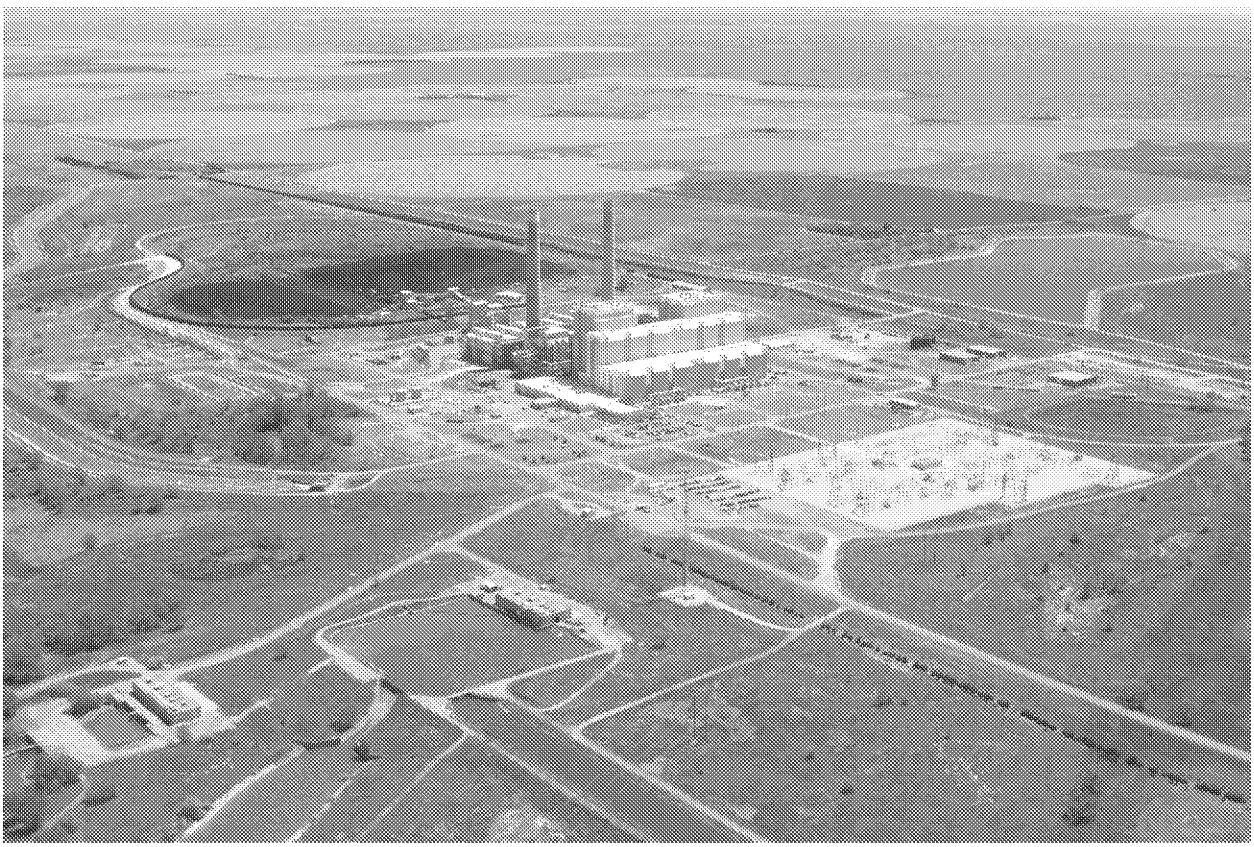
NPDES Permit Application

Nebraska Public Power District
Gerald Gentleman Station
6089 South Highway 25
Sutherland, NE 69165-0068



March XX, 2016

K. Michael Krumland
Environmental Protection Supvr.
PH: 402-563-5329

March 31, 2016

Mr. Reuel Anderson
Nebraska Department of Environmental Quality
Permits and Compliance Section
1200 N Street, Suite 400
P.O. Box 98922
Lincoln, NE 68509-8922

Re: Nebraska Public Power District – Gerald Gentleman Station
NPDES Permit No. NE0111546
NPDES Permit Application

Dear Mr. Anderson:

Nebraska Public Power District (NPPD) is respectfully submitting to the Nebraska Department of Environmental Quality the enclosed National Pollutant Discharge Elimination System Discharge (NPDES) application package for Gerald Gentleman Station, NPDES Permit No. NE0111546, for review and approval.

If you have any questions concerning this application, please contact me at (402) 562-5329 or Brian Kozisek at (402) 563-5318.

Sincerely,

K. M. Krumland
Environmental Protection Supervisor

Enclosure

NPPD Gerald Gentleman Station NPDES Application

Permit No. NE0111546

Contents

- Application Summary
- NPDES Combined Form 1 & 2C
- Area Maps
  - Overview Map with Boundaries
  - USGS 7.5 Minute Topographic Map with Plant Location and Structures (West)
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  - Storm Water Management Plan Map
- Water Balance Diagram
- Outfall Information
- Sludge Treatment and Disposal Practices
- Process Wastewater Streams and Treatment Systems
- Potential Pollutants
- Summary of Chemical Usage and Safety Data Sheets (SDSs)
- DMR Summary Data

Application Summary

Nebraska Public Power District (NPPD) Gerald Gentleman Station (GGS) is an electric generating facility located near Sutherland, Nebraska. GGS is currently permitted through the Nebraska Department of Environmental Quality (NDEQ) National Pollutant Discharge Elimination System (NPDES) **Permit No. NE0111546**. GGS's current NPDES Permit expires on September 30, 2016; therefore, this application package is being submitted to request a renewal of the existing NPDES permit, as well as a continuation of the 316(a) and 316(b) variances. Included with this application package are **NPDES Combined Form 1 and 2C**, area maps, process flow and water balance diagrams, and other pertinent information necessary to complete the permit renewal process.

GGS is a coal fired, steam electric generating station consisting of two boilers and turbine generating units having a total nominal rating of approximately 1350 megawatts electrical (MWe). Water is used throughout the plant in various processes that produce untreated or treated wastewater streams. The wastewater streams include once-through cooling, bottom ash system, HVAC cooling, coal pile runoff, water treatment (boiler make-up), condensate (boiler) water, building and plant equipment drains, metal cleaning waste streams, sanitary sewage, and site stormwater run-off.

GGS uses a once-through cooling water system. Heated water released from the condensers is passed through a cooling canal and cooling pond before being discharged into the Sutherland Reservoir. The plant drain system transports wastewater from all plant drains, reclaims wastewater where possible, and disposes of non-reclaimable wastewater to a fifty (50) acre **Evaporation Pond**. The bottom ash wastewater is either returned back to the bottom ash system or is discharged to the **Evaporation Pond** via the Chemical Waste Collection Sump. Coal pile runoff is collected in the **Coal Pile Runoff Pond**. Neither the **Evaporation Pond** nor the **Coal Pile Runoff Pond** have discharged to State Waters during the current NPDES permit cycle.

Appendix C NPDES Combined Form 1 & 2C National Pollutant Discharge Elimination System Permit Application for a Facility Discharging Wastewater from Manufacturing and Commercial Operations.
[New addition to regulation]

Nebraska Department of Environmental Quality

Wastewater Section
Suite 400, The Atrium, 1200 'N' Street
PO Box 98922
Lincoln, NE 68509-8922
Tel. 402/471-4220 Fax 402/471-2909

NPDES Combined Form 1 & 2C

National Pollutant Discharge Elimination System
Permit Application for a Facility Discharging Wastewater from
Manufacturing and Commercial Operations.

This Area is For Agency Use

NPDES Number NE	IIS Number	Date Rec'd

1. Facility Information

A. Owner of Facility (Permittee)
Nebraska Public Power District
Street 1414 15th Street
City Columbus State NE Zip 68601

B. Name of Facility
Gerald Gentleman Station (GGS)

C. Facility Contact Person
K.M. Krumland Ph (402) 563-5329 Email kmkruml@nppd.com

D. Facility Mailing Address
Street P.O. Box 68
City Sutherland State NE Zip 69165-0068

E. Facility Location (if different from above)
Street 6089 South Highway 25
City Sutherland State NE Zip 69165

F. Facility Legal Description

SW ¼ of the NE ¼, Section 19, Township 13 N, Range 33W (E or W), Lincoln County

G. Business Activity and Facility Operations (continued on next page)

Standard Industrial Classification (SIC) Code(s) Applicable to the Facility 4911

Description of Operations and Services:

Gerald Gentleman Station is a coal-fired electric generating facility consisting of two boilers and turbine generating units having a total nominal rating of approximately 1350 MWe. The facility serves residential, commercial, and industrial customers in Nebraska.

2. Wastewater Sources (check applicable items)

A. Application Status (check one)

_____ NPDES Permit Reapplication for Existing Source _____ NPDES Permit Application for New Source

B. Additional Forms Required

_____	Facility discharging domestic wastewater	Submit NPDES Form 2A
_____	Facility discharging industrial wastewater	Submit NPDES Form 2C
_____	Facility discharging nonprocess wastewater	Submit NPDES Form 2E
_____	Facility is a fish hatchery or fish farm	Submit NPDES Form 2B
_____	Industrial facility discharging stormwater	Submit NPDES Form 2F
_____	Land application of treated effluent	Submit Land Application Form

3. Other Existing Environmental Permits

		Permit Number
_____	NPDES (discharge to surface water)	NE0111546
_____	NPP (Nebraska Pretreatment Permit)	
_____	UIC (underground injection of fluids)	NE0210959
_____	RCRA (hazardous waste)	NED070121934
_____	Air Permit	Title V: OP14M1-040; Acid Rain: ACID-0005
_____	Other (specify)	Stormwater: NER900190
		Public Water Supply (non-community): NE3120264
		Ash Disposal Landfill: NE0203254
		Thermal Water Treatment System: CP 05-0044

4. Map

Attach to this application a topographic map (7.5 minute USGS) of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers, and other surface water bodies in the map area.

5. Facility Flow Diagram

Attach a line drawing showing the water flow through the facility. The diagram must show all regulated and non-regulated process wastewater flows, and all points of discharge to sanitary sewer, storm sewers, surface waters, septic tanks, injection wells, or other discharge points including floor drains. Indicate sources of intake water, operations contributing wastewater to the effluent, and wastewater treatment units along with each discharge outfall. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls.

6. Process Wastewater Treatment System Information

A. Does the process wastewater undergo treatment before discharge to the receiving water?

_____ Yes _____No

Provide a description of the wastewater treatment process. Include a description of the physical; chemical, or biological treatment processes used to treat the wastewater. (a schematic diagram of the treatment process should also be provided)

See attached "Process Wastewater Streams and Treatment Systems" description narrative.

Maximum Daily Flow (MGD) 759.86 Design Daily Flow (MGD) 760

Average Daily Flow (MGD) 530.48 Design Maximum Flow (MGD) 836*

*includes cooling treatment system well water

B. Is there any sludge (i.e. any solid, semisolid, or liquid waste) generated from the process wastewater treatment system?

_____ Yes _____No

If yes, provide an attachment specifying sludge treatment and disposal practices.

C. Does the treatment works land-apply treated wastewater?

_____ Yes (If yes, request a separate application form) _____No

7. Operator Information

A. Treatment Facility Operator (Last, First,) and Phone Number

Randy L. Hongsermeier Ph (308) 386-5221 Email rlhongs@nppd.com

Operator Certification Number 1476 Operator Class Class 1

B. Operator's Mailing Address

Street 6089 South Highway 25

City Sutherland State NE Zip 69165-0068

C. Operation/Maintenance Performed by Contractor(s)

Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of a contractor? _ __ yes _ __no If yes provide the following

Name_____Ph_____ Email _____

Street_____

City_____State_____Zip_____

Responsibilities of contractor_____

D. Compliance Sampling

Is compliance sampling of the discharge effluent the responsibility of a contract laboratory? _____ yes _____no If yes provide the following

Name_____Ph_____ Email _____

Street_____

City_____State_____Zip_____

Responsibilities of laboratory_____

8. "Non-Discharged" Wastes

Provide descriptions and quantities of wastes generated that are not discharged to the POTW or Waters of the State (provide attachment if more space is needed). Also describe how these wastes are disposed of:

Not applicable.

9. Outfall Information

How many separate outfalls discharge to the receiving waters? 3 - See attached **Outfall Information**

A. Location of Outfall(s) (Include an attachment to the permit for the following information if there are more than three outfalls).

Outfall 001

SW Quarter, NW Quarter, Section 16, Township 13 North, Range 33W (East / West), Lincoln County, NE

Latitude (deg. 41 min. 06 sec 07) Longitude (deg. 101 min. 06 sec 58)

Name of receiving waters Sutherland Reservoir

Name of watershed if known South Platte River Basin

Provide a description of all operations contributing wastewater to the effluent to include both process and nonprocess wastewater (e.g. noncontact or sanitary) and the average flows contributed by each process.

Operation Once-through cooling Flow 531 mgd Operation Zeolite Softener Waste Flow 0.021 mgd

Operation RO Reject Water Flow 0.156 mgd Operation _____ Flow_____

Outfall 002

NW Quarter, NE Quarter, Section 30, Township 13 North, Range 33W (East / West), Lincoln County, NE

Latitude (deg. 41 min. 04 sec 28) Longitude (deg. 101 min. 08 sec 33)

Name of receiving waters Sutherland Reservoir (outfall typically does not discharge)

Name of watershed if known South Platte River Basin

Provide a description of all operations contributing wastewater to the effluent to include both process and nonprocess wastewater (e.g. noncontact or sanitary) and the average flows contributed by each process.

Operation Low volume waste Flow 0.39 mgd Operation HVAC Tower Blowdown Flow 0.06 mgd

Operation Ash Contact Water Flow 0.08 mgd Operation Sanitary waste Flow 0.014 mgd

Operation Metal Cleaning Wastewater Flow infrequent Operation _____ Flow_____

Outfall 003

NW Quarter, SW Quarter, Section 20, Township 13 North, Range 33W (East / West), Lincoln County, NE

Latitude (deg. 41 min. 04 sec 57) Longitude (deg. 101 min. 07 sec 51)

Name of receiving waters Sutherland Reservoir

Name of watershed if known South Platte River Basin

Provide a description of all operations contributing wastewater to the effluent to include both process and nonprocess wastewater (e.g. noncontact or sanitary) and the average flows contributed by each process.

Operation Coal Pile Runoff Flow 0.08 mgd Operation Mobile Maintenance Shop Flow 0.00005 mgd

Operation Coal Conveyor Wash Water Flow 0.012 mgd Operation _____ Flow _____

B. Except for storm runoff, leaks or spills, are any of the discharges described above intermittent or batch? No

If yes, provide the following information:

Outfall Number	Operations Contributing Flow	Frequency (specify averages)		Flow Rate (in MGD)		Total Volume (in gal.)		Duration in Days
		days/week	months/yr	average	maximum	average	maximum	

10. Production

A. Does an Effluent Guideline limitation or standard apply to your facility? (e.g. metal finishing, fertilizer manufacturing, etc)

_____ Yes (complete item 10 B below) No_____ (go to Section 11)

B. Are the limitations in the applicable Effluent Guideline expressed in terms of production or other measure of operation? (e.g., pounds of pollutant per million pounds of production)

_____ Yes (complete table below) No_____ (go to Section 11)

Affected Outfalls	Quantity per Day	Units of Measure	Specify Operation, Product, or Materials

11. Intake and Effluent Characteristics

A. List the sources of intake water

Source	Gallons per Day (gpd)
Municipal System	Not applicable
Ground Water	~1.444 million
Other (Specify)	~760.320 million Sutherland Reservoir/Supply Canal
Total	~761.764 million

B. Which (if any) industrial category listed in Attachment A, Table I does your facility fall under? Steam Electric Power Plants

Provide an attachment to this application that lists all the pollutants listed in Attachment A, Tables II-V, which you know or have reason to believe are or may be discharged from any outfall. Also provide the source of the pollutants, the outfall they are discharged from and approximate amount discharged. If you have analytical results for any of these pollutants, please attach these as well. NDEQ may require additional information and/or analysis of these pollutants at a later date.

C. Provide the results of at least one analysis for every pollutant in this table for each outfall. This testing may be waived by the NDEQ in some circumstances or additional tests may be required by NDEQ to complete the application process. (provide an attachment for additional outfalls)

Outfall Number: 001				
Pollutant	**Units**	**Maximum daily value**	**Average monthly value**	**No. of analyses**
Biochemical oxygen demand (BOD)	mg/L	N/A	N/A	N/A
Chemical oxygen demand (COD)	mg/L	N/A	N/A	N/A
Total organic carbon (TOC)	mg/L	N/A	N/A	N/A
Ammonia (as N)	mg/L	N/A	N/A	N/A
Flow	MGD	759.86	530.48	1553
Temperature	° F	92.2	69.7	1553
pH	S.U.	Maximum = 8.88	Minimum = 7.48	221

Outfall Number: 002				
Pollutant	**Units**	**Maximum daily value**	**Average monthly value**	**No. of analyses**
Biochemical oxygen demand (BOD)	mg/L	N/A	N/A	N/A
Chemical oxygen demand (COD)	mg/L	N/A	N/A	N/A
Total organic carbon (TOC)	mg/L	N/A	N/A	N/A
Ammonia (as N)	mg/L	N/A	N/A	N/A
Flow	MGD	0	0	N/A
Temperature	° F	N/A	N/A	N/A
pH	S.U.	Maximum = N/A	Minimum = N/A	N/A

Outfall Number: 003				
Pollutant	**Units**	**Maximum daily value**	**Average monthly value**	**No. of analyses**
Biochemical oxygen demand (BOD)	mg/L	N/A	N/A	N/A
Chemical oxygen demand (COD)	mg/L	N/A	N/A	N/A
Total organic carbon (TOC)	mg/L	N/A	N/A	N/A
Ammonia (as N)	mg/L	N/A	N/A	N/A
Flow	MGD	0	0	N/A
Temperature	° F	N/A	N/A	N/A
pH	S.U.	Maximum = N/A	Minimum =N/A	N/A

D. Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last three years?

