactivity: No dangerous reaction known under conditions of normal use. See section 10 (Hazardous Decomposition Products) for additional information.

**Special Protective Equipment and Precautions for firefighters:**

Protection during firefighting: Keep upwind of the fire. Wear protective clothing and respiratory protection (SCBA). Use water spray to cool exposed containers.

Section 6 – Accidental Release Measures;

**Personal precautions, protective equipment and emergency procedures**

Protective equipment: Use personal protection recommended in section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

**Environmental precautions**

Do not disperse in the environment. Inform authorities if the material is fed into the public sewage system or in public waters.
Safety Data Sheet
Defoamer 40 AQXS

Methods and materials for containment and cleaning up
Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust. Collect in suitable and properly labeled containers. Wash the spill site with water. See Section 13, Disposal Considerations, for additional information.

Section 7 – Handling and Storage;
Precautions for safe handling
Recommendations for Wash hands and other exposed areas with mild soap and water safe handling: before eating, drinking, smoking and when leaving the work place.
Conditions for safe storage, including any incompatibilities
Storage conditions: Store in a cool, well ventilated area. Keep container closed when not in use.
Incompatible materials: Strong acids, oxidizing agents, strong bases.
Storage: Protect from heat

Section 8 – Exposure Controls/Personal Protection;
Control parameters
Exposure limits: No exposure limits established for components of this product.
Individual protection measures
Personal protection: Avoid all unnecessary exposure
Hand protection: Protective gloves made of rubber or PVC
Eye protection: Safety glasses or goggles are recommended when using this product.
Skin and body protection: None necessary under normal conditions of use
Respiratory protection: None necessary under normal conditions of use.
Engineering controls (Ventilation etc.)
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels.

Section 9 – Physical and Chemical Properties;
Physical state: Liquid
Appearance: Opaque
Color: White
Odor: Slight
Odor threshold: No data available
pH: 5.0 - 7.0
Melting point/freezing point: No data available
Initial boiling point: No data available
Boiling range: No data available
Flash point: > 212°F / > 100°C
Evaporation rate No data available
Flammability (solid, gas): No data available
Upper/lower flammability or explosive limits: No data available
Safety Data Sheet
Defoamer 40 AQXS

Vapor pressure: No data available.
Vapor density at 20°C: No data available.
Relative density @ 60°F: 1.00 ± 0.05
Solubility: Dispersible
Log Pow: No data available
Log Kow: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Dynamic viscosity: No data available

Section 10 – Stability and Reactivity;

Reactivity
No dangerous reaction known under conditions of normal use.

Chemical stability
Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions
Polymerization will not occur by itself.

Conditions to avoid
Heat, incompatible substances (see below)

Incompatible materials
Strong acids, oxidizing materials, strong bases

Hazardous decomposition products
Decomposition products can include and are not limited to: oxides of carbon, oxides of silicon

Section 11 – Toxicological Information;

Information on toxicological effects

Acute toxicity: Not classified
Skin corrosion/irritation: No data available
Inhalation: No data available
Ingestion: No data available
Eye damage/eye irritation: No data available
Sensitization of skin or respirations: No data available
Mutagenicity of germ cells: No data available
Reproductive toxicity: No data available
Specific target organ toxicity: No data available
(single exposure): No data available
Specific target organ toxicity: No data available
(repeated exposure): No data available
Symptoms after ingestion: No data available
Safety Data Sheet
Defoamer 40 AQXS

Section 12 – Ecological Information;
Ecotoxicity (aquatic and terrestrial, where available)
Not established
Persistence and degradability
No data available
Bioaccumulative potential
No data available
Mobility in soil
No data available
Other adverse effects
No additional information available

Section 13 – Disposal Considerations;
Waste treatment method
Waste disposal recommendations: Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.
Dispose of packaging or containers in accordance with local, regional, national and international regulations. Empty container contains product residue which may exhibit hazards of product.
Contaminated Packaging
Container packaging may exhibit hazards.

Section 14 – Transport Information;
UN number: Not regulated
UN proper shipping name: Proper shipping name: NOT REGULATED
Special precautions: No additional information available
Transport hazard class(es): Not regulated.
Packing group: Not regulated
Environmental Hazards: None known.
Transport in bulk: None known.

Section 15 – Regulatory Information;
Safety, health and environment regulations/legislation specific for the product:
U.S. federal and state regulations/legislation:
This SDS has been prepared in accordance with the hazard criteria of the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
U.S. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Reportable Quantity (RQ):
Not Applicable
U.S. Superfund Amendments and Reauthorization Act (SARA) - SARA Section 313:
None Known
California Proposition 65:
Safety Data Sheet
Defoamer 40 AQXS

This product contains no chemicals listed by the State of California under Proposition 65

Section 16 – Other Information;

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<th>Date of Revision</th>
<th>Revision Number</th>
<th>Date of Issue</th>
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<td>5/20/2015</td>
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</table>

This SDS supersedes all prior dated versions for this product

This SDS has been prepared in accordance with the hazard criteria of the OSHA Hazard Communication Standard, 29 CFR 1910.1200 including utilizing pertinent data associated with the mixtures’ components.

DISCLAIMER: The information contained herein is accurate to the best of our knowledge at the date of publication. This SDS has been compiled and is solely intended for this product. ARGO CHEMICAL MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. User must independently confirm the safety and fitness for use of this material for a particular purpose and suitability for user's method of use or application. The information given is not to be considered a warranty or quality specification. User assumes all responsibility and all the risk of liability for all results arising from the use, handling or storage of this product.

This product contains no chemicals listed by the State of California under Proposition 65
SAFETY DATA SHEET
DF-10 DEFOAMER
NON-HAZARDOUS • WATER-BASED • SILICONE EMULSION DEFOAMER •

SECTION 1 - IDENTIFICATION

PRODUCT NAME: DF-10 DEFOAMER
SUPPLIER/ ADDRESS: CHEMEX CHEMICALS, INC.
PRODUCT USE: ANTI-FOAM EMULSION
1903 E. VIRGINIA AVE
SUPPLIER ADDRESS: CHEMEX CHEMICALS, INC.
BAKERSFIELD, CA 93307
24-HR TEL: (661) 864-1600
REVISED: JANUARY 23, 2015

SECTION #2 - HAZARD(S) IDENTIFICATION

GHS

NFPA

GHS
PICTORAM
NOT
REQUIRED

WARNING

HAZARD STATEMENTS
MAY BE HARMFUL IF SWALLOWED, IN CONTACT WITH SKIN, OR INHALED. (H303+H313+H333)
CAUSES EYE IRRITATION (H320)

PRECAUTIONARY STATEMENTS
WASH SKIN THOROUGHLY AFTER HANDLING. (P264)
IF SWALLOWED: TREAT SYMPTOMATICALLY AND SUPPORTIVELY. IF INGESTION OF A LARGE AMOUNT
DOES OCCUR, CONTACT A POISON CONTROL CENTER IMMEDIATELY, AND SEEK MEDICAL
ADVICE/ATTENTION IF YOU FEEL UNWELL. (P312)
IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR SEVERAL MINUTES. REMOVE CONTACTS, IF
PRESENT AND EASY TO DO SO. CONTINUE RINSING. (P305+P351+P338) IF EYE IRRITATION
PERSISTS, GET MEDICAL ATTENTION/ADVICE. (P337+P313)
IF ON SKIN: RINSE CONTACTED AREAS WITH WATER THEN WASH THOROUGHLY WITH SOAP AND
PLENTY OF WATER. IF SKIN IRRITATION OCCURS, GET MEDICAL ADVICE/ATTENTION. (P312)
IF INHALED: NO ADVERSE EFFECTS ANTICIPATED. IF INHALED, REMOVE TO FRESH AIR, AND KEEP AT
REST IN A POSITION COMFORTABLE FOR BREATHING. IF BREATHING IS DIFFICULT, GIVE OXYGEN. IF
BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION, AND GET MEDICAL ATTENTION
IMMEDIATELY. (P304+P312)

OTHER
NO COMPONENTS OF THIS PRODUCT ARE CONSIDERED AS HAZARDOUS BY 29 CFR 1910.120.
WEAR PROTECTIVE GLOVES/PROTECTIVE CLOTHING/EYE PROTECTION/FACE PROTECTION.
THIS PRODUCT IS NOT LIKELY TO PRESENT AN INHALATION HAZARD UNDER NORMAL WORKING
CONDITIONS. AVOID INHALING MISTS AND VAPORS.
PROLONGED OR REPEATED CONTACT MAY CAUSE IRRITATION TO SKIN AND/OR DRYING OF SKIN.
MAY CAUSE GASTROINTESTINAL DISTRESS IF SWALLOWED.
THERE ARE NO KNOWN MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

SEE ALSO SECTIONS 8-EXPOSURE CONTROL/PERSONAL PROTECTION AND 11-TOXICOLOGICAL EFFECTS.
SAFETY DATA SHEET
DF-10 DEFOAMER
NON-HAZARDOUS • WATER-BASED • SILICONE EMULSION DEFOAMER •

SECTION #3 - COMPOSITION

DF-10* is a MIXTURE of silicone compounds in polypropylene glycol acrylic polymer and water, and contains NO COMPONENTS CONSIDERED AS HAZARDOUS (BY 29 CFR 1910.120).

*The precise composition of this product is proprietary information. A more detailed disclosure will be provided to qualified medical or initial hygiene personnel as privileged information upon request, in case of need for specific treatment.

SEE ALSO SECTIONS 8-EXPOSURE CONTROL/PERSONAL PROTECTION AND 11-TOXICOLOGICAL EFFECTS.

SECTION #4 - FIRST-AID MEASURES

GENERAL
Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet (SDS) to the medical personnel.

IF EXPOSED OR CONCERNED, GET MEDICAL ADVICE/ATTENTION, IF YOU FEEL UNWELL.

The most important symptoms/effects, acute and delayed are:

PRE-EXISTING SKIN CONDITIONS MAY BE AGGRAVATED BY PROLONGED OR REPEATED CONTACT.

To the best of our knowledge, there are no known medical conditions aggravated by exposure to this product (Chemex DF-10 Defoamer), and no effects are expected during normal use. However, if irritation or other symptoms occur/persist from any route of exposure, remove the affected individual from the area, treat symptomatically, and get medical attention if symptoms occur/persist.

There is no evidence of adverse chronic effects from available information.

EMERGENCY & FIRST-AID PROCEDURES:

SKIN CONTACT: Rinse contacted areas with water, then wash skin with plenty of soap and water. If skin irritation occurs, get medical advice/attention.

EYE CONTACT: Any material that contacts the eye(s) should be washed out immediately with water. Rinse cautiously, holding eyelids open to assure complete flushing. If eye irritation persists, get medical advice/attention.

INHALATION: No adverse effects anticipated. If inhaled, remove person to fresh air. If breathing is difficult, give oxygen, and administer C.P.R. if necessary. If you feel unwell, get medical advice/attention.

INGESTION: Treat symptomatically and supportively. If ingestion of a large amount does occur, call a poison control center immediately. If victim is conscious and alert, give two (2) glasses of water and induce vomiting, and get immediate medical advice/attention.

SEE ALSO SECTIONS 8-EXPOSURE CONTROL/PERSONAL PROTECTION AND 11-TOXICOLOGICAL EFFECTS.
SAFETY DATA SHEET
DF-10 DEFOAMER
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SECTION #5 - FIREFIGHTING MEASURES

FLAMMABLE PROPERTIES
NOT FLAMMABLE BY OSHA CRITERIA.

FIRE FIGHTING PROCEDURES:
If in confined area, wear special/chemical protective clothing and use positive-pressure self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) and full protective gear. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.
SEE ALSO SECTION 8 EXPOSURE CONTROL PERSONAL PROTECTIVE EQUIPMENT.

EXTINGUISHING MEDIA
Use WATER SPRAY, ABC DRY CHEMICAL, FOAM OR CARBON DIOXIDE.
Note: Water (jet) or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

UNUSUAL FIRE & EXPLOSION HAZARDS:
Airtight containers may burst or rupture when exposed to extreme heat. Do not allow sealed containers to overheat. Move containers from fire area if you can do so without risk. This container may be hazardous when emptied. Since emptied containers retain product residue (vapor & liquid), all labeled hazard precautions must be observed. Cutting, grinding, or welding on containers may cause explosion or fire, which could result in bodily harm, or release of harmful fumes.

COMBUSTION PRODUCTS:
Thermal decompositions products may include carbon dioxide, carbon monoxide, and silica may form if water boils off, and product burns.

SECTION #6 - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES

PRECAUTIONS
Avoid contact with eyes/skin. Avoid prolonged inhalation of mists/vapors, and do not ingest. Use personal protective equipment. Avoid all personal contact. Keep unnecessary/unprotected people away from, and upwind, of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate PPE during cleanup. Floor may become slippery.

SEE ALSO SECTIONS 8-EXPOSURE CONTROL/PERSONAL PROTECTION AND 7-HANDLING & STORAGE.

SPILL PROCEDURES
Avoid contact and use appropriate PPE. Ventilate area. Stop the flow of material, if without risk. Small spills: Small amounts may be flushed into sanitary sewer with water. Large spills: Dike the spilled material, where this is possible, and prevent entry into waterways, sewer, basements, and/or confined areas. Cover spill with an inert absorbent material (e.g. sand, sawdust) and transfer to container for disposal. Using clean, dedicated equipment, sweep and scoop all spilled material, and other contaminated material and place into clean, dry, plastic containers for disposal. Flush residue from surfaces with large quantities of water.

DISPOSE OF ALL WASTE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

SEE ALSO SECTION 13-DISPOSAL INFORMATION
SAFETY DATA SHEET
DF-10 DEFOAMER
NON-HAZARDOUS • WATER-BASED • SILICONE EMULSION DEFOAMER •

SECTION #7 - HANDLING and STORAGE

HANDLING
Wear personal protective equipment including safety glasses, and protective gloves & clothing.
Use in an adequate ventilated area to keep spray/mists to a minimum. Avoid inhaling mists & vapors, and avoid contact with skin and eyes. Do not ingest/swallow. Do not eat/drink/smoke when using this product. Do not handle near strong acids, oxidizing agents. Wash hands/skin thoroughly after handling.
As with all chemicals, good industrial hygiene practices should be followed when handling this material.

SEE ALSO SECTION 6 - EXPOSURE CONTROL / PERSONAL PROTECTION.

STORAGE
Do not allow containers to overheat. Keep away from heat, sparks, and open flame. Store in a dry, well-ventilated area. Keep container tightly closed when not in use. Keep product from freezing, and store at temperatures between 4°C-38°C (40°F-100°F). Do not store in open, unlabeled or mislabeled containers. Do not store near strong acids, oxidizing agents. Do not reuse empty container without commercial cleaning or reconditioning. The recommended shelf life of this product is 7-12 months.

SECTION #8 - EXPOSURE CONTROL / PERSONAL PROTECTION

EXPOSURE CONTROL

EXPOSURE LIMITS
DF-10 is a water-based silicone solution, and contains no components considered hazardous. The precise composition of this product is proprietary information. A more detailed disclosure can be provided to a qualified medical or industrial hygiene personnel as privileged information upon request in case of need for a specific treatment.

EXPOSURE GUIDELINES
In accordance with 29 CFR 1910.1200, this product does not contain sufficient concentration of any substances defined as hazardous. No exposure limits were found for this product or any of its ingredients. No threshold limit values (TLV) established by the Occupational Safety and Health Administration (OSHA) for this product. No permissible exposure levels (PEL) established by American Conference of Governmental Hygienists (ACGIH) for this product.

ENGINEERING CONTROLS
Where engineering controls are indicated by use conditions, or a potential for excessive exposure exist, then the following traditional exposure control techniques may be used effectively to minimize employee exposure:
- Wear protective gloves, clothing, and eyewear.
- Provide adequate ventilation or other engineering controls to keep the airborne concentration to a minimum.
- Ensure that eyewash stations and safety showers are near work areas.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES

GENERAL
Avoid contact with skin & eyes. Avoid inhaling vapors. Personal hygiene is an important work practice and exposure control measure. The following general measures should be taken when working with this material:
- Do not store/use/consume foods, beverages or tobacco products in areas where this material is stored.
- Wash hands and face carefully before eating, drinking, using tobacco, or using the toilet.
- Wash exposed skin promptly to remove accidental splashes or contact with this material.
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DF-10 DEFOAMER
NON-HAZARDOUS • WATER-BASED • SILICONE EMULSION DEFOAMER •

SECTION #8 - EXPOSURE CONTROL / PERSONAL PROTECTION (CONTINUED)

EYES: Chemical splash goggles should be used for minimum protection. Contact with eyes may cause irritation. Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Eye contact should be prevented through the use of safety glasses with side-shields, or chemical splash goggles. An emergency eye wash station should be readily accessible to the general work area.

SKIN: Gloves, protective clothing/footwear should be used to minimize skin contact. Skin contact should be minimized through use of gloves and suitable long-sleeved clothing (shirts, pants). Contact with skin may cause irritation to individuals with pre-existing skin conditions, and repeated or prolonged contact may cause irritation, dermatitis, or drying and/or cracking of skin.

INHALATION: Use ventilation, local exhaust, and breathing protection (if necessary). For the reasonable foreseeable industrial end use(s) of this material, respiratory protection should not be necessary. If ventilation is inadequate, wear an appropriate air purifying respirator or use supplied air system. Inhalation of a vapor or mist can irritate nasal passages. If ventilation is not sufficient to effectively prevent buildup of aerosols or vapors, appropriate NIOSH/MSHA respiratory protection must be provided. Respiratory protection is not required during normal use of this product.

INGESTION: Do not ingest this product. No data available.

SECTION #9 - PHYSICAL and CHEMICAL PROPERTIES

| APPEARANCE (COLOR, STATE, ODOR, ETC.): | MILKY WHITE LIQUID, BLAND ODOR |
| pH: | NOT DETERMINED (N/D) |
| SOLUBILITY IN WATER: | DISPERSIBLE |
| SPECIFIC GRAVITY: | 0.99 |
| VAPOR PRESSURE (mm Hg 68°F): | SIMILAR TO WATER |
| VAPOR DENSITY (AIR = 1): | LIGHTER THAN AIR (WATER VAPOR) |
| EVAPORATION RATE (BUTYL ACETATE = 1): | SIMILAR TO WATER |
| MELTING POINT: | N/D |
| BOILING POINT: | 212 °F |
| FLASH POINT: | >200 °F (PMCC) |
| EXPLOSIVE LIMITS: | NOT A SAFETY FACTOR |
| FLAMMABILITY: | NON-FLAMMABLE (BOILS WITH RELEASE OF WATER) |

SECTION #10 - STABILITY and REACTIVITY

STABILITY / INSTABILITY: STABLE

CONDITIONS TO AVOID: EXCESSIVE HEAT. OPEN FLAMES

MATERIALS TO AVOID: REACTS WITH STRONG OXIDIZERS, ACIDS, SLIGHTLY REACTVE WITH ALKALIS.

HAZARDOUS DECOMPOSITION PRODUCTS: THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE (CO), CARBON DIOXIDE (CO₂) AND SILICA.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.
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SECTION #11 - TOXICOLOGICAL INFORMATION

EXPOSURE ROUTES
The primary routes of entry are through SKIN, EYE, INGESTION, and INHALATION. Acute effects of exposure to this material through passage of the material through the skin, eyes, or inhalation may include the following:

Prolonged or repeated exposure to product contact with eyes/skin may cause irritation.
Vapors of the concentrated product or its application can irritate the eyes.

CARCINOGENICITY INFORMATION
The ingredients in this material ARE NOT listed as a carcinogenic by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

TOXICOLOGICAL INFORMATION (COMPONENTS/INGREDIENTS)
Based on the data available, and in accordance with 29 CFR 1910.1200, this product does not contain a sufficient concentration of any substance to be defined as hazardous. No toxicity studies have been conducted on this product.

SECTION #12 - ECOLOGICAL INFORMATION
This product is expected to be inherently biodegradable. Accidental spillage may lead to penetration of the soil and in groundwater. However, there is no evidence that this would cause adverse ecological effects.

SECTION #13 - DISPOSAL INFORMATION
Dispose of in accordance with local, state and federal requirements. No disposal method should be used which would pose an environmental or human health threat, including any that would contaminate the ground or surface water. Chemical additions, processing, or otherwise altering this material may make the waste management information presented in this SDS inaccurate, or otherwise inappropriate. Be advised that the state and local requirement for disposal may be different from federal laws and regulations. Consult state/local regulations regarding the proper disposal of your waste stream material.

SECTION #14 - TRANSPORT INFORMATION

DOT PROPER SHIPPING DESCRIPTION: NOT RESTRICTED LIQUID WATER-BASED SILICONE SOLUTION

DOT HAZARD CLASS, PG, ID#: CLASS 9, GROUP III, UN 3082

SECTION #15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS
TSCA Section 12(b) Export Notification, 40 CFR 707, Subpart D
THE INTENTIONAL INGREDIENTS OF THIS PRODUCT ARE LISTED.

CERCLA Reportable Quantity, 40 CFR 302.4(a) – Hazardous substances:
NONE PRESENT OR NONE PRESENT IN REGULATED QUANTITIES.
SAFETY DATA SHEET
DF-10 DEFOAMER
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SECTION #15 - REGULATORY INFORMATION (CONTINUED)

SARA 302, 40 CFR 355 Appendix A
NONE PRESENT OR NONE PRESENT IN REGULATED QUANTITIES.

SARA 311/312 Hazardous Class(es) 40 CFR 370.2
ACUTE (IMMEDIATE) HEALTH HAZARD.

SARA 313 Components 40 CFR 372.65
NONE PRESENT OR NONE PRESENT IN REGULATED QUANTITIES.
THIS MATERIAL DOES NOT CONTAIN ANY CHEMICAL COMPONENTS WITH KNOWN
CHEMICAL ABSTRACTS (CAS) REGISTRY NUMBERS THAT EXCEED THE THRESHOLD (DE
MINIMUS) REPORTING LEVELS ESTABLISHED BY SARA TITLE 313, SECTION 313.

STATE & LOCAL REGULATIONS
CALIFORNIA – Proposition 65
NO INGREDIENT IN THIS MIXTURE IS REGULATED BY CALIFORNIA PROP 65.

SECTION #16 - OTHER INFORMATION

Disclaimer: Some of the information presented and conclusions drawn, herein, are from sources other than
direct test data on this product itself. The information in this Safety Data Sheet (SDS) was obtained from sources
believed to be reliable, however the information is provided without warranty, expressed or implied, regarding its
correctness. The conditions or methods of handling, storage, use and disposal of this product are beyond our
control and may be beyond our knowledge. For this, and other reasons, we do not assume responsibility and
expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling,
storage, use and disposal of this product. This SDS was prepared and is for use for this product only. If this
product is used as a component in another product, this SDS information may not be applicable. This Safety
Data Sheet (SDS) for "CHEMEX DF-10 DEFOAMER" was revised JANUARY 23, 2015, and has been
prepared in accordance with OSHA Hazard Communication Standard (29 CFR 1910.120) and the Globally
Harmonized System (GHS) format.
MATERIAL SAFETY DATA SHEET
EnovaSB FA

Section 01 - Product Information

Product Name: EnovaSB FA
Product Number: SB-0830
Product Use: Sand Control
Manufacturer/Supplier: Enova Solutions Inc.
3553 Landco Drive, Ste B
Bakersfield, CA 93308
Phone Number: (661) 327-2405
Emergency Phone: (661) 327-2405

Emergency tel. number: +1 800-424-9300 CHEMTREC
Trade name: EnovaSB FA
Chemical family: Alcohol
Primary product use: Sand Control

Section 02 - Composition information on hazardous ingredients

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Section 03 - Hazards identification

Emergency overview:
Clear, colorless to light yellow to orange color.
Liquid.
Eye irritant.
Skin Irritant.

Potential Health Effects:
Eye: May cause eye irritation.
Skin: Harmful if absorbed through the skin. May cause skin irritation.
Ingestion: Toxic if swallowed. May cause irritation of the digestive tract.
Inhalation: Toxic if inhaled. May cause respiratory tract irritation.
Chronic: Two year study by NTP, inhalation rat.
Target Organs: Causes damage to: Respiratory tract, skin, central nervous system, eye, lens or cornea.

Section 04 - First aid measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Get medical aid.
Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Note to Physician: Treat symptomatically and supportively. No specific antidote.
Section 05 - Fire fighting measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 170°F, 77°C (TCC)

Auto Ignition Temperature: 736°F, 391°C (also reported 915°F, 490°C Merck Index)

Explosion limits, Lower: 1.8
Upper: 16.3

NFPA Rating: Health: 2; Flammability: 2; Reactivity: 1

Section 06 - Accidental release measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 07 - Handling and storage

Advice on safe handling and storage:

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 08 - Exposure controls / personal protection

Occupational exposure limits:

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits:

Chemical name: Furfuryl alcohol

ACGIH: Skin STEL 15 ppm, 15 minutes
TWA 10 ppm (8 hours)

NIOSH: Skin STEL 15 ppm, 15 minutes
TWA 10 ppm (10 hours)

OSHA – Final PELs: 50 ppm (8 hours)

Personal Protective Equipment:

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves (Nitrile rubber gloves) to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 09 - Physical and chemical properties

Physical State: Liquid
Appearance: Clear, colorless to yellow to orange color.
Odor: Mild odor.
pH: Mixed with water, pH of 4 to 7.
Vapor Pressure: 0.4 mm Hg at 20°C.
Vapor Density: 3.4
Evaporation Rate: 0.04 compared to butyl acetate
Viscosity: 5 cps at 25 °C
Boiling Point: 338°F, 170°C
Freezing/Melting Point: 6°F, -14°C.
Decomposition Temperature: Not available.
Solubility: Completely soluble in water, acetone, alcohols.
Specific Gravity/Density: 1.14 g/cc.
Molecular Formula: C5H6O2
Molecular Weight: 98.10

Section 10 - Stability and reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, strong acids, excess heat, strong oxidants.
Incompatibilities with other Materials: Strong acids and oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymeration: Has been reported when furfuryl alcohol is exposed to strong acids or high heat.

Section 11 - Toxicological information

RTECS#: 
CAS#: 98-00-0
LD50/LC50: Rat, oral LD50, 177 mg/kg.
              Rat, dermal LD50 3825 mg/kg
              Muskrat, oral LD50 160 mg/kg

• EU proposed classification, provisionally Carc. Cat 3.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: Not mutagenic, 4 Salmonella strains with and without S9. In vivo, male mice bone marrow cells, negative.
Neurotoxicity: No information available.
Other Studies: See RTECS reports.
Section 12 - Ecological information

No information available.

Section 13 - Disposal considerations

Furfuryl alcohol is not an EPA hazardous waste. Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport information

US DOT
Shipping Name: Furfuryl alcohol
Hazard Class: 6.1
UN Number: UN2874
Packing Group: III

Section 15 - Regulatory information

US FEDERAL:
TSCA (Toxic Substance Control Act):
Listed on the TSCA inventory. Furfuryl alcohol

TSCA Significant New Use Rule: None of the chemicals in this product have SNUR under TSCA.

Section 12b: None of the chemicals in this product are listed under TSCA Section 12b.

CERLA Hazardous Substances and Corresponding RQs:
None of the chemicals in this product have an RQ.

SARA Section 302 (Superfund Amendments and Reauthorizations Act):
None of the chemicals in this product have a TPQ.

313 Reportable Ingredients: None of the chemicals are reportable under Section 313.

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

Chemical Test Rules: None of the chemicals are under a Chemical Test Rule.

Clean Act: This material does not contain any hazardous air pollutants, Class 1 Ozone depletors, or Class 2 Ozone depletors.

Clean Water Act: None of the chemicals in this product are listed as Hazardous Substances, Priority Pollutants, or Toxic Pollutants under the CWA.

OSHA: OSHA considers none of the chemicals in this product highly hazardous.

Volatile organic compounds VOC:
Content VOC (weight-%): 100%
Section 16 – Other information

Revision Date: 7/20/2012

This information is supplied under the OSHA Hazard Communication Standard, 29 CFR 1910.1200, and is offered in good faith based on data available to us that we believe to be true and accurate. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable to the material. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate for that use. No warranty, express or implied, is made regarding the accuracy of this data, the hazards connected with the use of the material, or the results to be obtained from the use thereof. We assume no responsibility for damage or injury from the use of the product described herein. Data provided here are typical and not intended for use as product specifications.
MATERIAL SAFETY DATA SHEET
EnovaSB SCS

Section 01 - Product Information

Product Name: EnovaSB SCS
Product Number: SB-1113
Product Use: Sand Control
Manufacturer/Supplier: Enova Solutions Inc.
3553 Landco Drive, Ste B
Bakersfield, CA 93308
Phone Number: (661) 327-2405
Emergency Phone: (661) 327-2405

Emergency tel. number: +1 800-424-9300 CHEMTREC
Trade name: EnovaSB SCS
Chemical family: Mixture; Alcohol, Ester, and Inorganic Acid
Primary product use: Sand Control

Section 02 - Composition information on hazardous ingredients

Hazardous ingredients:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-no.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl Acetate</td>
<td>141-78-6</td>
<td>Trade Secret</td>
</tr>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>Trade Secret</td>
</tr>
<tr>
<td>Sulfuric Acid</td>
<td>7664-93-9</td>
<td>Trade Secret</td>
</tr>
</tbody>
</table>

Section 03 - Hazards identification

Emergency overview:
Clear, colorless liquid with a strong solvent odor.
Eye irritant.
Skin irritant.

Expected Route of entry:
Inhalation: Harmful if inhaled.

Skin contact: Danger. Corrosive.
Eye contact: Danger. Corrosive.
Ingestion: Harmful if ingested.
Skin absorption: No data available.

Health effects of exposure:
Causes severe eye and skin irritation or burns. Harmful if swallowed or inhaled.

Section 04 - First aid measures

Eyes:
Immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Call a physician immediately.
External:
In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes. Remove contaminated clothing and shoes. Then wash with soap and water. If burn or irritation occurs, call a physician.

Internal:
If swallowed, drink a glass of water and induce vomiting immediately, as directed by medical personnel. Then give a large quantity of milk or water to drink and transport to a hospital. Never give anything by mouth to an unconscious person.

NOTE: Methanol CANNOT be neutralized or made non-toxic.

Inhalation:
If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician. Exposure may aggravate existing respiratory, heart, skin, or eye disorders.

Section 05 - Fire fighting measures

Flashpoint: 25 °F
Lower explosion limit: 2.6 %(V)
Data relate to solvent
Upper explosion limit: 36.5 %(V)
Data relate to solvent
Auto ignition temperature: 820 °F
Special fire fighting procedure:
When fire fighting, wear full protective equipment, including self-contained breathing apparatus.
Unusual fire and explosion hazards:
May produce hazardous fumes and hazardous decomposition products. Vapors from this product may concentrate in confined spaces and form an explosive mixture. This product can readily attack some metals (i.e. aluminum, magnesium, and zinc) to liberate flammable/explosive hydrogen gases.
NFPA Rating: Health: 2; Flammability: 3; Reactivity: 0

Section 06 - Accidental release measures

Steps to be taken in case of spill or leak:
Remove all ignition sources and contain spilled liquid. Wearing recommended protective equipment, and using explosion-proof equipment, remove bulk of liquid; add dry material to absorb remaining liquid; pick up and containerize for product recovery or disposal.

Section 07 - Handling and storage

Advice on safe handling and storage:
Store in a cool area away from heat, sparks, flame and other sources of ignition. Keep container tightly sealed. Prevent a possible fire hazard by bonding and grounding or inert gas purge. Wash thoroughly after handling.
Section 08 - Exposure controls / personal protection

Respiratory protection: If airborne concentrations pose a health hazard, become irritating, or exceed recommended limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements under 29CFR1910.134.
Hand protection: Chemical resistant gloves (rubber or synthetic rubber)
Eye protection: Chemical splash goggles.
Other protective equipment: Rubber apron, rubber boots, eyewash, safety shower
Advice on system design: Local ventilation recommended - mechanical ventilation may be used.

Section 09 - Physical and chemical properties

Form: Liquid
Color: Clear, colorless
Odor: Strong Solvent
pH: No Data Available
Solubility in water: Appreciable
Freezing point: No Data Available
Boiling range: 148-171 °F
Information applies to the solvent.

Section 10 - Stability and reactivity

Thermal decomposition: When heated to decomposition it emits toxic oxides of carbon and sulfur as well as sulfuric acid fumes.
Chemical stability: Stable.
Hazardous Polymerization: Will not occur.
Conditions to avoid: Keep away from heat, sparks, open flames, and other sources of ignition.

Section 11 - Toxicological information

Product information:
Acute oral toxicity: LD50 > 530 mg/kg (rat)
The product has not been tested. The information is derived from the properties of the individual components.
Acute dermal toxicity: LD50 > 610 mg/kg (rabbit)
The product has not been tested. The information is derived from the properties of the individual components.
Skin irritation: irritant
The product has not been tested. The information is derived from the properties of the individual components.
Eye irritation: irritant
The product has not been tested. The information is derived from the properties of the individual components.

Section 12 - Ecological information

Not available.