_____ Yes _____No

If yes, identify the tests and describe their purpose below

48-hour whole effluent toxicity (WET) testing has continued to be conducted at outfall 001 as required by the NPDES permit. The permit requires WET testing at outall 002, however as there has not been a discharge from this outfall, WET testing has not been conducted. WET testing is conducted to determine if the biocides or chemicals added to the process wastewater streams will cause toxicity in the receiving stream. The testing results on outfall 001 have been in compliance with the permit limits throughout the current permit cycle.

12. Other Information

Use the space below to expand upon any of the above questions or to bring to the attention of the reviewer any other information you feel should be considered in establishing permit limitations for the facility.

NPPD is continuing to investigate methods of corbicula control in the water systems. A discharge of total residual chlorine or another oxidant for more than 2-hours per unit per day may be required.

NPPD is requesting a continuation of the Clean Water Act 316(a) thermal variance granted in 1994 and also requests the continuation of the Clean Water Act 316(b) variance granted in 1987.

13. Certification (see Signatory Authorization Form for designation of Cognizant Official)

I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete, and accurate, and if this permit is granted, I agree to abide by the Nebraska Environmental Protection Act (Neb. Rev. Stat. Secs. 81-1501 et. seq. as amended to date) and all rules, regulations, orders, decisions promulgated there under, and subject to any legitimate appeal available to the applicant under the Act

Cognizant Official's Signature_____ Date _____

Cognizant Official's Printed Name_____Title_____

NPPDRH114_0000173
ED_005798_00000434-00012

Nebraska Department of Environmental Quality
NPDES/NPP SIGNATORY AUTHORIZATION FORM

This form is to be used to identify or update information pertaining to the facility. THIS FORM MUST BE SIGNED BY THE COGNIZANT OFFICIAL. The Cognizant Official and Authorized Representative can be the same person.

Facility Name: Gerald Gentleman Station **Permit No.** NE NE0111546

Address: 6089 South Highway 25 **City** Sutherland **Zip** 69165-0068 **County** Lincoln

Location (Street/Directions to) From Sutherland, take Nebraska Highway 25 south for approximately 7 miles.

Phone (308) 386-2441

PERMITTEE
List the ***NAME*** of the company, business, governmental entity, or person that owns the facility and that will be responsible for the permit compliance: Nebraska Public Power District

COGNIZANT OFFICIAL
This person is responsible for the permit, signing reapplications, signing DMRs or designating someone to sign DMRs (Authorized Representative) and other correspondence. For a municipal, only the mayor, chairperson or city manager may sign as the Cognizant Official. *See page 10 for requirements.*

Name Thomas J. Kent Title Vice-President and COO

***Mailing Address** P.O. Box 499 City Columbus

State NE Zip 68602-0499 Phone (402) 563-5575 Home Ph (optional)

AUTHORIZED REPRESENTATIVE (Do not complete if same as Cognizant Official)
This person is designated by the Cognizant Official and is responsible for receiving, completing and signing DMRs, and receiving other correspondence (i.e., city clerk, plant operator). *See page 10 for requirements.*

Name Joe L. Citta / K. Michael Krumland Title Citta: Corporate Environmental Manager; Krumland: Environmental Protection Supervisor

***Mailing Address** P.O. Box 499 City Columbus

State NE Zip 68602-0499 Phone Citta: (402) 563-5355; Krumland: (402) 563-5329 Home Ph (optional)

If You Represent this Facility as/for a Contractor, list: Contractor's Name

Contractor's Address Phone

OPERATOR This person is responsible for the operation and maintenance of the plant. *See page 10 for requirements.*

Name Randy L. Hongsermeier Title Water Quality Tech. Certification # Class 1

Mailing Address 6089 South Highway 25, Sutherland NE 69165-0068 Phone (308) 386-5221

If You Represent this Facility as/for a Contractor, list: Contractor's Name

Contractor's Address Phone

***Mailing Address**: **DMRs will be mailed to this address. *DO NOT* use a home or personal address unless necessary. Please use city/village office address or facility/corporate address, etc. This address should remain the same, even with changes in the facility's Cognizant Official or Authorized Representative.**

NPDES/NPP SIGNATORY AUTHORIZATION FORM (continued)

Facility Name: NPPD-Gerald Gentleman Station **Permit No.** NE NE0111546

COMMENTS

COGNIZANT OFFICIAL SIGNATURE_____**DATE**_____

PRINTED NAME OF COGNIZANT OFFICIAL_____

SIGNATORY AUTHORIZATION FORM REQUIREMENTS

Cognizant Official. Nebraska Department of Environmental Quality, Title 119, Chapter 10 and Title 127, Chapter 29. All permit applications submitted to the Department shall be signed:

001.01 in the case of a corporation, by a principal executive officer of at least the level of vice-president;
001.02 in the case of a partnership, by a general partner;
001.03 in the case of a sole proprietorship, by the proprietor; and
001.04 in the case of a municipal, state or other public facility, by either a principal executive officer or ranking elected official.

Authorized Representative. Nebraska Department of Environmental Quality, Title 119, Chapter 10 and Chapter 127, Chapter 29 002. All other correspondence, reports and DMRs shall be signed by a person designated in 001.01 through 001.04 above or a duly authorized representative if such a representative is responsible for all the overall operation of the facility from which the discharge originates; the authorization is made, in writing, by the person designated under 001.01 through 001.04 above; and the written authorization is submitted to the Director. Any change in the signatures shall be submitted to the Department, in writing, within 30 days after the change.

Operator. Nebraska Department of Environmental Quality, Title 123, Chapter 15
001 A competent operator familiar with the principles of wastewater treatment and disposal and skilled in the operation of the plant equipment, shall be in charge of each wastewater works. The operator shall make such operations tests as may be specified by the Department.

The operator may be required to be certified according the NDEQ Title 197.

Nebraska Department of Environmental Quality
ATTN: NPDES Permit Unit
Suite 400, 1200 N Street, The Atrium
PO Box 98922
Lincoln, Nebraska 68509-8922
Telephone (402) 471-4220
Fax (402) 471-2909

Attachment A

Table I--Testing Requirements for Organic Toxic Pollutants by Industrial Category for Existing Dischargers				
GC/MS Fraction \1\				
Industrial category	Volatile	Acid	Base/ neutral	Pesticide
Adhesives and Sealants.....	\2\	\2\	\2\	.....
Aluminum Forming.....	\2\	\2\	\2\	.....
Auto and Other Laundries.....	\2\	\2\	\2\	\2\
Battery Manufacturing.....	\2\	.....	\2\	.....
Coal Mining.....	\2\	\2\	\2\	\2\
Coil Coating.....	\2\	\2\	\2\	.....
Copper Forming.....	\2\	\2\	\2\	.....
Electric and Electronic Components.....	\2\	\2\	\2\	\2\
Electroplating.....	\2\	\2\	\2\	.....
Explosives Manufacturing.....	.....	\2\	\2\	.....
Foundries.....	\2\	\2\	\2\	.....
Gum and Wood Chemicals.....	\2\	\2\	\2\	\2\
Inorganic Chemicals Manufacturing	\2\	\2\	\2\	.....
Iron and Steel Manufacturing.....	\2\	\2\	\2\	.....
Leather Tanning and Finishing....	\2\	\2\	\2\	\2\
Mechanical Products Manufacturing	\2\	\2\	\2\	.....
Nonferrous Metals Manufacturing..	\2\	\2\	\2\	\2\
Ore Mining.....	\2\	\2\	\2\	\2\
Organic Chemicals Manufacturing..	\2\	\2\	\2\	\2\
Paint and Ink Formulation.....	\2\	\2\	\2\	\2\
Pesticides.....	\2\	\2\	\2\	\2\
Petroleum Refining.....	\2\	\2\	\2\	\2\
Pharmaceutical Preparations.....	\2\	\2\	\2\	.....
Photographic Equipment and Supplies.....	\2\	\2\	\2\	\2\
Plastic and Synthetic Materials Manufacturing.....	\2\	\2\	\2\	\2\
Plastic Processing.....	\2\	.....	.....	.....
Porcelain Enameling.....	\2\	.....	\2\	\2\
Printing and Publishing.....	\2\	\2\	\2\	\2\
Pulp and Paper Mills.....	\2\	\2\	\2\	\2\
Rubber Processing.....	\2\	\2\	\2\	.....
Soap and Detergent Manufacturing.	\2\	\2\	\2\	.....
Steam Electric Power Plants.....	\2\	\2\	\2\	.....
Textile Mills.....	\2\	\2\	\2\	\2\
Timber Products Processing.....	\2\	\2\	\2\	\2\

\1\ The toxic pollutants in each fraction are listed in Table II.
\2\ Testing may be required.

Attachment A

Table II--Organic Toxic Pollutants in Each of Four Fractions in Analysis by Gas Chromatography/Mass Spectroscopy (GS/MS) **(continued on next page)**

Volatiles

1V acrolein	17V 1,2-dichloropropane
2V acrylonitrile	18V 1,3-dichloropropylene
3V benzene	19V ethylbenzene
5V bromoform	20V methyl bromide
6V carbon tetrachloride	21V methyl chloride
7V chlorobenzene	22V methylene chloride
8V chlorodibromomethane	23V 1,1,2,2-tetrachloroethane
9V chloroethane	24V tetrachloroethylene
10V 2-chloroethylvinyl ether	25V toluene
11V chloroform	26V 1,2-trans-dichloroethylene
12V dichlorobromomethane	27V 1,1,1-trichloroethane
14V 1,1-dichloroethane	28V 1,1,2-trichloroethane
15V 1,2-dichloroethane	29V trichloroethylene
16V 1,1-dichloroethylene	31V vinyl chloride

Acid Compounds

1A 2-chlorophenol	7A 4-nitrophenol
2A 2,4-dichlorophenol	8A p-chloro-m-cresol
3A 2,4-dimethylphenol	9A pentachlorophenol
4A 4,6-dinitro-o-cresol	10A phenol
5A 2,4-dinitrophenol	11A 2,4,6-trichlorophenol
6A 2-nitrophenol	

Base/Neutral **(continued on next page)**

1B acenaphthene	16B 2-chloronaphthalene
2B acenaphthylene	17B 4-chlorophenyl phenyl ether
3B anthracene	18B chrysene
4B benzidine	19B dibenzo(a,h)anthracene
5B benzo(a)anthracene	20B 1,2-dichlorobenzene
6B benzo(a)pyrene	21B 1,3-dichlorobenzene
7B 3,4-benzofluoranthene	22B 1,4-dichlorobenzene
8B benzo(ghi)perylene	23B 3,3'-dichlorobenzidine
9B benzo(k)fluoranthene	24B diethyl phthalate
10B bis(2-chloroethoxy)methane	25B dimethyl phthalate
11B bis(2-chloroethyl)ether	26B di-n-butyl phthalate
12B bis(2-chloroisopropyl)ether	27B 2,4-dinitrotoluene
13B bis (2-ethylhexyl)phthalate	28B 2,6-dinitrotoluene
14B 4-bromophenyl phenyl ether	29B di-n-octyl phthalate
15B butylbenzyl phthalate	30B 1,2-diphenylhydrazine (as azobenzene)

Attachment A

Table II--Organic Toxic Pollutants in Each of Four Fractions in Analysis by Gas Chromatography/Mass Spectroscopy (GS/MS) **(continued)**	
Base/Neutral (continued)	
31B fluroranthene	39B napthalene
32B fluorene	40B nitrobenzene
33B hexachlorobenzene	41B N-nitrosodimethylamine
34B hexachlorobutadiene	42B N-nitrosodi-n-propylamine
35B hexachlorocyclopentadiene	43B N-nitrosodiphenylamine
36B hexachloroethane	44B phenanthrene
37B indeno(1,2,3-cd)pyrene	45B pyrene
38B isophorone	46B 1,2,4-trichlorobenzene
Pesticides	
1P aldrin	14P endrin
2P alpha-BHC	15P endrin aldehyde
3P beta-BHC	16P heptachlor
4P gamma-BHC	17P heptachlor epoxide
5P delta-BHC	18P PCB-1242
6P chlordane	19P PCB-1254
7P 4,4'-DDT	20P PCB-1221
8P 4,4'-DDE	21P PCB-1232
9P 4,4'-DDD	22P PCB-1248
10P dieldrin	23P PCB-1260
11P alpha-endosulfan	24P PCB-1016
12P beta-endosulfan	25P toxaphene
13P endosulfan sulfate	

Table III--Other Toxic Pollutants (Metals and Cyanide) and Total Phenols	
Antimony, Total	Nickel, Total
Arsenic, Total	Selenium, Total
Beryllium, Total	Silver, Total
Cadmium, Total	Thallium, Total
Chromium, Total	Zinc, Total
Copper, Total	Cyanide, Total
Lead, Total	Phenols, Total
Mercury, Total	

Attachment A

Table IV--Conventional and Nonconventional Pollutants	
Bromide	Sulfite
Chlorine, Total Residual	Surfactants
Color	Aluminum, Total
Fecal Coliform	Barium, Total
Fluoride	Boron, Total
Nitrate-Nitrite	Cobalt, Total
Nitrogen, Total Organic	Iron, Total
Oil and Grease	Magnesium, Total
Phosphorus, Total	Molybdenum, Total
Radioactivity	Manganese, Total
Sulfate	Tin, Total
Sulfide	Titanium, Total

Attachment A

Table V--Toxic Pollutants and Hazardous Substances Required To Be Identified by Existing Dischargers if Expected To Be Present

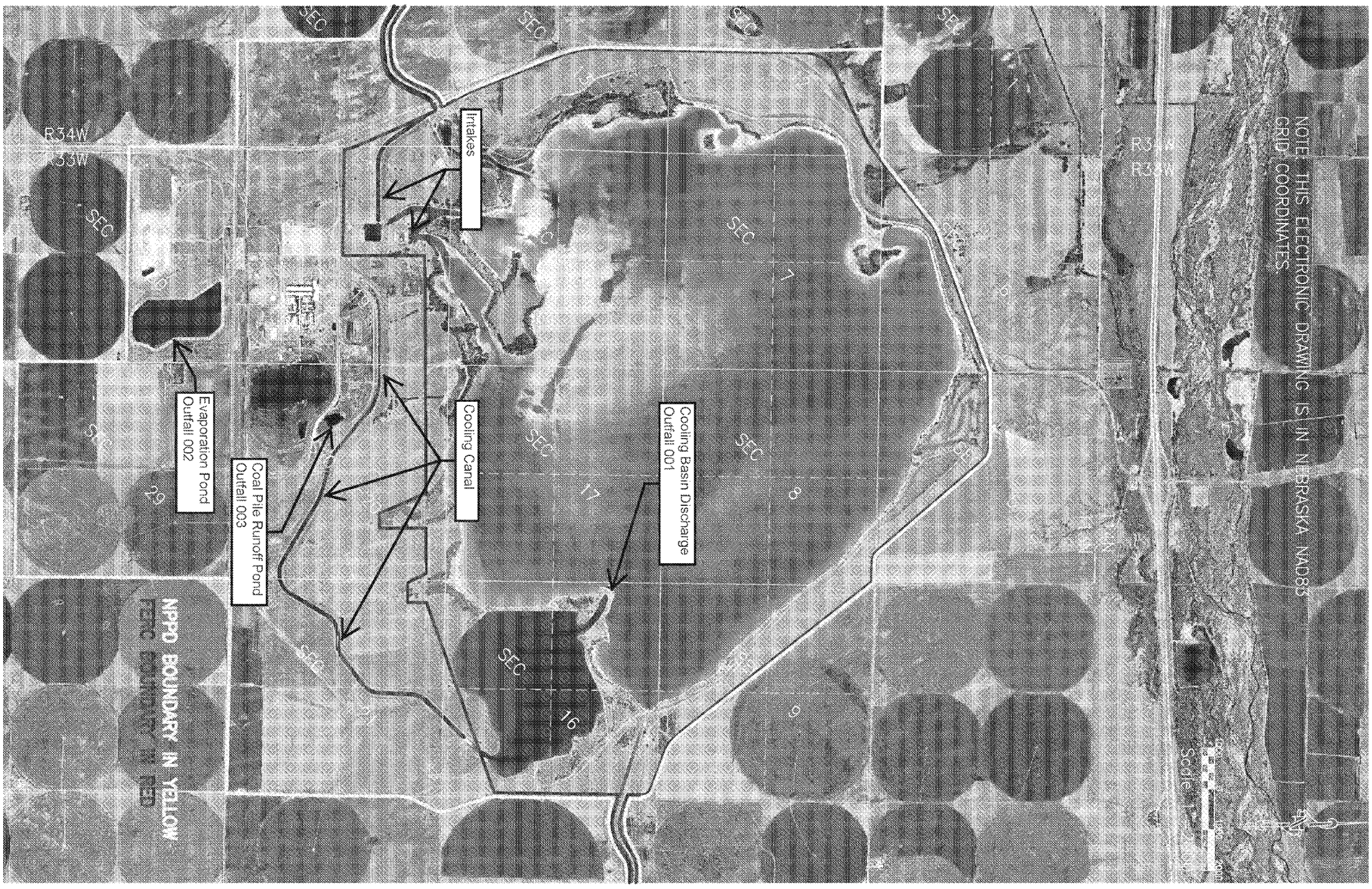
Toxic Pollutants

Asbestos

Hazardous Substances

Acetaldehyde	Kelthane
Allyl alcohol	Kepone
Allyl chloride	Malathion
Amyl acetate	Mercaptodimethur
Aniline	Methoxychlor
Benzonitrile	Methyl mercaptan
Benzyl chloride	Methyl methacrylate
Butyl acetate	Methyl parathion
Butylamine	Mevinphos
Captan	Mexacarbate
Carbaryl	Monoethyl amine
Carbofuran	Monomethyl amine
Carbon disulfide	Naled
Chlorpyrifos	Napthenic acid
Coumaphos	Nitrotoluene
Cresol	Parathion
Crotonaldehyde	Phenolsulfanate
Cyclohexane	Phosgene
2,4-D (2,4-Dichlorophenoxy acetic acid)	Propargite
Diazinon	Propylene oxide
Dicamba	Pyrethrins
Dichlobenil	Quinoline
Dichlone	Resorcinol
2,2-Dichloropropionic acid	Strontium
Dichlorvos	Strychnine
Diethyl amine	Styrene
Dimethyl amine	2,4,5-T (2,4,5-Trichlorophenoxy acetic acid)
Dintrobenzene	TDE (Tetrachlorodiphenylethane)
Diquat	2,4,5-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]
Disulfoton	Trichlorofan
Diuron	Triethanolamine dodecylbenzenesulfonate
Epichlorohydrin	Triethylamine
Ethion	Trimethylamine
Ethylene diamine	Uranium
Ethylene dibromide	Vanadium
Formaldehyde	Vinyl acetate
Furfural	Xylene
Guthion	Xylenol
Isoprene	Zirconium
Isopropanolamine Dodecylbenzenesulfonate	