Section 13 - Disposal considerations
Waste disposal information:
This product, if disposed as shipped, meets EPA criteria of hazardous waste as specified in 40 CFR 261 on the basis of its ignitability. Dispose of product in a licensed hazardous waste disposal facility in accordance with all applicable laws.

When empty, container should be cleaned thoroughly before disposal, return to manufacturer or any other industrial use.

Section 14 - Transport information

DOT Regulation:
- Proper shipping name: Ethyl Acetate
- Hazard class: 3
- Packing group: II
- UN/NA-number: UN 1173
- Primary hazard class: 3

Emergency Response
- Reportable Quantity: 5,000 lbs Ethyl Acetate/Methanol

Section 15 - Regulatory information

TSCA Status:
All components of this product are listed on the TSCA Inventory.

SARA (section 311/312):
- Reactive hazard: no
- Pressure hazard: no
- Fire hazard: yes
- Immediate/acute: yes
- Delayed/chronic: yes

SARA 313 information:
This product contains the chemical or chemicals listed below which are subject to the supplier notification requirements of Section 313 of the Superfund Amendments and Reauthorization Act of 1986 ("SARA") and the requirements of 40 CFR Part 372:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
</tr>
<tr>
<td>Sulfuric Acid</td>
<td>7664-93-9</td>
</tr>
</tbody>
</table>

Volatile organic compounds VOC:
Content VOC (weight-%): 80+% 

CERCLA information:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-no</th>
<th>Percentage RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl Acetate</td>
<td>141-78-6</td>
<td>5,000 lbs</td>
</tr>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>5,000 lbs</td>
</tr>
<tr>
<td>Sulfuric Acid</td>
<td>7664-93-9</td>
<td>1,000 lbs</td>
</tr>
</tbody>
</table>
Section 16 - Other information

Revision Date: 7-20-2012

Other precautions:
Observe all necessary precautions for handling combustible liquids.

Label information:
CAUTION! COMBUSTIBLE LIQUID AND VAPOR MAY IRRITATE LUNGS IF INHALED. MAY
CAUSE IRRITATION TO EYES. TARGET ORGANS: respiratory system, central nervous system,
Avoid breathing fumes, vapors, mists, or spray. Avoid contact with skin, eyes and clothing. Do not
swallow. Use with adequate ventilation and/or approved respiratory protection. Wear proper protective
equipment. Wash thoroughly after handling. Keep container closed when not in use. Skin contact: wash
thoroughly with soap and water for 15 minutes. If skin irritation occurs, seek medical attention. Wash
contaminated clothing before reuse. Eye contact: flush with water for at least 15 minutes while holding
eyelids open. Seek immediate medical attention. Ingestion: do not induce vomiting, if vomiting occurs,
keep airway clear and keep head lower than hips to prevent aspiration. Seek medical attention
immediately. Inhalation: remove to fresh air. If not breathing, give artificial respiration. If breathing is
difficult, give oxygen. Seek medical attention if respiratory irritation continues.

NFPA:
Health: 2 Flammability: 3 Reactivity: 0

This information is supplied under the OSHA Hazard Communication Standard, 29 CFR 1910.1200, and is offered in
good faith based on data available to us that we believe to be true and accurate. The recommended industrial
hygiene and safe handling procedures are believed to be generally applicable to the material. However, each user
should review these recommendations in the specific context of the intended use and determine whether they are
appropriate for that use. No warranty, express or implied, is made regarding the accuracy of this data, the hazards
connected with the use of the material, or the results to be obtained from the use thereof. We assume no
responsibility for damage or injury from the use of the product described herein. Data provided here are typical and
not intended for use as product specifications.
SAFETY DATA SHEET
F-603 FOAM SOAP

NOT REGULATED LIQUID • BIODEGRADABLE • WATER-BASED CONCENTRATED SOAP

SECTION 1 - IDENTIFICATION

PRODUCT NAME: F-603 FOAM SOAP
SUPPLIER/ ADDRESS: CHEMEX CHEMICALS, INC.
1903 E. VIRGINIA AVE
BAKERSFIELD, CA 93307

PRODUCT USE: WASHING, SCOURING,
CLEANING COMPOUND
24-HR TEL: (661) 864-1600

REVISED: JULY 15, 2014

SECTION #2 - HAZARD(S) IDENTIFICATION

GHS

WARNING

HAZARD STATEMENT
MAY BE HARMFUL IF SWALLOWED OR INHALED (H303+H333)
CAUSES SKIN AND EYE IRRITATION (H315+H320)

PRECAUTIONARY STATEMENTS
WASH SKIN THOROUGHLY AFTER HANDLING. (P264)
SKIN CONTACT SHOULD BE MINIMIZED THROUGH THE USE OF PROPER PROTECTIVE EQUIPMENT.
WEAR PROPER PROTECTIVE GLOVES/PROTECTIVE CLOTHING AND EYE PROTECTION/FACE
PROTECTION (CHEMICAL SPLASH GOGGLES/FACE SHIELD), GLOVES AND PROTECTIVE
CLOTHING/FOOTWEAR WHEN HANDLING. (P280)
IF SWALLOWED: TREAT SYMPTOMATICALLY AND SUPPORTIVELY. IF INGESTION OF A LARGE AMOUNT
DOES OCCUR, CONTACT A POISON CONTROL CENTER IMMEDIATELY, AND SEEK MEDICAL
ADVICE/ATTENTION IF YOU FEEL UNWELL. (P312)
IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR SEVERAL MINUTES. REMOVE CONTACTS, IF
PRESENT AND EASY TO DO SO. CONTINUE RINSING. (P305+P351+P338) IF EYE IRRITATION
PERSISTS, GET MEDICAL ATTENTION/ADVICE. (P337+P313)
IF ON SKIN: WASH SKIN WITH SOAP AND WATER. (P302+P352) TAKE OFF CONTAMINATED
CLOTHING/SHOES AND WASH BEFORE REUSE. (P321, P362+P364) IF SKIN IRRITATION OCCURS, AND
PERSISTS SEEK IMMEDIATE MEDICAL ADVICE/ATTENTION. (P322+P313)
IF INHALED: NO ADVERSE EFFECTS ANTICIPATED. IF INHALED, REMOVE TO FRESH AIR, AND KEEP AT
REST IN A POSITION COMFORTABLE FOR BREATHING. IF BREATHING IS DIFFICULT, GIVE OXYGEN. IF
BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION, AND GET MEDICAL ATTENTION
IMMEDIATELY. (P304+P312)

SEE ALSO SECTIONS 8-EXPOSURE CONTROL/PERSONAL PROTECTION AND 11-TOXICOLOGICAL EFFECTS.
SAFETY DATA SHEET
F-603 FOAM SOAP
NOT REGULATED LIQUID • BIODEGRADABLE • WATER-BASED CONCENTRATED SOAP

SECTION #3 - COMPOSITION

F-603 FOAM SOAP is a biodegradable water-based product, and contains NO COMPONENTS CONSIDERED AS HAZARDOUS (BY 29 CFR 1910.120). This product, under the generic name (alpha-olefin sulfonate) is approved for food grade applications (CFR 178.3400) by the United States Department of Agriculture (USDA), and by the Federal Drug Administration (FDA).

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS#</th>
<th>% BY WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER</td>
<td>7732-18-5</td>
<td>58</td>
</tr>
<tr>
<td>SODIUM (C14-16) OLEFIN SULFONATE</td>
<td>68439-57-6</td>
<td>40</td>
</tr>
<tr>
<td>SODIUM CHLORIDE</td>
<td>7647-14-5</td>
<td>1</td>
</tr>
<tr>
<td>SODIUM SULFATE</td>
<td>7757-82-6</td>
<td>1</td>
</tr>
</tbody>
</table>

*THE PRECISE COMPOSITION OF THIS PRODUCT IS PROPRIETARY INFORMATION. A MORE DETAILED DISCLOSURE WILL BE PROVIDED, BY CHEMEX CHEMICALS, INC. (C.C.I.), TO QUALIFIED MEDICAL OR INDUSTRIAL HYGIENE PERSONNEL, AS PRIVILEGED INFORMATION, AND UPON REQUEST OF NEED FOR SPECIFIC TREATMENT.

SEE ALSO SECTIONS 8-EXPOSURE CONTROL/PERSONAL PROTECTION AND 11-TOXICOLOGICAL EFFECTS.

SECTION #4 - FIRST-AID MEASURES

GENERAL
Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet (SDS) to the medical personnel. To the best of our knowledge, there are no known medical conditions aggravated by exposure to this product, and no effects are expected during normal use. However, if irritation or other symptoms occur/persist from any route of exposure, remove the affected individual from the area, treat symptomatically, and get medical attention.

The most important symptoms/effects, acute and delayed are:

IRRIGATION TO EYES
IRRIGATION TO SKIN
NAUSEA, DIARRHEA, AND/OR ABDOMINAL CRAMPS (IF INGESTED)

There is no evidence of adverse chronic effects from available information.

EMERGENCY & FIRST-AID PROCEDURES:

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.

SKIN CONTACT: Wash off with soap and plenty of water. Remove contaminated clothing. Get medical attention if irritation develops and persists. Wash clothing separately before reuse.

INHALATION: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.

INGESTION: Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. If ingestion of a large amount does occur, call a poison control center immediately;

SEE ALSO SECTIONS 8-EXPOSURE CONTROL/PERSONAL PROTECTION AND 11-TOXICOLOGICAL EFFECTS.
SAFETY DATA SHEET
F-603 FOAM SOAP
NOT REGULATED LIQUID • BIODEGRADABLE • WATER-BASED CONCENTRATED SOAP

SECTION #5 - FIREFIGHTING MEASURES

FLAMMABLE PROPERTIES
NOT FLAMMABLE BY OSHA CRITERIA.
NOT COMBUSTIBLE BY OSHA CRITERIA.

FIREFIGHTING PROCEDURES
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

EXTINGUISHING MEDIA
SMALL FIRE: USE DRY CHEMICAL POWDER
LARGE FIRE: USE WATER SPRAY, FOG, OR FOAM. DO NOT USE WATER JET.

UNUSUAL FIRE & EXPLOSION HAZARDS
Airtight containers may burst or rupture when exposed to extreme heat. Do not allow sealed containers to overheat. Move containers from fire area if you can do so without risk.

COMBUSTION PRODUCTS
Product may become combustible with extreme high temperature. Thermal decompositions products may include sulfur dioxide, oxides of sulfur.

SECTION #6 - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES

PRECAUTIONS
Avoid contact with eyes/skin. Avoid all personal contact. Keep unnecessary/unprotected people away from, and upwind, of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate PPE during cleanup. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).

SEE ALSO SECTIONS 8-EXPOSURE CONTROL/PERSONAL PROTECTION AND 7-HANDLING & STORAGE.

SPILL PROCEDURES
Avoid contact and use appropriate PPE. Ventilate area. Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas. Never return spills in original containers for re-use.

SMALL SPILLS: Dilute material with water and mop up, or absorb with inert, dry material, and then place in an appropriate waste container. Finish cleaning by spreading water on contaminated surface, and dispose of according to local and regional authority requirements.

LARGE SPILLS: Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on contaminated surface and allow evacuating through sanitary system.

DISPOSE OF ALL WASTE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

SEE ALSO SECTION 13-DISPOSAL INFORMATION
SAFETY DATA SHEET
F-603 FOAM SOAP
NOT REGULATED LIQUID • BIODEGRADABLE • WATER-BASED CONCENTRATED SOAP

SECTION #7 - HANDLING and STORAGE

HANDLING
WARNING: THIS PRODUCT IS A CONCENTRATED SOAP, WHICH CAN BE IRRITATING TO SKIN AND EYES. USE CAUTION WHEN HANDLING.
Do not use in areas without adequate ventilation. Wear proper personal protective equipment.
Avoid contact with skin. Avoid contact with eyes. Do not ingest/swallow this product. Wash contacted areas with water thoroughly, after handling.
Avoid release to the environment. As with all chemicals, good industrial hygiene practices should be followed when handling this material. Do not handle/store/open near an open flame, sources of heat/ignition, or near strong oxidizing agents.

SEE ALSO SECTION 8-EXPOSURE CONTROL/PERSONAL PROTECTION.

STORAGE
Store in a dry, well-ventilated area. Store at temperatures between 50-100 degrees F.
Keep container tightly closed. Keep away from heat, sparks, and open flame, or sources of ignition. Protect material from direct sunlight. Do not handle/store near strong oxidizing agents.

SECTION #8 - EXPOSURE CONTROL / PERSONAL PROTECTION

OVERVIEW
This product is a 40% active concentrated soap, and at dilution ratios required for proper foam strength (usually around 1%, 2% maximum) most or any harmful effects are greatly diminished. F-603 FOAM SOAP (alpha olefin sulfonate) is a biodegradable, water-based product, and contains no ingredients considered hazardous.

This product under the generic name "alpha olefin sulfonate" has USDA and FDA approval for food grade applications (CFR 178.3400). THIS PRODUCT IS A CONCENTRATED SOAP, AND IN THE CONCENTRATED FORM IT CAN BE IRRITATING TO SKIN AND EYES. USE CAUTION WHEN HANDLING. WASH CONTACTED AREAS WITH WATER UNTIL IRRITATION IS ALLEVIATED.

ALL CHEMICAL COMPOUNDS SHOULD BE HANDLED WITH CAUTION AND KEPT AWAY FROM CHILDREN.

EXPOSURE GUIDELINES
No exposure limits were found for this product or any of its ingredients. In accordance with 29 CFR 1910.1200, this product does not contain sufficient concentration of any substances considered as hazardous.

ENGINEERING CONTROLS
Where engineering controls are indicated by use conditions or a potential for excessive exposure exist, the following traditional exposure control techniques may be used effectively to minimize employee exposures:

- GENERAL DILUTION.
- EXHAUST VENTILATION
- ENSURE ADEQUATE VENTILATION, ESPECIALLY IN CONFINEED AREAS.
- ENSURE THAT EYEWASH STATIONS AND SAFETY SHOWERS ARE NEAR WORK AREAS.
- WASH HANDS FACE BEFORE EATING, DRINKING, USING TOBACCO, OR USING THE TOILET.

SEE ALSO SECTION 11-TOXICOLOGICAL INFORMATION.
SAFETY DATA SHEET
F-603 FOAM SOAP
NOT REGULATED LIQUID • BIODEGRADABLE • WATER-BASED CONCENTRATED SOAP

SECTION #8 - EXPOSURE CONTROL / PERSONAL PROTECTION (CONTINUED)

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES

EYES: Use eye/face protection, including chemical splash goggles and/or face shield. Contact with eyes can cause irritation.

SKIN: Gloves, protective clothing/footwear should be used to minimize skin contact. Contact with skin can cause irritation, redness. Repeated or prolonged contact may cause irritation, drying, and/or cracking of skin.

INHALATION: Use ventilation, local exhaust, and breathing protection. Respiratory protection is not required during normal use of this product. However, wear an appropriate air-purifying respirator when ventilation is inadequate. Inhalation of a vapor or mists can irritate respiratory tract.

INGESTION: Do not swallow/Ingest this product. Ingestion may cause irritation or gastrointestinal discomfort.

SECTION #9 - PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE (COLOR, STATE, ODOR, ETC.): LIQUID, LIGHT AMBER COLOR, MILD ODOR
pH (5% aqueous solution): 7.7
VAPOR PRESSURE: 1 mm Hg (68°F)
VAPOR DENSITY (AIR = 1): 1
SOLUBILITY IN WATER: VERY SOLUBLE
ACTIVITY: 38-40%
SPECIFIC GRAVITY: 1.067
EVAPORATION RATE (BUTYL ACETATE = 1): <1
MELTING POINT: NOT DETERMINED
BOILING POINT: >212 °F
FLASH POINT: >201 °F
FLAMMABLE LIMITS IN AIR (%VOLUME): PRODUCT MAY BECOME COMBUSTIBLE WITH EXTREME HIGH TEMPERATURE
AUTO-IGNITION TEMPERATURE: NOT DETERMINED

SECTION #10 - STABILITY and REACTIVITY

STABILITY / INSTABILITY: STABLE
CONDITIONS TO AVOID: EXCESSIVE HEAT, OPEN FLAMES, DIRECT SUNLIGHT.
MATERIALS TO AVOID: REACTS WITH STRONG OXIDIZERS
HAZARDOUS DECOMPOSITION PRODUCTS: THERMAL DECOMPOSITION MAY PRODUCE SULFUR DIOXIDE, OXIDES OF SULFUR AND OXIDES OF CARBON.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.
SAFETY DATA SHEET
F-603 FOAM SOAP
NOT REGULATED LIQUID • BIODEGRADABLE • WATER-BASED CONCENTRATED SOAP

SECTION #11 - TOXICOLOGICAL INFORMATION

EXPOSURE ROUTES
The most important acute effects of exposure to this material through passage of the material through the skin, eyes, or inhalation may include the following:

IRRITATION TO EYES
IRRITATION TO SKIN

Prolonged or repeated exposure to product contact with eyes/skin may cause irritation. Vapors of the concentrated product or its application can irritate the eyes. There is no evidence of adverse chronic effects from available information.

CARCINOGENICITY INFORMATION
The ingredients in this material ARE NOT listed as a carcinogenic by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

REPRODUCTIVITY
Contains no ingredient listed as toxic to reproduction.

TOXICOLOGICAL INFORMATION (COMPONENTS/INGREDIENTS)
Based on the data available, and in accordance with 29 CFR 1910.1200, this product does not contain a sufficient concentration of any substance to be defined as hazardous. No toxicity studies have been conducted on this product.

SECTION #12 - ECOLOGICAL INFORMATION

This material readily biodegrades under aerobic conditions of secondary wastewater treatment systems. This material has toxicity LC50 values for fish in the 0.3 mg/L to 21 mg/L range.

SECTION #13 - DISPOSAL INFORMATION

This product is NOT considered hazardous waste by the Environmental Protection Agency (EPA).

Chemical additions, processing or otherwise altering this material may make the waste management information presented in this Safety Data Sheet (SDS) inaccurate or otherwise inappropriate. Please be advised that the state and local requirement for disposal may be otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of your waste stream material.

Dispose of in accordance with all local, state and federal requirements.

SECTION #14 - TRANSPORT INFORMATION

DCT SHIPPING DESCRIPTION: NOT REGULATED LIQUID
WASHING, SCOURING, CLEANING COMPOUND
SAFETY DATA SHEET
F-603 FOAM SOAP
NOT REGULATED LIQUID • BIODEGRADABLE • WATER-BASED CONCENTRATED SOAP

SECTION #15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS
TSCA Section 12(b) Export Notification, 40 CFR 707, Subpart D
THE INTENTIONAL INGREDIENTS OF THIS PRODUCT ARE LISTED.
CERCLA Reportable Quantity, 40 CFR 302.4(a) – Hazardous substances:
NONE PRESENT OR NONE PRESENT IN REGULATED QUANTITIES.
SARA 302, 40 CFR 355 Appendix A
NONE PRESENT OR NONE PRESENT IN REGULATED QUANTITIES.
SARA 311/312 Hazardous Class(es) 40 CFR 370.2
ACUTE (IMMEDIATE) HEALTH HAZARD.
SARA 313 Components 40 CFR 372.65
NONE PRESENT OR NONE PRESENT IN REGULATED QUANTITIES.
THIS MATERIAL DOES NOT CONTAIN ANY CHEMICAL COMPONENTS WITH KNOWN
CHEMICAL ABSTRACTS (CAS) REGISTRY NUMBERS THAT EXCEED THE THRESHOLD (DE
MINIMUS) REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND
AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA)

STATE & LOCAL REGULATIONS
CALIFORNIA – Proposition 65
NO INGREDIENT IN THIS MIXTURE IS REGULATED BY CALIFORNIA PROP 65.

SECTION #16 - OTHER INFORMATION

Disclaimer: Some of the information presented and conclusions drawn herein are from sources other than
direct test data on this product itself. The information in this Safety Data Sheet (SDS) was obtained from sources
believed to be reliable, however the information is provided without warranty, expressed or implied, regarding its
correctness. The conditions or methods of handling, storage, use and disposal of this product are beyond our
control and may be beyond our knowledge. For this, and other reasons, we do not assume responsibility and
expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling,
storage, use and disposal of this product. This Safety Data Sheet (SDS) was prepared and is for use for this
product only. If this product is used as a component in another product, this SDS information may not be
applicable. This Safety Data Sheet (SDS) for “CHEMEX F-603 FOAM SOAP” was revised July 15, 2014, and
has been prepared in accordance with OSHA Hazard Communication Standard (29 CFR 1200) and the
Globally Harmonized System (GHS) format.
SAFETY DATA SHEET

Section 1. Identification

Product name: PAW4HF ASPHALTIC CRUDE EMULSIFIER
Product code: PAW4HF

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

Identified uses: Emulsifier.

Print date: 10/14/2014.
Validation date: 10/14/2014.
Version: 1

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture: FLAMMABLE LIQUIDS - Category 4

GHS label elements

Signal word: Warning
Hazard statements: Combustible liquid.

Precautionary statements

Prevention: Wear protective gloves: > 8 hours (breakthrough time): Natural rubber gloves.. Wear eye or face protection. Keep away from flames and hot surfaces. - No smoking.
Response: Not applicable.
Storage: Store in a well-ventilated place. Keep cool.
Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazard not otherwise classified: None known.
Section 3. Composition/information on ingredients

Substance/mixture : Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>5 - 10</td>
<td>111-76-2</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Skin contact : No known significant effects or critical hazards.
Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.
Inhalation : No specific data.
Skin contact : No specific data.
Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.
Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Section 4. First aid measures

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**
- Use dry chemical, CO₂, water spray (fog) or foam.

**Unsuitable extinguishing media**
- Do not use water jet.

**Specific hazards arising from the chemical**
- Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

**Hazardous thermal decomposition products**
- carbon dioxide, carbon monoxide

**Special protective actions for fire-fighters**
- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters**
- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

**Environmental precautions**
- Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Small spill**
- Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor.

10/14/2014.
Section 6. Accidental release measures

Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Occupational exposure limits</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients:</td>
<td>ppm</td>
<td>mg/m³ Other</td>
<td>ppm</td>
</tr>
<tr>
<td>2-Butoxyethanol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US ACGIH</td>
<td>20</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>OSHA PEL</td>
<td>50</td>
<td>240</td>
<td>-</td>
</tr>
<tr>
<td>OSHA PEL 1989</td>
<td>25</td>
<td>120</td>
<td>-</td>
</tr>
</tbody>
</table>


Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures
Section 8. Exposure controls/personal protection

**Hand protection**
If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Eye/face protection**
Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Skin protection**
Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection**
If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

**Appearance**

**Physical state**
Liquid. [Clear.]

**Color**
Water-white.

**Odor**
Alcohol-like.

**Odor threshold**
Not available.

**pH**
Not available.

**Melting/freezing point**
Not available.

**Boiling point**
Not available.

**Initial Boiling Point**
Not available.

**Flash point**
Closed cup: 62.22°C (144°F) [PMCC]

**Burning time**
Not applicable.

**Burning rate**
Not applicable.

**Evaporation rate**
Not available.

**Flammability (solid, gas)**
Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

**Lower and upper explosive (flammable) limits**
Not available.

**Vapor pressure**
32.4 kPa (243 mm Hg (4.7 psig)) @ 54.44°C 130 F (Reid)

**Vapor density**
>1 [Air = 1]

**Relative density**
1.0525 (15.6°C)

**Density**
8.77 (lbs/gal)

**Solubility in water**
Soluble

**Partition coefficient: n-octanol/water**
Not available.

**Auto-ignition temperature**
Not available.

**Decomposition temperature**
Not available.

**Viscosity**
Not available.

**VOC**
Not available.

**Pour Point**
-9.4°C (15.1°F)
Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>LC50 Inhalation Gas.</td>
<td>Rat</td>
<td>450 ppm</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Guinea pig</td>
<td>&gt;2000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>200 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>99 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Guinea pig</td>
<td>500 to 2000 mg/</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rabbit</td>
<td>320 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data

Mutagenicity
No applicable toxicity data

Carcinogenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>-</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)
Not applicable.

Aspiration hazard
Section 11. Toxicological information

Information on the likely routes of exposure: Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
Potential immediate effects: Not available.
Potential delayed effects: Not available.

Potential chronic health effects
General: No known significant effects or critical hazards.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental effects: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>5841.1 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>12850.5 mg/kg</td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td>128.5 mg/l</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>Acute EC50 &gt;1000 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 1000 mg/l Marine water</td>
<td>Crustaceans - Chaetogammarus marinus - Young</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 1250000 µg/l Marine water</td>
<td>Fish - Menidia beryllina</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Other adverse effects: No known significant effects or critical hazards.
Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>Combustible liquid, n.o. s. (Contains: 2-Butoxyethanol)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>Combustible liquid.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>Additional information</td>
<td>Remarks</td>
<td>This material is not regulated by DOT if transported in a packaging &lt;= 119 gallons. This material is not regulated by TDG or IMO.</td>
<td>-</td>
</tr>
</tbody>
</table>

Special precautions for user: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Not applicable.

Marine pollutant: Not available.
Section 14. Transport information

North-America NAERG: 128

Section 15. Regulatory information

U.S. Federal regulations:
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed
- SARA 302/304: No products were found.
- SARA 311/312 Classification: Fire hazard
- SARA 313

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>111-76-2</td>
<td>5 - 10</td>
<td></td>
</tr>
</tbody>
</table>

Canada
- Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability
- Health: 2
- Instability/Reactivity: 2
- Special

History
- Date of printing: 10/14/2014.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
SAFETY DATA SHEET

Section 1. Identification

Product name : PETROSWEET™ HSW700 SCAVENGER
   ™ a trademark of Baker Hughes, Inc.
Product code : HSW700

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

Identified uses : Hydrogen Sulfide Scavenger.

Print date : 10/6/2014.
Validation date : 10/6/2014.
Version : 1

Supplier's details : Baker Petrolite
   A Baker Hughes Company
   12645 W. Airport Blvd.
   Sugar Land, TX 77478
   For Product Information/SDSs Call: 800-231-3606
   (8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation) : CHEMTREC: 800-424-9300 (U.S. 24 hour)
   Baker Petrolite: 800-231-3606
   (001)281-276-5400
   CANUTEC: 613-996-6666 (Canada 24 hours)
   CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 3
   ACUTE TOXICITY: ORAL - Category 4
   ACUTE TOXICITY: INHALATION - Category 3
   SKIN CORROSION/IRRITATION - Category 2
   SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
   SKIN SENSITIZATION - Category 1
   SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [optic nerve] - Category 1
   SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) [respiratory tract] - Category 1

GHS label elements

Hazard pictograms : 

Signal word : Danger
Section 2. Hazards identification

Hazard statements: Flammable liquid and vapor. Toxic if inhaled. Harmful if swallowed. Causes serious eye damage. Causes skin irritation. May cause an allergic skin reaction. Causes damage to organs. (optic nerve) Causes damage to organs through prolonged or repeated exposure. (respiratory tract)

Precautionary statements

Prevention: Wear protective gloves: > 8 hours (breakthrough time): Nitrile or Neoprene gloves. 4H gloves. Butyl rubber gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area.

Response: Get medical attention if you feel unwell. IF exposed: Call a POISON CENTER or physician. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician. IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell. Rinse mouth. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation or rash occurs: Get medical attention. 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 physician.

Storage: Store locked up. Store in a well-ventilated place. Keep cool.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified: None known.

Additional information

The vapor pressure of the alkanolamine/aldehyde condensate in this product is extremely low. In hydrogen sulfide scavenging applications in oil and gas production or processing of hydrogen streams, mechanically generated mists or aerosols are not expected to be formed. Therefore, in these applications human inhalation exposure to this alkanolamine/aldehyde condensate is not expected to occur.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkanolamine/aldehyde condensate</td>
<td>40 - 50</td>
<td>4719-04-4</td>
</tr>
<tr>
<td>Methanol</td>
<td>5 - 10</td>
<td>67-56-1</td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>1 - 5</td>
<td>141-43-5</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.
Section 4. First aid measures

Inhalation: Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact: Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact: Causes serious eye damage.
Inhalation: Toxic if inhaled. May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Skin contact: Causes skin irritation. May cause an allergic skin reaction.
Ingestion: Harmful if swallowed. May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact: pain, watering, redness
Inhalation: No specific data.
Skin contact: pain or irritation, redness, blistering may occur
Ingestion: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments: No specific treatment.
Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)
Section 5. Fire-fighting measures

Extinguishing media

| Suitable extinguishing media | Use dry chemical, CO₂, water spray (fog) or foam. |
| Unsuitable extinguishing media | Do not use water jet. |

Specific hazards arising from the chemical

| Hazardous thermal decomposition products | Carbon dioxide, carbon monoxide, nitrogen oxides |

Special protective actions for fire-fighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill

Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill

Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.
Section 6. Accidental release measures

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Additional information

The recommended shelf life for this product is 12 months from the manufacturing date.

Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours) ppm</th>
<th>TWA (8 hours) mg/m³</th>
<th>STEL (15 mins) ppm</th>
<th>STEL (15 mins) mg/m³</th>
<th>Ceiling ppm</th>
<th>Ceiling mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>US ACGIH</td>
<td>200</td>
<td>262</td>
<td>-</td>
<td>250</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>200</td>
<td>260</td>
<td>-</td>
<td>250</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>200</td>
<td>260</td>
<td>-</td>
<td>250</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>US ACGIH</td>
<td>3</td>
<td>7.5</td>
<td>-</td>
<td>6</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>3</td>
<td>6</td>
<td>-</td>
<td>6</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>3</td>
<td>8</td>
<td>-</td>
<td>6</td>
<td>15</td>
<td>-</td>
</tr>
</tbody>
</table>


Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.
Section 8. Exposure controls/personal protection

Appropriate engineering controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection: Chemical-resistant gloves: Nitrile or Neoprene gloves. 4H gloves. Butyl rubber gloves.

Skin protection: Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid.

Color: Light yellow to Straw Yellow.

Odor: Amine like.

Odor threshold: Not available.

pH: 10 to 11.5

5% of product in 75% isopropanol / 25% water solution

Melting/freezing point: Not available.

Boiling point: Not available.

Initial Boiling Point: Not available.

Flash point: Closed cup: 52.2°C (126°F) [SFCC]

Burning time: Not applicable.

Burning rate: Not applicable.

Evaporation rate: Not available.

Flammability (solid, gas): Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

Lower and upper explosive (flammable) limits: Not available.

Vapor pressure: 32.4 kPa (243 mm Hg, 4.7 psig) @ 54.4°C, 130 F (Reid)

Vapor density: >1 [Air = 1]

Relative density: 1.074 (15.6°C)

Density: 8.95 (lbs/gal)

Solubility in water: Soluble

Partition coefficient: n-octanol/water: Not available.

Auto-ignition temperature: Not available.
Section 9. Physical and chemical properties

Decomposition temperature: Not available.
Viscosity: Dynamic (15.6°C): 14 to 16 cP
VOC: Not available.
Pour Point: -37°C (-34.6°F)

Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability: The product is stable.
Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials, reducing materials and acids. Methanol is incompatible and may react with acetyl bromide, alkyl aluminum solutions, beryllium hydride, boron trichloride, nitric acid, cyanuric chloride, dichloromethane, diethylzinc, metals (granulated forms of aluminum and magnesium – including aluminum and zinc salts), phosphorus III oxide, and potassium tert-butoxide.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkanolamine/aldehyde condensate</td>
<td>LC50 Inhalation Dusts and mists</td>
<td>Rat - Female</td>
<td>0.338 mg/l</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Dusts and mists</td>
<td>Rat - Male</td>
<td>0.4 mg/l</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>763 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Gas.</td>
<td>Rat</td>
<td>145000 ppm</td>
<td>1 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Gas.</td>
<td>Rat</td>
<td>64000 ppm</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>15800 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>5600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>1720 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Methanol

LC50 Inhalation Gas. Rat 145000 ppm 1 hours
LC50 Inhalation Gas. Rat 64000 ppm 4 hours
LD50 Oral Rat 763 mg/kg -
LD50 Oral Rat 145000 ppm 1 hours
LD50 Oral Rabbit 15800 mg/kg -
LD50 Oral Rat 5600 mg/kg -
LD50 Oral Rat 1720 mg/kg -

Monoethanolamine

LD50 Oral Rat 1720 mg/kg -

Irritation/Corrosion

No applicable toxicity data

Sensitization

No applicable toxicity data

Mutagenicity

No applicable toxicity data

Carcinogenicity

No applicable toxicity data
Section 11. Toxicological information

**Reproductive toxicity**
No applicable toxicity data

**Teratogenicity**
No applicable toxicity data

**Specific target organ toxicity (single exposure)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>Category 1</td>
<td>Not determined</td>
<td>optic nerve</td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract</td>
</tr>
</tbody>
</table>

**Specific target organ toxicity (repeated exposure)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkanolamine/aldehyde condensate</td>
<td>Category 1</td>
<td>Not determined</td>
<td>respiratory tract</td>
</tr>
</tbody>
</table>

**Aspiration hazard**
Not available.

**Information on the likely routes of exposure**

Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

Potential immediate effects : Not available.

Potential delayed effects : Not available.

**Potential chronic health effects**

General : Causes damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>657.8 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>3077.8 mg/kg</td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td>30.78 mg/l</td>
</tr>
<tr>
<td>Inhalation (dusts and mists)</td>
<td>0.7659 mg/l</td>
</tr>
</tbody>
</table>

10/6/2014.
Section 12. Ecological information

### Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkanolamine/aldehyde condensate</td>
<td>Acute EC50 6.66 mg/l</td>
<td>Algae - Green algae</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 11.9 mg/l</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 16.07 mg/l</td>
<td>Fish - Brachadanio rerio</td>
<td>96 hours</td>
</tr>
<tr>
<td>Methanol</td>
<td>Acute EC50 16.912 mg/l</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 10000000 µg/l</td>
<td>Crustaceans - Crangon crangon</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Fresh water</td>
<td>Fish - Pimephales promelias</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 2500000 µg/l</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>Algae - Isochrysis galbana</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 100 mg/l</td>
<td>Crustaceans - Crangon crangon - Adult</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Fresh water</td>
<td>Fish - Carrassius auratus</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 80000 µg/l</td>
<td>Algae</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>Crustaceans - Crangon crangon - Adult</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 &gt;100000 µg/l</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>Acute LC50 170000 µg/l</td>
<td>Fish - Carrassius auratus</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Fresh water</td>
<td>Algae</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute EC50 5.4 mg/l</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PETROSWEET™ HSW700 SCAVENGER</td>
<td>Acute LC50 64 mg/l</td>
<td>Fish</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 180 mg/l</td>
<td></td>
<td>96 hours</td>
</tr>
</tbody>
</table>

### Persistence and degradability

Not available.

### Other adverse effects

No known significant effects or critical hazards.

### Additional information

An EcoTox™ Report, and/or the material's environmental fate is available upon request at the following number: 1-800-235-4249, then press 4.

Section 13. Disposal considerations

### Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information
## Section 14. Transport information

<table>
<thead>
<tr>
<th>UN number</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN2929</td>
<td>UN2929</td>
<td>UN2929</td>
<td>UN2929</td>
<td>UN2929</td>
</tr>
</tbody>
</table>

**UN proper shipping name**

- **TOXIC LIQUIDS, FLAMMABLE, ORGANIC, N.O.S.**  
  (Contains: Alkanolamine/aldehyde condensate, Methanol)

**Transport hazard class(es)**

- 6.1 (3)

**Emergency schedules**

- F-E S-D

**Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

**DOT Reportable Quantity**: Methanol, 5988 gal of this product.

**Marine pollutant**: Not available.

**North-America NAERG**: 131

## Section 15. Regulatory information

**U.S. Federal regulations**

- **TSCA 4(a) final test rules**: Alkanolamine/aldehyde condensate
- **TSCA 12(b) one-time export**: Alkanolamine/aldehyde condensate
- **TSCA 12(b) annual export notification**: No products were found.

**United States inventory (TSCA 8b)**: All components are listed or exempted.

**Clean Water Act (CWA) 307**: No products were found.

**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)**

- **SARA 302/304**: Listed
- **SARA 311/312**: No products were found.
Section 15. Regulatory information

Classification: Fire hazard
Immediate (acute) health hazard
Delayed (chronic) health hazard

SARA 313

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>5 - 10</td>
</tr>
</tbody>
</table>

Canada

Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability
Health: 2
Instability/Reactivity: 3
Special: 0

History

Date of printing: 10/6/2014.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this SDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This SDS was prepared and is to be used for this product. If the product is used as a component in another product, this SDS information may not be applicable.

10/6/2014. HSW700
Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: SURF-SOL
Product Number: RJ 62000 D
Product Use: Work-Over Fluid.
Manufacturer/Supplier: Enova Solutions Inc.
3553 Landco Drive, Ste B
Bakersfield, CA 93308
Phone Number: (661) 327-2405
Emergency Phone: (661) 327-2405
Date of Preparation: April 4, 2012

Section 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION
MAY CAUSE EYE IRRITATION. MAY CAUSE SKIN IRRITATION.

Potential Health Effects: See Section 11 for more information.

Likely Routes of Exposure: Skin contact, eye contact, inhalation, and ingestion.

Eye: May cause eye irritation.
Skin: May cause skin irritation.
Ingestion: May be harmful if swallowed. May cause stomach distress, nausea, or vomiting. Harmful: may cause lung damage if swallowed.
Inhalation: May cause respiratory tract irritation. This product may be aspirated into the lungs and cause chemical pneumonitis.

Chronic Effects: Prolonged or repeated contact may dry skin and cause irritation.

Signs and Symptoms: Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. Symptoms may include redness, edema, drying, defatting and cracking of the skin.

Medical Conditions Aggravated By Exposure: Asthma. Allergies.

Target Organs: Skin, eyes, gastrointestinal tract, respiratory system.

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
Potential Environmental Effects: May cause long-term adverse effects in the aquatic environment. See Section 12 for more information.

### Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS #</th>
<th>Wt. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerosene</td>
<td>8008-20-6</td>
<td>5 – 70</td>
</tr>
<tr>
<td>Proprietary Blend of Surfactants</td>
<td>0 - 5</td>
<td></td>
</tr>
<tr>
<td>Conditioned Water</td>
<td>7732 - 18 – 5</td>
<td>2 - 30</td>
</tr>
<tr>
<td>Stoddard Solvents</td>
<td>8052 – 41 – 3</td>
<td>.1 - 2</td>
</tr>
</tbody>
</table>

### Section 4: FIRST AID MEASURES

**Eye Contact:** In case of contact, immediately flush eyes with plenty of water. If easy to do, remove contact lenses, if worn.

**Skin Contact:** In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician if irritation develops and persists.

**Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

**Ingestion:** If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

**General Advice:** In case of accident or if you feel unwell, seek medical advice immediately (show the label or MSDS where possible).

**Note to Physicians:** Symptoms may not appear immediately.

### Section 5: FIRE FIGHTING MEASURES

**Flammability:** Not flammable by OSHA criteria.

**Means of Extinction:**
- **Suitable Extinguishing Media:** Powder, water spray, foam, carbon dioxide.
- **Unsuitable Extinguishing Media:** Not available.

**Products of Combustion:** Oxides of carbon.

**Explosion Data:**
- **Sensitivity to Mechanical Impact:** Not available.
- **Sensitivity to Static Discharge:** Not available.

**Protection of Firefighters:** Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).
Section 6: ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

**Environmental Precautions:** This material is a water pollutant. Keep out of drains, sewers, ditches, and waterways. Minimize use of water to prevent environmental contamination.

**Methods for Containment:** Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).

**Methods for Clean-Up:** Vacuum or sweep material and place in a disposal container. Allow gas to dissipate harmlessly into the atmosphere.

**Other Information:** Not available.

Section 7: HANDLING AND STORAGE

**Handling:** Avoid contact with skin and eyes. Do not swallow. Do not breathe gas/fumes/vapor/spray. Handle and open container with care. When using, do not eat or drink. Wash hands before eating, drinking, or smoking.

**Storage:** Keep out of the reach of children. Keep container tightly closed. Keep away from food, drink and animal feeding stuffs.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure Guidelines**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>OSHA-PEL</th>
<th>ACGIH-TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerosene</td>
<td>Not available.</td>
<td>200 mg/m³</td>
</tr>
</tbody>
</table>

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

**Personal Protective Equipment:**

- **Eye/Face Protection:** Wear eye/face protection.
- **Hand Protection:** Wear suitable gloves.
- **Skin and Body Protection:** Wear suitable protective clothing.
- **Respiratory Protection:** In case of insufficient ventilation, wear suitable respiratory equipment.

**General Hygiene Considerations:** Handle according to established industrial hygiene and safety practices.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES
Appearance: Opaque.
Color: White-Pink
Odour: Kerosene.
Odour Threshold: Not available.
Physical State: Liquid.
pH: 7
Kinematic Viscosity @ 70 Deg F: 212.7 cSt
Freezing Point: Not available.
Boiling Point: ~ 212 °C (~ 413.6 °F)
Flash Point, COC: 178 Deg F
Evaporation Rate: Not available.
Lower Flammability Limit: Not available.
Upper Flammability Limit: Not available.
Vapor Pressure: 1.46 psi
Vapor Density: Not available.
Specific Gravity: Not available.
API Gravity: 29.3 deg. API
Solubility in Water: Complete.
Coefficient of Water/Oil Distribution: Not available.
Auto-ignition Temperature: Not available.
Percent Volatile, wt. %: 4
VOC content, wt. %: Not available.

Section 10: STABILITY AND REACTIVITY
Stability: Stable under normal storage conditions.
Incompatible Materials: Oxidizers.
Hazardous Decomposition Products: Oxides of carbon.
Possibility of Hazardous Reactions: No dangerous reaction known under conditions of normal use.

Section 11: TOXICOLOGY INFORMATION
EFFECTS OF ACUTE EXPOSURE
Component Analysis
Ingredient | LD₅₀ (oral) | LC₅₀
Kerosene | > 5000 mg/kg, rat | > 5000 mg/m³ 4hr, rat
Eye: May cause eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva.

Skin: May cause skin irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin.

Ingestion: May be harmful if swallowed. May cause stomach distress, nausea, or vomiting. Harmful: may cause lung damage if swallowed.

Inhalation: May cause respiratory tract irritation. This product may be aspirated into the lungs and cause chemical pneumonitis.

**EFFECTS OF CHRONIC EXPOSURE**

**Target Organs:** Not available.

**Chronic Effects:** Not hazardous by OSHA criteria.

**Carcinogenicity:** Not hazardous by OSHA criteria.

**Ingredient** Chemical Listed as Carcinogen or Potential Carcinogen *

| Ingredient | A3 |

* See Section 15 for more information.

**Mutagenicity:** Not hazardous by OSHA criteria.

**Reproductive Effects:** Not hazardous by OSHA criteria.

**Developmental Effects:**

**Teratogenicity:** Not hazardous by OSHA criteria.

**Embryotoxicity:** Not hazardous by OSHA criteria.

**Respiratory Sensitization:** Not hazardous by OSHA criteria.

**Skin Sensitization:** Not hazardous by OSHA criteria.

**Toxicologically Synergistic Materials:** Not available.

**Section 12: ECOLOGICAL INFORMATION**

**Ecotoxicity:** May cause long-term adverse effects in the aquatic environment

**Persistence / Degradability:** Not available.

**Bioaccumulation / Accumulation:** Not available.

**Mobility in Environment:** Not available.

**Section 13: DISPOSAL CONSIDERATIONS**

**Disposal Instructions:**

This material and its container must be disposed of in a safe way.

**Section 14: TRANSPORTATION INFORMATION**

**DOT Classification**

Not regulated
Section 15: REGULATORY INFORMATION

Federal Regulations


SARA Title III

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Section 302 (EHS) TPQ (lbs.)</th>
<th>Section 304 EHS RQ (lbs.)</th>
<th>CERCLA RQ (lbs.)</th>
<th>Section 313</th>
</tr>
</thead>
</table>

State Regulations

California Proposition 65:
This product contains a chemical known to the state of California to cause cancer.
This product contains a chemical or chemicals known to the State of California to cause birth defects or other reproductive harm.

Global Inventories

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>USA</th>
<th>TSCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerosene</td>
<td></td>
<td>Yes.</td>
</tr>
</tbody>
</table>

NFPA - National Fire Protection Association:

Health - 1 Fire - 2 Reactivity - 0

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

SOURCE AGENCY CARCINOGEN CLASSIFICATIONS:

OSHA (O) Occupational Safety and Health Administration.
ACGIH (G) American Conference of Governmental Industrial Hygienists.
A1 - Confirmed human carcinogen.
A2 - Suspected human carcinogen.
A3 - Animal carcinogen.
A4 - Not classifiable as a human carcinogen.
A5 - Not suspected as a human carcinogen.
IARC (I) International Agency for Research on Cancer.
1 - The agent (mixture) is carcinogenic to humans.
2A - The agent (mixture) is probably carcinogenic to humans; there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.
2B - The agent (mixture) is possibly carcinogenic to humans; there is limited evidence of carcinogenicity in humans in the absence of sufficient evidence of carcinogenicity in experimental animals.
3 - The agent (mixture, exposure circumstance) is not classifiable as to its carcinogenicity to humans.
4 - The agent (mixture, exposure circumstance) is probably not carcinogenic to humans.
NTP (N) National Toxicology Program.
1 - Known to be carcinogens.
2 - Reasonably anticipated to be carcinogens.
Section 16: OTHER INFORMATION

Disclaimer:
The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user’s responsibility to satisfy oneself as to the suitability and completeness of this information for the user’s own particular use.

Version #: 1.0
Expires: April 4, 2015
Prepared by: Nexreg Compliance Inc.
Phone: (519) 488-5126
www.nexreg.com
SAFETY DATA SHEET

Section 1. Identification

Product name: TECHNI-CHEK 3658  
Product code: CRW3658

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

Identified uses: Corrosion inhibitor.

Print date: 2/2/2015.  
Validation date: 2/2/2015.  
Version: 1

Supplier's details:

Baker Petrolite  
A Baker Hughes Company  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 800-231-3606  
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):

CHEMTREC: 800-424-9300 (U.S. 24 hour)  
Baker Petrolite: 800-231-3606  
(001)281-276-5400  
CANUTEC: 613-996-6666 (Canada 24 hours)  
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status:

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:

SKIN CORROSION/IRRITATION - Category 1  
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1  
AQUATIC HAZARD (ACUTE) - Category 1  
AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements

Hazard pictograms:

Signal word: Danger

Hazard statements:

Causes severe skin burns and eye damage.  
Very toxic to aquatic life.  
Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention:

Wear protective gloves. Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Wash hands thoroughly after handling.
Section 2. Hazards identification

Response

Collect spillage. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

Storage

Store locked up.

Disposal

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

Hazards not otherwise classified

None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>10 - 20</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Phosphate ester salt</td>
<td>5 - 10</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Ethanol</td>
<td>1 - 5</td>
<td>64-17-5</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>0.1 - 1</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Eye contact: Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

Inhalation: Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact: Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
Section 4. First aid measures

Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact: Causes serious eye damage.
Inhalation: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Skin contact: Causes severe burns.
Ingestion: May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact: pain, watering, redness
Inhalation: No specific data.
Skin contact: pain or irritation, redness, blistering may occur
Ingestion: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments: No specific treatment.
Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical: In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products: carbon dioxide, carbon monoxide, nitrogen oxides, phosphorus oxides, halogenated compounds

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel**: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders**: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions**: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

**Methods and materials for containment and cleaning up**

**Small spill**: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill**: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

**Precautions for safe handling**

**Protective measures**: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene**: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities**: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

### Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>List name</th>
<th>TWA (8 hours) ppm</th>
<th>TWA (8 hours) mg/m³</th>
<th>STEL (15 mins) ppm</th>
<th>STEL (15 mins) mg/m³</th>
<th>Ceiling ppm</th>
<th>Ceiling mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
<td>1000</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>1000</td>
<td>1900</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>1000</td>
<td>1900</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

### Appropriate engineering controls

If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

### Individual protection measures

#### Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

#### Eye/face protection

Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

#### Hand protection

Chemical-resistant gloves.

#### Skin protection

Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

#### Respiratory protection

If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

### Appearance

#### Physical state

Liquid. [Clear.]

#### Color

Colorless.

#### Odor

Alcohol [Slight]

#### Odor threshold

Not available.

#### pH

5.5 to 7.5

#### Melting/freezing point

Not available.

#### Boiling point

Not available.

#### Initial Boiling Point

Not available.

#### Flash point

Closed cup: >93.34°C (>200°F) [TCC]

#### Burning time

Not applicable.

#### Burning rate

Not applicable.

#### Evaporation rate

Not applicable.

#### Flammability (solid, gas)

Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>1</td>
</tr>
<tr>
<td>Density</td>
<td>8.32 (lbs/gal)</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
</tr>
<tr>
<td>VOC</td>
<td>Not available.</td>
</tr>
<tr>
<td>Pour Point</td>
<td>-1.67°C (29°F)</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials, metals, acids and alkalis.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>426 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Ethanol</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>20000 ppm</td>
<td>10 hours 10 hours</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>124700 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>7 g/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1000 to 1250 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data

Mutagenicity
No applicable toxicity data
Section 11. Toxicological information

**Carcinogenicity**
No applicable toxicity data

**Reproductive toxicity**
No applicable toxicity data

**Teratogenicity**
No applicable toxicity data

**Specific target organ toxicity (single exposure)**
Not applicable.

**Specific target organ toxicity (repeated exposure)**
Not applicable.

**Aspiration hazard**
Not available.

**Information on the likely routes of exposure**
Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**
Potential immediate effects: Not available.
Potential delayed effects: Not available.

**Potential chronic health effects**

- **General**: No known significant effects or critical hazards.
- **Carcinogenicity**: No known significant effects or critical hazards.
- **Mutagenicity**: No known significant effects or critical hazards.
- **Teratogenicity**: No known significant effects or critical hazards.
- **Developmental effects**: No known significant effects or critical hazards.
- **Fertility effects**: No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>3506.2 mg/kg</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

**Toxicity**
Section 12. Ecological information

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>Acute EC50 37 ppb Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 64 ppb Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.15 ppb Marine water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 32.2 ppb</td>
<td>Fish - Pimephales promelas</td>
<td>34 days</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 17.921 mg/l Marine water</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 25500 µg/l Marine water</td>
<td>Crustaceans - Artemia franciscana - Larvae</td>
<td>48 hours</td>
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<td></td>
<td>Acute LC50 42000 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
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<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 4.995 mg/l Marine water</td>
<td>Fish - Gambusia holbrooki - Larvae</td>
<td>12 weeks</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.375 ul/L Fresh water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Other adverse effects
No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods
The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th></th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
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<tbody>
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</tr>
<tr>
<td>UN proper shipping name</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
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</tr>
<tr>
<td>Transport hazard class(es)</td>
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<td>8</td>
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<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>Yes.</td>
<td>Yes.</td>
<td>No.</td>
</tr>
</tbody>
</table>

2/2/2015.
Section 14. Transport information

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Not applicable.

Marine pollutant: Quaternary ammonium compound

North-America NAERG: 154

Section 15. Regulatory information

U.S. Federal regulations
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed

SARA 302/304: No products were found.

SARA 311/312 Classification: Immediate (acute) health hazard

SARA 313 Supplier notification: No products were found.

Canada
- Canada (CEPA DSL): At least one component is not listed in DSL but all such components are listed in NDSL.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Health 3 0 
Flammability

Instability/Reactivity

Special

History
- Date of printing: 2/2/2015.

Indicates information that has changed from previously issued version.

Notice to reader
Section 16. Other information

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: TECHNI-HIB 3743
Product code: CRW3743

Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Corrosion inhibitor.

Print date: 10/31/2014.
Validation date: 10/31/2014.
Version: 1

Supplier's details:
Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
SKIN CORROSION/IRRITATION - Category 1B
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
AQUATIC HAZARD (ACUTE) - Category 1
AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements
Hazard pictograms:

Signal word: Danger
Hazard statements: Causes severe skin burns and eye damage.
Very toxic to aquatic life.
Toxic to aquatic life with long lasting effects.

Precautionary statements
Prevention: Wear protective gloves: > 8 hours (breakthrough time): neoprene nitrile polyvinyl alcohol (PVA) polyvinyl chloride (PVC). Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Wash hands thoroughly after handling.
Section 2. Hazards identification

Response: Collect spillage. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

Storage: Store locked up.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified: None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>20 - 30</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Phosphate ester salt</td>
<td>5 - 10</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Ethanol</td>
<td>1 - 5</td>
<td>64-17-5</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>0.1 - 1</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Eye contact: Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

Inhalation: Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact: Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
Section 4. First aid measures

Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**

**Potential acute health effects**

- **Eye contact**: Causes serious eye damage.
- **Inhalation**: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- **Skin contact**: Causes severe burns.
- **Ingestion**: May cause burns to mouth, throat and stomach.

**Over-exposure signs/symptoms**

- **Eye contact**: pain, watering, redness
- **Inhalation**: No specific data.
- **Skin contact**: pain or irritation, redness, blistering may occur
- **Ingestion**: stomach pains

**Indication of immediate medical attention and special treatment needed, if necessary**

- **Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- **Specific treatments**: No specific treatment.
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

- **Suitable extinguishing media**: Use an extinguishing agent suitable for the surrounding fire.
- **Unsuitable extinguishing media**: None known.

**Specific hazards arising from the chemical**

- **Hazardous thermal decomposition products**: carbon dioxide, carbon monoxide, nitrogen oxides, phosphorus oxides, halogenated compounds

**Special protective actions for fire-fighters**

- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters**

- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Occupational exposure limits</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients:</td>
<td>ppm</td>
<td>mg/m³</td>
<td>ppm</td>
</tr>
<tr>
<td>Ethanol</td>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OSHA PEL</td>
<td>1000</td>
<td>1900</td>
<td>-</td>
</tr>
<tr>
<td>OSHA PEL 1989</td>
<td>1000</td>
<td>1900</td>
<td>-</td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits.
Only components of this product with established exposure limits appear in the box above.
If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection: Chemical-resistant gloves: neoprene nitrile polyvinyl alcohol (PVA) polyvinyl chloride (PVC)

Skin protection: Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid. [Clear.]
Color: Colorless to pale pink.
Odor: Alcohol-like. [Slight]
Odor threshold: Not available.
pH: 5 to 7
Melting/freezing point: -4.444°C (24°F)
Boiling point: 104.44°C (220°F)
Initial Boiling Point: Not applicable.
Flash point: Closed cup: 93.333°C (200°F) [TCC]
Burning time: Not applicable.
Burning rate: Not applicable.
Evaporation rate: Not available.
Flammability (solid, gas): Not available.
Section 9. Physical and chemical properties

- **Lower and upper explosive (flammable) limits**: Not available.
- **Vapor pressure**: Not available.
- **Vapor density**: Not available.
- **Relative density**: 1
- **Density**: 8.33 (lbs/gal)
- **Solubility in water**: Soluble
- **Partition coefficient: n-octanol/water**: Not available.
- **Auto-ignition temperature**: Not available.
- **Decomposition temperature**: Not available.
- **Viscosity**: Not available.
- **VOC**: Not available.
- **Pour Point**: Not available.

Section 10. Stability and reactivity

- **Reactivity**: No specific test data related to reactivity available for this product or its ingredients.
- **Chemical stability**: The product is stable.
- **Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Conditions to avoid**: No specific data.
- **Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials, metals, acids and alkalis.

Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>426 mg/kg</td>
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<tr>
<td>Ethanol</td>
<td>LC50 Oral</td>
<td>Rat</td>
<td>124700 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>LC50 Oral</td>
<td>Rat</td>
<td>1000 to 1250 mg/kg</td>
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</tr>
</tbody>
</table>

**Irritation/Corrosion**
No applicable toxicity data

**Sensitization**
No applicable toxicity data

**Mutagenicity**
No applicable toxicity data
Section 11. Toxicological information

Carcinogenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
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<th>IARC</th>
<th>NTP</th>
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<tbody>
<tr>
<td>Ethanol</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)
Not applicable.

Aspiration hazard
Not available.

Information on the likely routes of exposure
: Not available.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
Potential immediate effects : Not available.
Potential delayed effects : Not available.

Potential chronic health effects
General : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
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</thead>
<tbody>
<tr>
<td>Oral</td>
<td>2103.7 mg/kg</td>
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</table>

Section 12. Ecological information

Toxicity
Section 12. Ecological information

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>Acute EC50 37 ppb Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 64 ppb Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.15 ppb Marine water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Acute NOEC 32.2 ppb</td>
<td>Fish - Pimephales promelas</td>
<td>34 days</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Acute EC50 17.921 mg/l Marine water</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
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<tr>
<td></td>
<td>Acute EC50 2000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 25500 µg/l Marine water</td>
<td>Crustaceans - Artemia</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 42000 µg/l Fresh water</td>
<td>franciscana - Larvae</td>
<td>4 days</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
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<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 32.2 ppb</td>
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<td>12 weeks</td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Other adverse effects
No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods
The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

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<tbody>
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<td>UN1760</td>
<td>UN1760</td>
<td>UN1760</td>
<td>UN1760</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>Yes.</td>
<td>Yes.</td>
<td>No.</td>
</tr>
</tbody>
</table>
Section 14. Transport information

Additional information

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Not applicable.

Marine pollutant: Quaternary ammonium compound

North-America NAERG: 154

Section 15. Regulatory information

U.S. Federal regulations:
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed
- SARA 302/304: No products were found.
- SARA 311/312 Classification: Immediate (acute) health hazard
- SARA 313 Supplier notification: No products were found.

Canada
- Canada (CEPA DSL): At least one component is not listed in DSL but all such components are listed in NDSL.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability
Health
Instability/Reactivity
Special

History

Date of printing: 10/31/2014.

Notice to reader

Indicates information that has changed from previously issued version.
Section 16. Other information

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
## Section 1. Identification

**Product name**: WCW3003 COMBINATION INHIBITOR  
**Product code**: WCW3003  

**Relevant identified uses of the substance or mixture and uses advised against**  
**Identified uses**: Emulsifier. Corrosion inhibitor.

**Print date**: 2/2/2015.  
**Validation date**: 2/2/2015.  
**Version**: 1  

**Supplier's details**: Baker Petrolite  
A Baker Hughes Company  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 800-231-3606  
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

**Emergency telephone number (with hours of operation)**:  
CHEMTREC: 800-424-9300 (U.S. 24 hour)  
Baker Petrolite: 800-231-3606  
(001)281-276-5400  
CANUTEC: 613-996-6666 (Canada 24 hours)  
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

## Section 2. Hazards identification

**OSHA/HCS status**: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture**:  
- **SKIN CORROSION/IRRITATION** - Category 1  
- **SERIOUS EYE DAMAGE/EYE IRRITATION** - Category 1  
- **AQUATIC HAZARD (ACUTE)** - Category 2  
- **AQUATIC HAZARD (LONG-TERM)** - Category 2

**GHS label elements**

**Hazard pictograms**: ![pictograms]

**Signal word**: Danger

**Hazard statements**:  
Causes severe skin burns and eye damage.  
Toxic to aquatic life with long lasting effects.

**Precautionary statements**

**Prevention**: Wear protective gloves. Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Wash hands thoroughly after handling.
Section 2. Hazards identification

Response:
Collect spillage. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

Storage:
Store locked up.

Disposal:
Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified:
None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>5 - 10</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Phosphate ester salt</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Ethanol</td>
<td>1 - 5</td>
<td>64-17-5</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>0.1 - 1</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**
Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation**
Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**
Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**
Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
Section 4. First aid measures

Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

**Eye contact:** Causes serious eye damage.

**Inhalation:** May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact:** Causes severe burns.

**Ingestion:** May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

**Eye contact:** pain, watering, redness

**Inhalation:** No specific data.

**Skin contact:** pain or irritation, redness, blistering may occur

**Ingestion:** stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician:** In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments:** No specific treatment.

**Protection of first-aiders:** No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media:** Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media:** None known.

**Specific hazards arising from the chemical:** In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products:** carbon dioxide, carbon monoxide, nitrogen oxides, phosphorus oxides, halogenated compounds

**Special protective actions for fire-fighters:** Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters:** Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours) ppm</th>
<th>mg/m³</th>
<th>STEL (15 mins) ppm</th>
<th>mg/m³</th>
<th>Ceiling ppm</th>
<th>mg/m³</th>
<th>Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
<td>1000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>1000</td>
<td>1900</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>1000</td>
<td>1900</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits. Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection: Chemical-resistant gloves.

Skin protection: Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid. [Clear.]
Color: Yellow.
Odor: Mercaptan.
Odor threshold: Not available.
pH: 5 to 7
Melting/freezing point: Neat - without dilution.
Boiling point: Not available.
Initial Boiling Point: Not available.
Flash point: Closed cup: 94°C (201.2°F) [SFCC]
Burning time: Not applicable.
Burning rate: Not applicable.
Evaporation rate: Not available.
Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability (solid, gas)</td>
<td>Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.</td>
</tr>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>&gt;1 [Air = 1]</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.0399 (15.6°C)</td>
</tr>
<tr>
<td>Density</td>
<td>8.66 (lbs/gal)</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
</tr>
<tr>
<td>VOC</td>
<td>Not available.</td>
</tr>
<tr>
<td>Pour Point</td>
<td>-5°C (23°F)</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials, metals, acids and alkalis.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound Ethanol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>426 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>20000 ppm</td>
<td>10 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>124700 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>7 g/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>1000 to 1250 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data
Section 11. Toxicological information

**Mutagenicity**
No applicable toxicity data

**Carcinogenicity**
No applicable toxicity data

**Reproductive toxicity**
No applicable toxicity data

**Teratogenicity**
No applicable toxicity data

**Specific target organ toxicity (single exposure)**
Not applicable.

**Specific target organ toxicity (repeated exposure)**
Not applicable.

**Aspiration hazard**
Not available.

**Information on the likely routes of exposure**
Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

**Potential immediate effects**
Not available.

**Potential delayed effects**
Not available.

**Potential chronic health effects**

- **General**
  No known significant effects or critical hazards.

- **Carcinogenicity**
  No known significant effects or critical hazards.

- **Mutagenicity**
  No known significant effects or critical hazards.

- **Teratogenicity**
  No known significant effects or critical hazards.

- **Developmental effects**
  No known significant effects or critical hazards.

- **Fertility effects**
  No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>6010.6 mg/kg</td>
</tr>
</tbody>
</table>

2/2/2015.
## Section 12. Ecological information

### Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>Acute EC50 37 ppb Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 64 ppb Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.15 ppb Marine water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 32.2 ppb</td>
<td>Fish - Pimephales promelas</td>
<td>34 days</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 17.921 mg/l Marine water</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Acute LC50 25500 µg/l Marine water</td>
<td>Crustaceans - Artemia franciscana - Larvae</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 42000 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>4 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.995 mg/l Marine water</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.375 ul/L Fresh water</td>
<td>Fish - Gambusia holbrooki - Larvae</td>
<td>12 weeks</td>
</tr>
</tbody>
</table>

### Persistence and degradability

Not available.

### Other adverse effects

No known significant effects or critical hazards.

## Section 13. Disposal considerations

### Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

<table>
<thead>
<tr>
<th>UN number</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport hazard class(es)</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
</tbody>
</table>
Section 14. Transport information

<table>
<thead>
<tr>
<th>Environmental hazards</th>
<th>Yes.</th>
<th>Yes.</th>
<th>Yes.</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
<td>Emergency schedules (EmS)</td>
<td>F-A S-B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No.</td>
<td></td>
</tr>
</tbody>
</table>

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Not applicable.

Marine pollutant: Quaternary ammonium compound

North-America NAERG: 154

Section 15. Regulatory information

U.S. Federal regulations:
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.
- Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed
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Canada:
- Canada (CEPA DSL): At least one component is not listed in DSL but all such components are listed in NDSL.

Section 16. Other information

National Fire Protection Association (U.S.A.)

- Flammability
- Health
- Instability/Reactivity
- Special

History:
- Date of printing: 2/2/2015.

Indicates information that has changed from previously issued version.
Section 16. Other information

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
SAFETY DATA SHEET

Section 1. Identification

Product name: WCW4527 COMBINATION ASPHALTIC OIL EMULSIFIER/CORROSION INHIBITOR
Product code: WCW4527

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

Identified uses: Emulsifier. Corrosion inhibitor.

Print date: 11/5/2014.
Validation date: 11/5/2014.
Version: 1

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/SDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation): CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
- SKIN CORROSION/IRRITATION - Category 2
- SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
- SKIN SENSITIZATION - Category 1
- SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) [heart, kidneys and liver] - Category 2
- AQUATIC HAZARD (ACUTE) - Category 3
- AQUATIC HAZARD (LONG-TERM) - Category 3

GHS label elements

Hazard pictograms:

Signal word: Warning

Hazard statements:
- Causes serious eye irritation.
- Causes skin irritation.
- May cause an allergic skin reaction.
- May cause damage to organs through prolonged or repeated exposure. (heart, kidneys, liver)
- Harmful to aquatic life with long lasting effects.

Precautionary statements:

Section 2. Hazards identification

**Prevention**
- Wear protective gloves: > 8 hours (breakthrough time): Natural rubber gloves. Wear eye or face protection. Avoid release to the environment. Do not breathe the vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

**Response**
- Get medical attention if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

**Storage**
- Not applicable.

**Disposal**
- Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified**
- None known.

Section 3. Composition/information on ingredients

| Substance/mixture | Mixture |

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>5 - 10</td>
<td>107-21-1</td>
</tr>
<tr>
<td>Sulfur compound</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Quaternary ammonium compound</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Eye contact**
- Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation**
- Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention following exposure or if feeling unwell. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**
- Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**
- Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention following exposure or if feeling unwell. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**
Section 4. First aid measures

Potential acute health effects

**Eye contact**

- Causes serious eye irritation.

**Inhalation**

- Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact**

- Causes skin irritation. May cause an allergic skin reaction.

**Ingestion**

- Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

**Eye contact**

- pain or irritation, watering, redness

**Inhalation**

- No specific data.

**Skin contact**

- irritation, redness

**Ingestion**

- No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician**

- In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments**

- No specific treatment.

**Protection of first-aiders**

- No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**

- Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media**

- None known.