Question 4

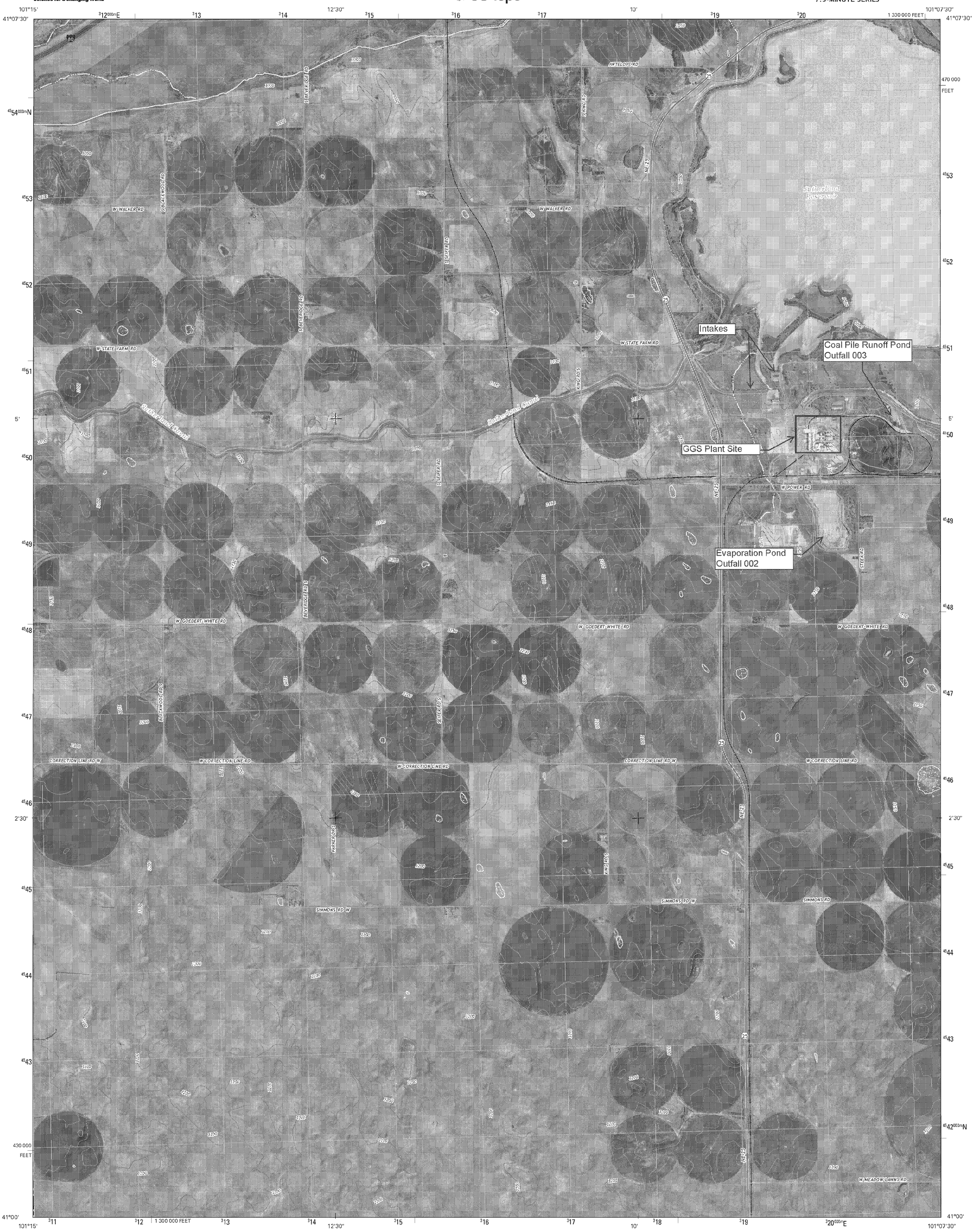


NPPDRH114_0000181

USGS science for a changing world
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

SUTHERLAND RESERVOIR WEST QUADRANGLE
NEBRASKA
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 14T
10 000-foot ticks: Nebraska Coordinate System of 1983

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, June 2012
Roads..... HERE, ©2013
Names.....GNIS, 2013
Hydrography.....National Hydrography Dataset, 2012
Contours.....National Elevation Dataset, 2001
Boundaries.....Multiple sources; see metadata file 1972 - 2014

MN
GN
6° 28'
115 MILS
1° 26'
26 MILS
UTM GRID AND 2014 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
LL
Grid Zone Designation
14T

SCALE 1:24 000

KILOMETERS 1 0.5 0 1 2
METERS 1000 500 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16

NEBRASKA
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Paxton North
2 Sutherland Reservoir NW
3 Hershey West
4 Paxton South
5 Sutherland Reservoir East
6 Elsie NE
7 Wallace NW
8 Wallace NE

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

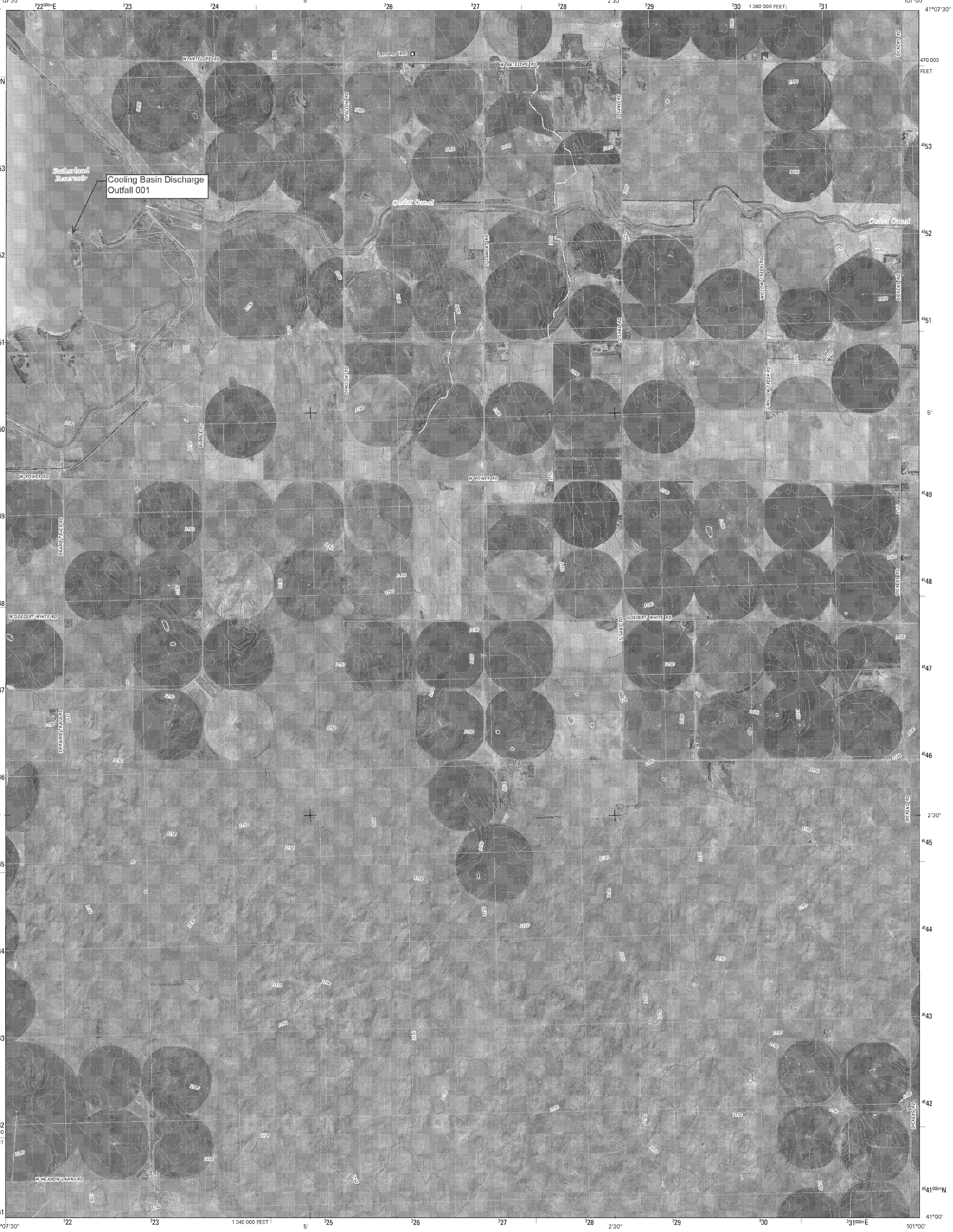
SUTHERLAND RESERVOIR WEST, NE
2014

NSN. 7643016381990
NGA REF NO. USGSX24K43925

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

SUTHERLAND RESERVOIR EAST QUADRANGLE
NEBRASKA-LINCOLN CO.
7.5-MINUTE SERIES



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MN
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6° 23'
114 MILS
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24 MILS
UTM GRID AND 2014 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
LL
Grid Zone Designation
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SCALE 1:24 000

KILOMETERS: 1 0.5 0 1 2
METERS: 1000 500 0 1000 2000
MILES: 1 0.5 0 1
FEET: 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 10 FEET
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NEBRASKA
QUADRANGLE LOCATION

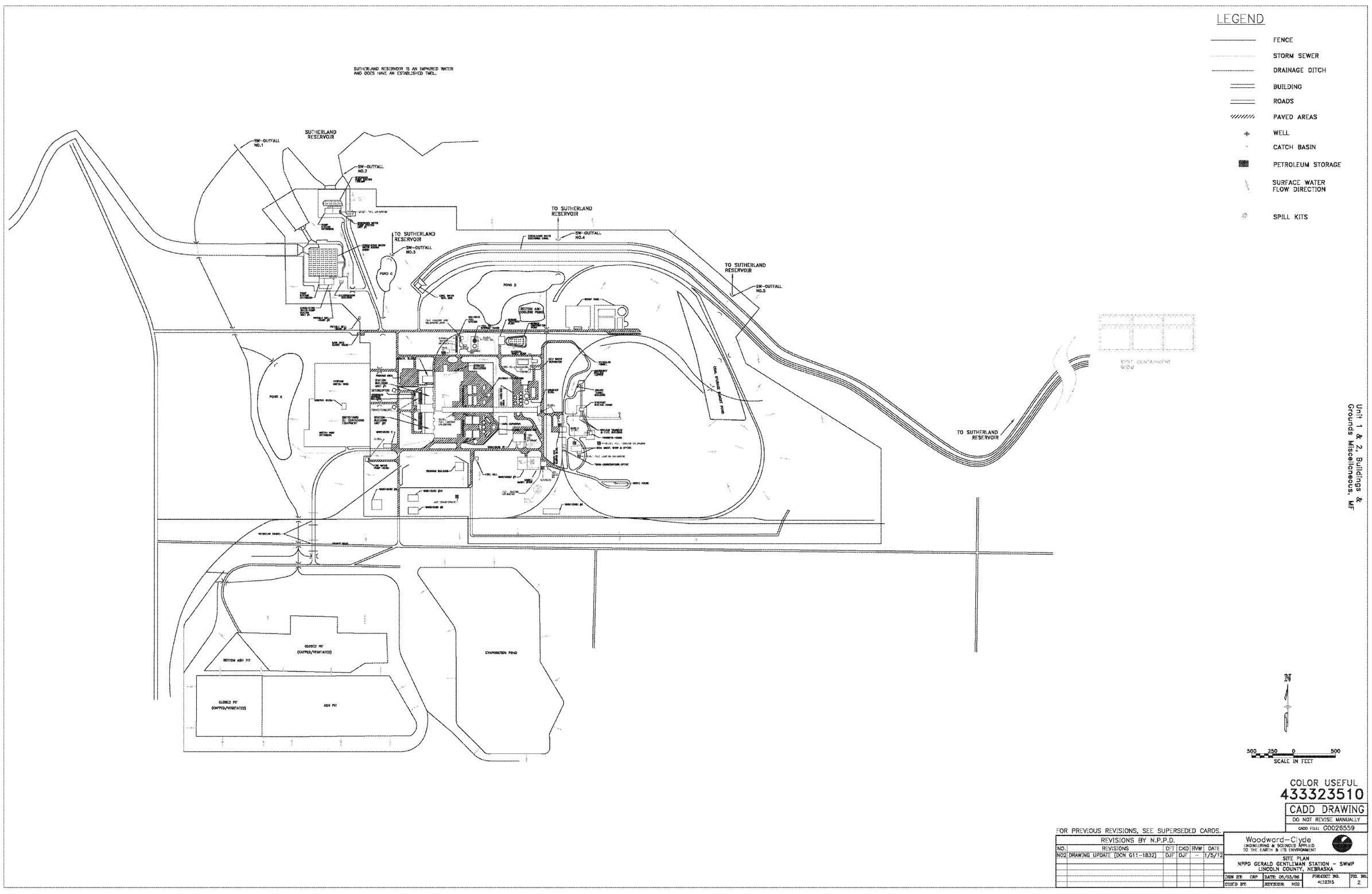
1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Sutherland Reservoir NW
2 Hershey West
3 Hershey East
4 Sutherland Reservoir West
5 North Platte SW
6 Wallace NW
7 Wallace NE
8 Dickens NW

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

SUTHERLAND RESERVOIR EAST, NE
2014

NSN. 7643016381987
NGA REF NO. USGSX24K43923



COLOR USEFUL
433323510

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CADD FILE: G0026559

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

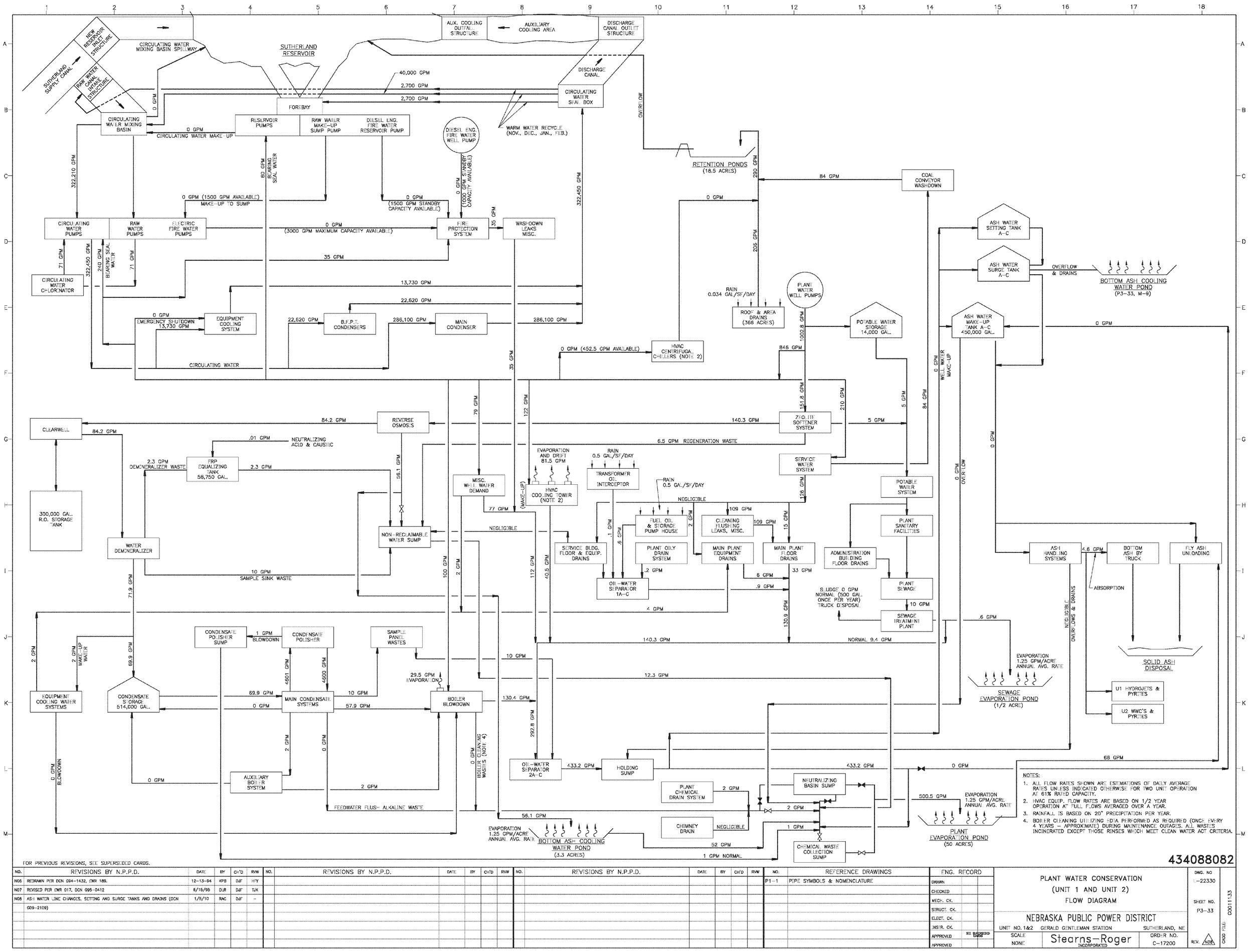
REVISIONS BY N.P.P.D.					
NO.	REVISIONS	DFT	CKD	RVW	DATE
N02	DRAWING UPDATE (DCN G11--1B32)	DJF	DJF	–	1/5/12

Woodward–Clyde
ENGINEERING & SCIENCES APPLIED TO THE EARTH & ITS ENVIRONMENT

SITE PLAN
NPPD GERALD GENTLEMAN STATION – SWMP
LINCOLN COUNTY, NEBRASKA

DRN BY: CRP	DATE: 06/03/96	PROJECT NO. 4C12315	FIG. NO. 2
CHKD BY:	REVISION: N02		

Question 4



NPPDRH114_0000185

Outfall Information

Outfall 001 - Cooling Basin Discharge

All non-contact, once-through cooling water is discharged from the facility via the seal box. From the seal box it enters a 2.78 mile long Circulating Water Cooling Canal prior to entering the Cooling Pond. The Cooling Pond provides a holding area for the water which provides more time for the water to cool. The cooling system was permitted as a waste water treatment system in 2005. The Outfall Structure Sluice Gates and trash screens, where the water is released to Sutherland Reservoir, are located on the west side of the Cooling Pond.