**Specific hazards arising from the chemical**

- In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products**

- carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides, halogenated compounds

**Special protective actions for fire-fighters**

- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters**

- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel**

- No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
Section 6. Accidental release measures

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Occupational exposure limits</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients:</td>
<td>ppm</td>
<td>mg/m³</td>
<td>Other</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OSHA PEL 1989</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Form: [a]Aerosol

Consult local authorities for acceptable exposure limits.
Only components of this product with established exposure limits appear in the box above.
If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls:
If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures:
Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection:
Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Hand protection:
Chemical-resistant gloves: Natural rubber gloves.

Skin protection:
Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory protection:
If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state:
Liquid. [Clear.]
Color:
Amber.
Odor:
Mercaptan.
Odor threshold:
Not available.
pH:
Not available.
Melting/freezing point:
Not available.
Boiling point:
Not available.
Initial Boiling Point:
Not available.
Flash point:
Closed cup: 98°C (208.4°F) [PMCC]
 Burning time:
Not applicable.
 Burning rate:
Not applicable.
 Evaporation rate:
Not available.
 Flammability (solid, gas):
Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>&gt;1 [Air = 1]</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.05 to 1.06 (15.6°C)</td>
</tr>
<tr>
<td>Density</td>
<td>8.77 (lbs/gal)</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
</tr>
<tr>
<td>VOC</td>
<td>Not available.</td>
</tr>
<tr>
<td>Pour Point</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials and alkalis. Slightly reactive or incompatible with the following materials: acids.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>4700 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Sulfur compound</td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>251 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Quaternary ammonium compound</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>244 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>400 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion

No applicable toxicity data

Sensitization

No applicable toxicity data

Mutagenicity

No applicable toxicity data

Carcinogenicity

No applicable toxicity data
Section 11. Toxicological information

No applicable toxicity data

**Reproductive toxicity**
No applicable toxicity data

**Teratogenicity**
No applicable toxicity data

**Specific target organ toxicity (single exposure)**
Not applicable.

**Specific target organ toxicity (repeated exposure)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Category 2</td>
<td>Not determined</td>
<td>Kidneys</td>
</tr>
<tr>
<td>Sulfur compound</td>
<td>Category 2</td>
<td>Not determined</td>
<td>Heart and liver</td>
</tr>
</tbody>
</table>

**Aspiration hazard**
Not available.

**Information on the likely routes of exposure**
Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

- **Potential immediate effects**: Not available.
- **Potential delayed effects**: Not available.

**Potential chronic health effects**

- **General**: May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- **Carcinogenicity**: No known significant effects or critical hazards.
- **Mutagenicity**: No known significant effects or critical hazards.
- **Teratogenicity**: No known significant effects or critical hazards.
- **Developmental effects**: No known significant effects or critical hazards.
- **Fertility effects**: No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>4348.8 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>3190.6 mg/kg</td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td>191.4 mg/l</td>
</tr>
</tbody>
</table>
Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Acute LC50 100000 µg/l Marine water&lt;br&gt;Acute LC50 10000000 µg/l Fresh water&lt;br&gt;Acute LC50 8050000 µg/l Fresh water&lt;br&gt;Acute LC50 100 to 500 µg/l</td>
<td>Crustaceans - Crangon crangon&lt;br&gt;Daphnia - Daphnia magna&lt;br&gt;Fish - Pimephales promelas&lt;br&gt;Crustaceans - Echinogammarus olivii</td>
<td>48 hours 48 hours 96 hours 48 hours</td>
</tr>
<tr>
<td>Quaternary ammonium compound</td>
<td>Acute LC50 100 to 500 µg/l</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN3082</td>
<td>Not regulated.</td>
<td>Not regulated.</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Contains: Ethylene glycol)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>No.</td>
<td>No.</td>
</tr>
</tbody>
</table>
Section 14. Transport information

<table>
<thead>
<tr>
<th>Additional information</th>
<th>Remarks</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This material is Not Regulated if transported in a package that does not meet or exceed the Reportable Quantity (RQ).</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Ethylene glycol, 8145 gal of this product.

Marine pollutant: Not available.

North-America NAERG: 171

Section 15. Regulatory information

U.S. Federal regulations:
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: Naphthalene
- Clean Water Act (CWA) 311: Potassium hydroxide; Xylene; Naphthalene; sodium hydroxide

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs):
- Listed

SARA 302/304: No products were found.

SARA 311/312 Classification:
- Immediate (acute) health hazard
- Delayed (chronic) health hazard

SARA 313

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier notification</td>
<td>Ethylene glycol</td>
<td>107-21-1</td>
</tr>
</tbody>
</table>

Canada

Canada (CEPA DSL): All components are listed or exempted.
Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability

Health 1

Instability/Reactivity

Special

History

Date of printing : 11/5/2014.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this SDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This SDS was prepared and is to be used for this product. If the product is used as a component in another product, this SDS information may not be applicable.
Section 1. Identification

Product name: DFO91 DEFOAMER
Product code: DFO91

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

Identified uses: Defoamer.

Print date: 10/28/2014.
Validation date: 10/28/2014.
Version: 1

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
FLAMMABLE LIQUIDS - Category 3
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
CARCINOGENICITY - Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation and Narcotic effects] - Category 3
AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements
Hazard pictograms:

Signal word: Warning
Hazard statements:
Flammable liquid and vapor.
Causes serious eye irritation.
Causes skin irritation.
Suspected of causing cancer.
May cause respiratory irritation.
May cause drowsiness and dizziness.
Toxic to aquatic life with long lasting effects.

Precautionary statements
Section 2. Hazards identification

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves: > 8 hours (breakthrough time): Nitrile or Neoprene gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling.

Response: Collect spillage. IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage: Store locked up. Store in a well-ventilated place. Keep cool.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements: Avoid contact with skin and clothing. Wash thoroughly after handling.

Hazards not otherwise classified: Prolonged or repeated contact may dry skin and cause irritation.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>40 - 50</td>
<td>64742-95-6</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>20 - 30</td>
<td>95-63-6</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>5 - 10</td>
<td>108-67-8</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>1 - 5</td>
<td>526-73-8</td>
</tr>
<tr>
<td>Xylene</td>
<td>1 - 5</td>
<td>1330-20-7</td>
</tr>
<tr>
<td>Cumene</td>
<td>0.1 - 1</td>
<td>98-82-8</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact: Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Section 4. First aid measures

Ingestion: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- **Eye contact**: Causes serious eye irritation.
- **Inhalation**: Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. May cause respiratory irritation.
- **Skin contact**: Causes skin irritation. Defatting to the skin.
- **Ingestion**: Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

- **Eye contact**: pain or irritation, watering, redness
- **Inhalation**: respiratory tract irritation, coughing, nausea or vomiting, headache, drowsiness, fatigue, dizziness, vertigo, unconsciousness
- **Skin contact**: irritation, redness, dryness, cracking
- **Ingestion**: No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

- **Notes to physician**: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- **Specific treatments**: No specific treatment.
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Additional information

If product is ingested and vomiting occurs naturally, have person lean forward to reduce the risk of aspiration into the lungs.

Section 5. Fire-fighting measures

Extinguishing media

- **Suitable extinguishing media**: Use dry chemical, CO₂, water spray (fog) or foam.
- **Unsuitable extinguishing media**: Do not use water jet.
Section 5. Fire-fighting measures

Specific hazards arising from the chemical: Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products: carbon dioxide, carbon monoxide, metal oxide/oxides

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.
Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ppm</td>
<td>mg/m³</td>
<td>Other</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
<td>-</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>125</td>
<td>-</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>OSHA PEL 1989</td>
<td>25</td>
<td>125</td>
<td>-</td>
</tr>
<tr>
<td>Xylene</td>
<td>US ACGIH</td>
<td>100</td>
<td>434</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>100</td>
<td>435</td>
<td>150</td>
</tr>
<tr>
<td>Cumene</td>
<td>US ACGIH</td>
<td>50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>50</td>
<td>245</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>50</td>
<td>245</td>
<td>-</td>
</tr>
</tbody>
</table>


Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.
Section 8. Exposure controls/personal protection

Appropriate engineering controls

- Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures

**Hand protection**

If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Eye/face protection**

Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Respiratory protection**

Respiratory protection:

- Chemical-resistant gloves: Nitrile or Neoprene gloves.
- Wear long sleeves to prevent repeated or prolonged skin contact.
- If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Skin protection**

Wear long sleeves to prevent repeated or prolonged skin contact.

**Hygiene measures**

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.**

Section 9. Physical and chemical properties

**Appearance**

- **Physical state**
  - Liquid.
- **Color**
  - Amber.
- **Odor**
  - Aromatic.
- **Odor threshold**
  - Not available.
- **pH**
  - Not available.
- **Melting/freezing point**
  - Not available.
- **Boiling point**
  - Not available.
- **Initial Boiling Point**
  - Not available.
- **Flash point**
  - Closed cup: 38°C (100.4°F) [SFCC]
- **Burning time**
  - Not applicable.
- **Burning rate**
  - Not applicable.
- **Evaporation rate**
  - Not available.
- **Decomposition temperature**
  - Not available.
- **Solubility in water**
  - Insoluble.
- **Partition coefficient: n-octanol/water**
  - Not available.
- **Auto-ignition temperature**
  - Not available.
- **Decomposition temperature**
  - Not available.
- **Viscosity**
  - Dynamic (16°C): 9.8 cP

**Physical state**

- Liquid.

**Color**

- Amber.

**Odor**

- Aromatic.

**Odor threshold**

- Not available.

**pH**

- Not available.

**Melting/freezing point**

- Not available.

**Boiling point**

- Not available.

**Initial Boiling Point**

- Not available.

**Flammability (solid, gas)**

- Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

**Lower and upper explosive (flammable) limits**

- Not available.

**Vapor pressure**

- 9.7 kPa (72.4 mm Hg (1.4 psig)) @ 54.44°C (130 F) (Reid)

**Vapor density**

- >1 [Air = 1]

**Relative density**

- 0.884 (15.6°C)

**Density**

- 7.36 (lbs/gal)

**Solubility in water**

- Insoluble

**Partition coefficient: n-octanol/water**

- Not available.

**Auto-ignition temperature**

- Not available.

**Decomposition temperature**

- Not available.

**Viscosity**

- Dynamic (16°C): 9.8 cP
Section 9. Physical and chemical properties

VOC : Not available.
Pour Point : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials and acids.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha 1,2,4-Trimethylbenzene</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2900 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Inhalation Vapor</td>
<td>Rat</td>
<td>18000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>5 g/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>24000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Xylene</td>
<td>LC50 Inhalation Gas.</td>
<td>Rat</td>
<td>5000 ppm</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>&gt;1700 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Male rat</td>
<td>3523 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Cumene</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>4300 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Mouse</td>
<td>10000 mg/m³</td>
<td>7 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rabbit</td>
<td>10600 mg/kg</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rat</td>
<td>2.9 g/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion

No applicable toxicity data

Sensitization

No applicable toxicity data

Mutagenicity

No applicable toxicity data

Carcinogenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>-</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Cumene</td>
<td>-</td>
<td>2B</td>
<td>Reasonably anticipated to be a human carcinogen.</td>
</tr>
</tbody>
</table>

Reproductive toxicity

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Section 11. Toxicological information

No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Xylene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>Cumene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)

Not applicable.

Aspiration hazard

<table>
<thead>
<tr>
<th>Name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Xylene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Cumene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
</tbody>
</table>

Information on the likely routes of exposure

Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects

Not available.

Potential delayed effects

Not available.

Potential chronic health effects

General

Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Carcinogenicity

Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity

No known significant effects or critical hazards.

Teratogenicity

No known significant effects or critical hazards.

Developmental effects

No known significant effects or critical hazards.

Fertility effects

No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates
Section 11. Toxicological information

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>4273.7 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>48888.9 mg/kg</td>
</tr>
<tr>
<td>Inhalation (gases)</td>
<td>222222.2 ppm</td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td>62.5 mg/l</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

**Toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>Acute LC50 4910 µg/l Marine water</td>
<td>Crustaceans - Elasmopus pectenicrus</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 22.4 mg/l Fresh water</td>
<td>Fish - Tilapia zillii</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 12520 to 15050 µg/l Fresh water</td>
<td>Fish - Carassius auratus</td>
<td>96 hours</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>Acute LC50 8500 µg/l Marine water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 22.4 mg/l Fresh water</td>
<td>Crustaceans - Palaemonetes pugio</td>
<td>21 days</td>
</tr>
<tr>
<td>Xylene</td>
<td>Acute LC50 13400 µg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2600 µg/l Fresh water</td>
<td>Algae - Pseudokirchneriella subcapitata</td>
<td>72 hours</td>
</tr>
<tr>
<td>Cumene</td>
<td>Acute LC50 7400 to 11290 µg/l Fresh water</td>
<td>Crustaceans - Artemia sp.</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 30500 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 2700 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

**Persistence and degradability**

Not available.

**Other adverse effects**

Not known significant effects or critical hazards.

**Additional information**

An EcoTox™ Report, and/or the material's environmental fate is available upon request at the following number: 1-800-235-4249, then press 4.

Section 13. Disposal considerations

**Disposal methods**

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
**Section 14. Transport information**

<table>
<thead>
<tr>
<th>UN number</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1993</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>Yes.</td>
<td>Yes.</td>
<td>No.</td>
</tr>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
<td>Emergency schedules (EmS) F-E S-E</td>
<td>-</td>
</tr>
</tbody>
</table>

**Special precautions for user**: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

**DOT Reportable Quantity**: Xylene, 604 gal of this product.

**Marine pollutant**: Light aromatic naphtha 1,2,4-Trimethylbenzene

**North-America NAERG**: 128

**Section 15. Regulatory information**

**U.S. Federal regulations**

- **TSCA 12(b) one-time export**: No products were found.
- **TSCA 12(b) annual export notification**: No products were found.
- **United States inventory (TSCA 8b)**: All components are listed or exempted.
- **Clean Water Act (CWA) 307**: Naphthalene
- **Clean Water Act (CWA) 311**: Xylene; Naphthalene

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)**

- **SARA 302/304**: Listed
- **SARA 311/312**: No products were found.

**Classification**

- Fire hazard
- Immediate (acute) health hazard
- Delayed (chronic) health hazard

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Section 15. Regulatory information

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>95-63-6</td>
<td>20 - 30</td>
</tr>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

Canada

Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

![Flammability](2 0)

Health Instability/Reactivity

Special

History

Date of printing: 10/28/2014.

▼ Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: PAO3857Y PARAFFIN DISPERSANT
Product code: PAO3857Y

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

Identified uses: Paraffin dispersant.

Print date: 11/21/2014.
Validation date: 11/21/2014.
Version: 1

Supplier's details:
Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
- FLAMMABLE LIQUIDS - Category 3
- SKIN CORROSION/IRRITATION - Category 2
- SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
- CARCINOGENICITY - Category 2
- SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation and Narcotic effects] - Category 3
- AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements
Hazard pictograms:

Signal word: Warning
Hazard statements:
- Flammable liquid and vapor.
- Causes serious eye irritation.
- Causes skin irritation.
- Suspected of causing cancer.
- May cause respiratory irritation.
- May cause drowsiness and dizziness.
- Toxic to aquatic life with long lasting effects.

Precautionary statements: 

11/21/2014.  PAO3857Y  1/11
Section 2. Hazards identification

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves: > 8 hours (breakthrough time): Nitrile or Neoprene gloves. 4H gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling.

Response: Collect spillage. IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage: Store locked up. Store in a well-ventilated place. Keep cool.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified: None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>20 - 30</td>
<td>64742-95-6</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>10 - 20</td>
<td>95-63-6</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>1 - 5</td>
<td>108-67-8</td>
</tr>
<tr>
<td>Ammonium alkylaryl sulfonates</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>1 - 5</td>
<td>526-73-8</td>
</tr>
<tr>
<td>Alkylaryl sulfonates</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Xylene</td>
<td>1 - 5</td>
<td>1330-20-7</td>
</tr>
<tr>
<td>Cumene</td>
<td>0.1 - 1</td>
<td>98-82-8</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Section 4. First aid measures

**Ingestion**

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

**Potential acute health effects**

- **Eye contact**: Causes serious eye irritation.
- **Inhalation**: Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. May cause respiratory irritation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- **Skin contact**: Causes skin irritation.
- **Ingestion**: Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.

**Over-exposure signs/symptoms**

- **Eye contact**: pain or irritation, watering, redness
- **Inhalation**: respiratory tract irritation, coughing, nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness
- **Skin contact**: irritation, redness
- **Ingestion**: No specific data.

**Indication of immediate medical attention and special treatment needed, if necessary**

- **Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- **Specific treatments**: No specific treatment.
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

**Additional information**

If product is ingested and vomiting occurs naturally, have person lean forward to reduce the risk of aspiration into the lungs.

Section 5. Fire-fighting measures

**Extinguishing media**

- **Suitable extinguishing media**: Use dry chemical, CO₂, water spray (fog) or foam.
- **Unsuitable extinguishing media**: Do not use water jet.
Section 5. Fire-fighting measures

Specific hazards arising from the chemical: Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products: carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.
Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ppm</td>
<td>mg/m³</td>
<td>Other</td>
<td>ppm</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
<td>-</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
<td>-</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
<td>-</td>
</tr>
<tr>
<td>Xylene</td>
<td>OSHA PEL 1989</td>
<td>100</td>
<td>435</td>
<td>150</td>
</tr>
<tr>
<td>Cumene</td>
<td>US ACGIH</td>
<td>50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>50</td>
<td>245</td>
<td>-</td>
</tr>
</tbody>
</table>


Consult local authorities for acceptable exposure limits.
Only components of this product with established exposure limits appear in the box above.
If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.
Section 8. Exposure controls/personal protection

Appropriate engineering controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Hand protection: Chemical-resistant gloves: Nitrile or Neoprene gloves. 4H gloves.

Skin protection: Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid. [Clear.]
Color: Amber.
Odor: Aromatic hydrocarbon.
Odor threshold: Not available.
PH: Not available.
Melting/freezing point: Not available.
Boiling point: Not available.
Initial Boiling Point: Not available.
Flash point: Closed cup: 52.8°C (127°F) [SFCC]
Burning time: Not applicable.
Burning rate: Not applicable.
Evaporation rate: Not available.
Flammability (solid, gas): Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

Lower and upper explosive (flammable) limits: Not available.

Vapor pressure: 22.1 kPa (165.5 mm Hg (3.2 psig)) @ 54.44°C 130 F (Reid)
Vapor density: >1 [Air = 1]
Relative density: 0.982 (15.6°C)
Density: 8.18 (lbs/gal)
Solubility in water: Insoluble
Partition coefficient: n-octanol/water: Not available.
Auto-ignition temperature: Not available.
Decomposition temperature: Not available.
Viscosity: Not available.
VOC: Not available.
Section 9. Physical and chemical properties

Pour Point : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials and acids. Addition of strong bases (such as sodium hydroxide or potassium hydroxide) to this product may release ammonia gas which is irritating and corrosive to the lungs.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2900 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>18000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>5 g/kg</td>
<td>-</td>
</tr>
<tr>
<td>Xylene</td>
<td>LC50 Inhalation Gas.</td>
<td>Rat</td>
<td>24000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>5000 ppm</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>&gt;1700 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Male rat</td>
<td>3523 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>4300 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Cumene</td>
<td>LC50 Inhalation Vapor</td>
<td>Mouse</td>
<td>10000 mg/m³</td>
<td>7 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>39000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>10600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2.9 g/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion

No applicable toxicity data

Sensitization

No applicable toxicity data

Mutagenicity

No applicable toxicity data

Carcinogenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>-</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Cumene</td>
<td>-</td>
<td>2B</td>
<td>Reasonably anticipated to be a human carcinogen.</td>
</tr>
</tbody>
</table>

Reproductive toxicity

11/21/2014.
Section 11. Toxicological information

No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Xylene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>Cumene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)

Not applicable.

Aspiration hazard

<table>
<thead>
<tr>
<th>Name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Xylene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Cumene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
</tbody>
</table>

Information on the likely routes of exposure: Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

Potential chronic health effects
- General: No known significant effects or critical hazards.
- Carcinogenicity: Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
- Mutagenicity: No known significant effects or critical hazards.
- Teratogenicity: No known significant effects or critical hazards.
- Developmental effects: No known significant effects or critical hazards.
- Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates
**Section 11. Toxicological information**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>4266.5 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>94278.6 mg/kg</td>
</tr>
<tr>
<td>Inhalation (gases)</td>
<td>428539.3 ppm</td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td>120.5 mg/l</td>
</tr>
</tbody>
</table>

**Section 12. Ecological information**

**Toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>Acute LC50 4910 µg/l Marine water</td>
<td>Crustaceans - Elasmopus pectenicrus</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 22.4 mg/l Fresh water</td>
<td>Fish - Tilapia zillii</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 12520 to 15050 µg/l Fresh water</td>
<td>Fish - Carassius auratus</td>
<td>96 hours</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>Chronic NOEC 400 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 8500 µg/l Marine water</td>
<td>Crustaceans - Palaemonetes pugio</td>
<td>48 hours</td>
</tr>
<tr>
<td>Xylene</td>
<td>Acute LC50 13400 µg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2600 µg/l Fresh water</td>
<td>Algae - Pseudokirchneriella subcapitata</td>
<td>72 hours</td>
</tr>
<tr>
<td>Cumene</td>
<td>Acute LC50 7400 to 11290 µg/l Fresh water</td>
<td>Crustaceans - Artemia sp.</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 30500 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 2700 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

**Persistence and degradability**

Not available.

**Other adverse effects**

: No known significant effects or critical hazards.

**Section 13. Disposal considerations**

**Disposal methods**

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
### Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN1993</td>
<td>UN1993</td>
<td>UN1993</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>Yes.</td>
<td>Yes.</td>
</tr>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
<td>Emergency schedules (EmS) F-E S-E</td>
</tr>
</tbody>
</table>

**Special precautions for user**

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Xylene, 1048 gal of this product.

Marine pollutant: Light aromatic naphtha 1,2,4-Trimethylbenzene

North-America NAERG: 128

### Section 15. Regulatory information

**U.S. Federal regulations**

TSCA 12(b) one-time export: No products were found.

TSCA 12(b) annual export notification: No products were found.

United States inventory (TSCA 8b): All components are listed or exempted.

Clean Water Act (CWA) 307: Naphthalene

Clean Water Act (CWA) 311: Xylene; Naphthalene; Potassium hydroxide

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Listed

SARA 302/304: No products were found.

SARA 311/312 Classification: Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard
Section 15. Regulatory information

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,2,4-Trimethylbenzene</td>
<td>95-63-6</td>
<td>10 - 20</td>
</tr>
<tr>
<td></td>
<td>Xylene</td>
<td>1330-20-7</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

Canada

Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

- Flammability: 2
- Health: 2
- Instability/Reactivity: 0
- Special

History

- Date of printing: 11/21/2014.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
# SAFETY DATA SHEET

## Section 1. Identification

<table>
<thead>
<tr>
<th>Product name</th>
<th>PAW4HF ASPHALTIC CRUDE EMULSIFIER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product code</td>
<td>PAW4HF</td>
</tr>
</tbody>
</table>

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

| Identified uses | Emulsifier. |

**Print date**

| 10/14/2014. |

**Validation date**

| 10/14/2014. |

**Version**

| 1 |

**Supplier's details**

<table>
<thead>
<tr>
<th>Baker Petrolite</th>
<th>A Baker Hughes Company</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12645 W. Airport Blvd.</td>
</tr>
<tr>
<td></td>
<td>Sugar Land, TX 77478</td>
</tr>
</tbody>
</table>

For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

**Emergency telephone number (with hours of operation)**

| CHEMTREC: 800-424-9300 (U.S. 24 hour) |
| Baker Petrolite: 800-231-3606 |
| (001)281-276-5400 |
| CANUTEC: 613-996-6666 (Canada 24 hours) |
| CHEMTREC Int'l 01-703-527-3887 (International 24 hour) |

## Section 2. Hazards identification

**OSHA/HCS status**

| This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). |

**Classification of the substance or mixture**

| FLAMMABLE LIQUIDS - Category 4 |

**GHS label elements**

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard statements</td>
<td>Combustible liquid.</td>
</tr>
<tr>
<td>Precautionary statements</td>
<td></td>
</tr>
<tr>
<td>Prevention</td>
<td>Wear protective gloves: &gt; 8 hours (breakthrough time): Natural rubber gloves.. Wear eye or face protection. Keep away from flames and hot surfaces. - No smoking.</td>
</tr>
<tr>
<td>Response</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Storage</td>
<td>Store in a well-ventilated place. Keep cool.</td>
</tr>
<tr>
<td>Disposal</td>
<td>Dispose of contents and container in accordance with all local, regional, national and international regulations.</td>
</tr>
<tr>
<td>Hazards not otherwise classified</td>
<td>None known.</td>
</tr>
</tbody>
</table>

SAFETY DATA SHEET
Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>111-76-2</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention if irritation occurs.

**Inhalation**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**

**Potential acute health effects**

**Eye contact**: No known significant effects or critical hazards.

**Inhalation**: No known significant effects or critical hazards.

**Skin contact**: No known significant effects or critical hazards.

**Ingestion**: No known significant effects or critical hazards.

**Over-exposure signs/symptoms**

**Eye contact**: No specific data.

**Inhalation**: No specific data.

**Skin contact**: No specific data.

**Ingestion**: No specific data.

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician**: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments**: No specific treatment.

**Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Section 4. First aid measures

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media** : Use dry chemical, CO₂, water spray (fog) or foam.

**Unsuitable extinguishing media** : Do not use water jet.

**Specific hazards arising from the chemical** : Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

**Hazardous thermal decomposition products** : carbon dioxide, carbon monoxide

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor.

10/14/2014.
Section 6. Accidental release measures

Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours) ppm</th>
<th>mg/m³</th>
<th>STEL (15 mins) ppm</th>
<th>mg/m³</th>
<th>Ceiling ppm</th>
<th>mg/m³</th>
<th>Other Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>US ACGIH</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>50</td>
<td>240</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>[1]</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>25</td>
<td>120</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>[1]</td>
</tr>
</tbody>
</table>


Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures
Section 8. Exposure controls/personal protection

**Hygiene measures**
- Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**
- Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection**
- Chemical-resistant gloves: Natural rubber gloves.

**Skin protection**
- Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection**
- If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

**Appearance**

**Physical state**
- Liquid. [Clear.]

**Color**
- Water-white.

**Odor**
- Alcohol-like.

**Odor threshold**
- Not available.

**pH**
- Not available.

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

**Boiling point**
- Not available.

**Initial Boiling Point**
- Not available.

**Flash point**
- Closed cup: 62.22°C (144°F) [PMCC]

**Burning time**
- Not applicable.

**Burning rate**
- Not applicable.

**Evaporation rate**
- Not available.

**Flammability (solid, gas)**
- Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

**Lower and upper explosive (flammable) limits**
- Not available.

**Vapor pressure**
- 32.4 kPa (243 mm Hg (4.7 psig)) @ 54.44°C 130 F (Reid)

**Vapor density**
- >1 [Air = 1]

**Relative density**
- 1.0525 (15.6°C)

**Density**
- 8.77 (lbs/gal)

**Solubility in water**
- Soluble

**Partition coefficient: n-octanol/water**
- Not available.

**Auto-ignition temperature**
- Not available.

**Decomposition temperature**
- Not available.

**Viscosity**
- Not available.

**VOC**
- Not available.

**Pour Point**
- -9.4°C (15.1°F)
Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>LC50 Inhalation Gas.</td>
<td>Rat</td>
<td>450 ppm</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Guinea pig</td>
<td>&gt;2000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>200 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>99 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Guinea pig</td>
<td>500 to 2000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rabbit</td>
<td>320 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion

No applicable toxicity data

Sensitization

No applicable toxicity data

Mutagenicity

No applicable toxicity data

Carcinogenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>-</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

Reproductive toxicity

No applicable toxicity data

Teratogenicity

No applicable toxicity data

Specific target organ toxicity (single exposure)

Not applicable.

Specific target organ toxicity (repeated exposure)

Not applicable.

Aspiration hazard

10/14/2014.
**Section 11. Toxicological information**

Information on the likely routes of exposure:
- Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**
- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

**Potential chronic health effects**
- General: No known significant effects or critical hazards.
- Carcinogenicity: No known significant effects or critical hazards.
- Mutagenicity: No known significant effects or critical hazards.
- Teratogenicity: No known significant effects or critical hazards.
- Developmental effects: No known significant effects or critical hazards.
- Fertility effects: No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>5841.1 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>12850.5 mg/kg</td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td>128.5 mg/l</td>
</tr>
</tbody>
</table>

**Section 12. Ecological information**

**Toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>Acute EC50 &gt;1000 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 1000 mg/l Marine water</td>
<td>Crustaceans - Chaetogammarus marinus - Young</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 1250000 µg/l Marine water</td>
<td>Fish - Menidia beryllina</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

**Persistence and degradability**
- Not available.

**Other adverse effects**
- No known significant effects or critical hazards.
Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>Combustible liquid, n.o.s. (Contains: 2-Butoxyethanol)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>Combustible liquid.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>Additional information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remarks</td>
<td>This material is not regulated by DOT if transported in a packaging &lt;= 119 gallons. This material is not regulated by TDG or IMO.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Not applicable.

Marine pollutant: Not available.
Section 14. Transport information

North-America NAERG : 128

Section 15. Regulatory information

U.S. Federal regulations : TSCA 12(b) one-time export: No products were found.
TSCA 12(b) annual export notification: No products were found.

United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed

SARA 302/304: No products were found.
SARA 311/312:
Classification: Fire hazard

SARA 313

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butoxyethanol</td>
<td>111-76-2</td>
<td>5 - 10</td>
</tr>
</tbody>
</table>

Canada

Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

History
Date of printing : 10/14/2014.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
**RE8869DMO DEMULSIFIER**

**Product name**: RE8869DMO DEMULSIFIER

**Product code**: RE8869DMO

**Section 1. Identification**

**Identified uses**: Demulsifier.

**Supplier's details**:
Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

**Print date**: 11/24/2014.

**Validation date**: 11/24/2014.

**Version**: 1

**Emergency telephone number (with hours of operation)**:
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

**Section 2. Hazards identification**

**OSH/NIOSH/ICHS status**: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture**:
FLAMMABLE LIQUIDS - Category 3
ACUTE TOXICITY: INHALATION - Category 4
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
CARCINOGENICITY - Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Narcotic effects] - Category 3
AQUATIC HAZARD (LONG-TERM) - Category 2

**GHS label elements**

**Hazard pictograms**:

![Hazard pictograms]

**Signal word**: Warning

**Hazard statements**:
- Flammable liquid and vapor.
- Harmful if inhaled.
- Causes serious eye irritation.
- Causes skin irritation.
- Suspected of causing cancer.
- May cause drowsiness and dizziness.
- Toxic to aquatic life with long lasting effects.
Section 2. Hazards identification

Precautionary statements

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves: > 8 hours (breakthrough time): PVC gloves. Viton gloves. 4H gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling.

Response: Collect spillage. IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage: Store locked up. Store in a well-ventilated place. Keep cool.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified: None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>20 - 30</td>
<td>1330-20-7</td>
</tr>
<tr>
<td>Light aromatic naphtha</td>
<td>10 - 20</td>
<td>64742-95-6</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>5 - 10</td>
<td>95-63-6</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>1 - 5</td>
<td>100-41-4</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>1 - 5</td>
<td>108-67-8</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>1 - 5</td>
<td>526-73-8</td>
</tr>
<tr>
<td>Cumene</td>
<td>0.1 - 1</td>
<td>98-82-8</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
## Section 4. First aid measures

**Ingestion**: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or wristband.

**Most important symptoms/effects, acute and delayed**

### Potential acute health effects

**Eye contact**: Causes serious eye irritation.

**Inhalation**: Harmful if inhaled. Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact**: Causes skin irritation.

**Ingestion**: Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.

### Over-exposure signs/symptoms

**Eye contact**: pain or irritation, watering, redness

**Inhalation**: nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness

**Skin contact**: irritation, redness

**Ingestion**: No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments**: No specific treatment.

**Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

**See toxicological information (Section 11)**

### Additional information

If product is ingested and vomiting occurs naturally, have person lean forward to reduce the risk of aspiration into the lungs.

## Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**: Use dry chemical, CO₂, water spray (fog) or foam.

**Unsuitable extinguishing media**: Do not use water jet.
## Section 5. Fire-fighting measures

**Specific hazards arising from the chemical**
- Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products**
- Carbon dioxide, carbon monoxide, nitrogen oxides

**Special protective actions for fire-fighters**
- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters**
- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel**
- No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders**
- If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

### Environmental precautions
- Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

### Methods and materials for containment and cleaning up

**Small spill**
- Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill**
- Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

11/24/2014.
Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ppm</td>
<td>mg/m³</td>
<td>ppm</td>
<td>mg/m³</td>
</tr>
<tr>
<td>Xylene</td>
<td>US ACGIH</td>
<td>100</td>
<td>434</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>100</td>
<td>435</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>100</td>
<td>435</td>
<td>150</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>25</td>
<td>125</td>
<td>-</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>US ACGIH</td>
<td>20</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>100</td>
<td>435</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>100</td>
<td>435</td>
<td>125</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>25</td>
<td>125</td>
<td>-</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>25</td>
<td>125</td>
<td>-</td>
</tr>
<tr>
<td>Cumene</td>
<td>US ACGIH</td>
<td>50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>50</td>
<td>245</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>50</td>
<td>245</td>
<td>-</td>
</tr>
</tbody>
</table>


Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.
Section 8. Exposure controls/personal protection

**Appropriate engineering controls**

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Individual protection measures**

**Hygiene measures**

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**

Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection**

Chemical-resistant gloves: PVC gloves. Viton gloves. 4H gloves.

**Skin protection**

Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection**

If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

**Appearance**

**Physical state**

Liquid. [Clear to hazy.]

**Color**

Amber.

**Odor**

Aromatic hydrocarbon.

**Odor threshold**

Not available.

**pH**

11.2 [Conc. (% w/w): 5%]

5% of product in 75% water / 25% isopropanol solution

**Melting/freezing point**

Not available.

**Boiling point**

Not available.

**Initial Boiling Point**

Not available.

**Flash point**

Closed cup: 35°C (95°F) [SFCC]

**Burning time**

Not applicable.

**Burning rate**

Not applicable.

**Evaporation rate**

Not available.

**Flammability (solid, gas)**

Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

**Lower and upper explosive (flammable) limits**

Not available.

**Vapor pressure**

29 kPa (217.2 mm Hg (4.2 psig)) @ 54.44°C (130°F) (Reid)

**Vapor density**

>1 [Air = 1]

**Relative density**

0.9257 (15.6°C)

**Density**

7.71 (lbs/gal)

**Solubility in water**

Insoluble

**Partition coefficient: n-octanol/water**

Not available.

**Auto-ignition temperature**

Not available.

**Decomposition temperature**

Not available.
Section 9. Physical and chemical properties

- **Viscosity**: Dynamic (15.6°C): 29.3 cP
- **VOC**: Not available.
- **Pour Point**: <-42.78°C (<-45°F)

Section 10. Stability and reactivity

- **Reactivity**: No specific test data related to reactivity available for this product or its ingredients.
- **Chemical stability**: The product is stable.
- **Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Conditions to avoid**: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
- **Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials and acids.
- **Hazardous decomposition products**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

- **Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Xylene</strong></td>
<td>LC50 Inhalation Gas.</td>
<td>Rat</td>
<td>5000 ppm</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>&gt;1700 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Male rat</td>
<td>3523 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>4300 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Light aromatic naphtha</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2900 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>18000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>5 g/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>15400 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>3500 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Cumene</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>24000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Mouse</td>
<td>10000 mg/m³</td>
<td>7 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rabbit</td>
<td>39000 mg/m³</td>
<td>4 hours</td>
<td></td>
</tr>
</tbody>
</table>

**Irritation/Corrosion**

No applicable toxicity data

**Sensitization**

No applicable toxicity data

**Mutagenicity**

No applicable toxicity data

**Carcinogenicity**

11/24/2014.
## Section 11. Toxicological information

### Reproductive toxicity
No applicable toxicity data

### Teratogenicity
No applicable toxicity data

### Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>Light aromatic naphtha</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Cumene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>

### Specific target organ toxicity (repeated exposure)
Not applicable.

### Aspiration hazard

<table>
<thead>
<tr>
<th>Name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Light aromatic naphtha</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Cumene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
</tbody>
</table>

### Information on the likely routes of exposure
Routes of entry anticipated: Dermal, Inhalation.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

- **Potential immediate effects**: Not available.
- **Potential delayed effects**: Not available.

#### Potential chronic health effects

- **General**: No known significant effects or critical hazards.
- **Carcinogenicity**: Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
- **Mutagenicity**: No known significant effects or critical hazards.
- **Teratogenicity**: No known significant effects or critical hazards.
- **Developmental effects**: No known significant effects or critical hazards.
- **Fertility effects**: No known significant effects or critical hazards.

### Numerical measures of toxicity
Section 11. Toxicological information

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>6742.1 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>4146 mg/kg</td>
</tr>
<tr>
<td>Inhalation (gases)</td>
<td>18845.4 ppm</td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td>107.9 mg/l</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>Acute LC50 8500 µg/l Marine</td>
<td>Crustaceans - Palaemonetes</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>water</td>
<td>pugio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 13400 µg/l Fresh</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 4910 µg/l Marine</td>
<td>Crustaceans - Elasmopus</td>
<td>48 hours</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>22.4 mg/l Fresh water</td>
<td>pectenicrus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 22.4 mg/l Fresh</td>
<td>Fish - Tilapia zillii</td>
<td>96 hours</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute EC50 4600 µg/l Fresh</td>
<td>Algae - Pseudokirchneriella</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>water</td>
<td>subcapitata</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2930 to 4400 µg/l</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Fresh water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 5200 µg/l Marine</td>
<td>Crustaceans - Americamysis</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>4910 µg/l Marine water</td>
<td>bahia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 4200 µg/l Fresh</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 12520 to 15050 µg/l</td>
<td>Crustaceans - Americamysis</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Fresh water</td>
<td>bahia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 1000 µg/l Fresh</td>
<td>Algae - Pseudokirchneriella</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>water</td>
<td>subcapitata</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 7400 to 11290 µg/l</td>
<td>Fish - Carassius auratus</td>
<td>96 hours</td>
</tr>
<tr>
<td>Cumene</td>
<td>Fresh water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 400 µg/l Fresh</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2600 µg/l Fresh</td>
<td>Algae - Pseudokirchneriella</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>water</td>
<td>subcapitata</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 7400 to 11290 µg/l</td>
<td>Crustaceans - Artemia sp.</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Fresh water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 30500 µg/l Fresh</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute LC50 2700 µg/l Fresh</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability

Not available.

Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been
Section 13. Disposal considerations

Cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN1993</td>
<td>UN1993</td>
<td>UN1993</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Xylene, Ethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Xylene, Ethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Xylene, Ethylbenzene)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>Yes.</td>
<td>Yes.</td>
</tr>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Special precautions for user: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity
Xylene, 49 gal of this product.
Ethylbenzene, 2869 gal of this product.

Marine pollutant
Light aromatic naphtha
1,2,4-Trimethylbenzene

North-America NAERG: 128

Section 15. Regulatory information

U.S. Federal regulations
TSCA 12(b) one-time export: No products were found.
TSCA 12(b) annual export notification: No products were found.
United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 307: Ethylbenzene; Naphthalene
Clean Water Act (CWA) 311: Xylene; Ethylbenzene; Naphthalene; Potassium hydroxide

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Listed
Section 15. Regulatory information

**SARA 302/304**

: No products were found.

**SARA 311/312**

Classification : Fire hazard
Immediate (acute) health hazard
Delayed (chronic) health hazard

**SARA 313**

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Xylene</td>
<td>1330-20-7</td>
<td>10 - 30</td>
</tr>
<tr>
<td></td>
<td>1,2,4-Trimethylbenzene</td>
<td>95-63-6</td>
<td>5 - 10</td>
</tr>
<tr>
<td></td>
<td>Ethylbenzene</td>
<td>100-41-4</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

**Canada**

Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

**National Fire Protection Association (U.S.A.)**

- Flammability: 3
- Health: 2
- Instability/Reactivity: 0
- Special

**History**

- Date of printing: 11/24/2014.

- Indicates information that has changed from previously issued version.

**Notice to reader**

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
SAFETY DATA SHEET

Section 1. Identification

Product name: TECHNI-HIB 3743
Product code: CRW3743

Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Corrosion inhibitor.

Print date: 10/31/2014.
Validation date: 10/31/2014.
Version: 1

Supplier's details:
Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
- SKIN CORROSION/IRRITATION - Category 1B
- SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
- AQUATIC HAZARD (ACUTE) - Category 1
- AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements
Hazard pictograms:

Signal word: Danger
Hazard statements:
- Causes severe skin burns and eye damage.
- Very toxic to aquatic life.
- Toxic to aquatic life with long lasting effects.

Precautionary statements
Prevention:
- Wear protective gloves: > 8 hours (breakthrough time): neoprene nitrile polyvinyl alcohol (PVA) polyvinyl chloride (PVC). Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Wash hands thoroughly after handling.
Section 2. Hazards identification

Response: Collect spillage. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

Storage: Store locked up.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazard not otherwise classified: None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>20 - 30</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Phosphate ester salt</td>
<td>5 - 10</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Ethanol</td>
<td>1 - 5</td>
<td>64-17-5</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>0.1 - 1</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**: Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation**: Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**: Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**: Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
Section 4. First aid measures

Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

| Eye contact | Causes serious eye damage. |
| Ingestion   | May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure. |
| Skin contact| Causes severe burns. |
| Ingestion   | May cause burns to mouth, throat and stomach. |

Notes to physician

In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Over-exposure signs/symptoms

Eye contact : pain, watering, redness
Inhalation : No specific data.
Skin contact : pain or irritation, redness, blistering may occur
Ingestion : stomach pains

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Indication of immediate medical attention and special treatment needed, if necessary

No specific treatment.

Section 5. Fire-fighting measures

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical

In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : carbon dioxide, carbon monoxide, nitrogen oxides, phosphorus oxides, halogenated compounds

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Diike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Occupational exposure limits</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients:</td>
<td>ppm</td>
<td>mg/m³</td>
<td>Other</td>
</tr>
<tr>
<td>Ethanol</td>
<td>US ACGIH -</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1000</td>
<td>1900 -</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>1000</td>
<td>1900</td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits.
Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection: Chemical-resistant gloves: neoprene nitrile polyvinyl alcohol (PVA) polyvinyl chloride (PVC)

Skin protection: Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid. [Clear.]
Color: Colorless to pale pink.
Odor: Alcohol-like. [Slight]
Odor threshold: Not available.
pH: 5 to 7
Melting/freezing point: -4.444°C (24°F)
Boiling point: 104.44°C (220°F)
Initial Boiling Point: Not available.
Flash point: Closed cup: 93.333°C (200°F) [TCC]
Burning time: Not applicable.
Burning rate: Not applicable.
Evaporation rate: Not available.
Flammability (solid, gas): Not available.
Section 9. Physical and chemical properties

- **Lower and upper explosive (flammable) limits**: Not available.
- **Vapor pressure**: Not available.
- **Vapor density**: Not available.
- **Relative density**: Not available.
- **Density**: 8.33 (lbs/gal)
- **Solubility in water**: Soluble
- **Partition coefficient: n-octanol/water**: Not available.
- **Auto-ignition temperature**: Not available.
- **Decomposition temperature**: Not available.
- **Viscosity**: Not available.
- **VOC**: Not available.
- **Pour Point**: Not available.
- **Solubility in water**: Soluble

Section 10. Stability and reactivity

- **Reactivity**: No specific test data related to reactivity available for this product or its ingredients.
- **Chemical stability**: The product is stable.
- **Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Conditions to avoid**: No specific data.
- **Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials, metals, acids and alkalis.
- **Hazardous decomposition products**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>426 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Ethanol</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>20000 ppm</td>
<td>10 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>124700 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>7 g/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>1000 to 1250 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

**Irritation/Corrosion**
No applicable toxicity data

**Sensitization**
No applicable toxicity data

**Mutagenicity**
No applicable toxicity data
Section 11. Toxicological information

**Carcinogenicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
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</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

**Reproductive toxicity**
No applicable toxicity data

**Teratogenicity**
No applicable toxicity data

**Specific target organ toxicity (single exposure)**
Not applicable.

**Specific target organ toxicity (repeated exposure)**
Not applicable.

**Aspiration hazard**
Not available.

**Information on the likely routes of exposure**
Not available.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

- **Potential immediate effects**: Not available.
- **Potential delayed effects**: Not available.

**Potential chronic health effects**

- **General**: No known significant effects or critical hazards.
- **Carcinogenicity**: No known significant effects or critical hazards.
- **Mutagenicity**: No known significant effects or critical hazards.
- **Teratogenicity**: No known significant effects or critical hazards.
- **Developmental effects**: No known significant effects or critical hazards.
- **Fertility effects**: No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>2103.7 mg/kg</td>
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</tbody>
</table>

Section 12. Ecological information

**Toxicity**
Section 12. Ecological information

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>Acute EC50 37 ppb Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 64 ppb Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.15 ppb Marine water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 32.2 ppb</td>
<td>Fish - Pimephales promelas</td>
<td>34 days</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 17.921 mg/l Marine water</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 25500 µg/l Marine water</td>
<td>Crustaceans - Artemia</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>franciscana - Larvae</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute EC50 42000 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>4 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.995 mg/l Marine water</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Acute LC50 25500 µg/l Marine water</td>
<td>Fish - Gambusia holbrooki -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.375 ul/L Fresh water</td>
<td>Larvae</td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Other adverse effects
No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods
The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN1760</td>
<td>UN1760</td>
<td>UN1760</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>Yes.</td>
<td>No.</td>
</tr>
</tbody>
</table>
Section 14. Transport information

Additional information

**Special precautions for user**: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Not applicable.

Marine pollutant: Quaternary ammonium compound

Section 15. Regulatory information

**U.S. Federal regulations**
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.

**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)**: Not listed

**SARA 302/304**
- Classification: Immediate (acute) health hazard
- Supplier notification: No products were found.

**Canada (CEPA DSL)**: At least one component is not listed in DSL but all such components are listed in NDSL.

Section 16. Other information

**National Fire Protection Association (U.S.A.)**

- Flammability: 1
- Instability/Reactivity: 3
- Special: 0

**History**
- Date of printing: 10/31/2014.

Notice to reader: Indicates information that has changed from previously issued version.
Section 16. Other information

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: TRETOLITE™ RBW213 WATER CLARIFIER
   ™ a trademark of Baker Hughes Incorporated.
Product code: RBW213

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

Identified uses: Water clarifier.

Print date: 1/5/2015.
Validation date: 1/5/2015.
Version: 1.01

Supplier's details:
Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
SKIN CORROSION/IRRITATION - Category 1
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) [kidneys] - Category 2

GHS label elements
Hazard pictograms: 

Signal word: Danger

Hazard statements: Causes severe skin burns and eye damage.
May cause damage to organs through prolonged or repeated exposure. (kidneys)

Precautionary statements
Prevention: Wear protective gloves. Wear eye or face protection. Wear protective clothing. Do not breathe vapor. Wash hands thoroughly after handling.
Section 2. Hazards identification

Response : Get medical attention if you feel unwell. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt of an organic sulfur compound</td>
<td>30 - 40</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>10 - 20</td>
<td>107-21-1</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Section 4. First aid measures

Most important symptoms/effects, acute and delayed

Potential acute health effects

**Eye contact**: Causes serious eye damage.

**Inhalation**: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact**: Causes severe burns.

**Ingestion**: May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

**Eye contact**: pain, watering, redness

**Inhalation**: No specific data.

**Skin contact**: pain or irritation, redness, blistering may occur

**Ingestion**: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments**: No specific treatment.

**Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**: Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media**: None known.

**Specific hazards arising from the chemical**

In a fire or if heated, a pressure increase will occur and the container may burst.

**Hazardous thermal decomposition products**: carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides

**Special protective actions for fire-fighters**: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters**: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Separate from acids. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>US ACGIH</td>
<td>ppm</td>
<td>mg/m³</td>
<td>Other</td>
</tr>
<tr>
<td>OSHA PEL 1989</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Form: [a]Aerosol

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection: Chemical-resistant gloves.

Skin protection: Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid. [Clear.]
Color: Yellow. to Green.
Odor: Pungent.
Odor threshold: Not available.
pH: 11 to 12
5% in water
Melting/freezing point: Not available.
Boiling point: Not available.
Initial Boiling Point: Not available.
Flash point: Closed cup: >93.4°C (>200.1°F) [PMCC]
Burning time: Not applicable.
Burning rate: Not applicable.
Evaporation rate: Not available.
Section 9. Physical and chemical properties

- **Relative density**: Not available.
- **Vapor density**: Not available.
- **Auto-ignition temperature**: Not available.
- **Partition coefficient: n-octanol/water**: Not available.
- **Flammability (solid, gas)**: Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
- **Lower and upper explosive (flammable) limits**: Not available.
- **Vapor pressure**: 5.1 kPa (38.6 mm Hg) @ 38°C
- **Vapor density**: Not available.
- **Relative density**: 1.162 (15.6°C)
- **Density**: 9.68 (lbs/gal)
- **Solubility in water**: Soluble
- **Viscosity**: Not available.
- **VOC**: Not available.
- **Pour Point**: Not available.
- **Decomposition temperature**: Not available.
- **Solubility in water**: 1.162 (15.6°C)
- **Density**: 9.68 (lbs/gal)
- **Viscosity**: Not available.
- **VOC**: Not available.

Section 10. Stability and reactivity

- **Reactivity**: No specific test data related to reactivity available for this product or its ingredients.
- **Chemical stability**: The product is stable.
- **Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Conditions to avoid**: No specific data.
- **Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials. Slightly reactive or incompatible with the following materials: acids.
- **Hazardous decomposition products**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

**Information on toxicological effects**

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>4700 mg/kg</td>
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</tr>
</tbody>
</table>

**Irritation/Corrosion**

No applicable toxicity data

**Sensitization**

No applicable toxicity data

**Mutagenicity**

No applicable toxicity data

**Carcinogenicity**

No applicable toxicity data
Section 11. Toxicological information

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
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</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Category 2</td>
<td>Not determined</td>
<td>kidneys</td>
</tr>
</tbody>
</table>

Aspiration hazard
Not available.

Information on the likely routes of exposure
Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
Potential immediate effects: Not available.
Potential delayed effects: Not available.

Potential chronic health effects
General: May cause damage to organs through prolonged or repeated exposure.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental effects: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
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</thead>
<tbody>
<tr>
<td>Oral</td>
<td>2870 mg/kg</td>
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</tbody>
</table>

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Acute LC50 100000 µg/l Marine water</td>
<td>Crustaceans - Crangon crangon</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 100000000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 80500000 µg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
Section 12. Ecological information

Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>UN number</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport hazard class(es)</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
<td>Emergency schedules (EmS) F-A S-B</td>
<td>-</td>
</tr>
</tbody>
</table>

Special precautions for user : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity : Ethylene glycol, 2965 gal of this product.
Section 14. Transport information

Marine pollutant: Not available.

North-America NAERG: 153

Section 15. Regulatory information

U.S. Federal regulations:
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: Potassium hydroxide

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs):
- Listed

SARA 302/304: No products were found.

SARA 311/312:
- Immediate (acute) health hazard
- Delayed (chronic) health hazard

SARA 313

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>10 - 20</td>
<td></td>
</tr>
</tbody>
</table>

Canada (CEPA DSL):
- At least one component is not listed in DSL but all such components are listed in NDSL.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Health
- Flammability
- Instability/Reactivity
- Special

History

Date of printing: 1/5/2015.

Indicates information that has changed from previously issued version.

Notice to reader

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This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
**SAFETY DATA SHEET**

### Section 1. Identification

**Product name**: TRETOLITE™ RBW301X WATER CLARIFIER

**Product code**: RBW301X

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

**Identified uses**: Water clarifier.

**Print date**: 10/27/2014.

**Validation date**: 10/27/2014.

**Version**: 1

**Supplier's details**: Baker Petrolite

A Baker Hughes Company

12645 W. Airport Blvd.

Sugar Land, TX 77478

For Product Information/MSDSs Call: 800-231-3606

(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

**Emergency telephone number (with hours of operation)**: CHEMTREC: 800-424-9300 (U.S. 24 hour)

Baker Petrolite: 800-231-3606

(001)281-276-5400

CANUTEC: 613-996-6666 (Canada 24 hours)

CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

### Section 2. Hazards identification

**OSHA/HCS status**: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture**: SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) [kidneys] - Category 2

AQUATIC HAZARD (ACUTE) - Category 2

AQUATIC HAZARD (LONG-TERM) - Category 3

**GHS label elements**

**Hazard pictograms**: [Image of hazard symbol]

**Signal word**: Warning

**Hazard statements**: May cause damage to organs through prolonged or repeated exposure. (kidneys)

Toxic to aquatic life.

Harmful to aquatic life with long lasting effects.

**Precautionary statements**

**Prevention**: Avoid release to the environment. Do not breathe vapor.

**Response**: Get medical attention if you feel unwell.

**Storage**: Not applicable.

**Disposal**: Dispose of contents and container in accordance with all local, regional, national and international regulations.
Section 2. Hazards identification

Hazards not otherwise classified: None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>10 - 20</td>
<td>107-21-1</td>
</tr>
<tr>
<td>Amine salt</td>
<td>5 - 10</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Zinc chloride</td>
<td>0.1 - 1</td>
<td>7646-85-7</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention following exposure or if feeling unwell.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention following exposure or if feeling unwell. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention following exposure or if feeling unwell. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention following exposure or if feeling unwell. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact: No known significant effects or critical hazards.

Inhalation: Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact: No known significant effects or critical hazards.

Ingestion: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact: No specific data.

Inhalation: No specific data.

Skin contact: No specific data.

Ingestion: No specific data.
Section 4. First aid measures

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments: No specific treatment.

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical: In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products: carbon dioxide, carbon monoxide, nitrogen oxides, halogenated compounds

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Section 6. Accidental release measures

Large spill
- Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling
- Put on appropriate personal protective equipment (see Section 8). Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene
- Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities
- Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>List name</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ppm</td>
<td>mg/m³</td>
<td>Other</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Zinc chloride</td>
<td>US ACGIH</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

Form: [a]Aerosol [b]Fume

Consult local authorities for acceptable exposure limits.
Only components of this product with established exposure limits appear in the box above.
If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls
- If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures
10/27/2014.
Section 8. Exposure controls/personal protection

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Hand protection: Chemical-resistant gloves: Neoprene gloves.

Skin protection: Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance
- Physical state: Liquid. [Clear to hazy.]
- Color: Amber to dark brown.
- Odor: Sweet. [Slight]
- Odor threshold: Not available.
- pH: 3.6
- Melting/freezing point: Not available.
- Boiling point: Not available.
- Initial Boiling Point: Not available.
- Flash point: Closed cup: >93.4°C (>200.1°F) [SFCC]
- Burning time: Not applicable.
- Burning rate: Not applicable.
- Evaporation rate: Not available.
- Flammability (solid, gas): Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
- Lower and upper explosive (flammable) limits: Not available.
- Vapor pressure: Not available.
- Vapor density: >1 [Air = 1]
- Relative density: 1.11 (15.6°C)
- Density: 9.25 (lbs/gal)
- Solubility in water: Soluble
- Partition coefficient: n-octanol/water: Not available.
- Auto-ignition temperature: Not available.
- Decomposition temperature: Not available.
- Viscosity: Not available.
- VOC: 140 g/l
- Pour Point: Not available.
Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials.
Slightly reactive or incompatible with the following materials: acids.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>4700 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Zinc chloride</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>350 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data

Mutagenicity
No applicable toxicity data

Carcinogenicity
No applicable toxicity data

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Category 2</td>
<td>Not determined</td>
<td>kidneys</td>
</tr>
</tbody>
</table>

Aspiration hazard
Not available.
Section 11. Toxicological information

Information on the likely routes of exposure:

Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects:

Not available.

Potential delayed effects:

Not available.

Potential chronic health effects

General:

May cause damage to organs through prolonged or repeated exposure.

Carcinogenicity:

No known significant effects or critical hazards.

Mutagenicity:

No known significant effects or critical hazards.

Teratogenicity:

No known significant effects or critical hazards.

Developmental effects:

No known significant effects or critical hazards.

Fertility effects:

No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>4975.4 mg/kg</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Acute LC50 100000 µg/l Marine water</td>
<td>Crustaceans - Crangon crangon</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 10000000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 8050000 µg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 26 µg/l</td>
<td>Algae - Navicula incerta</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 34 µg/l Fresh water</td>
<td>Algae - Chlorella vulgaris</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 1.8 mg/l Fresh water</td>
<td>Aquatic plants - Lemna equinoctialis</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 100 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 49.99 µg/l Fresh water</td>
<td>Crustaceans - Moina irrasa</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 0.027 mg/l Marine water</td>
<td>Fish - Limanda punctatissima</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 20 µg/l Marine water</td>
<td>Algae - Chlorella sp.</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 1000 µg/l Fresh water</td>
<td>Crustaceans - Procambarus clarkii</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 80 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 31.5 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>30 days</td>
</tr>
</tbody>
</table>

Persistence and degradability:

Not available.

Other adverse effects:

No known significant effects or critical hazards.
Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Contains: Ethylene glycol)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>Additional information</td>
<td>This material is Not Regulated if transported in a package that does not meet or exceed the Reportable Quantity (RQ).</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Special precautions for user: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Ethylene glycol, 5379 gal of this product.

Marine pollutant: Not available.
Section 14. Transport information

North-America NAERG : 171

Section 15. Regulatory information

U.S. Federal regulations : TSCA 12(b) one-time export: No products were found.
TSCA 12(b) annual export notification: No products were found.
United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 307: zinc chloride
Clean Water Act (CWA) 311: zinc chloride

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed
SARA 302/304 : No products were found.
SARA 311/312
Classification : Delayed (chronic) health hazard
SARA 313

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>10 - 20</td>
<td></td>
</tr>
</tbody>
</table>

Canada
Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability
Health
1
Instability/Reactivity
1
Special
0

History
Date of printing : 10/27/2014.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: WCW3003 COMBINATION INHIBITOR
Product code: WCW3003

Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Emulsifier. Corrosion inhibitor.

Print date: 2/2/2015.
Validation date: 2/2/2015.
Version: 1

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation): CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int’l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
- SKIN CORROSION/IRRITATION - Category 1
- SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
- AQUATIC HAZARD (ACUTE) - Category 2
- AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements
Hazard pictograms:

Signal word: Danger
Hazard statements: Causes severe skin burns and eye damage. Toxic to aquatic life with long lasting effects.

Precautionary statements
Prevention: Wear protective gloves. Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Wash hands thoroughly after handling.
Section 2. Hazards identification

**Response**
- Collect spillage. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

**Storage**
- Store locked up.

**Disposal**
- Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified**
- None known.

Section 3. Composition/information on ingredients

**Substance/mixture**
- Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>5 - 10</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Phosphate ester salt</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Ethanol</td>
<td>1 - 5</td>
<td>64-17-5</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>0.1 - 1</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**
- Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation**
- Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**
- Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**
- Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
**Section 4. First aid measures**

Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**

**Potential acute health effects**

- **Eye contact**: Causes serious eye damage.
- **Inhalation**: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- **Skin contact**: Causes severe burns.
- **Ingestion**: May cause burns to mouth, throat and stomach.

**Over-exposure signs/symptoms**

- **Eye contact**: pain, watering, redness
- **Inhalation**: No specific data.
- **Skin contact**: pain or irritation, redness, blistering may occur
- **Ingestion**: stomach pains

**Indication of immediate medical attention and special treatment needed, if necessary**

- **Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- **Specific treatments**: No specific treatment.
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**See toxicological information (Section 11)**

**Section 5. Fire-fighting measures**

**Extinguishing media**

- **Suitable extinguishing media**: Use an extinguishing agent suitable for the surrounding fire.
- **Unsuitable extinguishing media**: None known.

**Specific hazards arising from the chemical**

- **Hazardous thermal decomposition products**: carbon dioxide, carbon monoxide, nitrogen oxides, phosphorus oxides, halogenated compounds

**Special protective actions for fire-fighters**

- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters**

- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

### Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours) ppm</th>
<th>TWA (8 hours) mg/m³</th>
<th>STEL (15 mins) ppm</th>
<th>STEL (15 mins) mg/m³</th>
<th>Ceiling ppm</th>
<th>Ceiling mg/m³</th>
<th>Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
<td>1000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>1000</td>
<td>1900</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>1000</td>
<td>1900</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

### Appropriate engineering controls

If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

### Individual protection measures

#### Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

#### Eye/face protection

Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

#### Hand protection

Chemical-resistant gloves.

#### Skin protection

Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

#### Respiratory protection

If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

### Appearance

#### Physical state

Liquid. [Clear.]

#### Color

Yellow.

#### Odor

Mercaptan.

#### Odor threshold

Not available.

#### pH

5 to 7

#### Melting/freezing point

Neat - without dilution.

#### Boiling point

Not available.

#### Initial Boiling Point

Not available.

#### Flash point

Closed cup: 94°C (201.2°F) [SFCC]

#### Burning time

Not applicable.

#### Burning rate

Not applicable.

#### Evaporation rate

Not available.
Section 9. Physical and chemical properties

- **Flammability (solid, gas)**: Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
- **Lower and upper explosive (flammable) limits**: Not available.
- **Vapor pressure**: Not available.
- **Vapor density**: >1 [Air = 1]
- **Relative density**: 1.0399 (15.6°C)
- **Density**: 8.66 (lbs/gal)
- **Solubility in water**: Soluble
- **Partition coefficient: n-octanol/water**: Not available.
- **Auto-ignition temperature**: Not available.
- **Decomposition temperature**: Not available.
- **Viscosity**: Not available.
- **VOC**: Not available.
- **Pour Point**: -5°C (23°F)

Section 10. Stability and reactivity

- **Reactivity**: No specific test data related to reactivity available for this product or its ingredients.
- **Chemical stability**: The product is stable.
- **Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Conditions to avoid**: No specific data.
- **Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials, metals, acids and alkalis.
- **Hazardous decomposition products**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

**Information on toxicological effects**

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>426 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Ethanol</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>20000 ppm</td>
<td>10 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>124700 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>7 g/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>1000 to 1250 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

- **Irritation/Corrosion**: No applicable toxicity data
- **Sensitization**: No applicable toxicity data
Section 11. Toxicological information

**Mutagenicity**
No applicable toxicity data

**Carcinogenicity**
No applicable toxicity data

**Reproductive toxicity**
No applicable toxicity data

**Teratogenicity**
No applicable toxicity data

**Specific target organ toxicity (single exposure)**
Not applicable.

**Specific target organ toxicity (repeated exposure)**
Not applicable.

**Aspiration hazard**
Not available.

**Information on the likely routes of exposure**
Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

**Potential immediate effects**
Not available.

**Potential delayed effects**
Not available.

**Potential chronic health effects**

**General**
No known significant effects or critical hazards.

**Carcinogenicity**
No known significant effects or critical hazards.

**Mutagenicity**
No known significant effects or critical hazards.

**Teratogenicity**
No known significant effects or critical hazards.

**Developmental effects**
No known significant effects or critical hazards.

**Fertility effects**
No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>6010.6 mg/kg</td>
</tr>
</tbody>
</table>
## Section 12. Ecological information

### Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>Acute EC50 37 ppb Fresh water</td>
<td>Daphnia - <em>Daphnia magna</em></td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 64 ppb Fresh water</td>
<td>Fish - <em>Oncorhynchus mykiss</em></td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.15 ppb Marine water</td>
<td>Daphnia - <em>Daphnia magna</em></td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 32.2 ppb</td>
<td>Fish - <em>Pimephales promelas</em></td>
<td>34 days</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 17.921 mg/l Marine water</td>
<td>Algae - <em>Ulva pertusa</em></td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2000 µg/l Fresh water</td>
<td>Daphnia - <em>Daphnia magna</em></td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 25500 µg/l Marine water</td>
<td>Crustaceans - <em>Artemia franciscana</em> - Larvae</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 42000 µg/l Fresh water</td>
<td>Fish - <em>Oncorhynchus mykiss</em></td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.995 mg/l Marine water</td>
<td>Algae - <em>Ulva pertusa</em></td>
<td>4 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.375 ul/L Fresh water</td>
<td>Fish - <em>Gambusia holbrooki</em> - Larvae</td>
<td>12 weeks</td>
</tr>
</tbody>
</table>

### Persistence and degradability
Not available.

### Other adverse effects
No known significant effects or critical hazards.

## Section 13. Disposal considerations

### Disposal methods
The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport hazard class(es)</th>
<th>III</th>
<th>III</th>
<th>III</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN1760</td>
<td>UN1760</td>
<td>UN1760</td>
<td>UN1760</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)</td>
<td></td>
</tr>
</tbody>
</table>
Section 14. Transport information

<table>
<thead>
<tr>
<th>Environmental hazards</th>
<th>Yes.</th>
<th>Yes.</th>
<th>Yes.</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
<td>Emergency schedules (EmS) F-A S-B</td>
<td>-</td>
</tr>
</tbody>
</table>

**Special precautions for user**: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

**DOT Reportable Quantity**: Not applicable.

**Marine pollutant**: Quaternary ammonium compound

**North-America NAERG**: 154

Section 15. Regulatory information

**U.S. Federal regulations**
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)**: Not listed

**SARA 302/304**: No products were found.

**SARA 311/312 Classification**: Immediate (acute) health hazard

**SARA 313 Supplier notification**: No products were found.

**Canada**
- Canada (CEPA DSL): At least one component is not listed in DSL but all such components are listed in NDSL.

Section 16. Other information

**National Fire Protection Association (U.S.A.)**

- Flammability: 1
- Health: 3
- Instability/Reactivity: 0
- Special:

**History**
- Date of printing: 2/2/2015.

 Indicates information that has changed from previously issued version.
Section 16. Other information

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: WCW4527 COMBINATION ASPHALTIC OIL EMULSIFIER/CORROSION INHIBITOR
Product code: WCW4527

Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Emulsifier. Corrosion inhibitor.