Source of Water	Characteristics
Once Through Cooling	Biocide/antiscalent treated surface water
Reverse Osmosis Reject Water	Biocide/antiscalent and high silica reject
Zeolite Softener	High Salt

Outfall 002 – Evaporation Pond

Outfall 002 generally has zero-discharge. The outfall has discharged twice since 1979 due to high water flows. Since the two discharge events, Gerald Gentleman Station has implemented a water conservation program and does not anticipate future discharges. The process water volume varies on a daily basis. Typically the daily total flow is approximately 220,000 gallons. The flow rates provided in this application are the maximum flows while process waters are discharging into the evaporation pond. General types and characteristics of process waters treated and discharged into the evaporation pond are as follows:

Source of Water	Characteristics
Low Volume Wastes	
Demineralizer regeneration	Neutralized 4% caustic – 5% sulfuric acid

Boiler/heater drains	Cooled high purity water
Condensate polisher drains	Powdered resin in high purity water
Building drains and floor drains	Service water via oily water separator
Condensate storage tanks	
Laboratory wastes	
Emergency diesel generator	
Bottom Ash System	
Drag Chain Cooling Water	Service water used to cool the drag chain
Cooling Tower Blowdown	
HVAC cooling tower blowdown	Cycled/treated potable water
Sanitary	
Sewage pond overflow	Aerated sanitary treatment plant
Metal and Chemical Cleaning Wastewater	
In addition to the typical process water flows (i.e. from air heater cleaning), boiler chemical cleaning is conducted on an as needed basis. Each boiler cleaning evolution generates approximately 1 million gallons of wastewater.	

Outfall 003 – Coal Pile Runoff Pond

Coal pile runoff and coal system washdown (approximately 84 gallons per minute (gpm) when in use) are collected in the **Coal Pile Runoff Pond**. The **Coal Pile Runoff Pond** also receives low volume discharges from the floor drains in the Mobile Maintenance Building, which houses the coal handling equipment (i.e. scrapers, bulldozers, etc.). The **Coal Pile Runoff Pond** has not discharged since the facility was constructed. If a discharge were to occur, the water would be discharged to Sutherland Reservoir via site surface water drainage.

Source of Water	**Characteristics**

Coal pile runoff	Stormwater from coal pile (approximately 20 inches of rainfall per year)
Coal system washdown	Service water with TSS (approximate flow of 84 gpm)
Mobile Maintenance Building floor drains	Service water with TSS, oil, and grease

Sludge Treatment and Disposal Practices

Gerald Gentleman Station (GGS) utilizes an oil/water separator that collects wastewater from building floor drains located throughout the plant site. The sludge from this separator is periodically removed via an excavator or vacuum truck. Once the sludge is removed it is deposited on the coal pile for energy recovery.

The sludge that accumulates in the Chemical Waste Water Sump is periodically removed and deposited on the coal pile for energy recovery. Sludge collected from the oil/water separators and Chemical Waste Water Sump is not treated prior to disposal on the coal pile.

The coal sediment/sludge that accumulates in the south basin of the Coal Pile Runoff Pond is periodically removed from the pond with hydraulic excavators. The material is deposited on the coal pile for energy recovery. The sludge is not treated.

Depending on current activities at the station, ash sludge may accumulate in the Neutralization Basin. This sludge is periodically removed from the basin using either an excavator or a vacuum truck and transported to the ash landfill for disposal. This sludge is not treated.

The sanitary sewage sludge is periodically removed and transported to a permitted local publically owned treatment works (POTW) for disposal.

Process Wastewater Streams and Treatment Systems

The wastewater streams produced from the GGS water process systems include once-through cooling water, a bottom ash system, HVAC cooling, water treatment (boiler make-up), condensate (boiler) water, building and plant equipment drains, chemical and metal cleaning waste streams, and site stormwater run-off. Gerald Gentleman Station (GGS) does not generate flue-gas desulfurization (FGD) wastewater, fly ash transport water, flue-gas mercury control (FGMC) wastewater, gasification wastewater, or combustion residual leachate.

A summary of chemicals additives used in the cooling tower, water treatment system, boiler treatment and other water treatment systems are provided in **Summary of Typical Chemical Usage at Gerald Gentleman Station** section of this application, including the applicable Safety Data Sheets (SDSs) for the additives.

Circulating Water (Cooling Water) System

The water systems present at Gerald Gentleman Station (GGS) are typical of those associated with a coal-fired steam electric power generating facility. GGS uses a once-through cooling water system. Cooling water is diverted to the condensers from the Sutherland Supply Canal near the inlet to Sutherland Reservoir and/or directly from the reservoir. Heated water released from the condensers is treated, as needed, with cold well water in a cooling canal and a cooling pond and discharged through **Outfall 001** into Sutherland Reservoir.

The circulating water system includes a supply and intake canal, circulating water pumps, reservoir water pumps, traveling screens and screen wash pumps, a mixing basin, main and Boiler Feed Pump Turbine (BFPT) condensers, equipment cooling water heat exchangers, cooling canal and pond, and a warm-water recirculation sub-system. The primary intake is on the Supply Canal just before it enters the Sutherland Reservoir. The secondary intake is directly from the Sutherland Reservoir. The secondary intake is used when water supply in the Supply Canal is insufficient or contains large amounts of debris or when the water is turbid. The circulating water system provides approximately 528,000 gallons per minute (gpm) of cooling water to remove unwanted or "waste" heat from the main condenser and equipment cooling heat exchangers in the power plant.

The cooling water is treated via a 14,700 ft. cooling canal and a 220-acre cooling pond that discharges through **Outfall 001** back to Sutherland Reservoir through four submerged circular conduits. When conditions demand additional cooling,

GGS uses water from deep aquifer wells located around GGS to treat the heated water released from the condensers. This wastewater treatment system was last permitted in 2011. The water from these wells is pumped into the inlet canal, cooling canal, and the cooling pond.

The circulating water system is treated to prevent biofouling. This is to prevent biological growth from inhibiting heat transfer or decreasing flow capacity. Once daily, sodium hypochlorite is injected into the circulating water that is pumped through the system. During this treatment process, the warm water return lines to the intake canal and reservoir pump house forebay are shut off. An antiscalant (PBTC/PMA/PCA) is also added to the circulating water system to prevent scaling of the system. The chemicals added to the cooling water do not contain any of the 126 priority pollutants.

Service Water System

Three (3) deep groundwater wells provide potable and service water for the plant. Service water is used throughout the plant in various processes and systems that produce treated or untreated wastewater streams. The number of wells in service varies depending on several factors (e.g. plant load, outages, and time of the year) and the number changes both daily and seasonally. Groundwater withdrawal for the service water system is approximately 1002.8 gpm.

Bottom Ash Removal System

Slag and ash from the bottom of the boilers is collected in a water quench bath and a drag chain conveyor (mechanical drag system) then pulls the bottom ash out of the water bath on an incline to dewater the bottom ash. Cooled water from the **Bottom Ash Cooling Pond** and/or the wastewater recovery tanks is pumped back to the chain conveyor system where it is used to solidify small molten particles of ash. The bottom ash wastewater is either returned back to the **Bottom Ash Cooling Pond** and/or the wastewater recovery tanks for reuse or is discharged to the chemical waste collection sump. The **Bottom Ash Cooling Pond**, when used, serves to cool the water in the bottom ash system. The main source of makeup water to the **Bottom Ash Cooling Pond** is the reject water from the reverse osmosis unit (~56 gpm). Some additional makeup water comes from the Unit 1 tripper washdown drainage system and the zeolite softener. Excess water in the **Bottom Ash Cooling Pond** is discharged to the chemical waste collection sump

and the **Evaporation Pond** (~52 gpm). Operating experience has proven that there is a need for water treatment in the **Bottom Ash Cooling Pond** to control moss and algae, therefore BCP 1015 is added to the **Bottom Ash Cooling Pond** periodically.

The bottom ash removal system is compliant with 40 CFR Part 423, "Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category", which was finalized on November 3, 2015. Per the Rule, the GGS system is classified as a "dry handling system" as it utilizes a submerged mechanical drag system to remove the bottom ash which meets the requirements for Best Available Technology (BAT).

Water Treatment (Boiler Make-up Water)

Make-up water for the boilers requires water of very high quality to prevent scaling and damage in the high temperature, high pressure boilers. As a result, to treat service water GGS utilizes a water treatment system consisting of a zeolite softener, filters, reverse osmosis (RO), and demineralizer ion (DI) exchange units. Water supplied from the potable water system is passed through a zeolite softener and then is directed through a RO unit and followed by cation, anion, and mixed bed ion exchange units. The RO unit is periodically cleaned or replaced to remove solids, prevent biological contaminants, and to reestablish the rejection capacity of the membranes. Zeolite softener regeneration waste and RO reject waste may be discharged into the once-through cooling water system, the bottom ash cooling pond, and/or the **Evaporation Pond**. The DI exchange units are periodically placed into regeneration mode to maintain operability. Sulfuric acid is used to regenerate the cation resins and sodium hydroxide is utilized to regenerate the anion resins. Regeneration wastewater and rinse waters from the DI units can have low (cation) or high (anion) pH values, high TDS, and high conductivity. These wastes are discharged to the equalizing tank (where they are treated for pH), the non-reclaimable sump, the chemical waste sump, and eventually drain to the **Evaporation Pond**.

Condensate System (Boiler Blowdown)

High quality water from the water treatment system provides make-up water for the feedwater/steam condensate system. The water quality of the feedwater/steam condensate system is maintained by boiler blowdown and the addition of

chemicals to minimize corrosion and scale formation. Chemicals are fed to the condensate system for oxygen scavenging and pH control. Residual levels of these chemicals and/or byproducts are maintained in low concentrations by boiler blowdown. The boiler blowdown (~130 gpm) is directed to the oil-water separator and then to the chemical waste sump and finally to the **Evaporation Pond**.

Building Floor and Equipment Drains System

Other water system losses from floor drains, seals, system leaks, building wash down activities, and other low volume wastes are captured by the plant floor and equipment drains. The flow and quality of equipment drain water is variable depending upon the source, but some total suspended solids and oil and grease may be present.

The plant drain system transports all the wastewater from plant drains and disposes of the non-reclaimable wastewater in the **Evaporation Pond**. The plant drain system consists of a series of sub-systems including floor drains, equipment drains, reclaimable water, non-reclaimable water, and chemical waste drains. The non-reclaimable water and chemical waste drain systems receive non-reclaimable wastes from various areas of the plant. These wastes are neutralized for pH to a degree acceptable for disposal and then directed through an oil-water separator prior to being discharged to the **Evaporation Pond**.

In addition to the above mentioned source of inflow, the chemical waste collection sump also receives waste drains from other areas of the plant which are potentially corrosive. During normal operation, these include the condensate polisher sump pump discharge, plant chemical drains, chimney drains, air heater drains, and roof drains from the precipitator building. Wastewater collected in the Chemical Waste Collection Sump is periodically pumped (500 gpm) to the plant **Evaporation Pond** for final disposal.

Floor drains at the Reservoir Pump House and the Circulating Water Pump House are untreated and discharge into the once-through cooling water system. Floor drains from the Mobile Maintenance Shop are untreated and discharge into the **Coal Pile Runoff Pond**.

Metal Cleaning and Chemical Metal Cleaning Wastewater Streams

In addition to the continuous and intermittent wastewater flows, metal cleaning is

conducted on the fireside boiler tubes, air heaters, and other equipment periodically when required. Chemical metal cleaning of interior boiler tubes typically involves the use of high and low pH soaks. Additionally, other cleaning chemicals are used to remove scaling and other deposits that affect heat transfer. Wastes from these types of chemical cleanings are collected and treated before being discharged to the Chemical Waste Collection Sump and the **Evaporation Pond**.

Sanitary Sewage System

The sanitary sewage system receives sewage from the main plant building, warehouses, and miscellaneous on-site buildings from service sinks, lavatories, toilets, showers, etc. The sewage is collected first in sumps and then pumped to the sewage treatment plant. The sewage treatment plant effluent water flows to the **Sewage Evaporation Pond** (~1 gpm) or can flow to the oil-water separator (~9 gpm) which discharges to the Chemical Waste Collection Sump and eventually to the **Evaporation Pond**.

HVAC Cooling System

During summer months, chilled water for the main plant building is provided by four absorption-type water units (chillers). These chillers remove heat from the system and transfer it to a HVAC cooling tower. In the cooling tower, the heat in the circulating water is released to the atmosphere, and the cooled water is again recirculated to the chilled water units. To prevent total dissolved solids from depositing on the surfaces of the HVAC circulating water system, a portion of the water is discharged from the tower as blowdown (~40 gpm). The circulating water is treated with sulfuric acid to control the pH, corrosion inhibitors to protect the system piping, and a sodium hypochlorite solution and/or DTEA II to control biofouling.

Coal Pile Runoff

Coal pile runoff is collected in the **Coal Pile Runoff Pond**. The **Coal Pile Runoff Pond** was designed to contain a l0-year, 24-hour rain event. An emergency overflow pipe is provided to accommodate an exceptionally heavy rainfall. The **Coal Pile Runoff Pond** has not had a discharge since the facility was built.

The **Coal Pile Runoff Pond** also receives effluent from the floor drains in the Mobile Maintenance Building (maintenance of the coal handling equipment is performed in this building) and the coal system washdown, which is approximately 84 gpm when in use. Although the Mobile Maintenance Building constitutes a different classification from the coal pile runoff, the Mobile Maintenance Building should be combined with the coal pile runoff. The Mobile Maintenance Building is used for washing equipment used on the coal pile and therefore the discharge is similar to the discharge from the coal pile.

Evaporation Pond Water Reuse

Evaporation Pond water may be utilized for dust control at the ash disposal site. The ash disposal site utilizes a pivot system to pump water from the **Evaporation Pond**.

Potential Pollutants

The table below identifies the potential pollutants listed in Combined Form 1 & 2C.