Print date: 11/5/2014.
Validation date: 11/5/2014.
Version: 1

Supplier's details
Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/SDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation)
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
SKIN SENSITIZATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) [heart, kidneys and liver] - Category 2
AQUATIC HAZARD (ACUTE) - Category 3
AQUATIC HAZARD (LONG-TERM) - Category 3

GHS label elements
Hazard pictograms:

Signal word: Warning
Hazard statements:
Causes serious eye irritation.
Causes skin irritation.
May cause an allergic skin reaction.
May cause damage to organs through prolonged or repeated exposure. (heart, kidneys, liver)
Harmful to aquatic life with long lasting effects.

Precautionary statements
Section 2. Hazards identification

Prevention: Wear protective gloves: > 8 hours (breakthrough time): Natural rubber gloves. Eye or face protection. Avoid release to the environment. Do not breathe vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response: Get medical attention if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage: Not applicable.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified: None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>5 - 10</td>
<td>107-21-1</td>
</tr>
<tr>
<td>Sulfur compound</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Quaternary ammonium compound</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention following exposure or if feeling unwell. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact: Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention following exposure or if feeling unwell. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed
Section 4. First aid measures

**Potential acute health effects**

- **Eye contact**: Causes serious eye irritation.
- **Inhalation**: Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- **Skin contact**: Causes skin irritation. May cause an allergic skin reaction.
- **Ingestion**: Irritating to mouth, throat and stomach.

**Over-exposure signs/symptoms**

- **Eye contact**: pain or irritation, watering, redness
- **Inhalation**: No specific data.
- **Skin contact**: irritation, redness
- **Ingestion**: No specific data.

**Indication of immediate medical attention and special treatment needed, if necessary**

- **Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- **Specific treatments**: No specific treatment.
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

- **Suitable extinguishing media**: Use an extinguishing agent suitable for the surrounding fire.
- **Unsuitable extinguishing media**: None known.

**Specific hazards arising from the chemical**

- **Hazardous thermal decomposition products**: carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides, halogenated compounds

**Special protective actions for fire-fighters**

- **Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.**

**Special protective equipment for fire-fighters**

- **Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.**

Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

- **For non-emergency personnel**: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
Section 6. Accidental release measures

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>ppm</th>
<th>mg/m³</th>
<th>Other</th>
<th>ppm</th>
<th>mg/m³</th>
<th>Other</th>
<th>ppm</th>
<th>mg/m³</th>
<th>Other</th>
<th>Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>[a]</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Form: [a]Aerosol

Consult local authorities for acceptable exposure limits.
Only components of this product with established exposure limits appear in the box above.
If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Hand protection: Chemical-resistant gloves: Natural rubber gloves.

Skin protection: Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid. [Clear.]
Color: Amber.
Odor: Mercaptan.
Odor threshold: Not available.
pH: Not available.
Melting/freezing point: Not available.
Boiling point: Not available.
Initial Boiling Point: Not available.
Flash point: Closed cup: 98°C (208.4°F) [PMCC]
Burning time: Not applicable.
Burning rate: Not applicable.
Evaporation rate: Not available.
Flammability (solid, gas): Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>&gt;1 [Air = 1]</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.05 to 1.06 (15.6°C)</td>
</tr>
<tr>
<td>Density</td>
<td>8.77 (lbs/gal)</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
</tr>
<tr>
<td>VOC</td>
<td>Not available.</td>
</tr>
<tr>
<td>Pour Point</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
<tr>
<td>Chemical stability</td>
<td>The product is stable.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>Reactive or incompatible with the following materials: oxidizing materials and alkalis. Slightly reactive or incompatible with the following materials: acids.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
</tbody>
</table>

Section 11. Toxicological information

<table>
<thead>
<tr>
<th>Information on toxicological effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td></td>
</tr>
<tr>
<td>Product/ingredient name</td>
<td>Result</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>LD50 Oral</td>
</tr>
<tr>
<td>Sulfur compound</td>
<td>LD50 Dermal</td>
</tr>
<tr>
<td>Quaternary ammonium compound</td>
<td>LD50 Oral</td>
</tr>
<tr>
<td>LD50 Oral</td>
<td>Rat</td>
</tr>
<tr>
<td>Irritation/Corrosion</td>
<td>No applicable toxicity data</td>
</tr>
<tr>
<td>Sensitization</td>
<td>No applicable toxicity data</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>No applicable toxicity data</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>No applicable toxicity data</td>
</tr>
</tbody>
</table>

Section 11. Toxicological information

No applicable toxicity data

**Reproductive toxicity**
No applicable toxicity data

**Teratogenicity**
No applicable toxicity data

**Specific target organ toxicity (single exposure)**
Not applicable.

**Specific target organ toxicity (repeated exposure)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Category 2</td>
<td>Not determined</td>
<td>kidneys</td>
</tr>
<tr>
<td>Sulfur compound</td>
<td>Category 2</td>
<td>Not determined</td>
<td>heart and liver</td>
</tr>
</tbody>
</table>

**Aspiration hazard**
Not available.

**Information on the likely routes of exposure**
Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

Potential immediate effects: Not available.

Potential delayed effects: Not available.

**Potential chronic health effects**

**General**
May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: No known significant effects or critical hazards.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>4348.8 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>3190.6 mg/kg</td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td>191.4 mg/l</td>
</tr>
</tbody>
</table>
Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Acute LC50 100000 µg/l Marine water</td>
<td>Crustaceans - Crangon crangon</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 10000000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 8050000 µg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td>Quaternary ammonium compound</td>
<td>Acute LC50 100 to 500 µg/l</td>
<td>Crustaceans - Echinogammarus olivii</td>
<td>48 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability

Not available.

Other adverse effects

: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Contains: Ethylene glycol)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>No.</td>
<td>No.</td>
</tr>
</tbody>
</table>
Section 14. Transport information

<table>
<thead>
<tr>
<th>Additional information</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This material is Not Regulated if transported in a package that does not meet or exceed the Reportable Quantity (RQ).</td>
</tr>
</tbody>
</table>

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Ethylene glycol, 8145 gal of this product.

Marine pollutant: Not available.

Section 15. Regulatory information

**U.S. Federal regulations**

- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- Clean Water Act (CWA) 307: Naphthalene
- Clean Water Act (CWA) 311: Potassium hydroxide; Xylene; Naphthalene; sodium hydroxide

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)**: Listed

- SARA 302/304: No products were found.
- SARA 311/312: Immediate (acute) health hazard, Delayed (chronic) health hazard

**SARA 313**

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>5 - 10</td>
</tr>
</tbody>
</table>

**Canada**

- Canada (CEPA DSL): All components are listed or exempted.
Section 16. Other information

National Fire Protection Association (U.S.A.)

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Health</th>
<th>Instability/Reactivity</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

History

Date of printing : 11/5/2014.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this SDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This SDS was prepared and is to be used for this product. If the product is used as a component in another product, this SDS information may not be applicable.
# Underground Injection Control Testing Summary Table: #1

## MATERIAL SAFETY DATA SHEET

**DATE:** January 2013

### SECTION 1  MATERIAL IDENTIFICATION

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>Sodium Iodide Iodine 131 (1-131) Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMICAL SYNONYMS</td>
<td>Na&lt;sup&gt;131&lt;/sup&gt;I in NaOH containing 0.02M Na&lt;sub&gt;2&lt;/sub&gt;SO&lt;sub&gt;4&lt;/sub&gt; pH-9-13</td>
</tr>
<tr>
<td>CHEMICAL FAMILY</td>
<td>Base; Sodium Iodide in dilute sodium hydroxide solution</td>
</tr>
<tr>
<td>MANUFACTURER/SUPPLIER NAME</td>
<td>Nordion Canada Inc. 447 March Road Kanata, Ontario K2K 1X8 Telephone: (613) 592-2790 - Radiation Safety</td>
</tr>
</tbody>
</table>

### SECTION 2  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>Activity or %</th>
<th>Radiation Category</th>
<th>%</th>
<th>TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Radioactivity</td>
<td>200-10000 mCi/ml</td>
<td>High energy gamma and high energy beta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium Hydroxide</td>
<td>&lt; 2.8 mg/ml (&lt; 0.3% w/v)</td>
<td>Half-Life: 8.02 days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CNSC Permitted Exposures: 20 mSv/ y for Radiation Workers; 1 mSv/ y for Public

### SECTION 3  PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT: 760 mm Hg (°C)</th>
<th>100-105°C</th>
<th>SOLUBILITY IN WATER, % by weight @ 25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAPOUR PRESSURE: 20°C (mm Hg)</td>
<td>N/A</td>
<td>SPECIFIC GRAVITY (H&lt;sub&gt;2&lt;/sub&gt;O = 1)</td>
</tr>
<tr>
<td>VAPOUR DENSITY (air = 1)</td>
<td>&gt; 1.0</td>
<td>EVAPORATION RATE (butyfacetate = 1)</td>
</tr>
<tr>
<td>pH</td>
<td></td>
<td>MELTING POINT</td>
</tr>
<tr>
<td>APPEARANCE AND ODOUR:</td>
<td>Product appears like water and is contained in a shielded and securely sealed package. No odour.</td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 4  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT (°C); TEST METHOD:</th>
<th>None</th>
<th>FLAMMABLE LIMITS</th>
<th>LEL</th>
<th>UEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTOIGNITION TEMPERATURE (°C)</td>
<td>None</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

| EXTINGUISHING MEDIA: | N/A |

| SPECIAL FIREFIGHTING PROCEDURES: | N/A |

| UNUSUAL FIRE AND EXPLOSION HAZARDS: | Aqueous solutions of isotopes may generate combustible gases. Precautions are necessary to isolate the gases from potential sources of ignition. |

### SECTION 5  REACTIVITY DATA

<table>
<thead>
<tr>
<th>STABILITY:</th>
<th>STABLEX</th>
<th>CONDITIONS TO AVOID: None</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCOMPATIBILITY:</td>
<td>UNSTABLE</td>
<td></td>
</tr>
<tr>
<td>HAZARDOUS DECOMPOSITION PRODUCTS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HAZARDOUS POLYMERIZATION:</td>
<td>WILL NOT OCCURX</td>
<td>CONDITIONS TO AVOID: Not identified.</td>
</tr>
<tr>
<td>MAY OCCUR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N/A = Not Applicable
### MATERIAL SAFETY DATA SHEET - Sodium Iodide Iodine 131 Solution (cont’d)

#### SECTION 6  HEALTH HAZARD DATA

**EFFECTS OF OVEREXPOSURE:**

**INHALATION:** Will result in heavy thyroid radiation dose. No respiratory symptoms.

**INGESTION:** Will result in heavy thyroid radiation dose. Sodium hydroxide concentration low, may cause throat irritation and burning sensation.

**EYES:** Sodium hydroxide will have irritation effect; wash immediately.

**SKIN:** Corrosive effect and high radiation on contact; wash immediately.

**EMERGENCY FIRST AID PROCEDURES:**

**INHALATION:** Remove to fresh air and stand upwind if outside. Ascertain if individual has allergies to iodine. If not, administer stable iodine (eg. Lugol’s solution). Seek medical attention for radiation intake.

**INGESTION:** Ascertain if individual has allergies to iodine. If not, administer stable iodine (eg. Lugol’s solution). Do not induce vomiting, due to corrosive effect of solution. Remove from source. Seek medical aid for radiation intake.

**EYES:** Flush open eye(s) continuously for 15 minutes with clean water. Remove from source. See Physician for external radiation or if irritation persists.

**SKIN:** Wash well with soap and water to remove contamination. Remove contaminated clothing. Remove from source. See Physician for external radiation or if irritation persists.

**NOTE:** IN ALL CASES, OBTAIN MEDICAL AID PROMPTLY.

#### SECTION 7  SPECIAL PROTECTION INFORMATION

**VENTILATION:** With I-131 local ventilation is very important, if I-131 gasses off. Wear respiratory protection, and stand upwind (if outside).

**RESPIRATORY PROTECTION:** Air purifying respirator with combination radio-adsorbent filter or SCBA where spill has occurred.

**PROTECTIVE CLOTHING:** If package is damaged, wear lead-lined gloves before handling.

**EYE PROTECTION:**

- □ NOT NORMALLY NECESSARY
- □ SAFETY GLASSES WITH SIDE SHIELDS
- □ SAFETY GLASSES
- □ GASTIGHT GOGGLES OR EQUIVALENT
- □ CHEMICAL WORKERS GOGGLES
- □ OTHER

#### SECTION 8  SPECIAL PRECAUTIONS

**PRECAUTIONS IN HANDLING AND STORAGE:** Shielded container and vial may have some radioactive surface contamination. It must always be opened in an adequately ventilated enclosure and employing appropriate contamination control techniques.

**OTHER PRECAUTIONS:** All shippers and consignees must possess radioisotope license and conform with all conditions of license.

#### SECTION 9  SPILL OR LEAK PROCEDURES

**STEPS TO BE TAKEN IF MATERIAL SPILLED OR LEAKED:** Note also Section 7. If wet spill occurs, isolate contaminated area using vermiculite or charcoal. When acidified this material will release I-131. If in transport mode, call CANUTEC at (613) 996-6666 in Canada or National Response Centre at 1-800-424-8802 in USA.

**WASTE DISPOSAL METHOD:** If on site, follow instructions on site license or as directed by local Radiation Control Officer. Disposal should be in accordance with local or national regulations for acceptable levels of radioactive contamination. For non-returnable components, disposal of shielding materials should also be in accordance with local or national regulations for disposal of heavy metals (eg lead.)

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# SAFETY DATA SHEET

## Section 1 - Product ID

**Chemical Name**
Xenon - 133

**Chemical Synonym**
Xe-133

**Recommended Product Use**
Medical Imaging Agent

**Hazard Symbols**

## Section 2 - Hazards Identification

### Precautionary Measures
Avoid ingestion, inhalation, skin and eye contact. Care should be taken to minimize radiation exposure. Appropriate radiation shielding should be used. Keep material in a lead container. Avoid direct handling by using remote manipulation tools.
Wash hands after handling to minimize exposure. Pregnant or nursing women should avoid exposure.

### Hazardous Ingredients
- Xe-133 Gas
- Carbon dioxide
- Xenon

### Health Hazards

- **Eyes:** Exposure to ionizing radiation may produce adverse effects
- **Skin:** Exposure to ionizing radiation may produce adverse effects
- **Inhalation:** Exposure to ionizing radiation may produce adverse effects
- **Ingestion:** Exposure to ionizing radiation may produce adverse effects
- **Absorption:** NA

- **Target Organs:** Lung, bone, fatty tissue

## Section 3 - Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
<th>CAS #</th>
</tr>
</thead>
</table>

Prepared November 2013
Section 4: First Aid Measures

Contact First Aid:
Eyes - NA
Skin - NA
Inhalation - Remove from source to fresh air environment
Ingestion - NA
Absorption - NA

Medical Responders Information:
Xenon-133 gas is a radiopharmaceutical that is used to evaluate pulmonary function and cerebral blood flow, and for imaging the lungs. It is administered by inhalation from closed respirator systems and spirometers. Xenon-133 gas is a readily diffusible gas which is neither utilized nor produced by the body. Most of the Xenon-133 gas that enters the circulation from a single breath is returned to the lungs and exhaled after a single pass through the peripheral circulation. It is essentially an inert gas. Overexposure manifests as asphyxiation.

Section 5: Fire Fighting Measures

Flammable Properties
Non flammable gas

Extinguishing Media
Dry chemical, Water spray, Foam

Firefighting Personal Protective Equipment
Specific hazards: Radioactive. Protective equipment Use personal protective equipment. In the event of fire or leak, wear self-contained breathing apparatus.

Post fire Monitoring
Monitor and decontaminate protective clothing and equipment for radioactive exposure before reuse.

Section 6: Accidental Release Management

Personal Precautions
Evacuate affected rooms. Contact the company Radiation Safety Officer. Care should be taken to minimize radiation exposure. Handle as radioactive gas release. Use personal protective equipment. Depending on the nature of the spill (quantity and extent of release) a self-contained breathing apparatus may be needed.

Environmental Precautions
Minimize release to the environment

Containment Equipment and Method
Seal leaking containers

Cleanup Method
Allow released gas to clear from the affected area through building ventilation
Section 7 - Safe Handling and Storage

Handling Precautions
Avoid exposure - obtain special instructions before use. Contact the company/institution Radiation Safety Officer. Care should be taken to minimize radiation exposure. Handling time should be kept to a minimum. Appropriate radiation shielding should be used. Use of syringe shields and tongs are recommended. Keep material in a lead container. Avoid direct handling by using remote manipulation tools. Obtain appropriate governmental licenses to possess and handle radioactive material.

Storage Conditions Required
Store at controlled room temperature of 15 - 30°C. Store and dispose of product should be controlled in a manner compliant with applicable governmental regulations pertaining to radionuclides. Store and handle in a designated area. Keep away from heat, sparks and flames.

Container Requirements
Store in sturdy containers appropriate to maintain the integrity of this material for its intended use.

Section 8 - Exposure Controls / Personal Protection

<table>
<thead>
<tr>
<th>Exposure limits</th>
<th>NRC</th>
<th>ICRP/ACGIH</th>
<th>OSHA</th>
<th>NIOSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>20mSv/yr for Rad. workers</td>
<td>20mSv/yr for Rad. workers</td>
<td>50mSv/yr</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>1mSv/yr for public</td>
<td>1mSv/yr for public</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Recommended Industrial Hygiene Monitoring
Follow standard hygiene monitoring for radionuclides as per local federal regulations. If required please contact Nordion at the supplied phone number to see assistance.

Engineering Controls
Use process enclosures, containment technology, or other engineering controls to keep airborne levels below recommended exposure limit.

Respiratory Protection
Use and selection of respiratory protection is based upon engineering controls in use and potential for gas release. When engineering controls are not sufficient to control exposure to below the exposure limit, wear an approved air supply respirator.

Eye Protection
Chemical safety goggles and face shields are recommended.
Hand Protection
Impervious nitrile, rubber and latex gloves are recommended. Please note that employees who are allergic to natural rubber latex should use nitrile gloves.

Skin Protection
Wear disposable coverall, polyethylene apron and sleeves, and shoe covers.

Personal Hygiene
Wash hands and face before breaks and immediately after handling the product.

Section 9 - Physical and Chemical Properties

Physical State
Gas

Colour
No Colour

Molecular Weight
NA

Odor
No odor

Solubility in Water
100% soluble

Section 10 - Stability and Reactivity

Chemical Stability
Stable under recommended storage conditions

Conditions to Avoid
Heat sparks and open flame

Incompatible Products
NA

Hazardous Decompositions Products
NA

Hazardous Reactions
No hazardous polymerization occurs
Section 11 - Toxicological Information

**Routes of Entry**
- Eyes: NA
- Skin: NA
- Inhalation: NA
- Ingestion: NA

**Acute Toxicity**
Xenon/Carbon dioxide: asphyxiation if oxygen displaced. Carbon dioxide: In high concentrations causes rapid circulatory insufficiency

**Carcinogenicity**
Ionizing radiation: exposure known to increase risk of cancer.

**Reproductive/Development Toxicity**
Ionizing radiation: exposure known to increase risk of reproductive and developmental effects

**Target Organs**
Carbon dioxide: cardiovascular system

**Symptoms of Exposure**
Carbon dioxide: headache, nausea and vomiting, which may lead to unconsciousness

Section 12 - Ecological Information

**Exotoxicological Information (Aquatic)**
NA

**Exotoxicological Information (Terrestrial)**
NA

**Chemical Fate**
Not available. Hazardous component, Xe-133 will undergo radiological decay to Cs-133, a non-radioactive isotope of Cesium.

Section 13 - Disposal Considerations

**Disposal and Packaging Recommendations**
Segregate and label radioactive waste. Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements. This information presented only applies to the material as supplied.
SAFETY DATA SHEET ANSI Z400.1-2004
447 March Road Kanata Ontario Canada K2K 1X8
Emergency Radiation Contact 613-592-9375

Section 14 - Transportation Information
The classification for transportation of radioactive materials will depend on the specific activity level of the material, type of isotope, as well as the quantity shipped. Please follow the license requirements attached to product to ensure proper shipping protocols are being followed.

Section 15 - Regulatory Information
All shippers and consignees must possess a valid radiotrace license and conform with all conditions of that license.

Section 16 - Other Information

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Prepared November 2013
# Underground Injection Control Summary Table: #3

## Nuclide Safety Data Sheet

**Krypton-85**

Based on information from www.nchps.org

## I. PHYSICAL DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation¹</td>
<td>Gamma/X - 514 keV (0.434% abundance)</td>
</tr>
<tr>
<td></td>
<td>Beta 687.4 keV max; 251.59 keV average (99.6% abundance)</td>
</tr>
<tr>
<td>Gamma Constant</td>
<td>mR/hr per mCi @ 1.0 meter [mSv/hr per MBq @ 1.0 meter]²</td>
</tr>
<tr>
<td>Beta Dose</td>
<td>1.78E-2 mSv/hr per MBq @ 30 cm from point source</td>
</tr>
<tr>
<td>Half-Life [T½]</td>
<td>Physical T½: 3934.4 days</td>
</tr>
<tr>
<td></td>
<td>Biological T½: Rapid (~minutes); small fraction deposited in fatty tissue</td>
</tr>
<tr>
<td></td>
<td>Effective T½: Rapid (~minutes)</td>
</tr>
<tr>
<td>Specific Activity³</td>
<td>3.9E2 Ci/g [6.98E3 TBq/g] max.</td>
</tr>
</tbody>
</table>

## II. RADIOLOGICAL DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiotoxicity⁵</td>
<td>Submersion: 6.1E-12 Sv/hr per Bq/m³ [EDE]; 1.2E-11 Sv/hr per Bq/m³ [Bone]</td>
</tr>
<tr>
<td>Critical Organs</td>
<td>Lung; bone; fatty tissue</td>
</tr>
<tr>
<td>Intake Routes</td>
<td>Inhalation</td>
</tr>
<tr>
<td>Radiological Hazard</td>
<td>External &amp; Internal Exposure</td>
</tr>
</tbody>
</table>

## III. SHIELDING

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Value Layer [HVL]</td>
<td>0.04 mm (0.002 inches)</td>
</tr>
<tr>
<td>Tenth Value Layer [TVL]</td>
<td>0.37 mm (0.015 inches)</td>
</tr>
</tbody>
</table>

- The accessible dose rate should be background but must be < 2 mR/hr

## IV. DOSIMETRY MONITORING

- Always wear radiation dosimetry monitoring badges [body & ring] whenever handling $^{85}$Kr

## V. DETECTION & MEASUREMENT

- Portable Survey Meters:
  - Geiger-Mueller [e.g. Bicron PGM, ] to assess shielding effectiveness
  - Low Energy Gamma Detector [e.g. Ludlow 44-21] for contamination surveys
- Wipe Test: N/A – inert gas

## VI. SPECIAL PRECAUTIONS

- Avoid inhalation [only significant route of intake]
- Use shielding [lead or leaded Plexiglas] to minimize exposure while handling mCi quantities of $^{85}$Kr
- Ensure $^{85}$Kr gas delivery systems are leak proof
- $^{85}$Kr adheres to some plastics, rubber, greases & oils; handle in glass where possible

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² Health Physics & Radiological Health Handbook, 3rd Ed. [Baltimore, MD: Williams & Wilkins, 1998], p. 6-11
³ Federal Guidance Report No. 11 [Oak Ridge, TN; Oak Ridge National Laboratory, 1988], p. 182
VII. GENERAL PRECAUTIONS

1. Maintain your occupational exposure to radiation As Low As Reasonably Achievable [ALARA].
2. Ensure all persons handling radioactive material are trained, registered, & listed on an approved protocol.
3. Review the nuclide characteristics on (reverse side) prior to working with that nuclide. Review the protocol(s) authorizing the procedure to be performed and follow any additional precautions in the protocol. Contact the responsible Principal Investigator to view the protocol information.
4. Plan experiments to minimize external exposure by reducing exposure time, using shielding and increasing your distance from the radiation source. Reduce internal and external radiation dose by monitoring the worker and the work area after each use of radioactive material, then promptly cleaning up any contamination discovered. Use the smallest amount of radioisotope possible so as to minimize radiation dose and radioactive waste.
5. Keep an accurate inventory of radioactive material, including records of all receipts, transfers & disposal. Perform and record regular lab surveys.
6. Provide for safe disposal of radioactive waste by following institutional Waste Handling & Disposal Procedures. Avoid generating mixed waste (combinations of radioactive, biological, and chemical waste). Note that lab staff may not pour measurable quantities of radioactive material down the drain.
7. If there is a question regarding any aspect of the radiation safety program or radioactive material use, contact Radiation Safety.

VIII. LAB PRACTICES

1. Disposable gloves, lab coats, and safety glasses are the minimum PPE [Personal Protective Equipment] required when handling radioactive material. Remove & discard potentially contaminated PPE prior to leaving the area where radioactive material is used.
2. Clearly outline radioactive material use areas with tape bearing the legend "radioactive". Cover lab bench tops where radioactive material will be handled with plastic-backed absorbent paper; change this covering periodically and whenever it's contaminated. Alternatively cover benches with thick plastic sheeting (i.e., painter's drop cloth), periodically wipe it clean and replace it if torn.
3. Label each unattended radioactive material container with the radioactive symbol, isotope, activity, and, except for waste, the ICN [inventory control number]. Place containers too small for such labels in larger labeled containers.
4. Handle radioactive solutions in trays large enough to contain the material in the event of a spill.
5. Never eat, drink, smoke, handle contact lenses, apply cosmetics, or take/apply medicine in the lab; keep food, drinks, cosmetics, etc. out of the lab entirely. Do not pipette by mouth.
7. Prevent skin contact with skin-absorbable solvents containing radioactive material.
8. Fume hoods and biological safety cabinets for use with non-airborne radioactive material must be approved (through the protocol) and must be labeled "Caution Radioactive Material".
9. All volatile, gaseous, or aerosolized radioactive material must be used only in a properly operating charcoal and/or HEPA filtered fume hood or Biological Safety Cabinet bearing a Caution Airborne Radioactivity hood label, unless otherwise specified in writing by the Radiation Safety Officer. In particular, radioactive iodination must be performed only in these specially designed fume hoods. The Radiation Safety Officer (through a protocol) must approve all such use.
10. Take special precautions when working with radioactive compounds that tend to become volatile [e.g. 35S labeled amino acids, 125I - iodine tends to volatilize in acidic solutions]. These precautions may include: using the materials only within an approved fume hood, protecting the house vacuum system with primary and secondary vapor trapping devices, and covering active cell cultures with carbon-impregnating paper.
11. Use sealed containers and appropriate secondary containment to carry radioactive material between rooms Notify Radiation Safety staff before taking any radioactive material off site.
Section 1. Identification

Product name: BPB 59480
Product code: BPB59480

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

Identified uses: Boiler Water Treatment. Neutralizing agent.

Print date: 1/8/2015.
Validation date: 12/22/2014.
Version: 1

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
- FLAMMABLE LIQUIDS - Category 4
- SKIN CORROSION/IRRITATION - Category 1
- SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
- TOXIC TO REPRODUCTION [Fertility] - Category 2

GHS label elements
Hazard pictograms:

Signal word: Danger
Hazard statements:
- Combustible liquid.
- Causes severe skin burns and eye damage.
- Suspected of damaging fertility.

Precautionary statements
Prevention:
- Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from flames and hot surfaces. - No smoking. Wash hands thoroughly after handling.
Section 2. Hazards identification

**Response**
- IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

**Storage**
- Store locked up. Store in a well-ventilated place. Keep cool.

**Disposal**
- Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified**
- None known.

Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substance/mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixture</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexylamine</td>
<td>5 - 10</td>
<td>108-91-8</td>
</tr>
<tr>
<td>Isobutanolamine</td>
<td>5 - 10</td>
<td>124-68-5</td>
</tr>
<tr>
<td>Ethoxylated amine</td>
<td>5 - 10</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**
- Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation**
- Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**
- Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**
- Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
Section 4. First aid measures

Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**

**Potential acute health effects**

- **Eye contact**: Causes serious eye damage.
- **Inhalation**: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- **Skin contact**: Causes severe burns.
- **Ingestion**: May cause burns to mouth, throat and stomach.

**Over-exposure signs/symptoms**

- **Eye contact**: pain, watering, redness
- **Inhalation**: reduced fetal weight, increase in fetal deaths, skeletal malformations
- **Skin contact**: pain or irritation, redness, blistering may occur, reduced fetal weight, increase in fetal deaths, skeletal malformations
- **Ingestion**: stomach pains, reduced fetal weight, increase in fetal deaths, skeletal malformations

**Indication of immediate medical attention and special treatment needed, if necessary**

- **Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- **Specific treatments**: No specific treatment.
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

- **Suitable extinguishing media**: Use dry chemical, CO₂, water spray (fog) or foam.
- **Unsuitable extinguishing media**: Do not use water jet.

**Specific hazards arising from the chemical**

- **Carbon dioxide, carbon monoxide, nitrogen oxides**
- **Combustible liquid.** In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

**Special protective actions for fire-fighters**

- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters**

- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

1/8/2015.

BPB59480
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flames, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Section 7. Handling and storage

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

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from acids. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

**Control parameters**

**Occupational exposure limits**

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ppm</td>
<td>mg/m³</td>
<td>ppm</td>
<td>mg/m³</td>
</tr>
<tr>
<td>Cyclohexylamine</td>
<td>US ACGIH</td>
<td>10</td>
<td>41</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>10</td>
<td>40</td>
<td>-</td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

**Appropriate engineering controls**

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Individual protection measures**

**Hygiene measures**

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**

Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

**Hand protection**

Chemical-resistant gloves.

**Skin protection**

Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

**Respiratory protection**

If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

**Appearance**

**Physical state**

Liquid. [Clear.]

**Color**

Yellow to light amber [Light]

**Odor**

Amine-like.

**Odor threshold**

Not available.

**pH**

11.5 to 13
Section 9. Physical and chemical properties

- **Melting/freezing point**: -1°C (30.2°F)
- **Boiling point**: 101°C (213.8°F)
- **Initial Boiling Point**: Not available.
- **Flash point**: Closed cup: 66.1°C (151°F) [TCC]
- **Evaporation rate**: Not available.
- **Auto-ignition temperature**: Not available.
- **Flash point**: Not available.
- **Partition coefficient: n-octanol/water**: Not available.
- **Boiling point**: 101°C (213.8°F)
- **Flammability (solid, gas)**: Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
- **Lower and upper explosive (flammable) limits**: Not available.
- **Vapor pressure**: 2.4 kPa (18 mm Hg) @ 21.1°C (Calculated Value for all Components.)
- **Vapor density**: >1 [Air = 1]
- **Relative density**: 0.994 (15.6°C)
- **Density**: 8.28 (lbs/gal)
- **Solubility in water**: Soluble
- **Partition coefficient: n-octanol/water**: Not available.
- **Auto-ignition temperature**: Not available.
- **Decomposition temperature**: Not available.
- **Viscosity**: Dynamic (15.6°C): 25 cP
- **VOC**: Not available.
- **Pour Point**: 0.994 (15.6°C)
- **Initial Boiling Point**: Not available.
- **Density**: 8.28 (lbs/gal)

Section 10. Stability and reactivity

- **Reactivity**: No specific test data related to reactivity available for this product or its ingredients.
- **Chemical stability**: The product is stable.
- **Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Conditions to avoid**: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
- **Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials, acids and alkalis.
- **Hazardous decomposition products**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexylamine</td>
<td>LC50 Inhalation Vapor</td>
<td>Mouse</td>
<td>1070 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>2.3 mg/l</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>7500 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>Isobutanolamine</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2900 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Ethoxylated amine</td>
<td>LD50 Dermal</td>
<td>Rat</td>
<td>&gt;10000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>620 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data

Mutagenicity
No applicable toxicity data

Carcinogenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexylamine</td>
<td>-</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)
Not applicable.

Aspiration hazard
Not available.

Information on the likely routes of exposure
Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

<table>
<thead>
<tr>
<th>Potential immediate effects</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential delayed effects</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Potential chronic health effects

General
No known significant effects or critical hazards.

Carcinogenicity
No known significant effects or critical hazards.

Mutagenicity
No known significant effects or critical hazards.

Teratogenicity
No known significant effects or critical hazards.

Developmental effects
No known significant effects or critical hazards.
Section 11. Toxicological information

Fertility effects  :  Suspected of damaging fertility.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>3057.6 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>12771.4 mg/kg</td>
</tr>
</tbody>
</table>

Additional information

This product was corrosive when tested using the Corrositex test method.

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexylamine</td>
<td>Acute EC50 20 mg/l Fresh water</td>
<td>Algae - Pseudokirchneriella subcapitata</td>
<td>96 hours</td>
</tr>
<tr>
<td>Ethoxylated amine</td>
<td>Acute LC50 44 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>BPB 59480</td>
<td>Acute EC50 3.7 to 7.2 mg/l</td>
<td>Daphnia</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 0.51 to 0.91 mg/l</td>
<td>Fish</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 3.95 ppm</td>
<td>Daphnia</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 2.41 ppm</td>
<td>Fish</td>
<td>96 hours</td>
</tr>
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</table>

Persistence and degradability

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Aquatic half-life</th>
<th>Photolysis</th>
<th>Biodegradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPB 59480</td>
<td>-</td>
<td>-</td>
<td>Not readily</td>
</tr>
</tbody>
</table>

Other adverse effects

:  No known significant effects or critical hazards.