Outfall 001- Cooling Basin Outfall

Pollutant	Source	Outfall	Detected?	Concentration (mg/l)
Oil and Grease	Low Volume Waste	001	Yes	<5.0 – <8.8
Phosphorus	Chemical Additive	001	No	—
Total Residual Chlorine	Chemical Additive	001	No	Less than the LDL

Outfall - 002 Evaporation Pond

Pollutant	Source	Outfall	Detected?	Concentration (mg/l)
Oil and Grease	Low Volume Waste	002	No	—
Nitrate - Nitrite	Chemical Additive	002	No	—
Styrene	Chemical Additive	002	No	—
Phosphorus, Total	Chemical Additive	002	No	—
Total Residual Chlorine	Chemical Additive	002	No	—
Sulfite	Chemical Additive	002	No	—
Copper	Ash Handling	002	No	—
Barium	Ash Handling	002	No	—
Manganese	Ash Handling	002	No	—
Cobalt	Ash Handling	002	No	—
Aluminum	Ash Handling	002	No	—
Mercury	Ash Handling	002	No	—
Arsenic	Ash Handling	002	No	—
Beryllium	Ash Handling	002	No	—

Cadmium	Ash Handling	002	No	—
Chromium	Ash Handling	002	No	—
Lead	Ash Handling	002	No	—
Nickel	Ash Handling	002	No	—
Selenium	Ash Handling	002	No	—
Silver	Ash Handling	002	No	—
Zinc	Ash Handling	002	No	—
Thallium	Ash Handling	002	No	—

Outfall - 003 Coal Pile Runoff Pond

Pollutant	Source	Outfall	Detected?	Concentration (mg/l)
Oil and Grease	Low Volume Waste	003	No	—

Table 1. Summary of Typical Chemical Usage at Gerald Gentleman Station					
Plant System	**Chemical Name**	**Use**	**Dose**	**Annual Usage**	**Discharged To**
Circulating Water	Sodium Hypochlorite (12.5%)	Biocide	180 gal/unit/day	114,560 gal	Sutherland Reservoir
	PBTC/PMA/PCA	Anti-scalant	20 gal/unit/day	13,000 gal	Sutherland Reservoir
Boiler Treatment	Ammonium Hydroxide (19.5%)	pH Control	3 gal/unit/day	1,980 gal	Evaporation Pond
	Sodium Hydroxide (50%)	pH control	1000 mls/Unit (4X); as-needed	2.1 gal	Evaporation Pond
	Hydrazine (35%)	Oxygen scavenger	2.5 gal/Unit/dose (2X); as-needed	10 gal	Evaporation Pond
	Formula 281	Oxygen scavenger	2.5 gal/Unit/dose (2X); as-needed	10 gal	Evaporation Pond
Equipment Cooling	CS – 78	Corrosion Inhibitor	0.9 gal/unit/day; as needed	658 gal	Evaporation Pond
	CS – 25	Corrosion Inhibitor	1000 ml / unit; as needed	4000 mls	Evaporation Pond
Water Treatment					
Zeolite Softener	Salt	Softener	3,987 lbs/day	1,455,400 lbs	Sutherland Reservoir
Reverse Osmosis Reject	CC–4200	Anti- scalent	0.75 gal/day	275 gal	Sutherland Reservoir
	CC-103	Biocide	0.50 gal/day	180 gal	Sutherland Reservoir
Ion Exchange Reject	Caustic Soda (50%)	DI Regeneration& Neutralization	155 gal/reg	3,223 gal total	Evaporation Pond
Ion Exchange Reject	Sulfuric Acid (93%)	DI Regeneration	180 gal/reg	1,273 gal total	Evaporation Pond

Table 1. Summary of Typical Chemical Usage at Gerald Gentleman Station					
Plant System	**Chemical Name**	**Use**	**Dose**	**Annual Usage**	**Discharged To**
Auxiliary Boiler	Disodium Phosphate	pH Control	0.8 lb /treatment	3.2 lb	Evaporation Pond
	Trisodium Phosphate	pH Control	0.8 lb /treatment	3.2 lb	Evaporation Pond
	Sodium Sulfite	Oxygen Scavenger	0.4 lb/treatment	1.6 lb	Evaporation Pond
Condensate Polisher	Powdex Premix 22N	Resin	40 bags/recoat/unit	23,700 lbs	Evaporation Pond
	Powdex PAO	Resin	6 bags/recoat/unit	3,120 lbs	Evaporation Pond
	Powdex Premix 45H	Resin	1 bag/recoat; as-needed	40 lbs	Evaporation Pond
HVAC Cooling Tower	Sodium Hypochlorite (12.5%)	Biocide	5 gal/day	450 gal	Evaporation Pond
	Sulfuric Acid (93%)	pH control	10 gal/day	900 gal	Evaporation Pond
	FCT-4008TT	Anti-scalant	One dose/yr	15 gal	Evaporation Pond
	BCP-1015	Bio-control/fouling	5 gal/treatment; as-needed	20 gal	Evaporation Pond
	Boost Plus	Anti-scalant / cleaner	5 gal/treatment	5 gal	Evaporation Pond
Fire System	Biotrol 15	Molusicide	110 gal/treatment	220 gal	Evaporation Pond
Ash Water Pump House	CC-312	Anti-scalant	9 gal/day	3,300 gal	Evaporation Pond
	BCP-1015	Dispersant	15 gal / treatment, as needed	60 gal	Evaporation Pond

SAFETY DATA SHEET

AQUA AMMONIA 19% DEMINERALIZED
Product ID: NH001400
Revised: 04-07-2014
Replaces: 12-13-2010

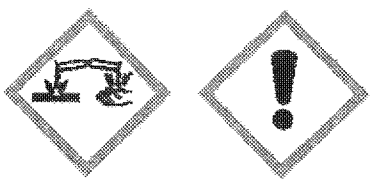
1. IDENTIFICATION

Product Name:	AQUA AMMONIA 19% DEMINERALIZED
Synonyms:	Ammonium Hydroxide; Aqueous Ammonia; Ammonia Water; Ammonia Solution
CAS Number:	MIXTURE
Recommended Use:	No data available.
Restrictions on Use:	No data available.

Hydrite Chemical Co.
300 N. Patrick Blvd.
Brookfield, WI 53008-0948
(262) 792-1450

EMERGENCY RESPONSE NUMBERS:
24 Hour Emergency #: (414) 277-1311
CHEMTREC Emergency #: (800) 424-9300

2. HAZARD(S) IDENTIFICATION



Signal Word:	Danger
GHS Classification:	Skin Corrosion/Irritation Category 1C Serious Eye Damage/Eye Irritation Category 1 Acute Toxicity - Oral Category 4
Hazard Statements:	Harmful if swallowed. Causes severe skin burns and eye damage.

Precautionary Statements:

Prevention:	Do not breathe dust, fume, gas, mist, vapors or spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear gloves, eye and face protection and protective clothing.
Response:	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. Specific treatment (see First Aid on SDS or on this label). Wash contaminated clothing before reuse.
Storage:	Store in a secure manner.
Disposal:	Dispose of in accordance with local, regional and international regulations.

Hazards Not Otherwise Classified: None known.

Percentage of Components with Unknown Acute Toxicity:

Dermal:	39.0 %
Inhalation Vapor:	39.0 %
Inhalation Dust/Mist:	39.0 %

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	% by Wt.
Ammonium Hydroxide	1336-21-6	39 %

Note: Contains 19% Ammonia (CAS# 7664-41-7).

4. FIRST-AID MEASURES

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Tilt head to avoid contaminating unaffected eye. Get immediate medical attention.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Do not reuse clothing and shoes until cleaned.

Inhalation: Remove to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration. GET MEDICAL ATTENTION IMMEDIATELY.

Ingestion: If fully conscious, drink a quart of water. DO NOT induce vomiting. CALL A PHYSICIAN IMMEDIATELY. If unconscious or in convulsions, take immediately to a hospital or a physician. NEVER induce vomiting or give anything by mouth to an unconscious victim. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. After dilution with water, fruit juice or diluted vinegar may be administered to accomplish neutralization.

Note to Physicians:
The conventional symptoms of developing pulmonary edema should be observed regularly. Anyone exposed to ammonia who breathes in short, rapid shallow breaths should be immobilized. In most cases 24 hour bed rest, under the observation of a physician, will be necessary before it can be determined that the victim is out of danger. Anyone who accidentally has been exposed to high or unknown concentrations of ammonia and who has ammonical breath, tightness of the chest, bloodshot eyes with swollen lids, and a cough that may discharge bloody mucous is seriously ill. Medical assistance should be summoned immediately. SUCH A PERSON SHOULD BE IMMOBILIZED AT ONCE, eyes washed, and oxygen administered by a physician. Any sort of movement on the victim's part will aggravate the developing edema and may result in death.

Most Important Symptoms/Effects:

Eye Contact: CORROSIVE-Causes severe irritation and burns. Vapors may cause: burns. May cause: corneal damage. conjunctivitis. permanent eye damage. blindness.

Skin Contact: CORROSIVE-Causes severe irritation and burns. Concentrated ammonia may produce liquefication necrosis and deep penetrating burns. Contact may cause: dermatitis (inflammation of the skin).

Skin Absorption: May be harmful if absorbed through skin.

Inhalation: CORROSIVE-Causes severe irritation and burns. May cause damage to the: mouth. throat. nose. lungs. respiratory tract. May cause: chest pain. coughing. asthma. pink frothy sputum. lung fibrosis. running nose. pulmonary edema. chemical pneumonitis. death. Effects may be delayed.

Ingestion: CORROSIVE-Causes severe irritation and burns. May produce systemic effects similar to inhalation. May cause: headache. drowsiness. liver congestion. urinary retention. nausea. vomiting. coma. death. May cause swelling of the: lips. larynx. May cause damage to the: mouth. throat. esophagus.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Foam. Carbon dioxide. Dry chemical. Water spray.

Fire Fighting Methods: Evacuate area of unprotected personnel. Wear protective clothing including NIOSH-approved self-contained breathing apparatus. Remain upwind of fire to avoid hazardous vapors and decomposition products. Use water spray to cool fire-exposed containers and disperse vapors. Run-off from fire control may cause pollution.

Fire and Explosion Hazards: Contact with strong oxidizing agents may cause an explosion. The presence of oil or other combustible materials will increase the fire hazard. The heat of a welding or cutting torch could cause an explosion. Ammonia will combine readily with either silver oxide or mercury to form explosive fulminating compounds. Contact with halogens and chlorates can cause explosions.

Hazardous Combustion Products: Nitrogen oxides. Ammonia.

6. ACCIDENTAL RELEASE MEASURES

Spill Clean-Up Procedures: CORROSIVE MATERIAL. Evacuate unprotected personnel from area. Maintain adequate ventilation. Follow personal protective equipment recommendations found in Section 8. Never exceed any occupational exposure limit. Shut off source of leak if safe to do so. Keep upwind of leak or spill. Contain spill, place into drums for proper disposal. Flush remaining area with water to remove trace residue and dispose of properly. CAUTIOUSLY neutralize remaining residue with dilute acid such as Acetic, Hydrochloric or Sulfuric. Soak up residue with inert absorbent material. Place in non-leaking containers for immediate disposal. Avoid direct discharge to sewers and surface waters. Notify authorities if entry occurs.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Do not swallow. Avoid breathing vapors, mists, or dust. Do not eat, drink, or smoke in work area. Wash thoroughly after handling. Empty containers retain product residue (vapor, dust, or liquid) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other source of ignition. They may explode and cause injury or death. CORROSIVE MATERIAL. Avoid dust or mist formation.

Storage: CORROSIVE MATERIAL. Store in a cool, well ventilated area, out of direct sunlight. Store in a dry location away from heat. Keep away from incompatible materials. Keep containers tightly closed. Do not store in unlabeled or mislabeled containers. Keep away from all sources of ignition. Store in suitable stainless steel or aluminum containers. Store below 77 Deg. F. Avoid copper bearing fittings on pipes, tanks, etc. See Section 10 for incompatible materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OSHA Exposure Guidelines:

Component	Limits
No components found.	

ACGIH Exposure Guidelines:

Component	Limits
No components found.	

Note:
Exposure limits for Ammonia: 50 ppm-TWA (OSHA); 25 ppm-TWA, 35 ppm-STEL (ACGIH).

Engineering Controls: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure. Avoid creating dust or mist. Maintain adequate ventilation. Do not use in closed or confined spaces. Keep levels below exposure limits. To determine exposure levels, monitoring should be performed regularly.

Eye/Face Protection: Wear chemical safety goggles while handling this product. Do not wear contact lenses. Wear additional eye protection such as a face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material.

Skin Protection: Prevent contact with this product. Wear gloves and protective clothing depending on condition of use. Protective gloves: Impervious. Chemical-resistant.

Respiratory Protection: Respiratory protection may be required to avoid overexposure when handling this product. If exposure limits are exceeded, wear: NIOSH approved full facepiece respirator with: Ammonia cartridge. NIOSH/MSHA-Approved (or equivalent) full facepiece airline respirator in the positive pressure mode with emergency escape provisions. NIOSH-Approved self-contained breathing apparatus. DO NOT exceed limits established by the respirator manufacturer. All respiratory protection programs must comply with OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements and must be followed whenever workplace conditions require a respirator's use.

Other Protective Equipment: Eye-wash station. Safety shower. Rubber apron. Chemical safety shoes. Rubber boots. Full body suit. Protective clothing.

General Hygiene Conditions: Wash with soap and water before meal times and at the end of each work shift.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid.
Color: Clear. Colorless.
Odor: Pungent ammonia odor.
Odor Threshold: N.D.
pH: > 12.00 (as is)
Freezing Point (deg. F): ~-20
Melting Point (deg. F): ~-20
Initial Boiling Point or Boiling Range: ~ 125 °F
Flash Point: NONE.
Flash Point Method: N.A.
Evaporation Rate (nBuAc = 1): <1
Flammability (solid, gas): N.D.
Lower Explosion Limit: 16%
Upper Explosion Limit: 25%
Vapor Pressure (mm Hg): 227.9 @ 20C
Vapor Density (air=1): 0.60 (NH3)
Specific Gravity or Relative Density: 0.929 @ 25C
Solubility in Water: Complete
Partition Coefficient (n-octanol/water): N.D.
Autoignition Temperature: 1204 Deg. F. (651 Deg. C.)
Decomposition Temperature: N.D.
Viscosity: N.D.
% Volatile (wt%): N.D.
VOC (wt%): 0
VOC (lbs/gal): 0
Fire Point: N.D.

10. STABILITY AND REACTIVITY

Reactivity: No data available.

Chemical Stability: Stable under normal conditions.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur under normal conditions.

Conditions to Avoid: Avoid contact with heat, sparks, electric arcs, other hot surfaces, and open flames. Avoid elevated temperatures.

Incompatible Materials: Acids. Strong oxidizing agents. Combustible materials. Halogens or halogen compounds. Oleum. Acrolein. Sodium hydroxide. Chlorates. Chromium trioxide. Ethylene oxide. Boron. Chlorites. Dimethyl trioxide. Phosphorous trioxide. Propylene oxide. Nitrogen tetroxide. Silver nitrate. Silver chloride. Potassium chlorate. Potassium ferricyanide. Dimethyl sulfate. Metals. Copper. Organic Acids. Gaseous

or liquid ammonia will vigorously attack, copper, silver, zinc and their alloys. It will combine readily with either silver oxide or mercury to form explosive fulminating compounds. Avoid use of nonferrous metals. Galvanized surfaces. Forms explosive compounds with many heavy metals (gold, silver, mercury, etc.) and their salts, especially halide salts.

Hazardous Decomposition Products: Ammonia. Nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

Component	Oral LD50	Dermal LD50	Inhalation LC50
Ammonium Hydroxide	Rat: 350 mg/kg	No Data	No Data

Acute Toxicity Estimate (ATE):
Oral: 897 mg/kg

Routes of Exposure: Eyes. Ingestion. Inhalation. Skin.

Eye Contact: CORROSIVE-Causes severe irritation and burns. Vapors may cause: burns. May cause: corneal damage. conjunctivitis. permanent eye damage. blindness.

Skin Contact: CORROSIVE-Causes severe irritation and burns. Concentrated ammonia may produce liquefication necrosis and deep penetrating burns. Contact may cause: dermatitis (inflammation of the skin).

Skin Absorption: May be harmful if absorbed through skin.

Inhalation: CORROSIVE-Causes severe irritation and burns. May cause damage to the: mouth. throat. nose. lungs. respiratory tract. May cause: chest pain. coughing. asthma. pink frothy sputum. lung fibrosis. running nose. pulmonary edema. chemical pneumonitis. death. Effects may be delayed.

Ingestion: CORROSIVE-Causes severe irritation and burns. May produce systemic effects similar to inhalation. May cause: headache. drowsiness. liver congestion. urinary retention. nausea. vomiting. coma. death. May cause swelling of the: lips. larynx. May cause damage to the: mouth. throat. esophagus.

Medical Conditions Aggravated by Exposure to Product: Eye disorders. Liver disorders. Lung disorders. Respiratory system disorders. Skin disorders. Allergies.

Other: Exposure to atmospheric concentrations of ammonia above 5000 pmm in air will produce death by suffocation within minutes. Atmospheric ammonia in concentrations above 2000 ppm will burn and blister the skin after a few seconds of exposure. Excess ammonia in the body is detoxified in the liver by conversion to urea. Those with a history of reduced liver function should avoid exposure to ammonia. Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the kidney, eye, respiratory, cardiovascular and nervous systems.

Cancer Information:
This product does not contain 0.1% or more of the known or potential carcinogens listed in NTP, IARC, or OSHA.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information: This material is expected to be very toxic to aquatic life. The 96 hour LC50 values for fish are less than 1 mg/L. The 48 hour EC50 values for daphnia are less than 1 mg/L.

Chemical Fate Information: This material is not expected to significantly bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Hazardous Waste Number: D002
Disposal Method: Dispose of in a permitted hazardous waste management facility following all local, state and federal regulations. DO NOT pressurize, cut, weld, solder, drill, grind or expose empty containers to heat, flame, sparks or other sources of ignition.

14. TRANSPORT INFORMATION

DOT (Department of Transportation):

Identification Number:	UN2672
Proper Shipping Name:	Ammonia Solution
Hazard Class:	8
Packing Group:	III
Label Required:	CORROSIVE
Reportable Quantity (RQ):	100# (Ammonia); 1000# (Ammonium Hydroxide)

15. REGULATORY INFORMATION

TSCA Inventory Status: This product or all components of this product are listed on the EPA/TSCA Inventory of Chemical Substances.

SARA Title III Section 311/312 Category Hazards:

Immediate (Acute)	Delayed (Chronic)	Fire Hazard	Pressure Release	Reactive
Yes	Yes	Yes	No	No

Regulated Components:

Component	CAS Number	CERCLA RQ	SARA EHS	SARA 313	U.S. HAP	WI HAP	Prop 65
Ammonium Hydroxide	1336-21-6	Yes	No	Yes	No	No	No

***Prop 65 - May Contain the Following Trace Components:**
No data available.

Note: * Section 313 threshold and release determinations are based on 10% of the total aqueous ammonia manufactured, processed or otherwise used. This product contains Ammonia (CAS# 7664-41-7) which is subject to 313 reporting requirements. If ammonia is released to the environment, it is subject to EPCRA 302 and 304 reporting requirements: CERCLA RQ of 100 pounds, SARA RQ of 100 pounds, and TPQ of 500 pounds. Ammonia is not an EPA HAP.

16. OTHER INFORMATION

Hazard Rating System
Health: 3*
Flammability: 1
Reactivity: 0
* = Chronic Health Hazard

NFPA Rating System
Health: 3
Flammability: 1
Reactivity: 0
Special Hazard: None

MSDS Abbreviations
N.A. = Not Applicable
N.D. = Not Determined
HAP = Hazardous Air Pollutant
VOC = Volatile Organic Compound
C = Ceiling Limit
N.E./Not Estab. = Not Established

MSDS Prepared by: NAO

Reason for Revision: New format. Changes made throughout the MSDS.

Revised: 04-07-2014
Replaces: 12-13-2010

The data in this Material Safety Data Sheet relates to the specific material designated and does not relate

to its use in combination with any other material or process. The data contained is believed to be correct. However, since conditions of use are outside our control it should not be taken as warranty or representation for which HYDRITE CHEMICAL CO. assumes legal responsibility. This information is provided solely for your consideration, investigation, and verification.