Additional information

An EcoTox™ Report, and/or the material's environmental fate is available upon request at the following number: 1-800-235-4249, then press 4.

Section 13. Disposal considerations

Disposal methods

:  The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
### Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
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<tbody>
<tr>
<td>UN number</td>
<td>UN3267</td>
<td>UN3267</td>
<td>UN3267</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>CORROSIVE LIQUID, BASIC, ORGANIC, N.O. S. (Contains: Cyclohexylamine, Isobutanolamine)</td>
<td>CORROSIVE LIQUID, BASIC, ORGANIC, N.O. S. (Contains: Cyclohexylamine, Isobutanolamine)</td>
<td>CORROSIVE LIQUID, BASIC, ORGANIC, N.O. S. (Contains: Cyclohexylamine, Isobutanolamine)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
<td>Emergency schedules (EmS) F-A S-B</td>
</tr>
</tbody>
</table>

**Special precautions for user**: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

**DOT Reportable Quantity**: Not applicable.

**Marine pollutant**: Not available.

**North-America NAERG**: 153

### Section 15. Regulatory information

**U.S. Federal regulations**
- TSCA 4(a) final test rules: Cyclohexanol
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: sodium hydroxide
- Clean Air Act (CAA) 112 regulated toxic substances: Cyclohexylamine

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)**: Not listed

**SARA 302/304**
Section 15. Regulatory information

<table>
<thead>
<tr>
<th>Name</th>
<th>%</th>
<th>EHS</th>
<th>SARA 302 TPQ</th>
<th>SARA 304 RQ</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(lbs)</td>
<td>(gallons)</td>
</tr>
<tr>
<td>Cyclohexylamine</td>
<td>5 - 10</td>
<td>Yes.</td>
<td>10000</td>
<td>1386.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(lbs)</td>
<td>(gallons)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10000</td>
<td>1386.5</td>
</tr>
</tbody>
</table>

SARA 311/312

Classification: Fire hazard
Immediate (acute) health hazard
Delayed (chronic) health hazard

SARA 313

Supplier notification: No products were found.

Canada

Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability
Health: 3
Instability/Reactivity: 0
Special

History

Date of printing: 1/8/2015.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name : CLO64 CLEANER  
Product code  : CLO64

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

Identified uses : Cleaner

Print date : 1/8/2015.  
Validation date : 12/10/2014.  
Version : 1

Supplier's details : Baker Petrolite  
A Baker Hughes Company  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 800-231-3606  
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation) : CHEMTREC: 800-424-9300 (U.S. 24 hour)  
Baker Petrolite: 800-231-3606  
(001)281-276-5400  
CANUTEC: 613-996-6666 (Canada 24 hours)  
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 3  
SKIN CORROSION/IRRITATION - Category 2  
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2  
CARCINOGENICITY - Category 2  
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation and Narcotic effects] - Category 3  
AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements

Hazard pictograms : ![pictograms]

Signal word : Warning

Hazard statements : Flammable liquid and vapor.  
Causes serious eye irritation.  
Causes skin irritation.  
Suspected of causing cancer.  
May cause respiratory irritation.  
May cause drowsiness and dizziness.  
Toxic to aquatic life with long lasting effects.

Precautionary statements
Section 2. Hazards identification

**Prevention**: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling.

**Response**: Collect spillage. IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

**Storage**: Store locked up. Store in a well-ventilated place. Keep cool.

**Disposal**: Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified**: None known.

Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substance/mixture</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>40 - 50</td>
<td>64742-95-6</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>30 - 40</td>
<td>95-63-6</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>5 - 10</td>
<td>108-67-8</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>1 - 5</td>
<td>526-73-8</td>
</tr>
<tr>
<td>Xylene</td>
<td>1 - 5</td>
<td>1330-20-7</td>
</tr>
<tr>
<td>Cumene</td>
<td>1 - 5</td>
<td>98-82-8</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

**Inhalation**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Section 4. First aid measures

**Ingestion**: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**

**Potential acute health effects**

- **Eye contact**: Causes serious eye irritation.
- **Inhalation**: Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. May cause respiratory irritation.
- **Skin contact**: Causes skin irritation.
- **Ingestion**: Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.

**Over-exposure signs/symptoms**

- **Eye contact**: pain or irritation, watering, redness
- **Inhalation**: respiratory tract irritation, coughing, nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness
- **Skin contact**: irritation, redness
- **Ingestion**: No specific data.

**Indication of immediate medical attention and special treatment needed, if necessary**

- **Notes to physician**: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- **Specific treatments**: No specific treatment.
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

**Additional information**

If product is ingested and vomiting occurs naturally, have person lean forward to reduce the risk of aspiration into the lungs.

Section 5. Fire-fighting measures

**Extinguishing media**

- **Suitable extinguishing media**: Use dry chemical, CO₂, water spray (fog) or foam.
- **Unsuitable extinguishing media**: Do not use water jet.
Section 5. Fire-fighting measures

Specific hazards arising from the chemical: Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products: carbon dioxide, carbon monoxide

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.
Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours) ppm</th>
<th>mg/m³</th>
<th>Other ppm</th>
<th>mg/m³</th>
<th>Ceiling ppm</th>
<th>mg/m³</th>
<th>Other ppm</th>
<th>mg/m³</th>
<th>Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>25</td>
<td>125</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td></td>
<td>OSHA PEL 1989</td>
<td>25</td>
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<td>-</td>
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<td></td>
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<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>US ACGIH</td>
<td>25</td>
<td>123</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>25</td>
<td>125</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Xylene</td>
<td>US ACGIH</td>
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<td>434</td>
<td>150</td>
<td>651</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>100</td>
<td>435</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>100</td>
<td>435</td>
<td>150</td>
<td>655</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td></td>
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<tr>
<td>Cumene</td>
<td>US ACGIH</td>
<td>50</td>
<td>-</td>
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<td>[1]</td>
</tr>
<tr>
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<td>OSHA PEL</td>
<td>50</td>
<td>245</td>
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<tr>
<td></td>
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<td>50</td>
<td>245</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>[1]</td>
</tr>
</tbody>
</table>


Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

1/8/2015.

CLO64 5/11
Section 8. Exposure controls/personal protection

Appropriate engineering controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Hand protection: Chemical-resistant gloves.

Skin protection: Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid.
Color: Amber.
Odor: Aromatic.
Odor threshold: Not available.
pH: Not available.
Melting/freezing point: Not available.
Boiling point: Not available.
Initial Boiling Point: Not available.
Flash point: Closed cup: 39°C (102.2°F) [SFCC ASTM D-3828]
 Burning time: Not applicable.
 Burning rate: Not applicable.
 Evaporation rate: Not available.
 Flammability (solid, gas): Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
 Lower and upper explosive (flammable) limits: Not available.
 Vapor pressure: Not available.
 Vapor density: >1 [Air = 1]
 Relative density: 0.878 (16°C)
 Density: 7.31 (lbs/gal)
 Solubility in water: Insoluble
 Partition coefficient: n-octanol/water: Not available.
 Auto-ignition temperature: Not available.
 Decomposition temperature: Not available.
 Viscosity: Dynamic (16°C): 7 cP
Section 9. Physical and chemical properties

VOC: Not available.
Pour Point: -40°C (-40°F)

Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials and acids.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2900 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>18000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>5 g/kg</td>
<td>-</td>
</tr>
<tr>
<td>Xylene</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>24000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Gas.</td>
<td>Rat</td>
<td>5000 ppm</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>&gt;1700 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Male rat</td>
<td>3523 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>4300 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Mouse</td>
<td>10000 mg/m³</td>
<td>7 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>39000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>10600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2.9 g/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data

Mutagenicity
No applicable toxicity data

Carcinogenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>-</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Cumene</td>
<td>-</td>
<td>2B</td>
<td>-</td>
</tr>
</tbody>
</table>

Reasonably anticipated to be a human carcinogen.

Reproductive toxicity

1/8/2015. CLO64
CLO64 CLEANER

Section 11. Toxicological information

No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Xylene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>Cumene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)

Aspiration hazard

<table>
<thead>
<tr>
<th>Name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light aromatic naphtha</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>1,2,3-Trimethylbenzene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Xylene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Cumene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
</tbody>
</table>

Information on the likely routes of exposure

- Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

Potential chronic health effects

- General: No known significant effects or critical hazards.
- Carcinogenicity: Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
- Mutagenicity: No known significant effects or critical hazards.
- Teratogenicity: No known significant effects or critical hazards.
- Developmental effects: No known significant effects or critical hazards.
- Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates
### Section 11. Toxicological information

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>3845.5 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>44631.9 mg/kg</td>
</tr>
<tr>
<td>Inhalation (gases)</td>
<td>202872.1 ppm</td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td>57.06 mg/l</td>
</tr>
</tbody>
</table>

### Section 12. Ecological information

#### Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>Acute LC50 4910 µg/l Marine water</td>
<td>Crustaceans - Elasmopuspectenicus</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 22.4 mg/l Fresh water</td>
<td>Fish - Tilapia zillii</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 12520 to 15050 µg/l Fresh water</td>
<td>Fish - Carassius auratus</td>
<td>96 hours</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>Chronic NOEC 400 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 8500 µg/l Marine water</td>
<td>Crustaceans - Palaemonetespugio</td>
<td>48 hours</td>
</tr>
<tr>
<td>Xylene</td>
<td>Acute LC50 13400 µg/l Fresh water</td>
<td>Fish - Pimephales promelasa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2600 µg/l Fresh water</td>
<td>Algae - Pseudokirchneriellasiaubcapitata</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 7400 to 11290 µg/l Fresh water</td>
<td>Crustaceans - Artemia sp.</td>
<td>48 hours</td>
</tr>
<tr>
<td>Cumene</td>
<td>Acute LC50 30500 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 2700 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

#### Persistence and degradability

Not available.

#### Other adverse effects

: No known significant effects or critical hazards.

### Section 13. Disposal considerations

<table>
<thead>
<tr>
<th>Disposal methods</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.</td>
</tr>
</tbody>
</table>
### Section 14. Transport information

<table>
<thead>
<tr>
<th></th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN1993</td>
<td>UN1993</td>
<td>UN1993</td>
<td>UN1993</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
<td>FLAMMABLE LIQUID, N.O.S. (Contains: Light aromatic naphtha, 1,2, 4-Trimethylbenzene)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>Yes.</td>
<td>Yes.</td>
<td>No.</td>
</tr>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
<td>Emergency schedules (EmS)</td>
<td>F-E S-E</td>
</tr>
</tbody>
</table>

**Special precautions for user**: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

**DOT Reportable Quantity** Xylene, 555 gal of this product.

**Marine pollutant** Light aromatic naphtha 1,2,4-Trimethylbenzene

**North-America NAERG**: 128

### Section 15. Regulatory information

**U.S. Federal regulations**
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: Naphthalene
- Clean Water Act (CWA) 311: Xylene; Naphthalene

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)**
- Listed

**SARA 302/304**
- No products were found.

**SARA 311/312 Classification**
- Fire hazard
  - Immediate (acute) health hazard
  - Delayed (chronic) health hazard
Section 15. Regulatory information

**SARA 313**

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,2,4-Trimethylbenzene</td>
<td>95-63-6</td>
<td>30 - 40</td>
</tr>
<tr>
<td></td>
<td>Xylene</td>
<td>1330-20-7</td>
<td>1 - 5</td>
</tr>
<tr>
<td></td>
<td>Cumene</td>
<td>98-82-8</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

**Canada**

Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

**National Fire Protection Association (U.S.A.)**

- Flammability
- Instability/Reactivity
- Health
- Special

**History**

- Date of printing: 1/8/2015.

⚠ Indicates information that has changed from previously issued version.

**Notice to reader**

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: CLW3075 CLEANER
Product code: CLW3075

Identified uses: Cleaner.

Print date: 1/8/2015.
Validation date: 12/19/2014.
Version: 1

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation): CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
- SKIN CORROSION/IRRITATION - Category 2
- SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
- SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3

GHS label elements
Hazard pictograms: 

Signal word: Danger
Hazard statements: Causes serious eye damage.
Causes skin irritation.
May cause respiratory irritation.

Precautionary statements
Prevention: Wear protective gloves. Wear eye or face protection. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling.
Section 2. Hazards identification

**Response**
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical attention. 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 physician.

**Storage**
- Store locked up.

**Disposal**
- Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified**
- None known.

Section 3. Composition/information on ingredients

**Substance/mixture**
- Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkylarylsulfonate amine salt</td>
<td>20 - 30</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Organic surfactant</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**
- Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation**
- Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**
- Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**
- Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**

1/8/2015. CLW3075
Section 4. First aid measures

Potential acute health effects

Eye contact: Causes serious eye damage.
Inhalation: May cause respiratory irritation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Skin contact: Causes skin irritation.
Ingestion: May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact: pain, watering, redness
Inhalation: respiratory tract irritation, coughing
Skin contact: pain or irritation, redness, blistering may occur
Ingestion: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments: No specific treatment.
Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical

Hazardous thermal decomposition products: carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides, metal oxide/oxides

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
Section 6. Accidental release measures

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Occupational exposure limits</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients:</td>
<td>List name</td>
<td>ppm</td>
<td>mg/m³</td>
</tr>
<tr>
<td>No exposure limit value known.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits. Only components of this product with established exposure limits appear in the box above.
Section 8. Exposure controls/personal protection

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

**Appropriate engineering controls**

Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**Individual protection measures**

**Hygiene measures**

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**

Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

**Hand protection**

Chemical-resistant gloves.

**Skin protection**

Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

**Respiratory protection**

If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

**Appearance**

**Physical state**

Liquid. [Clear to hazy.]

**Color**

Yellow. [Dark]

**Odor**

Mild.

**Odor threshold**

Not available.

**pH**

7.3 to 8.3

**Melting/freezing point**

Not available.

**Boiling point**

Not available.

**Initial Boiling Point**

Not available.

**Flash point**

Closed cup: >93.4°C (>200.1°F) [SFCC]

**Burning time**

Not applicable.

**Burning rate**

Not applicable.

**Evaporation rate**

Not available.

**Flammability (solid, gas)**

Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

**Lower and upper explosive (flammable) limits**

Not available.

**Vapor pressure**

2.2 kPa (16.5 mm Hg) @ 21.1°C (Calculated Value for all Components.)

**Vapor density**

>1 [Air = 1]

**Relative density**

0.952 (15.6°C)

**Density**

7.93 (lbs/gal)

**Solubility in water**

Dispersible
Section 9. Physical and chemical properties

Partition coefficient: n-octanol/water : Not available.
Auto-ignition temperature : Not available.
Decomposition temperature : Not available.
Viscosity : Dynamic (15.6°C): 50 cP

VOC : 8 g/l
Pour Point : -3.9°C (25°F)

Additional information
Soluble in Diesel

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic surfactant</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>2500 ppm</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>10000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>1900 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data

Mutagenicity
No applicable toxicity data

Carcinogenicity
No applicable toxicity data

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

1/8/2015.
Section 11. Toxicological information

Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkylaryl sulfonate amine salt</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)
Not applicable.

Aspiration hazard
Not available.

Information on the likely routes of exposure
Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
Potential immediate effects
Not available.

Potential delayed effects
Not available.

Potential chronic health effects
General
No known significant effects or critical hazards.
Carcinogenicity
No known significant effects or critical hazards.
Mutagenicity
No known significant effects or critical hazards.
Teratogenicity
No known significant effects or critical hazards.
Developmental effects
No known significant effects or critical hazards.
Fertility effects
No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates
Not available.

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic surfactant</td>
<td>Acute EC50 43 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 28000 to 40000 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Other adverse effects
No known significant effects or critical hazards.
Section 13. Disposal considerations

**Disposal methods**

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>UN number</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
</table>

**UN proper shipping name**

- Not regulated.

**Transport hazard class(es)**

- Not regulated.

**Packing group**

- Not regulated.

**Environmental hazards**

No. No. No. No.

**Additional information**

- Not regulated.

**Special precautions for user**

Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not available.

**DOT Reportable Quantity**

Not applicable.

**Marine pollutant**

Not available.

**North-America NAERG**

Not available.
Section 15. Regulatory information

U.S. Federal regulations:
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.
- SARA 313: Not listed.
- Clean Air Act  Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed.
- SARA 302/304: No products were found.
- SARA 311/312 Classification: Immediate (acute) health hazard.
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Health</th>
<th>Instability/Reactivity</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

History
- Date of printing: 1/8/2015.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
OSW5200 OXYGEN SCAVENGER

Section 1. Identification

Product name : OSW5200 OXYGEN SCAVENGER
Product code : OSW5200

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

Identified uses : Oxygen scavenger.

Print date : 10/21/2014.
Validation date : 10/21/2014.
Version : 1

Supplier's details : Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation) : CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSAHCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : CORROSIVE TO METALS - Category 1
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
RESPIRATORY SENSITIZATION - Category 1
SKIN SENSITIZATION - Category 1
CARCINOGENICITY: INHALATION - Category 1A
TOXIC TO REPRODUCTION [Unborn child] - Category 1B
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE): INHALATION [respiratory tract] - Category 2

GHS label elements

Hazard pictograms : 

Signal word : Danger

Hazard statements : May be corrosive to metals. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause cancer if inhaled. May damage the unborn child. May cause damage to organs through prolonged or repeated exposure if inhaled. (respiratory tract)
Section 2. Hazards identification

Precautionary statements

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves: > 8 hours (breakthrough time): Butyl rubber gloves. Wear eye or face protection. In case of inadequate ventilation wear respiratory protection. Keep only in original container. Do not breathe vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response: Absorb spillage to prevent material damage. Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or physician. IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage: Store locked up. Store in corrosive resistant container with a resistant inner liner.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified: None known.

Additional information
Corrosive to metal.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium bisulfite</td>
<td>60 - 70</td>
<td>10192-30-0</td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>0.1 - 1</td>
<td>7786-81-4</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. In the event of any complaints or symptoms, avoid further exposure.

Skin contact: Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Section 4. First aid measures

Ingestion: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact: Causes serious eye irritation.
Inhalation: May cause allergy or asthma symptoms or breathing difficulties if inhaled. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Skin contact: May cause an allergic skin reaction.
Ingestion: Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact: pain or irritation, watering, redness
Inhalation: wheezing and breathing difficulties, asthma, reduced fetal weight, increase in fetal deaths, skeletal malformations
Skin contact: irritation, redness, reduced fetal weight, increase in fetal deaths, skeletal malformations
Ingestion: reduced fetal weight, increase in fetal deaths, skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments: No specific treatment.
Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical

Hazardous thermal decomposition products: nitrogen oxides, sulfur oxides
Section 5. Fire-fighting measures

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up:

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Absorb spillage to prevent material damage. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Absorb spillage to prevent material damage. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling:

Protective measures: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. Absorb spillage to prevent material damage.
Section 7. Handling and storage

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store in corrosive resistant container with a resistant inner liner. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>ppm</th>
<th>mg/m³</th>
<th>Other</th>
<th>ppm</th>
<th>mg/m³</th>
<th>Other</th>
<th>ppm</th>
<th>mg/m³</th>
<th>Other</th>
<th>Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel sulfate, as Ni</td>
<td>US ACGIH</td>
<td>-</td>
<td>0.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>[a][A]</td>
</tr>
<tr>
<td>OSHA PEL</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>[b][A]</td>
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<tr>
<td>OSHA PEL 1989</td>
<td>-</td>
<td>0.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>[a][A]</td>
</tr>
</tbody>
</table>

Form: [a]Inhalable fraction [b]Soluble
Notes: [A]as Ni

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Hand protection: Chemical-resistant gloves: Butyl rubber gloves.

Skin protection: Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Section 9. Physical and chemical properties

**Appearance**
- **Physical state**: Liquid. [Clear.]
- **Color**: Yellow. [Light]
- **Odor**: Pungent.
- **Odor threshold**: Not available.
- **pH**: 4.5 to 5.5
  - Neat - without dilution.

**Melting/freezing point**: Not available.
**Boiling point**: Not available.
**Initial Boiling Point**: Not available.
**Flash point**: Closed cup: >93.34°C (>200°F) [SFCC]
** Burning time**: Not applicable.
** Burning rate**: Not applicable.
** Evaporation rate**: Not available.
** Flammability (solid, gas)**: Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
** Lower and upper explosive (flammable) limits**: Not available.
**Vapor pressure**: Not available.
** Vapor density**: >1 [Air = 1]
** Relative density**: 1.35 (25°C)
** Density**: 11.27 (lbs/gal)
** Solubility in water**: Soluble
** Partition coefficient: n-octanol/water**: Not available.
** Auto-ignition temperature**: Not available.
** Decomposition temperature**: Not available.
** Viscosity**: Dynamic: 8.04 cP

**VOC**: Not available.
** Pour Point**: -40°C (-40°F)

Section 10. Stability and reactivity

**Reactivity**: No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability**: The product is stable.

**Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid**: No specific data.

**Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials, acids and alkalis. Avoid strong mineral acids which will yield sulfur dioxide gas. Do not use copper or its alloys
Section 10. Stability and reactivity

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity
No applicable toxicity data

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data

Mutagenicity
No applicable toxicity data

Carcinogenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel sulfate</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel sulfate</td>
<td>Category 1</td>
<td>Inhalation</td>
<td>respiratory tract</td>
</tr>
</tbody>
</table>

Aspiration hazard
Not available.

Information on the likely routes of exposure: Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects: Not available.

Potential delayed effects: Not available.

Potential chronic health effects

General: May cause damage to organs through prolonged or repeated exposure if inhaled. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: May cause cancer if inhaled. Risk of cancer depends on duration and level of exposure.

Mutagenicity: No known significant effects or critical hazards.
Section 11. Toxicological information

Teratogenicity: May damage the unborn child.
Developmental effects: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates
Not available.

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel sulfate</td>
<td>Acute IC50 7.28 mg/l Marine water</td>
<td>Algae - Phaeodactylum tricornutum - Exponential growth phase</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Acute IC50 4.59 mg/l Marine water</td>
<td>Algae - Phaeodactylum tricornutum - Exponential growth phase</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 125000 µg/l Marine water</td>
<td>Crustaceans - Crangon crangon - Adult</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 180 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 1280 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss - Larvae</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Other adverse effects: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN2693</td>
<td>UN2693</td>
<td>UN2693</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>BISULFITES, AQUEOUS SOLUTION, N.O.S. (Contains: Ammonium bisulfite)</td>
<td>BISULFITES, AQUEOUS SOLUTION, N.O.S. (Contains: Ammonium bisulfite)</td>
<td>BISULPHITES, AQUEOUS SOLUTION, N.O.S. (Contains: Ammonium bisulfite)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
<td>Emergency schedules (EmS) F-A S-B</td>
</tr>
</tbody>
</table>

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Ammonium bisulfite, 727 gal of this product.

Marine pollutant: Not available.

North-America NAERG: 154

Section 15. Regulatory information

U.S. Federal regulations: TSCA 12(b) one-time export: No products were found.

TSCA 12(b) annual export notification: No products were found.

United States inventory (TSCA 8b): All components are listed or exempted.

Clean Water Act (CWA) 307: nickel sulphate

Clean Water Act (CWA) 311: ammonium hydrogensulphite; nickel sulphate

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) Not listed

SARA 302/304: No products were found.

SARA 311/312 Classification: Reactive

Immediate (acute) health hazard

Delayed (chronic) health hazard

10/21/2014. OSW5200 9/10
Section 15. Regulatory information

SARA 313

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ammonium bisulfite</td>
<td>10192-30-0</td>
<td>60 - 70</td>
</tr>
<tr>
<td></td>
<td>Nickel sulfate</td>
<td>7786-81-4</td>
<td>0.1 - 1</td>
</tr>
</tbody>
</table>

Canada

Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability: 1
Health: 2
Instability/Reactivity: 0
Special:

History

Date of printing: 10/21/2014.

Notice to reader

Indicates information that has changed from previously issued version.

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: TECHNI-HIB 3743
Product code: CRW3743

Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Corrosion inhibitor.

Print date: 10/31/2014.
Validation date: 10/31/2014.
Version: 1

Supplier’s details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
SKIN CORROSION/IRRITATION - Category 1B
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
AQUATIC HAZARD (ACUTE) - Category 1
AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements
Hazard pictograms:

Signal word: Danger
Hazard statements: Causes severe skin burns and eye damage. Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Precautionary statements
Prevention: Wear protective gloves: > 8 hours (breakthrough time): neoprene nitrile polyvinyl alcohol (PVA) polyvinyl chloride (PVC). Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Wash hands thoroughly after handling.
Section 2. Hazards identification

**Response**
- Collect spillage. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

**Storage**
- Store locked up.

**Disposal**
- Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified**
- None known.

Section 3. Composition/information on ingredients

**Substance/mixture**
- Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>20 - 30</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Phosphate ester salt</td>
<td>5 - 10</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Ethanol</td>
<td>1 - 5</td>
<td>64-17-5</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>0.1 - 1</td>
<td>Trade secret.</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**
- Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation**
- Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**
- Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**
- Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
Section 4. First aid measures

Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- **Eye contact**: Causes serious eye damage.
- **Inhalation**: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- **Skin contact**: Causes severe burns.
- **Ingestion**: May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

- **Eye contact**: pain, watering, redness
- **Inhalation**: No specific data.
- **Skin contact**: pain or irritation, redness, blistering may occur
- **Ingestion**: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

- **Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- **Specific treatments**: No specific treatment.
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

- **Extinguishing media**
  - **Suitable extinguishing media**: Use an extinguishing agent suitable for the surrounding fire.
  - **Unsuitable extinguishing media**: None known.
  
- **Specific hazards arising from the chemical**: In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
  
- **Hazardous thermal decomposition products**: carbon dioxide, carbon monoxide, nitrogen oxides, phosphorus oxides, halogenated compounds

- **Special protective actions for fire-fighters**: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

- **Special protective equipment for fire-fighters**: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
### Section 8. Exposure controls/personal protection

#### Control parameters

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>ppm</th>
<th>mg/m³</th>
<th>Other</th>
<th>ppm</th>
<th>mg/m³</th>
<th>Other</th>
<th>ppm</th>
<th>mg/m³</th>
<th>Other</th>
<th>Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>1000</td>
<td>1900</td>
<td>-</td>
<td>1000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>1000</td>
<td>1900</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

#### Individual protection measures

**Appropriate engineering controls**

If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**Hygiene measures**

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**

Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

**Hand protection**

Chemical-resistant gloves: neoprene nitrile polyvinyl alcohol (PVA) polyvinyl chloride (PVC)

**Skin protection**

Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

**Respiratory protection**

If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

### Section 9. Physical and chemical properties

#### Appearance

**Physical state**

Liquid. [Clear.]

**Color**

Colorless to pale pink.

**Odor**

Alcohol-like. [Slight]

**Odor threshold**

Not available.

**pH**

5 to 7

**Melting/freezing point**

-4.444°C (24°F)

**Boiling point**

104.44°C (220°F)

**Initial Boiling Point**

Not available.

**Flash point**

Closed cup: 93.333°C (200°F) [TCC]

**Burning time**

Not applicable.

**Burning rate**

Not applicable.

**Evaporation rate**

Not available.

**Flammability (solid, gas)**

Not available.
Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative density</td>
<td>1</td>
</tr>
<tr>
<td>Density</td>
<td>8.33 (lbs/gal)</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>VOC</td>
<td>Not available</td>
</tr>
<tr>
<td>Pour Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Density</td>
<td>8.33 (lbs/gal)</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

<table>
<thead>
<tr>
<th>Stability aspect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
<tr>
<td>Chemical stability</td>
<td>The product is stable.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>Reactive or incompatible with the following materials: oxidizing materials, metals, acids and alkalis.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
</tbody>
</table>

Section 11. Toxicological information

**Information on toxicological effects**

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>426 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Ethanol</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>20000 ppm</td>
<td>10 hours</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>124700 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>Alkyl amine</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>7 g/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1000 to 1250 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

**Irritation/Corrosion**

No applicable toxicity data

**Sensitization**

No applicable toxicity data

**Mutagenicity**

No applicable toxicity data
Section 11. Toxicological information

Carcinogenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td></td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)
Not applicable.

Aspiration hazard
Not available.

Information on the likely routes of exposure
Not available.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects
Not available.

Potential delayed effects
Not available.

Potential chronic health effects

General
No known significant effects or critical hazards.

Carcinogenicity
No known significant effects or critical hazards.

Mutagenicity
No known significant effects or critical hazards.

Teratogenicity
No known significant effects or critical hazards.

Developmental effects
No known significant effects or critical hazards.

Fertility effects
No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>2103.7 mg/kg</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

Toxicity
Section 12. Ecological information

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium compound</td>
<td>Acute EC50 37 ppb Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 64 ppb Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.15 ppb Marine water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 32.2 ppb</td>
<td>Fish - Pimephales promelas</td>
<td>34 days</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 17.921 mg/l Marine water</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 2000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 25500 µg/l Marine water</td>
<td>Crustaceans - Artemia</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 42000 µg/l Fresh water</td>
<td>franciscana - Larvae</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 4.995 mg/l Marine water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>4 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.375 ul/L Fresh water</td>
<td>Algae - Ulva pertusa</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fish - Gambusia holbrooki -</td>
<td>12 weeks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Larvae</td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN1760</td>
<td>UN1760</td>
<td>UN1760</td>
</tr>
</tbody>
</table>

UN proper shipping name: CORROSIVE LIQUID, N.O.S. (Contains: Quaternary ammonium compound)

Transport hazard class(es): 8

Packing group: III

Environmental hazards: Yes.

10/31/2014. CRW3743
Section 14. Transport information

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity: Not applicable.

Marine pollutant: Quaternary ammonium compound

North-America NAERG: 154

Section 15. Regulatory information

U.S. Federal regulations: TSCA 12(b) one-time export: No products were found.
TSCA 12(b) annual export notification: No products were found.
United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed
SARA 302/304: No products were found.
SARA 311/312
Classification: Immediate (acute) health hazard
SARA 313
Supplier notification: No products were found.

Canada
Canada (CEPA DSL): At least one component is not listed in DSL but all such components are listed in NDSL.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability

Health

Instability/Reactivity

Special

History

Date of printing: 10/31/2014.

Notice to reader

Indicates information that has changed from previously issued version.
Section 16. Other information

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: TRETOLITE™ FLW163 FLOTATION AID

Product code: FLW163

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

Identified uses: Flotation aid.

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
- SKIN CORROSION/IRRITATION - Category 2
- SKIN SENSITIZATION - Category 1
- SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Narcotic effects] - Category 3

GHS label elements

Hazard pictograms:

Signal word: Warning

Hazard statements:
- Causes skin irritation.
- May cause an allergic skin reaction.
- May cause drowsiness and dizziness.

Precautionary statements

Prevention:
- Wear protective gloves. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.
Section 2. Hazards identification

Response: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention.

Storage: Store locked up.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements: Avoid contact with skin and clothing. Wash thoroughly after handling.

Hazards not otherwise classified: Prolonged or repeated contact may dry skin and cause irritation.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum distillates</td>
<td>20 - 30</td>
<td>64742-47-8</td>
</tr>
<tr>
<td>Oxyalkylated alkylphenol</td>
<td>1 - 5</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Fatty acid oxyalkylate</td>
<td>0.1 - 1</td>
<td>70142-34-6</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact: Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects
## Section 4. First aid measures

**Eye contact**: Causes serious eye irritation.
**Inhalation**: Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
**Skin contact**: Causes skin irritation. Defatting to the skin. May cause an allergic skin reaction.
**Ingestion**: Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.

### Over-exposure signs/symptoms

<table>
<thead>
<tr>
<th>Eye contact</th>
<th>Inhalation</th>
<th>Skin contact</th>
<th>Ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>pain or irritation, watering, redness</td>
<td>nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness</td>
<td>irritation, redness, dryness, cracking</td>
<td></td>
</tr>
</tbody>
</table>

### Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
**Specific treatments**: No specific treatment.
**Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

### See toxicological information (Section 11)

#### Additional information
If product is ingested and vomiting occurs naturally, have person lean forward to reduce the risk of aspiration into the lungs.

## Section 5. Fire-fighting measures

**Extinguishing media**

<table>
<thead>
<tr>
<th>Suitable extinguishing media</th>
<th>Unsuitable extinguishing media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
<td>None known.</td>
</tr>
</tbody>
</table>

**Specific hazards arising from the chemical**

<table>
<thead>
<tr>
<th>Hazardous thermal decomposition products</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbon dioxide, carbon monoxide, nitrogen oxides, halogenated compounds</td>
</tr>
</tbody>
</table>

**Special protective actions for fire-fighters**

<table>
<thead>
<tr>
<th>Special protective equipment for fire-fighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.</td>
</tr>
<tr>
<td>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</td>
</tr>
</tbody>
</table>
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum distillates, as total hydrocarbon vapor</td>
<td>US ACGIH</td>
<td>-</td>
<td>200</td>
<td>-</td>
</tr>
</tbody>
</table>


Consult local authorities for acceptable exposure limits.
Only components of this product with established exposure limits appear in the box above.
If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Hand protection

Chemical-resistant gloves.

Skin protection

Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory protection

If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid.
Color: White.
Odor: Organic.
Odor threshold: Not available.

pH: Not available.

Melting/freezing point: Not available.
Boiling point: Not available.
Initial Boiling Point: Not available.
Flash point: Closed cup: >93.4°C (>200.1°F) [PMCC]

Burning time: Not applicable.
Burning rate: Not applicable.
Evaporation rate: Not available.

Flammability (solid, gas): Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Section 9. Physical and chemical properties

- **Relative density**: Not available.
- **Vapor density**: >1 [Air = 1]
- **Relative density**: 1.038 (15.6°C)
- **Density**: 8.65 (lbs/gal)
- **Solubility in water**: Dispersible
- **Partition coefficient: n-octanol/water**: Not available.
- **Auto-ignition temperature**: Not available.
- **Decomposition temperature**: Not available.
- **Solubility in water**: 1.038 (15.6°C)
- **Density**: 8.65 (lbs/gal)
- **VOC**: Not available.
- **Viscosity**: Not available.
- **Pour Point**: Not available.

Section 10. Stability and reactivity

- **Reactivity**: No specific test data related to reactivity available for this product or its ingredients.
- **Chemical stability**: The product is stable.
- **Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Conditions to avoid**: No specific data.
- **Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials.
- **Hazardous decomposition products**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

**Information on toxicological effects**

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum distillates</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

**Irritation/Corrosion**
No applicable toxicity data

**Sensitization**
No applicable toxicity data

**Mutagenicity**
No applicable toxicity data

**Carcinogenicity**
No applicable toxicity data

**Reproductive toxicity**
No applicable toxicity data
Section 11. Toxicological information

**Teratogenicity**

No applicable toxicity data

**Specific target organ toxicity (single exposure)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum distillates</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>Fatty acid oxyalkylate</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>

**Specific target organ toxicity (repeated exposure)**

Not applicable.

**Aspiration hazard**

<table>
<thead>
<tr>
<th>Name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum distillates</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
</tbody>
</table>

**Information on the likely routes of exposure**

- Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

**Potential chronic health effects**

**General**

- Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

**Carcinogenicity**

- No known significant effects or critical hazards.

**Mutagenicity**

- No known significant effects or critical hazards.

**Teratogenicity**

- No known significant effects or critical hazards.

**Developmental effects**

- No known significant effects or critical hazards.

**Fertility effects**

- No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>24038.5 mg/kg</td>
</tr>
</tbody>
</table>
Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum distillates</td>
<td>Acute LC50 2200 µg/l Fresh water</td>
<td>Fish - Lepomis macrochirus</td>
<td>4 days</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 2900 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability

Not available.

Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>UN number</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>UN proper shipping name</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport hazard class(es)</th>
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<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
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<td>-</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Packing group</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental hazards</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Additional information</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Special precautions for user

Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not available.
Section 14. Transport information

DOT Reportable Quantity
Not applicable.

Marine pollutant
Not available.

North-America NAERG: Not available.

Section 15. Regulatory information

U.S. Federal regulations:
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs):
- Not listed

SARA 302/304: No products were found.

SARA 311/312 Classification: Immediate (acute) health hazard

SARA 313 Supplier notification: No products were found.

Canada
- Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

- Flammability
- Health
- Instability/Reactivity
- Special

History
Date of printing: 1/15/2015.

Indicates information that has changed from previously issued version.

Notice to reader
NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: TRETOLITE™ RBW517 WATER CLARIFIER
Product code: RBW517

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

Identified uses: Water clarifier.

Print date: 1/23/2015.
Validation date: 1/22/2015.
Version: 1

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation): CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture: Not classified.

GHS label elements

Signal word: No signal word.

Hazard statements: No known significant effects or critical hazards.

Precautionary statements

Prevention: Not applicable.
Response: Not applicable.
Storage: Not applicable.
Disposal: Not applicable.
Hazards not otherwise classified: None known.
Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substance/mixture</th>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixture</td>
<td>Ammonium chloride</td>
<td>1 - 5</td>
<td>12125-02-9</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Description of necessary first aid measures

**Eye contact**
- Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

**Inhalation**
- Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**
- Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

**Ingestion**
- Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

**Potential acute health effects**

**Eye contact**
- No known significant effects or critical hazards.

**Inhalation**
- Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact**
- No known significant effects or critical hazards.

**Ingestion**
- No known significant effects or critical hazards.

**Over-exposure signs/symptoms**

**Eye contact**
- No specific data.

**Inhalation**
- No specific data.

**Skin contact**
- No specific data.

**Ingestion**
- No specific data.

**Indication of immediate medical attention and special treatment needed, if necessary**

Notes to physician
- In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments
- No specific treatment.

Protection of first-aiders
- No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

1/23/2015.
Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**: Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media**: None known.

**Specific hazards arising from the chemical**

**Hazardous thermal decomposition products**: In a fire or if heated, a pressure increase will occur and the container may burst.

**Special protective actions for fire-fighters**: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

**Special protective equipment for fire-fighters**

Use an extinguishing agent suitable for the surrounding fire.

**Extinguishing media**: None known.

**Suitable extinguishing media**: None known.

**Unsuitable extinguishing media**: None known.

**Section 6. Accidental release measures**

**Environmental precautions**

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel**: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

**For emergency responders**: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Methods and materials for containment and cleaning up**

**Small spill**: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill**: Stop leak if without risk. Move containers from spill area. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.
Section 7. Handling and storage

Precautions for safe handling

**Protective measures**
- Put on appropriate personal protective equipment (see Section 8).

**Advice on general occupational hygiene**
- Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities
- Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Occupational exposure limits</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium chloride</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US ACGIH</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>OSHA PEL 1989</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Form: [a]Fume

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls
- Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Individual protection measures

**Hygiene measures**
- Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**
- Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Hand protection**
- Chemical-resistant gloves: Nitrile or Neoprene gloves. 4H gloves.

**Skin protection**
- Wear long sleeves to prevent repeated or prolonged skin contact.

**Respiratory protection**
- If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

1/23/2015.
Section 9. Physical and chemical properties

**Appearance**

- **Physical state**: Liquid. [Milky.]
- **Color**: White.
- **Odor**: Mild.
- **Odor threshold**: Not available.
- **pH**: 3.5 to 4.5 [Conc. (% w/w): 100%]
  - Neat - without dilution.
- **Melting/freezing point**: -20°C (-4°F)
- **Boiling point**: 120°C (248°F)
- **Initial Boiling Point**: Not available.
- **Flash point**: Closed cup: >93.4°C (>200.1°F)
- **Burning time**: Not applicable.
- **Burning rate**: Not applicable.
- **Evaporation rate**: Not available.
- **Flammability (solid, gas)**: Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
- **Lower and upper explosive (flammable) limits**: Not available.
- **Vapor pressure**: Not available.
- **Vapor density**: >1 [Air = 1]
- **Relative density**: 1.15 to 1.21 (15.6°C)
- **Density**: 9.633 to 10.079 (lbs/gal)
- **Solubility in water**: Soluble
- **Partition coefficient: n-octanol/water**: Not available.
- **Auto-ignition temperature**: Not available.
- **Decomposition temperature**: Not available.
- **Viscosity**: Not available.
- **VOC**: Not available.
- **Pour Point**: Not available.

Section 10. Stability and reactivity

**Reactivity**: No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability**: The product is stable.

**Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid**: No specific data.

**Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials and acids.

**Hazardous decomposition products**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
TRETOLITE™ RBW517 WATER CLARIFIER

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium chloride</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>1220 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>TRETOLITE™ RBW517 WATER CLARIFIER</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>1410 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>&gt;7500 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data

Mutagenicity
No applicable toxicity data

Carcinogenicity
No applicable toxicity data

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)
Not applicable.

Aspiration hazard
Not available.

Information on the likely routes of exposure
Routes of entry anticipated: Dermal.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
Potential immediate effects
Not available.

Potential delayed effects
Not available.

Potential chronic health effects
General
No known significant effects or critical hazards.
Carcinogenicity
No known significant effects or critical hazards.
Mutagenicity
No known significant effects or critical hazards.
Teratogenicity
No known significant effects or critical hazards.
Developmental effects
No known significant effects or critical hazards.
Fertility effects
No known significant effects or critical hazards.

Numerical measures of toxicity

1/23/2015.

RBW517 6/10
Section 11. Toxicological information

**Acute toxicity estimates**
Not available.

**Additional information**

Acrylamide is a component of this product. The major effects of chronic acrylamide exposure are on the nervous system. Exposure to acrylamide for a few days or weeks can produce lassitude (weariness), drowsiness, sleepiness, loss of concentration, nervousness, irritability, loss of body coordination, speech and language disturbances, jerking of the eye, and urinary retention (ACGIH, 1991). Peripheral neuropathy with primarily motor and proprioceptive disturbances (interruptions in the ability of the muscles, tendons, and other internal tissue to receive stimuli), may follow 2 to 3 weeks later (Igisu et al, 1975).

In chronic low-dose exposure, effects are predominantly sensorimotor (mixed bed fibers containing sensory and motor nerves) and proprioceptive neuropathies (interruptions in the nerves ability to receive stimuli) with loss of deep tendon reflexes, muscle weakness and wasting, distal extremity numbness, paresthesias (abnormal burning, pricking, tickling or tingling), foot drop, and persistent ataxia (Auld & Bedwell, 1967; Garland & Patterson, 1967; Fullerton, 1969; Satchell & McLeod, 1981). In severe cases, residual ataxia, loss of reflexes, distal extremity weakness, and sensory disturbances may remain (Donovan & Pearson, 1987; Fullerton, 1969). Persons exposed for more than 22 weeks showed little recovery in peripheral neural function (outer neurons) after one year (Cavigneaux & Cabasson, 1972; Kesson et al, 1977; He et al, 1989). Rats and hens exposed to 12, 25, or 50 mg/kg of acrylamide 3 times per week for 3 weeks developed ataxia (staggering gait). Both peripheral and central nervous system damage were seen in rats, while hens developed only peripheral nerve lesions (Jortner & Ehrich, 1993).

In a two year study in rats where acrylamide was administered in the drinking water, an increased incidence of scrotal mesotheliomas (a rare abnormal increase in tissue growth in the scrotum), central nervous system tumors, thyroid tumors and tumors at other sites were described.

Acrylamide has been reported to be genotoxic in many test systems. Acrylamide inhibited DNA synthesis in rat cells in vitro (RTECS, 1996). Acrylamide induced chromosome aberrations in mice in vivo, in mouse lymphocytes and hamster lung cells, and in cultured human lymphocytes (white blood cells) (RTECS, 1996; HSDB, 1996). Sister chromatid exchanges were seen in rats and mice in vivo, and in hamster lung cells (RTECS, 1996).

IARC has classified acrylamide as a Group 2A carcinogen [probable human carcinogen (human evidence is inadequate, animal evidence is sufficient)]. NTP has classified acrylamide as a suspect carcinogen, and OSHA has classified acrylamide as a Group 2A (possible select carcinogen), upgraded from a Group 2B, based on a study conducted in 1994. (LOLI)

Section 12. Ecological information

**Toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium chloride</td>
<td>Acute EC50 0.07 mg/l Marine water</td>
<td>Algae - Hormosira banksii</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 0.1 mg/l Fresh water</td>
<td>Crustaceans - Cypris subglobosa</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 390 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 80 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.6 mg/l Marine water</td>
<td>Algae - Entomoneis punctulata</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 330 µg/l Fresh water</td>
<td>Crustaceans - Crangonyx sp.</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 19.66 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.006 mg/l Fresh water</td>
<td>Fish - Ictalurus punctatus</td>
<td>30 days</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 88 mg/l</td>
<td>Daphnia</td>
<td>48 hours</td>
</tr>
<tr>
<td>TRETOLITE™ RBW517 WATER CLARIFIER</td>
<td>Acute LC50 52 mg/l</td>
<td></td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 28 mg/l</td>
<td>Daphnia</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 7.9 mg/l</td>
<td>Fish</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

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Section 12. Ecological information

**Persistence and degradability**

Not available.

**Other adverse effects**: No known significant effects or critical hazards.

Section 13. Disposal considerations

**Disposal methods**: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Contains: Ammonium chloride)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
<td>No.</td>
<td>No.</td>
</tr>
</tbody>
</table>
| Additional information | **Remarks**  
This material is Not Regulated if transported in a package that does not meet or exceed the Reportable Quantity (RQ). | - | - | - |

**Special precautions for user**: **Transport within user's premises**: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
Section 14. Transport information

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

DOT Reportable Quantity Ammonium chloride, 16910 gal of this product.

Marine pollutant: Not available.

North-America NAERG: 171

Section 15. Regulatory information

U.S. Federal regulations

- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: Ammonium chloride

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed

SARA 302/304: No products were found.

SARA 311/312 Classification: Not applicable.

SARA 313

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier notification</td>
<td>Ammonium sulfate</td>
<td>7783-20-2</td>
</tr>
<tr>
<td></td>
<td>Ammonium chloride</td>
<td>12125-02-9</td>
</tr>
</tbody>
</table>

Canada

Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability
Health 1 0
Instability/Reactivity
Special

History

Date of printing: 1/23/2015.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.
Section 16. Other information

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
SAFETY DATA SHEET

Section 1. Identification

Product name: TRETOLITE™ RBW611 WATER CLARIFIER
™ a trademark of Baker Hughes Incorporated.

Product code: RBW611

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

Identified uses: Water clarifier.

Print date: 1/16/2015.
Validation date: 1/15/2015.
Version: 1

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l: 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) [kidneys] - Category 2
AQUATIC HAZARD (ACUTE) - Category 3
AQUATIC HAZARD (LONG-TERM) - Category 3

GHS label elements
Hazard pictograms:

Signal word: Warning
Hazard statements: May cause damage to organs through prolonged or repeated exposure. (kidneys)
Harmful to aquatic life with long lasting effects.

Precautionary statements
Prevention: Avoid release to the environment. Do not breathe vapor.
Response: Get medical attention if you feel unwell.
Storage: Not applicable.
Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.
Section 2. Hazards identification

Hazards not otherwise classified: None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>10 - 20</td>
<td>107-21-1</td>
</tr>
<tr>
<td>Aluminum chloride hydroxide</td>
<td>5 - 10</td>
<td>12042-91-0</td>
</tr>
<tr>
<td>Zinc chloride</td>
<td>0.1 - 1</td>
<td>7646-85-7</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention following exposure or if feeling unwell.

**Inhalation**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention following exposure or if feeling unwell. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention following exposure or if feeling unwell. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick. Vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention following exposure or if feeling unwell. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**

**Potential acute health effects**

**Eye contact**: No known significant effects or critical hazards.

**Inhalation**: Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact**: No known significant effects or critical hazards.

**Ingestion**: No known significant effects or critical hazards.

**Over-exposure signs/symptoms**

**Eye contact**: No specific data.

**Inhalation**: No specific data.

**Skin contact**: No specific data.

**Ingestion**: No specific data.
Section 4. First aid measures

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments: No specific treatment.

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical: In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products: carbon dioxide, carbon monoxide, nitrogen oxides, halogenated compounds, metal oxide/oxides

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Section 6. Accidental release measures

**Large spill**: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

**Precautions for safe handling**

**Protective measures**: Put on appropriate personal protective equipment (see Section 8). Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Advice on general occupational hygiene**: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities**: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

**Control parameters**

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ppm</td>
<td>mg/m³</td>
<td>Other ppm</td>
<td>mg/m³</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>US ACGIH</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Aluminum chloride hydroxide, as Al</td>
<td>OSHA PEL 1989</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Zinc chloride</td>
<td>US ACGIH</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

Form: [a]Aerosol [b]Fume
Notes: [A]as Al

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

**Appropriate engineering controls**: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Section 8. Exposure controls/personal protection

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Hand protection: Chemical-resistant gloves.

Skin protection: Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid. [Clear.]
Color: Amber. [Dark]
Odor: Sweet. [Slight]
Odor threshold: Not available.
pH: 4.3 [Conc. (% w/w): 1%]
Neat - without dilution.

Melting/freezing point: Not available.
Boiling point: Not available.
Initial Boiling Point: Not available.
Flash point: Closed cup: >93.4°C (>200.1°F) [SFCC]
Burning time: Not applicable.
Burning rate: Not applicable.
Evaporation rate: Not available.
Flammability (solid, gas): Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

Lower and upper explosive (flammable) limits: Not available.

Vapor pressure: Not available.
Vapor density: >1 [Air = 1]
Relative density: 1.1336 (15.6°C)
Density: 9.44 (lbs/gal)
Solubility in water: Soluble
Partition coefficient: n-octanol/water: Not available.
Auto-ignition temperature: Not available.
Decomposition temperature: Not available.
Viscosity: Dynamic (15.6°C): 13 cP

VOC: Not available.
Pour Point: -31.1°C (-24°F)
Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials. Slightly reactive or incompatible with the following materials: acids.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>4700 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Aluminum chloride hydroxide</td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>&gt;2000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Zinc chloride</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>9187 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>350 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion
No applicable toxicity data

Sensitization
No applicable toxicity data

Mutagenicity
No applicable toxicity data

Carcinogenicity
No applicable toxicity data

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Category 2</td>
<td>Not determined</td>
<td>kidneys</td>
</tr>
</tbody>
</table>

Aspiration hazard
Not available.
Section 11. Toxicological information

Information on the likely routes of exposure:
Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
Potential immediate effects: Not available.
Potential delayed effects: Not available.
Potential chronic health effects
General: May cause damage to organs through prolonged or repeated exposure.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental effects: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>4783.8 mg/kg</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Acute LC50 100000 µg/l Marine water</td>
<td>Crustaceans - Crangon crangon</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 100000000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 8050000 µg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td>Aluminum chloride hydroxide</td>
<td>Acute LC50 100 to 500 mg/l</td>
<td>Fish</td>
<td>48 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Other adverse effects: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods
The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues.
Section 13. Disposal considerations
Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>UN number</th>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
</table>

**UN proper shipping name**
ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Contains: Ethylene glycol)

**Transport hazard class(es)**
9

Packaging group
III

Environmental hazards
Yes.

Additional information
Remarks
This material is Not Regulated if transported in a package that does not meet or exceed the Reportable Quantity (RQ).

**Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

**DOT Reportable Quantity**
Ethylene glycol, 5068 gal of this product.

**Marine pollutant**
Not available.

**North-America NAERG**
171
Section 15. Regulatory information

U.S. Federal regulations:
- TSCA 12(b) one-time export: No products were found.
- TSCA 12(b) annual export notification: No products were found.
- United States inventory (TSCA 8b): All components are listed or exempted.
- Clean Water Act (CWA) 307: zinc chloride
- Clean Water Act (CWA) 311: zinc chloride; Acetic acid

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs):
- Listed

SARA 302/304:
- No products were found.

SARA 311/312 Classification:
- Delayed (chronic) health hazard

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>10 - 20</td>
<td></td>
</tr>
</tbody>
</table>

Canada:
- Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

Flammability
- Health 2
- Instability/Reactivity 0
- Special

History:
- Date of printing: 1/16/2015.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
SAFETY DATA SHEET

Section 1. Identification

Product name: TRETOLITE™ RBW777W WATER CLARIFIER
Product code: RBW777W

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

Identified uses: Not available.

Print date: 1/16/2015.
Validation date: 1/14/2015.
Version: 1

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation):
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
- ACUTE TOXICITY: ORAL - Category 4
- SKIN CORROSION/IRRITATION - Category 1
- SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
- AQUATIC HAZARD (ACUTE) - Category 1
- AQUATIC HAZARD (LONG-TERM) - Category 1

GHS label elements

Hazard pictograms:

Signal word: Danger

Hazard statements:
- Harmful if swallowed.
- Causes severe skin burns and eye damage.
- Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention:
- Wear protective gloves. Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.
Section 2. Hazards identification

**Response**
- Collect spillage. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

**Storage**
- Store locked up.

**Disposal**
- Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazards not otherwise classified**
- None known.

Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc chloride</td>
<td>40 - 50</td>
<td>7646-85-7</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>1 - 5</td>
<td>64-19-7</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**
- Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

**Inhalation**
- Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**
- Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**
- Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Section 4. First aid measures

Most important symptoms/effects, acute and delayed

Potential acute health effects

**Eye contact**
- Causes serious eye damage.

**Inhalation**
- May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Skin contact**
- Causes severe burns.

**Ingestion**
- Harmful if swallowed. May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

**Eye contact**
- pain, watering, redness

**Inhalation**
- No specific data.

**Skin contact**
- pain or irritation, redness, blistering may occur

**Ingestion**
- stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician**
- In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments**
- No specific treatment.

**Protection of first-aiders**
- No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**
- Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media**
- None known.

**Specific hazards arising from the chemical**
- In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products**
- carbon dioxide, carbon monoxide, nitrogen oxides, halogenated compounds

**Special protective actions for fire-fighters**
- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters**
- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). The spilled material may be neutralized with sodium carbonate, sodium bicarbonate or sodium hydroxide. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from alkalis. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Separate from alkalis. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

### Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredients:</th>
<th>List name</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ppm</td>
<td>mg/m³</td>
<td>Other</td>
</tr>
<tr>
<td>Zinc chloride</td>
<td>US ACGIH</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>US ACGIH</td>
<td>10</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>10</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>10</td>
<td>25</td>
<td>-</td>
</tr>
</tbody>
</table>

Form: [a]Fume

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection: Chemical-resistant gloves.

Skin protection: Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid. [Clear to hazy.]

Color: Yellow to amber.

Odor: Acid. Mild.

Odor threshold: Not available.

pH: 0.8 to 1.2

Melting/freezing point: Not available.

Boiling point: Not available.

Initial Boiling Point: Not available.

Flash point: Closed cup: >93.4°C (>200.1°F) [SFCC]

Burning time: Not applicable.
Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burning rate</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.</td>
</tr>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>&gt;1 [Air = 1]</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.594 (15.6°C)</td>
</tr>
<tr>
<td>Density</td>
<td>13.28 (lbs/gal)</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
</tr>
<tr>
<td>VOC</td>
<td>Not available.</td>
</tr>
<tr>
<td>Pour Point</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
<tr>
<td>Chemical stability</td>
<td>The product is stable.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>Reactive or incompatible with the following materials: oxidizing materials, organic materials and alkalis.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
</tbody>
</table>

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc chloride</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>350 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>11000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>1060 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>3310 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion

No applicable toxicity data

Sensitization

No applicable toxicity data
Section 11. Toxicological information

**Mutagenicity**
No applicable toxicity data

**Carcinogenicity**
No applicable toxicity data

**Reproductive toxicity**
No applicable toxicity data

**Teratogenicity**
No applicable toxicity data

**Specific target organ toxicity (single exposure)**
Not applicable.

**Specific target organ toxicity (repeated exposure)**
Not applicable.

**Aspiration hazard**
Not available.

Information on the likely routes of exposure: Routes of entry anticipated: Dermal, Inhalation.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**
Potential immediate effects: Not available.
Potential delayed effects: Not available.

**Potential chronic health effects**
General: No known significant effects or critical hazards.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental effects: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>728.7 mg/kg</td>
</tr>
</tbody>
</table>
### Section 12. Ecological information

#### Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc chloride</td>
<td>Acute EC50 26 µg/l</td>
<td>Algae - Navicula incerta</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 34 µg/l</td>
<td>Algae - Chlorella vulgaris - Exponential growth phase</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 1.8 mg/l</td>
<td>Aquatic plants - Lemna aequinoctialis</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 100 µg/l</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 49.99 µg/l</td>
<td>Crustaceans - Moina irrasa - Neonate</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 0.027 mg/l</td>
<td>Fish - Limanda punctatissima - Pre-larvae</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.02 µg/l</td>
<td>Algae - Pseudokirchneriella subcapitata</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 1000 µg/l</td>
<td>Crustaceans - Procambarus clarkii - Intermol</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 80 µg/l</td>
<td>Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)</td>
<td>21 days</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>Chronic NOEC 31.5 µg/l</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>30 days</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 73400 µg/l</td>
<td>Algae - Navicula seminulum</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 65000 µg/l</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 50.1 µL</td>
<td>Crustaceans - Artemia sp.</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 75000 µg/l</td>
<td>Fish - Lepomis macrochirus</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

#### Persistence and degradability

Not available.

#### Other adverse effects

: No known significant effects or critical hazards.

### Section 13. Disposal considerations

#### Disposal methods

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

### Section 14. Transport information
**Section 14. Transport information**

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UN number</strong></td>
<td>UN1760</td>
<td>UN1760</td>
<td>UN1760</td>
</tr>
<tr>
<td><strong>UN proper shipping name</strong></td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Zinc chloride, Acetic acid)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Zinc chloride, Acetic acid)</td>
<td>CORROSIVE LIQUID, N.O.S. (Contains: Zinc chloride, Acetic acid)</td>
</tr>
<tr>
<td><strong>Transport hazard class(es)</strong></td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td><strong>Packing group</strong></td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td><strong>Environmental hazards</strong></td>
<td>Yes.</td>
<td>Yes.</td>
<td>Yes.</td>
</tr>
<tr>
<td><strong>Additional information</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Special precautions for user**: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

**DOT Reportable Quantity**: Zinc chloride, 159 gal of this product. Acetic acid, 7530 gal of this product.

**Marine pollutant**: Zinc chloride

**North-America NAERG**: 1

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**Section 15. Regulatory information**

**U.S. Federal regulations**: TSCA 12(b) one-time export: No products were found. TSCA 12(b) annual export notification: No products were found. United States inventory (TSCA 8b): All components are listed or exempted. Clean Water Act (CWA) 307: zinc chloride Clean Water Act (CWA) 311: zinc chloride; Acetic acid

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)**: Not listed

**SARA 302/304**: No products were found. **SARA 311/312 Classification**: Immediate (acute) health hazard **SARA 313**
Section 15. Regulatory information

<table>
<thead>
<tr>
<th>Supplier notification</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Zinc chloride</td>
<td>7646-85-7</td>
<td>40 - 50</td>
</tr>
</tbody>
</table>

Canada
Canada (CEPA DSL): At least one component is not listed in DSL but all such components are listed in NDSL.

Section 16. Other information

National Fire Protection Association (U.S.A.)

- Flammability: 1
- Health: 3
- Instability/Reactivity: 0
- Special

History
Date of printing: 1/16/2015.

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.
Section 1. Identification

Product name: WAW4000 WETTING AGENT
Product code: WAW4000

Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Wetting agent.

Print date: 2/3/2015.
Validation date: 2/3/2015.
Version: 2

Supplier's details: Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Emergency telephone number (with hours of operation)
CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Intl 01-703-527-3887 (International 24 hour)

Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
ACUTE TOXICITY: ORAL - Category 4
SKIN CORROSION/IRRITATION - Category 1C
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
AQUATIC HAZARD (ACUTE) - Category 2
AQUATIC HAZARD (LONG-TERM) - Category 3

GHS label elements
Hazard pictograms:

Signal word: Danger

Hazard statements:
Harmful if swallowed.
Causes severe skin burns and eye damage.
Toxic to aquatic life.
Harmful to aquatic life with long lasting effects.

Precautionary statements
Prevention:
Wear protective gloves. Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.
Section 2. Hazards identification

Response:
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 physician.

Storage: Store locked up.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified: None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyoxyalkylene</td>
<td>20 - 30</td>
<td>Trade secret.</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>20 - 30</td>
<td>64-19-7</td>
</tr>
</tbody>
</table>

Section 4. First aid measures

Eye contact:
Get medical attention immediately. Call a poison center or physician. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

Inhalation:
Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact:
Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion:
Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

2/3/2015.
Section 4. First aid measures

Potential acute health effects

- **Eye contact**: Causes serious eye damage.
- **Inhalation**: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.
- **Skin contact**: Causes severe burns.
- **Ingestion**: Harmful if swallowed. May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

- **Eye contact**: pain, watering, redness
- **Inhalation**: No specific data.
- **Skin contact**: pain or irritation, redness, blistering may occur
- **Ingestion**: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

- **Notes to physician**: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- **Specific treatments**: No specific treatment.
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

- **Suitable extinguishing media**: Use an extinguishing agent suitable for the surrounding fire.
- **Unsuitable extinguishing media**: None known.

**Specific hazards arising from the chemical**

- In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

- **Hazardous thermal decomposition products**: carbon dioxide, carbon monoxide

**Special protective actions for fire-fighters**

- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters**

- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Section 8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Occupational exposure limits</th>
<th>TWA (8 hours)</th>
<th>STEL (15 mins)</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients:</td>
<td>List name</td>
<td>ppm</td>
<td>mg/m³</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>US ACGIH</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1989</td>
<td>10</td>
<td>25</td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits. Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Appropriate engineering controls
If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection: Chemical-resistant gloves.

Skin protection: Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

Respiratory protection: If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state: Liquid.

Color: Colorless.

Odor: Vinegar-like. [Slight]

Odor threshold: Not available.

pH: 2 to 3

5% in water

Melting/freezing point: Not available.

Boiling point: Not available.

Initial Boiling Point: Not available.

Flash point: Closed cup: >93.4°C (>200.1°F) [SFCC]

Burning time: Not applicable.

Burning rate: Not applicable.

Evaporation rate: Not available.
Section 9. Physical and chemical properties

- **Flammability (solid, gas)**: Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
- **Lower and upper explosive (flammable) limits**: Not available.
- **Vapor pressure**: Not available.
- **Vapor density**: >1 [Air = 1]
- **Relative density**: 1.04 (15.6°C)
- **Density**: 8.67 (lbs/gal)
- **Solubility in water**: Soluble
- **Partition coefficient: n-octanol/water**: Not available.
- **Auto-ignition temperature**: Not available.
- **Decomposition temperature**: Not available.
- **Viscosity**: Not available.
- **VOC**: Not available.
- **Pour Point**: -16.11°C (3°F)

Section 10. Stability and reactivity

- **Reactivity**: No specific test data related to reactivity available for this product or its ingredients.
- **Chemical stability**: The product is stable.
- **Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Conditions to avoid**: No specific data.
- **Incompatible materials**: Reactive or incompatible with the following materials: oxidizing materials, organic materials and alkalis.
- **Hazardous decomposition products**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

**Information on toxicological effects**

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyoxyalkylene</td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>&gt;2000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2140 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>11000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>1060 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>3310 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

**Irritation/Corrosion**

No applicable toxicity data

**Sensitization**

No applicable toxicity data

**Mutagenicity**

No applicable toxicity data
Section 11. Toxicological information

No applicable toxicity data

Carcinogenicity
No applicable toxicity data

Reproductive toxicity
No applicable toxicity data

Teratogenicity
No applicable toxicity data

Specific target organ toxicity (single exposure)
Not applicable.

Specific target organ toxicity (repeated exposure)
Not applicable.

Aspiration hazard
Not available.

Information on the likely routes of exposure
Routes of entry anticipated: Dermal, Inhalation.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure
Potential immediate effects
Not available.

Potential delayed effects
Not available.

Potential chronic health effects
General
No known significant effects or critical hazards.

Carcinogenicity
No known significant effects or critical hazards.

Mutagenicity
No known significant effects or critical hazards.

Teratogenicity
No known significant effects or critical hazards.

Developmental effects
No known significant effects or critical hazards.

Fertility effects
No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>1480.3 mg/kg</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic acid</td>
<td>Acute EC50 73400 µg/l Fresh water</td>
<td>Algae - Navicula seminulum</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 65000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 50.1 ul/L Marine water</td>
<td>Crustaceans - Artemia sp.</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 75000 µg/l Fresh water</td>
<td>Fish - Lepomis macrochirus</td>
<td>96 hours</td>
</tr>
</tbody>
</table>
Section 12. Ecological information

Persistence and degradability
Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>TDG Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN3265</td>
<td>UN3265</td>
<td>UN3265</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>CORROSIVE LIQUID, ACIDIC, ORGANIC, N. O.S. (Contains: Acetic acid)</td>
<td>CORROSIVE LIQUID, ACIDIC, ORGANIC, N. O.S. (Contains: Acetic acid)</td>
<td>CORROSIVE LIQUID, ACIDIC, ORGANIC, N. O.S. (Contains: Acetic acid)</td>
</tr>
</tbody>
</table>

Transport hazard class(es) : 8

Packing group : III

Environmental hazards : Yes. / Yes. / Yes. / No.

Additional information : Emergency schedules (EmS) F-A S-B

Special precautions for user : Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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

DOT Reportable Quantity : Acetic acid, 2307 gal of this product.

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Section 14. Transport information

Marine pollutant  Polyoxyalkylene

North-America NAERG : 153

Section 15. Regulatory information

U.S. Federal regulations
TSCA 12(b) one-time export: No products were found.
TSCA 12(b) annual export notification: No products were found.
United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: Acetic acid

Clean Air Act  Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed
SARA 302/304 : No products were found.
SARA 311/312
Classification: Immediate (acute) health hazard
SARA 313
Supplier notification : No products were found.

Canada
Canada (CEPA DSL): All components are listed or exempted.

Section 16. Other information

National Fire Protection Association (U.S.A.)

History
Date of printing : 2/3/2015.

Notice to reader
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