GGS 2208

BCP 1015

AMSA, INC.
1406 E. Pine St.
Midland, MI USA 48640
Phone: 989-662-0377

H81 SAFETY DATA SHEETS

SAFETY DATA SHEET

I. IDENTIFICATION

GHS Product Identifier: **BCP™ 1015**

Synonyms: None
General Description: Industrial water treatment product
SDS Identification Code: 1001-073014
Revision Date: 07/30/2014
24 hour Emergency Response: 1-888-739-0377

NFPA Rating	
Health	2
Fire	1
Reactivity	0

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

Recommended Use: Organic deposit penetrant, dispersant, remover and corrosion inhibitor

II. HAZARD IDENTIFICATION

Hazard Classification: Skin irritation, category 2
Eye irritation, category 2

Signal Word: Warning
Hazard Statement(s):
H315: Causes skin irritation
H319: Causes serious eye irritation

Pictograms of related hazards:

Precautionary Statements:
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P280: Wear protective gloves / protective clothing / eye protection / face protection.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P332+P313: If skin irritation occurs: Get medical advice/attention.
P362: Take off contaminated clothing and wash before reuse.
P321: Specific treatment (see First Aid Measures on Safety Data Sheet)
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.
Description of other Hazards: Not available

III. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	Approximate Wt.
Alkylamide hydrolysate	Proprietary	15
Water	7732-18-5	85

* Chemical Identity and/or exact percentage of composition has been withheld as a trade secret.

IV. FIRST-AID MEASURES

Eye Contact: Immediately flush eyes with running water for at least 15 minutes. Seek medical attention if irritation develops or persists.

Skin Contact: Wash off with soap and water. Seek medical attention if irritation develops or persists.

Ingestion: If swallowed, do NOT induce vomiting. Never give anything by mouth to an unconscious person. Seek medical attention.

Inhalation: Move to fresh air. Seek medical advice if effects persist.

Note to Physicians: Not Available

V. FIRE-FIGHTING MEASURES

Extinguishing Media: To extinguish combustible residues of this product, use water fog, carbon dioxide, dry chemical, or foam.

Fire and Explosion Hazards: The material will not burn until the water has evaporated. Residue can burn.

Hazardous products of combustion: Decomposes on heating emitting toxic fumes, including those of oxides of nitrogen, oxides of sulfur and oxides of carbon.

Fire Fighting Equipment: In the event of a fire, self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.

VI. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear protective equipment to prevent skin and eye contact. Avoid breathing in vapors. May be a slipping hazard. Work up wind or increase ventilation. Contain / prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Collect and seal in properly labeled containers or drums for disposal.

Environmental Precautions: Clear area of all unprotected personnel. If contamination of sewers or waterways has occurred advise local emergency services.

Methods for clean-up:

Small Spill: Use absorbent (soil, sand or other inert material). Collect and seal in properly labeled containers or drums for disposal.

Large Spill: Use absorbent (soil, sand or other inert material). Collect and seal in properly labeled containers or drums for disposal.

VII. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Avoid breathing vapors. Refer to "Exposure Controls/Personal Protection," Section 8, of the MSDS.

Storage: Keep containers tightly closed when not in use. Do not store near food, foodstuff, drugs or potable water supplies. Storage must only be in original containers. If exposed to temperatures below freezing point (40° F, 5° C), assure product reaches 50° F, 10° C, prior to use. Gently agitate contents of container. Vigorous agitation is not required.

Note: Please Note: **Freezing will not harm product performance.** Simply bring to room temperature by storing at room temperature and allowing it to warm up. It is not recommended to heat or to put a heating device into contact with the liquid product.

VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:

OSHA Permissible Exposure Limits (PELs):	Not Available
American Conference of Governmental Industrial Hygienists (ACGIH):	Not Available
Threshold Limit Values (TLVs):	Not Available
Other Exposure Limits:	Not Available

Engineering Controls: Natural ventilation should be adequate under normal use conditions. If inhalation risk exists: Use with local exhausts ventilation or while wearing suitable mist respirator. Keep containers closed when not in use. Maintain eye wash fountain and quick-drench facilities in work area.

Personal Protection:

Eye Protection:	Use chemical safety glasses with side shields, goggles, or face shield are recommended.
Hand Protection:	Wear protective gloves
Skin Protection:	Wear clean body-covering clothing or apron
Respiratory Protection:	Mist respirator as needed

IX. PHYSICAL AND CHEMICAL PROPERTIES

Property	Value	Test Used (if applicable)
Appearance:	Clear to slightly hazy liquid	
Odor:	Vinegar-like	
pH(neat):	6	
Specific Gravity:	1.00 g/mL	
Relative Density:	8.31 lb/gallon	
Melting/Freezing Point:	< 35°F	
Initial Boiling Point and boiling range:	>100°C (>212°F)	
Flash Point:	Not available	
Solubility (water):	Complete	

Intrinsic Viscosity:	Not available
Flammability (solid, gas):	Not available
Upper/Lower flammability limits:	Not available
Vapor Pressure:	Not available
Vapor Density:	Not available
Evaporation rate:	Not available
Auto-ignition Temperature:	Not available
Decomposition Temperature:	Not available
Partition coefficient: n-octanol/water:	Not available

Note: These physical properties are typical values for this product and not specifications.

X. STABILITY AND REACTIVITY

Reactivity Data: No specific data for this product

Chemical Stability:

Stability under normal conditions:	Stable under ordinary conditions of use and storage.
Stabilizers needed:	None needed

Other information:

Conditions to avoid:	Product can decompose at elevated temperatures.
Materials to avoid:	Strong oxidizing and reducing agents, aldehydes, caustic materials
Hazardous reactions:	Will not occur.
Hazardous decomposition products:	Oxides of nitrogen, oxides of carbon

XI. TOXICOLOGICAL INFORMATION

Toxicity Studies: No toxicity studies have been conducted on this product.

Acute Toxicity: No LD50 data available for the product.

For the constituent: *Alkylamide hydrolysate:
Acute oral LD50 (rat): 5000 mg/kg
Acute dermal LD50 (rabbit): 2000 mg/kg
*Similar product tested

Skin Corrosion/Irritation:	Not available
Serious Eye Damage/Irritation:	Not available
Respiratory or Skin Sensitization:	Not available
Germ Cell Mutagenicity:	Not available
Carcinogenicity:	Not available
Reproductive Toxicity:	Not available
STOT-single exposure:	Not available
STOT-repeated exposure:	Not available
Aspiration Hazard:	Not available

XII. ECOLOGICAL INFORMATION

Toxicity:	No ecological studies have been conducted on this product.
Persistence and Degradability:	The product is expected to be rapidly biodegradable.
Bioaccumulative Potential:	The product is not expected to significantly bioaccumulate.
Mobility in Soil:	NA
Other Adverse Effects:	Not available

XIII. DISPOSAL CONSIDERATIONS

Recommended Disposal Containers: N/A
Recommended Disposal Methods: Consult local regulations regarding proper disposal as they may be more restrictive or otherwise different from Federal/International regulations.
Physical and Chemical Properties that Affect Disposal: N/A
Sewage Disposal: N/A
Special Precautions for Landfills or Incineration: N/A

XIV. TRANSPORT INFORMATION

The proper shipping name and/or hazard class for this product may vary according to packaging, properties and mode of transportation. Typical proper shipping names for this product are:

Transportation Mode: **DOT**
DOT Status: Non-Regulated
UN/ID Number:
Proper Shipping Name:
Technical Name:
Hazard Class (subclass):
Packing Group:

Transportation Mode: **IATA/ICAO**
IATA/ICAO Status: Non-Regulated
UN/ID Number:
Proper Shipping Name:
Technical Name:
Hazard Class (subclass):
Packing Group:

Transportation Mode: **IMDG**
IMDG Status: Non-Regulated
UN/ID Number:
Proper Shipping Name:
Technical Name:
Hazard Class (subclass):
Packing Group:

Other Information:
Harmonized Tariff Number: Not available
Flash Point: Not available
RQ lbs: Not available
RQ Component(s): Not available

XV. REGULATORY INFORMATION

US Federal Regulations:

OSHA Hazard Communication Status: Hazardous

TSCA: The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.

CERCLA: EPA Hazardous Substances (40 CFR 302):

Chemical Name	CERCLA Reportable Quantity (RQ)
None	

SARA TITLE III (Sections 302, 311, 312, and 313):

Section 302 Extremely Hazardous Substances (40 CFR 355):

Chemical Name	CAS#	RQ	TPQ
None			

Section 311 and 312 Health and Physical Hazards:

Immediate	Delayed	Fire	Pressure	Reactivity
yes	no	no	no	no

Section 313 Toxic Chemicals (40 CFR 372):

Chemical Name	CAS Number	Percent by Weight
None		

US State Regulations:
California Proposition 65: This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

There are no known additional requirements necessary for compliance with State Right to Know Regulations.

International Inventories:
Inventory name:

Country(s) or region Inventory name:	On inventory (yes/no)
Canada Domestic Substances List (DSL):	Yes
Canada Non-Domestic Substances List (NDSL):	No

XVI. OTHER INFORMATION

Revision Date:	04/28/2014
Revision Number:	1
Reason for revision:	NEW

NOTICE: The information accumulated herein is believed to be accurate based on the information provided, although no guarantee or warranty, either expressed or implied is made as to the accuracy or completeness of this information, whether originating with this company or not. Recipients are advised to confirm in advance of need that the information is correct, applicable and suitable to their circumstances. The conditions or methods of handling, storage, use and disposal of the product and container 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 or use of this information or product. If the product is used as a component in another product, this information may not be applicable.

ZEE COMPANY
A Member of The Vincit Group

Safety Data Sheet
acc. to OSHA HCS

Printing date 06/26/2015 Reviewed on 06/26/2015

1 Identification

· **Product identifier**
Industrial water treatment compound
Antimicrobial

· **Trade name:** BIOTROL 15 (EPA REG 10324-42-12446)

· **Article number:** WBO21A

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
ZEE COMPANY, INC.
4146 South Creek Road
Chattanooga, TN 37406

· **Information department:** Technical Services: 423-698-1401
· **Emergency telephone number:** CHEMTREC: 800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**

Flame

Flam. Liq. 3 H226 Flammable liquid and vapour.

Corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Eye Dam. 1 H318 Causes serious eye damage.

Acute Tox. 4 H302 Harmful if swallowed.
STOT SE 3 H335 May cause respiratory irritation.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Harmful
Harmful if swallowed.

Irritant
Irritating to eyes, respiratory system and skin.
Flammable.

· **Information concerning particular hazards for human and environment:**
The product has to be labeled due to the calculation procedure of international guidelines.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Printing date 06/26/2015 Reviewed on 06/26/2015

Trade name: BIOTROL 15 (EPA REG 10324-42-12446)

(Contd. of page 1)

· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Code letter and hazard designation of product:**

Harmful

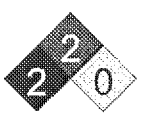
· **Hazard-determining components of labeling:**
Alkyl dimethyl benzyl ammonium chloride (C12-16)

· **Risk phrases:**
Flammable.
Harmful if swallowed.
Irritating to eyes, respiratory system and skin.

· **Safety phrases:**
Keep container tightly closed.
Keep away from sources of ignition - No smoking.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
This material and its container must be disposed of as hazardous waste.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 2
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 2
Fire = 2
Reactivity = 0

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

68424-85-1	Alkyl dimethyl benzyl ammonium chloride (C12-16)	50-65%
64-17-5	ethanol	2.5-10%

USA

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4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** Remove to fresh air. If symptoms persist consult a doctor.
· **After skin contact:**
Get medical attention immediately. Wash with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 15 minutes. Wash clothing before reuse. Destroy contaminated shoes.
· **After eye contact:**
Immediately flush open eye with running water for a minimum of 15 minutes. Immediately get medical attention.
· **After swallowing:**
Immediately contact a doctor or Poison Control Center.
Do not induce vomiting. Rinse mouth. If vomiting should occur spontaneously, keep airway clear. Never give anything by mouth to an unconscious person.
· **Most important symptoms and effects, both acute and delayed**
No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO_2, sand, extinguishing powder. Do not use water.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**
Can form explosive gas-air mixtures.
During fire, gases hazardous to health may be formed.
· **Advice for firefighters**
In case of fire and/or explosion do not breathe fumes. Move containers away from fire area if you can do so without risk.
· **Protective equipment:**
Wear fully protective suit.
Wear self-contained respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.

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See Section 13 for disposal information.

7 Handling and storage

· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Keep this and all chemicals out of the reach of children.
Store in a cool, dry, well ventilated area.
Do not store in direct sunlight.
· **Information about storage in one common storage facility:**
Store away from incompatible materials.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
64-17-5 ethanol	
PEL	Long-term value: 1900 mg/m³, 1000 ppm
REL	Long-term value: 1900 mg/m³, 1000 ppm
TLV	Short-term value: 1880 mg/m³, 1000 ppm

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
· **Breathing equipment:** Use suitable respiratory protective device in case of insufficient ventilation.
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

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· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**

Tightly sealed goggles

· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	Colorless to Beige
· **Odor:**	Almond
· **Odor threshold:**	Not determined.
· **pH-value at 20 °C (68 °F):**	8
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	47 °C (117 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	425 °C (797 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not determined.
· **Density at 20 °C (68 °F):**	0.96 g/cm³ (8.011 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Fully miscible.

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Trade name: BIOTROL 15 (EPA REG 10324-42-12446)

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· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Solvent content:**	
VOC content:	5 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability** Stable
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** Strong oxidizing agents, extreme heat, or open flames.
· **Incompatible materials:** Strong oxidizing agents
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** Caustic effect on skin and mucous membranes.
· **on the eye:** Strong irritant with the danger of severe eye injury.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**		
64-17-5	ethanol	1

· **NTP (National Toxicology Program)**
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Bioaccumulative potential** No further relevant information available.

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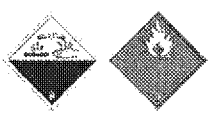
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Dispose of in accordance with federal, state, and local regulations.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN2920
· **UN proper shipping name**	
· **DOT, IATA**	Corrosive liquids, flammable, n.o.s. (Quaternary Ammonium Compound, Ethanol)
· **IMDG**	Corrosive liquids, flammable, n.o.s. (Quaternary Ammonium Compound, Ethanol (Ethyl alcohol))
· **Transport hazard class(es)**	
· **DOT**	
	
· **Class**	3 Flammable liquids
· **Label**	8+3
· **Class**	3 Flammable liquids
· **Label**	8+3
· **IMDG, IATA**	
· **Class**	3 Flammable liquids
· **Label**	8+3
· **Packing group**	
· **DOT, IMDG, IATA**	II

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Trade name: BIOTROL 15 (EPA REG 10324-42-12446)

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· Environmental hazards:	
· Marine pollutant:	No
· Special precautions for user	Warning: Flammable liquids
· Danger code (Kemler):	36
· EMS Number:	F-E,S-C
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information:	
· DOT	
· Quantity limitations	On passenger aircraft/rail: 1 L On cargo aircraft only: 30 L
· IMDG	
· Limited quantities (LQ)	5L
· Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· UN "Model Regulation":	UN2920, Corrosive liquids, flammable, n.o.s. Quaternary Ammonium Compound, Ethanol (Ethyl alcohol)), 8 (3), II

15 Regulatory information

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

· Section 355 (extremely hazardous substances):
None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):
None of the ingredients is listed.

· TSCA (Toxic Substances Control Act):
All ingredients are listed.

· Proposition 65

· Chemicals known to cause cancer:
None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:
None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:
None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

64-17-5	ethanol

· Carcinogenic categories

· EPA (Environmental Protection Agency)
None of the ingredients is listed.

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· TLV (Threshold Limit Value established by ACGIH)		
64-17-5	ethanol	A3

· NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients is listed.

· **Product related hazard informations:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Hazard symbols:**

Harmful

· **Hazard-determining components of labeling:**
Alkyl dimethyl benzyl ammonium chloride (C12-16)

· **Risk phrases:**
Flammable.
Harmful if swallowed.
Irritating to eyes, respiratory system and skin.

· **Safety phrases:**
Keep container tightly closed.
Keep away from sources of ignition - No smoking.
Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
This material and its container must be disposed of as hazardous waste.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Contact:** Jim Faller/Keith Seyfried
· **Date of preparation / last revision** 06/26/2015 / -
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
Flam. Liq. 3: Flammable liquids, Hazard Category 3
Acute Tox. 4: Acute toxicity, Hazard Category 4
Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1
STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3

2015

WATER engineering inc

SAFETY DATA SHEET GGS 2463

Boost Plus

H81 SAFETY DATA SHEETS

PRODUCT USE: Water Treatment Polymer Solution

REVISION DATE: August 2011

1. PRODUCT AND COMPANY INFORMATION

Water Engineering Inc.
1574 County Rd 10
Mead, NE 68041

24 HOUR EMERGENCY TELEPHONE: (800) 255-3924
ACCOUNT NUMBER: MIS0004338
TO REQUEST AN MSDS: Contact Product Manager
CUSTOMER SERVICE: (800) 476-5545

MSDS NUMBER:

PREPARED DATE: November 2008

2. HAZARDS CLASSIFICATION

OSHA REGULATORY STATUS: NON-REGULATED MATERIAL
GHS CLASSIFICATION: Not applicable
GHS SYMBOL: Not applicable
GHS SIGNAL WORD: Not applicable
GHS HAZARD STATEMENT: Not applicable

EMERGENCY OVERVIEW:
COLOR: Clear – Lt. Amber
PHYSICAL FORM: Liquid
ODOR: Slight
SIGNAL WORD: Not applicable
MAJOR HEALTH HAZARDS: Can cause irritation or severe burns to eh eyes, nose, throat, mucous membranes, or skin. Corrosive to mucous membranes of the mouth, throat, and esophagus.
PHYSICAL HAZARDS: Data not available
ECOLOGICAL HAZARDS: Data not available
PRECAUTIONARY STATEMENTS: Data not available

POTENTIAL HEALTH EFFECTS:
INHALATION: Mists may be irritating to eyes, nose, throat and mucous membranes.
SKIN CONTACT: May cause irritation or dermatitis; possible burns with prolonged or repeated contact.
EYE CONTACT: Severe irritation, possible burns or permanent eye injury.
INGESTION: Corrosive to mucous membranes of mouth, throat and esophagus.

TARGET ORGANS: Not available
CHRONIC EFFECTS: None known

CARCINOGEN STATUS:
OSHA: No
NTP: No
IARC: No

See Section 11: TOXICOLOGICAL INFORMATION

3. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT: 1-Hydroxyethylene 1, 3 Diphosphonic acid
CAS NUMBER: 2809-21-4
PERCENTAGE: 15-40%

The remaining components are non-hazardous, proprietary information

4. FIRST AID MEASURES

INHALATION: Remove to fresh air. Get medical attention if symptoms persist.

WATER

SAFETY DATA SHEET

Boost Plus

PRODUCT USE: Water Treatment Polymer Solution **REVISION DATE:** August 2011

SKIN CONTACT: Wash with soap and plenty of water. Remove contaminated clothing. Get medical attention if irritation persists.

EYE CONTACT: Immediately flush with plenty of water for 15 minutes. Get medical attention.

INGESTION: DO NOT INDUCE VOMITING. If conscious, give water or milk to dilute. Get medical attention.

NOTE TO PHYSICIAN: Not available

5. FIRE FIGHTING HAZARDS

FIRE AND EXPOLOSION HAZARDS: Dried product may burn.

EXTINQUISHING MEDIA: As for surrounding fire (this product will not burn).

FIRE FIGHTING: Wear self-contained breathing equipment. Avoid exposure to mists and splashes. Cool fire-exposed containers and structures with water spray.

SENSITIVITY TO MECHANICAL IMPACT: Not available

SENSITIVITY TO STATIC DISCHARGE: Not available

FLASH POINT: None

HAZARDOUS COMBUSTION PRODUCTS: Not available

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE: Cleanup personnel should wear protective equipment.

Small Spills: Soak up and place in containers.

Large Spills: Dike to contain, reclaim all possible. Soak up remaining with inert absorbent and place in containers for disposal, or dilute with water and carefully neutralize with soda ash or lime and pickup for disposal. Consult authorities before discharging waste.

7. HANDLING AND STORAGE

STORAGE: Keep away from heat and flame. Keep out of reach of children.

HANDLING: Avoid breathing mists. Do not get in eyes, on skin or clothing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS: Not available

BIOLOGICAL LIMIT VALUES: Not available

VENTILATION: As needed to control mists.

EYE PROTECTION: Chemical safety goggles.

CLOTHING: Wear proper clothing to minimize skin contact.

GLOVES: Rubber or neoprene

PROTECTIVE MATERIAL TYPES: Not available

RESPIRATOR: Not normally required. NIOSH approved mist respirator if mist in air causes irritation.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:		**VAPOR DENSITY:**	As water
COLOR:	Clear – Lt. Amber	**SPECIFIC GRAVITY (water=1.000):**	1.15 - 1.25
PHYSICAL FORM:	Liquid	**BULK DENSITY:**	Not available
ODOR:	Slight	**WATER SOLUBILITY:**	Complete
BOILING POINT:	212°F	**pH:**	< 3
MELTING POINT:	Not available	**VOLATILITY:**	Not available
FLASH POINT:	None	**ODOR THRESHOLD:**	Not available
DECOMPOSITION POINT:	Not available	**EVAPORATION RATE:**	1
VAPOR PRESSURE:	As water	**COEFFICIENT OF WATER/OIL DISTRIBUTION:**	Not available

WATER

SAFETY DATA SHEET

Boost Plus

PRODUCT USE: Water Treatment Polymer Solution **REVISION DATE:** August 2011

10. STABILITY AND REACTIVITY

REACTIVITY:	Stable
CONDITIONS TO AVOID:	None
INCOMPATIBILITIES:	There are no known materials which are incompatible with this product. However, avoid temperatures above 230°C/446°F, the onset of polymer decomposition. Thermal decomposition is dependent on time and temperature.
HAZARDOUS DECOMPOSITION:	Thermal decomposition may yield acrylic monomers, oxides of nitrogen, carbon or phosphorus
POLYMERIZATION:	Not available

11. TOXICOLOGICAL INFORMATION

Boost Plus:

IRRITATION DATA:	Not available
TOXICITY DATA:	Not available
CARCINOGEN STATUS:	None under OSHA, IARC or NTP.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:	Not available
ALGAL TOXICITY:	Not available
FATE AND TRANSPORT:	Not available
BIODEGRATION:	Not available
PERSISTANCE:	Not available
BIOCONCENTRATION:	Not available
OTHER ECOLOGICAL INFORMATION:	Not available

13. DISPOSAL CONSIDERATIONS

Trained and properly equipped personnel may dilute and neutralize wastes with dilute alkali for disposal of in accordance with Federal, State and local regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME:	NON-REGULATED MATERIAL
ID NUMBER:	Not applicable
HAZARD CLASS OF DIVISION:	Not applicable
PACKING GROUP:	Not applicable
LABELING REQUIREMENTS:	Not applicable

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME:	NON-REGULATED MATERIAL
UN NUMBER:	Not applicable
CLASS:	Not applicable
PACKING GROUP/RISK GROUP:	Not applicable

15. REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

WATER

SAFETY DATA SHEET

Boost Plus

PRODUCT USE: Water Treatment Polymer Solution **REVISION DATE:** August 2011

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE:	NO
CHRONIC:	NO
FIRE:	NO
REACTIVE:	NO
SUDDEN RELEASE:	NO

SARA TITLE III SECTION 313 (40 CFR 372.65):

OSHA PROCESS SAFETY (29 CFR 1901.119):

OTHER U.S. REGULATIONS:

STATE REGULATIONS:
California Proposition 65:

NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW:
REPORTING REQUIREMENT:
(LIST CHEMICAL, CAS NUMBER, PERCENTAGE)

SPECIAL HEALTH HAZARD SUBSTANCE LIST:
(LIST CHEMICAL, CAS NUMBER, PERCENTAGE)

PENNSLYVANIA RIGHT TO KNOW:
REPORTING REQUIREMENT:
(LIST CHEMICAL, CAS NUMBER, PERCENTAGE)

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION:

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA):

TSCA 12(b) EXPORT NOTIFICATION:

CANADA INVENTORY (DSL/NDSL):

16. OTHER INFORMATION

NFPA RATINGS (SCALE 0-4):	HEALTH=	1	FIRE=	0	REACTIVITY=	0	B
HMIS RATINGS (SCALE 0-4):	HEALTH=	1	FIRE=	0	REACTIVITY=	0	B

Disclaimer:
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

The above information is not claiming characteristics of the product in term of legal claims of performance / guarantee. This information only describes safety measures and no liability may arise from the use or application of the product described herein. This information is given in good faith and based on our current knowledge of the product.

Univar
3075 Highland Pkwy STE 200
Downers Grove, IL 60515
425-889-3400

SAFETY DATA SHEET

1. Identification

Product identifier: CAUSTIC SODA 50%

Other means of identification

Synonyms: Sodium Hydroxide

SDS number: 000100000088

Recommended use and restriction on use

Recommended use: Not available.

Restrictions on use: Not known.

nergency telephone number:For emergency assistance Involving chemicals

call CHEMTREC day or night at: 1-800-424-9300. CHEMTREC INTERNATIONAL Tel# 703-527-3887

2. Hazard(s) identification

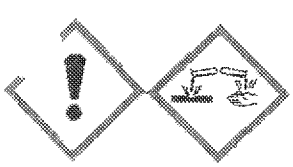
Hazard classification

Health hazards

Acute toxicity (Oral)	Category 4
Skin corrosion/irritation	Category 1A
Serious eye damage/eye irritation	Category 1
Environmental hazards Acute hazards to the aquatic environment	Category 3

Label elements

Hazard symbol



Signal word	Danger
Hazard statement	Corrosive. Harmful if swallowed. Causes severe skin burns and eye damage.
Precautionary statement	
Prevention	Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe dust or mists. Wear protective gloves/protective clothing/eye protection/face protection.
Response	IF INHALED: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. IF SWALLOWED: Call a POISON CENTER/doctor/ if you feel unwell. Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER/doctor. Specific treatment (see this label). Wash contaminated clothing before reuse.
Storage	Store in a closed container. Keep container tightly closed. Store in a well-ventilated place. Store in a dry place. Store locked up.
Disposal	Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.
Other hazards which do not result in GHS classification	None.

3. Composition/information on ingredients

Substances

Chemical identity	Common name and synonyms	CAS number	Content in percent (%)*
Sodium hydroxide		1310-73-2	>=48 - <=52%
Water		7732-18-5	>=48 - <=52%
Sodium Chloride		7647-14-5	>=0 - <=5%

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

4. First-aid measures

ıeral information: CAUTION! First aid personnel must be aware of own risk during rescue!

estion: Do NOT induce vomiting. Never give liquid to an unconscious person. Get medical attention immediately.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. Perform artificial respiration if breathing has stopped. Get medical attention immediately.

Skin contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Eye contact: If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor.

Most important symptoms/effects, acute and delayed

Symptoms: No data available.

Indication of immediate medical attention and special treatment needed

Treatment: No data available.

5. Fire-fighting measures

General fire hazards: No data available.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Use: Powder. In case of fire in the surroundings: all extinguishing agents allowed.

Unsuitable extinguishing media: No data available.

Specific hazards arising from the chemical:	No data available.

Special protective equipment and precautions for firefighters

Special fire fighting procedures:	No data available.
Special protective equipment for fire-fighters:	No data available.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	Use personal protective equipment. Keep unauthorized personnel away.
Methods and material for containment and cleaning up:	Absorb spillage with non-combustible, absorbent material. Dike for later disposal.

7. Handling and storage

.cautions for safe handling:	Use personal protective equipment as required. Use only with adequate ventilation. Container must be kept tightly closed.
Conditions for safe storage, including any incompatibilities:	No data available.

8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Chemical identity	Type	Exposure Limit values	Source
Sodium hydroxide	Ceiling	2 mg/m3	US. ACGIH Threshold Limit Values (03 2013)
	Ceil_Time	2 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceiling	2 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	Ceiling	2 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)
Sodium hydroxide - Particulate.	ST ESL	20 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (02 2013)
	AN ESL	2 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (02 2013)
Sodium hydroxide	Ceiling	2 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (02 2012)

Appropriate engineering controls No data available.

Individual protection measures, such as personal protective equipment

General information: Use personal protective equipment as required. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned. Practice good housekeeping.

Eye/face protection: Use personal protective equipment as required. Wear goggles/face shield.

Skin protection

Hand protection: No data available.

Other: No data available.

Respiratory protection:	No data available.
Hygiene measures:	No data available.

9. Physical and chemical properties

Physical state:	Liquid
Form:	No data available.
Color:	No data available.
Odor:	No data available.
Odor threshold:	No data available.
pH:	14
Melting point/freezing point:	-12 - 10 °C
Initial boiling point and boiling range:	105 - 140 °C
Flash Point:	No data available.
poration rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	No data available.
Vapor density:	No data available.
Relative density:	No data available.
Solubility(ies)	
Solubility in water:	No data available.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. Stability and reactivity

Reactivity:	No data available.
Chemical stability:	No data available.
Possibility of hazardous reactions:	No data available.
Conditions to avoid:	No data available.
Incompatible materials:	No data available.
Hazardous decomposition products:	No data available.

11. Toxicological information

Symptoms related to the physical, chemical and toxicological characteristics

Ingestion:	No data available.
Inhalation:	No data available.
Skin contact:	No data available.
Eye contact:	No data available.

rmation on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: ATEmix (): 353.488372 mg/kg

Dermal

Product:

Not classified for acute toxicity based on available data.

Inhalation

Product: No data available.

Specified substance(s):

Sodium Chloride — LC 50 (Rat,): > 42 mg/l 2 (reliable with restrictions)

Repeated dose toxicity

Product: No data available.

Skin corrosion/irritation

Product: No data available.

Serious eye damage/eye irritation

Product: No data available.

Respiratory or skin sensitization

Product: No data available.

Carcinogenicity

Product: No data available.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogenic components identified
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):
No carcinogenic components identified

Germ cell mutagenicity
In vitro
Product: No data available.
In vivo
Product: No data available.

Reproductive toxicity
Product: No data available.

Specific target organ toxicity - single exposure
Product: No data available.

ecific target organ toxicity - repeated exposure
Product: No data available.

Aspiration hazard
Product: No data available.

Other effects: No data available.

12. Ecological information

Ecotoxicity:
Acute hazards to the aquatic environment:
Fish
Product: No data available.
Specified substance(s):
Sodium hydroxide — LC 50 (Western mosquitofish (Gambusia affinis), 24 h): 125 mg/l Mortality LC 50 (Guppy (Poecilia reticulata), 24 h): 145 mg/l Mortality LC 50 (Goldfish (Carassius auratus), 24 h): 160 mg/l Mortality LC 50 (Bony fish superclass (Osteichthyes), 48 h): 33 - 100 mg/l Mortality LC 50 (Western mosquitofish (Gambusia affinis), 48 h): 125 mg/l Mortality

Aquatic invertebrates
Product: No data available.
Specified substance(s):
Sodium hydroxide — EC 50 (Water flea (Ceriodaphnia dubia), 48 h): 34.59 - 47.13 mg/l Intoxication LC 50 (Common shrimp, sand shrimp (Crangon crangon), 48 h): 33 - 100 mg/l Mortality LC 50 (Cockle (Cerastoderma edule), 48 h): 330 -

1,000 mg/l Mortality

Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Aquatic invertebrates

Product: No data available.

Toxicity to Aquatic Plants

Product: No data available.

Persistence and degradability

Biodegradation

Product: No data available.

BOD/COD ratio

Product: No data available.

Bioaccumulative potential

Bioconcentration factor (BCF)

Product: No data available.

Partition coefficient n-octanol / water (log Kow)

Product: No data available.

ability in soil: No data available.

Known or predicted distribution to environmental compartments

Sodium hydroxide	No data available.
Water	No data available.
Sodium chloride	No data available.

Known or predicted distribution to environmental compartments

Water	No data available.

13. Disposal considerations

Disposal instructions: No data available.

Contaminated packaging: No data available.

14. Transport information

DOT

UN number:	UN 1824
UN proper shipping name:	Sodium hydroxide solution
Transport hazard class(es)	
Class:	8
Label(s):	8
Packing group:	II
Marine Pollutant:	Not regulated.

Special precautions for user:	–
IMDG	
UN number:	UN 1824
UN proper shipping name:	SODIUM HYDROXIDE SOLUTION
Transport hazard class(es)	
Class:	8
Label(s):	8
EmS No.:	F-A, S-B
Packing group:	II
Marine Pollutant:	Not regulated.
Special precautions for user:	–
IATA	
UN number:	UN 1824
Proper Shipping Name:	Sodium hydroxide solution
Transport hazard class(es):	
Class:	8
Label(s):	8
Packing group:	II
Environmental hazards	Not regulated.
Special precautions for user:	–
Other information	
Passenger and cargo aircraft:	Allowed.
Cargo aircraft only:	Allowed.

15. Regulatory information

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

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

Sodium hydroxide Reportable quantity: 1000 lbs.

Superfund amendments and reauthorization act of 1986 (SARA)

Hazard categories

Not listed.

SARA 302 Extremely hazardous substance

None present or none present in regulated quantities.

SARA 304 Emergency release notification

Chemical identity	RQ
Sodium hydroxide	1000 lbs.

SARA 311/312 Hazardous chemical

Chemical identity	Threshold Planning Quantity
Sodium hydroxide	500 lbs
Sodium Chloride	500 lbs

SARA 313 (TRI reporting)

None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

Sodium hydroxide Reportable quantity: 1000 lbs.

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

None present or none present in regulated quantities.

state regulations

US. California Proposition 65

No ingredient regulated by CA Prop 65 present.

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

Sodium hydroxide Listed

US. Massachusetts RTK - Substance List

Sodium hydroxide Listed

US. Pennsylvania RTK - Hazardous Substances

Sodium hydroxide Listed

US. Rhode Island RTK

Sodium hydroxide Listed

Inventory Status: Australia AICS:	Not in compliance with the inventory.
Canada DSL Inventory List:	Not in compliance with the inventory.
EU EINECS List:	Not in compliance with the inventory.
EU ELINCS List:	Not in compliance with the inventory.
Japan (ENCS) List:	Not in compliance with the inventory.
EU No Longer Polymers List:	Not in compliance with the inventory.
China Inv. Existing Chemical Substances:	Not in compliance with the inventory.
Korea Existing Chemicals Inv. (KECI):	Not in compliance with the inventory.
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	Not in compliance with the inventory.
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	Not in compliance with the inventory.
Japan ISHL Listing:	Not in compliance with the inventory.
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

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

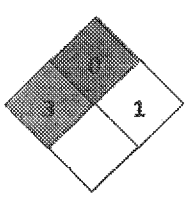
HMIS Hazard ID

Health	*	3
Flammability		0
Physical Hazards		1
PERSONAL PROTECTION		B

B - Safety Glasses & Gloves

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; *Chronic health effect

NFPA Hazard ID



Flammability
Health
Reactivity
Special hazard.

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

Issue date:	04/29/2015
Revision date:	No data available.
Version #:	1.2
Further information:	No data available.

Univar USA Inc Safety Data Sheet

For Additional Information contact SDS Coordinator during business hours, Pacific time: (425) 889-3400

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GGS 2871 H81 SAFETY DATA SHEETS

Consolidated Water Solutions

Affiliates in Water Treatment Technology

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Chemical Emergency Call Infotrac (800) 535-5053 / 24hrs / 7 days a week

Material Safety Data Sheet

CC 103

R.D. Brock

Section 1 Product Identification

Product Name: CC 103
Revision Date: June 13, 2007

Section 2 Composition / Information On Ingredients

Component	CAS#	Wt%
2, 2–Dibromo–3 nitrilopropion amide	10222-01-2	20%
Polyethylene glycol	25322-68-3	50%
Non-Hazardous Ingredients		30%

Section 3 Hazards Identification

Emergency Overview: Clear, yellow to amber liquid. Corrosive, causes irreversible eye damage. May be fatal if swallowed. Harmful if inhaled or absorbed through skin.
Potential Health Effects:
Eyes: May cause pain disproportionate to the level of irritation to eye tissues. May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Skin: Prolonged contact may cause severe skin irritation with local redness and discomfort. Repeated exposure may cause irritation, even a burn. May cause more severe response if skin is abraded (scratched or cut). Prolonged skin contact is unlikely to result in absorption of harmful amounts. A similar formulation with less active ingredient has caused allergic skin reactions when tested in guinea pigs. Did not cause allergic skin reactions when tested in humans.
Ingestion: Low to moderate toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause serious injury, even death.
Inhalation: Mist may cause irritation of upper respiratory tract (nose and throat). Trace levels of cyanogen bromide and dibromoacetonitrile vapors may be present in unvented containers and may be irritating.
Systemic (Other Target Organs) Effects: Excessive exposure may increase the blood and tissue levels of bromine. Observations in animals include kidney effects following repeated ingestion of active ingredient, but no evidence of systemic toxicity following repeated dermal exposure at maximum attainable doses.
Cancer Information: No relevant information found.
Teratology (Birth Defects): For the active ingredient(s). Did not cause birth defects in laboratory animals. Has been toxic to the fetus in lab animals only at doses toxic to the mother.
Reproductive Effects: No relevant information found.

Section 4 First Aid Measures

Eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
Skin: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
Ingestion: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. DO NOT induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.
Inhalation: Remove to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advise.
Note to Physician: Probably mucosal damage may contraindicate the use of gastric lavage.

Material Safety Data Sheet
CC 103

Section 5 Fire Fighting Measures

Flash Point: 159-156 C
Flammable/Explosion Limits: Not available
Auto-ignition Temperature: Not available
Suitable Extinguishing Media: Dry powder, carbon dioxide or water spray
Fire Fighting Procedure: Cool containers with water spray. Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) in positive pressure mode. Do not release runoff from fire control methods to sewers or waterways.
Unusual Fire and Explosion Hazards: Decompose with liberation of oxygen, paper, cloth or other absorbent materials saturated with this product may ignite spontaneously.
Hazardous Combustion Products: Release oxygen, toxic fumes of: Bromine, Hydrogen bromide and Nitrogen oxides.

HMIS Ratings :
Health: 2 **Flammability: 1** **Reactivity: 0** **Other: J (protective equipment)**

Section 6 Accidental Release Measures

Personal Precautions: Wear self-contained breathing apparatus in positive pressure mode.
Clean up Methods: Ventilate area and wash spill site after material pickup is complete. Decontaminate spill areal with 10% sodium bicarbonate solution. Absorb decontaminated solution with sand or vermiculite. Place sand or vermiculite in closed container for disposal. Sweep up, place in a suitable container and hold for waste disposal. Avoid access to streams, lakes or ponds.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120)

Section 7 Handling and Storage

Handling: Keep containers tightly closed. Avoid bodily contact. Use recommended safety controls and personal protective equipment. Avoid contact with skin or eyes. Avoid breathing dust or mist.
Storage: Store in a dry, cool, well-ventilated and shaded area, away from heat sources away from incompatible materials (see section 10, "materials to avoid").

Section 8 Exposure Controls / Personal Protection

Ventilation Requirements: Use local exhaust as necessary, especially under mist conditions.
Personal Protective Equipment:
Respiratory: NIOSH-approved respirator
Hand: Rubber gloves
Eye: Chemical safety goggles or face shield with safety glasses.
Skin and Body: Body covering clothes and boots
Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.
Hygiene Measures: Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking. Safety shower and eye bath should be provided.

Section 9 Physical and Chemical Properties

Appearance/Physical State: Clear, light yellow to amber liquid
Vapor Pressure: 17 mm Hg @ 20 C
Boiling Point: Decomposes > 70°C (158°F)
Freezing Point: -25 to -20 C
Water Solubility: Complete
Odor: Light, disinfectant odor
Vapor Density: < 1
Decomposition Temperature: >70°C
Specific Gravity or Density: 1.20-1.30 @ 23°C
% Volatile: <20

Section 10 Stability and Reactivity

Stability: Stable under normal conditions. However, avoid temperature extremes.
Materials to Avoid: Oxidizing agents, reducing agents, strong acids and bases or any type of reactive material
Conditions to Avoid: Exposure to light, heating above decomposition temperature
Hazardous Decomposition Products: Br2, HBr, NOx
Hazardous Polymerization: Will not occur

Material Safety Data Sheet
CC 103

Section 11 Toxicological Information

Note: The toxicological data presented below are the results of studies conducted on an active ingredient 2,2-Dibromonitrilopropionamide.
Acute Toxicity:
Rat oral LD50: 308 mg/kg **Rabbit dermal LD50:** > 2000mg/m^3 **Rat inhalation LC50:** 0.32 mg/l/4 hour
Rabbit eye irritation: Corrosive **Rabbit dermal irritation:** Moderate irritant
Dermal sensitization: Weak sensitizer
Sub-chronic toxicity: Sub-chronic toxicity
-NOEL: 5 mg/kg/day (13 weeks oral, rat)
Chronic toxicity: Not available
Mutagenicity: Not mutagenic by the Ames Test
Genotoxicity: Did not induce DNA repair synthesis in the hepatocytes of male rats in vitro. Not clastogenic in chromosome aberration test with Human lymphocytes. Not clastogenic in chromosomes aberration test with Chinese hamster cells.
Carcinogenicity: Not classified by IARC. Not included in NTP 11th Report on Carcinogens.
Reproductive toxicity: In a 2-generation study in rats, the NOEL for reproduction parameters was >=30 mg/kg/day.
Teratogenicity: Not teratogenic. The NOAEL (for fetal toxicity in rabbits) = 10 mg/kg/day.

Section 12 Ecological Information

Note: The toxicological data presented below are the results of studies conducted on an active ingredient 2,2-Dibromo-3-nitrilopropionamide.
Aquatic Toxicity:

-96 Hour-LC50, Fish	2.3 mg/l (Rainbow trout)
	3.4 mg/l (Sheepshead minnow)
	2.3 mg/l (Bluegill sunfish)
	0.72 mg/l (Mysid shrimp)
	0.37 mg/l (Eastern oyster)
-48 Hour-EC50, Daphnia magna	0.86 mg/l

Avian toxicity:

-Oral LD50, Bobwhite quail	354 mg/kg
-Dietary LC50, Mallard duck	>5620 ppm
-Dietary LC50, Bobwhite quail	>5620 ppm

Germany, water endangering classes (WGK): 3

Section 13 Disposal Considerations

Disposal: Observe all federal, state and local environmental regulations when disposing of this material.

Section 14 Transport Information

DOT: Not regulated for non bulk shipments.

UN No.: 3082
Proper Shipping Name: Environmentally hazardous substance, liquid, n.o.s (2,2-dibromo-3 nitrilopropionamide)
Class: 9- Miscellaneous Hazardous Material
Label: 9
Marking: MARINE POLLUTANT
Packing Group: III

Material Safety Data Sheet
CC 103

Section 15 Regulatory Information

EPA Regulations
Reported in the EPA TSCA Inventory (Acetamide, 2,2-dibromo-2-cyano)
EPA Reg. No.: 8622-20-56567
RCRA Hazardous Waste Number: Product blend is not listed (40 CFR 261.33)
RCRA Hazardous Waste Classification (40 CFR 261.): Product blend is not classified
CERCLA Hazardous Substance (40 CFR 302.4) Product blend is unlisted specific per RCRA, Sec. 3001; CWA, Sec. 311 (b)(4); CWA, Sec. 307 (a), CAA, Sec. 112
CERCLA Reportable Quanitiy (RQ): Not Listed

SARA 313 Codes:
SARA Toxic Chemical (40 CFR 372.65): See CERCLA (RQ)

SARA 302/304 Extremely Hazardous Substance (40 CFR 355)
This product is a hazardous chemical under 29 CFR 1910.1200
SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not listed
Threshold Planning Quantity (TPQ): Not listed
FIFRA: This product is a registered micro-biocide

OSHA Regulations:
Air Contaminant (20 CFR 1910.1000, Table Z-1, Z-1-A): See Section 2
OSHA Specifically Regulated Substance (29 CFR 1910): See Section 2
State Regulations: As a product blend, the materials are generally not listed. Check with your local state regulatory board for more detailed information regarding the specific components of this product.

Section 16 Other Information

Date Reviewed: August 27, 2010

Do not use ingredient information and/or percentages in this MSDS as a product specification. For product specification information, refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Consolidated Water Solutions sales office.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, CONSOLIDATED WATER SOLUTIONS MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND CONSOLIDATED WATER SOLUTIONS CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

******** End of MSDS ********

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Chemical Emergency Call Infotrac (800) 535-5053 / 24hrs / 7 days a week

Safety Data Sheet

CC 3000

Section 1 Product Identification

Product Name: CC3000 Scale Inhibitor PBTC / PMA / PCA
Product Code: CC3000 Scale Inhibitor
Product Use: Scale Inhibitor
Revision Date: March 2, 2015

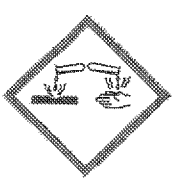
Manufacturer: Consolidated Water Solutions
10100 J St.
Omaha, NE 68127
www.consolidatedh2o.com
sales@consolidatedh2o.com
(800) 852-1150

Emergency Telephone #: Infotrac (800) 535-5053

ection 2 Hazards Identification

zardous Classification: Corrosive Liquid

Signal Word: DANGER



Signal Word: Danger Hazard Statement(s)
Primary Hazard Type: Skin Corrosion/Irritation
Secondary Hazard Type: None
Special health and handling considerations: Use good industrial practices when handling. Avoid eye, skin, and clothing contact.

Likely Exposure Routes: Eyes, Ingestion, Inhalation, Skin

Exposure Effects:
Eyes: May cause physical discomfort to the respiratory tract.
Skin: Prolonged contact may cause mild skin irritation.
Ingestion: May cause nausea and vomiting. May cause irritation to the mouth, throat and stomach.
Inhalation: Causes severe irritation (tears, blurred vision and redness) May result in permanent eye damage.
rget Organs: Not Determined

ential Carcinogens as listed by OSHA, IARC, or NTP: NONE

Other Possible Health Effects: See Section 11 for more information.

Potential Environmental Effects: Not considered to be harmful to aquatic life.

Section 3 Composition / Information On Ingredients

Chemical Name: CC3000 Scale Inhibitor

omponent	CAS #	Wt. % by Volume*
2-Phosponobutane-1,2,4-ButaneTricarboxylic Acid (PBTC)	37971-36-1	14-16%
Polymaleic Acid (PMA)	26099-09-2	11-13%
Polycarboxylic Acid (PCA)	77-92-9	9-11%

Section 4 First Aid Measures

Inhalation: Move to fresh air. Remove any contaminated clothing. If breathing is difficult, administer oxygen. Get medical attention.
Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. Get immediate medical attention.
Eyes: Immediately flush with water for at least 15 minutes or until the chemical is removed. Get medical attention!
Skin: Wash off immediately with soap and water. If clothing is contaminated, remove and launder before reuse.
Special instructions for physicians: Follow usual and customary procedures

Section 5 Fire Fighting Measures

Fire fighting measures: Standard procedure for chemical fires.
Fire fighter protection: Vapors and fumes may be irritating and toxic. Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.
Suitable extinguishing media: Carbon dioxide, dry chemical, foam or water spray.
Unsuitable extinguishing media: Not applicable

with any chemical fire, combustion products of unknown toxicity are always possible.

Section 6 Accidental Release Measures

Containment methods: If possible, stop further leakage of the material. Contain spilled material by diking with nonflammable diking materials.
Clean-Up methods: Neutralize spilled material. Pump spilled liquid into disposal container.
Environmental precautions: This material is a water pollutant. Keep out of drains, sewers, ditches and waterways. Minimize use of water to prevent environmental contamination.
Spill Reporting Requirements: If the spilled amount is greater than the RQ in section 15, this spill must be reported to the National Response Center.

Section 7 Handling and Storage

Handling: Use good industrial practices when handling. Avoid eye, skin, and clothing contact. Do not inhale mist or vapors. Do not taste or swallow. Use only with adequate ventilation.

Storage: Keep container closed when not in use. Avoid elevated and freezing temperatures.

Section 8 Exposure Controls / Personal Protection

Exposure Guideline Material Name	OSHA TWA	 STEL	ACGIH TWA	 STEL
/maleic Acid (PMA)	NE	NE	NE	NE

Section 8 Exposure Controls / Personal Protection

General Hygiene Considerations: Discard contaminated gloves after use. Have eye-wash facilities in the immediate vicinity. Work in adequately ventilated area. Do not breathe vapors or mist. Minimize any contact with any chemical.
Respiratory Protection: No special respiratory equipment is needed
ye/Face Protection: Wear safety glasses when handling this material
kin Protection: Wear nitrile or latex glove. Wear protective clothing
Engineering Controls: Work in well ventilated areas. Do not breathe vapors or mist.
Other Protective Equipment: Eye wash station and safety shower should be available in immediate work area. Select additional protective equipment based upo9n potential for exposure.

Section 9 Physical and Chemical Properties

Color:	Amber	**VOC Percentage:**	0
Physical State:	Liquid	**Evaporation Rate:**	Not Determined
Odor:	Mild	**Odor Threshold:**	Not Established
Melting Point:	Not Determined	**Coeff. Water/Oil Dist.:**	Not Established
Boiling Point:	<200 F	**Lower Explosive Limit:**	Not Determined
Specific Gravity:	1.156	**Upper Explosive Limit:**	Not Determined
pH:	1-2	**Flash Point:**	Non Flammable
Vapor Pressure:	Not Determined	**Solubility:**	Complete
Vapor Density:	<1		

Section 10 Stability and Reactivity

Stability: Stable
Conditions to Avoid: None know
Incompatible Material: Strong alkalis, strong oxidizing and reducing agents
Hazardous decomposition products: Upon thermal decomposition carbon oxides and nitrogen oxides may form
Possibility of Hazardous Reactions: None expected

ection 11 Toxicological Information

ı he toxicological data below is based on the main component(s)

Acute Effects:

Acute Oral Toxicity:	LD50 (rat) > 5000 mg/Kg
Acute Derma lToxicity:	Not Determined
Acute Inhalation Toxicty:	Not Determined
Sensitizaton:	Not a sensitizer
Acute Eye Irritation:	Severely irritating.
Acute Skin Irritation:	Severely irritating.

Chronic Effects:

Carcinogenicity:	None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGI
Mutagenicity:	One of the components of this products is considered a mutagen
Reproductive Effects:	Not Determine
Teratogenicity:	Not Determine
Synergistic Products:	NONE

Section 12 Ecological Information

The ecological data below is based on the main component(s)

ute Fish Results:

cies	Exposure	LC50
Rainbow Trout	96 hrs.	> 1000 mg/L
Zebra Fish	96 hrs.	> 1000 mg/L

Section 12 Ecological Information

Acute Invertebrate Results:

ɔecies	Exposure	LC50	EC50
Brown Shrimp	96 hrs.	> 10000 mg/L	

Aquatic Plant Results:

Species	Exposure	LC50/EC50
Not Determined		

Persistence/Degradability: Degradation is expected under aerobic and anaerobic conditions
Bioaccumulation/Accumulation: No appreciable bioaccumulation is expected
Mobility in Environment: Not determined.

Section 13 Disposal Considerations

Product is a RCRA Hazardous Waste? D002
Dispose of in accordance with federal, state, and local regulations.

Section 14 Transport Information

US D.O.T. and Canadian TDG (ground)

Proper Shipping Description:
UN3265, CORROSIVE LIQUIDS, ACIDIC, ORGANIC, N.O.S. (Polymaleic Acid), 8, PGII

ICAO (air)
UN3265, CORROSIVE LIQUIDS, ACIDIC, ORGANIC, N.O.S. (Polymaleic Acid), 8, PGII

IMDG (water)
UN3265, CORROSIVE LIQUIDS, ACIDIC, ORGANIC, N.O.S. (Polymaleic Acid), 8, PGII

Section 15 Regulatory Information

FEDERAL REGULATORY INFORMATION
All components are listed in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory:

Title III SARA Section 302
Product contains materials subject to reporting under SARA Section 302? **NO**

CERCLA
Product contains materials subject to reporting under CERCLA (40 CFR302.4) **NO**

Title III SARA Section 313
Product contains materials subject to reporting under SARA Section 313? **NO**

Resource Conservation and Recovery Act (RCRA)
Waste code if a hazardous waste under RCRA (40 CFR 261.20) **D002**

Section 15 Regulatory Information

ATE REGULATORY INFORMATION

California Proposition 65
Product contains materials that are carcinogenic and/or can cause reproductive harm and is subject to warning and discharge requirements under the "Safe Water and Toxic Enforcement Act of 1986": **NO**

Section 15 Regulatory Information

WHMIS Canadian Workplace Hazardous Material Information System
WHMIS Classification: E

FPA 704: National Fire Protection Association

Health: 2 Fire: 0 Reactivity: 0

Section 16 Other Information

Date Reviewed: March2, 2015

Do not use ingredient information and/or percentages in this MSDS as a product specification. For product specification information, refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Consolidated Water Solutions sales office.

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******** **End of MSDS** ********

GGS 2849 H81 SAFETY DATA SHEETS

Consolidated Water Solutions

Affiliates in Water Treatment Technology

10100 "J" Street * Omaha, NE 68127; Toll: (800) 852-1150; Fax: (402) 697-7828; Website: www.consolidatedcompanies.com

Chemical Emergency Call Infotrac (800) 535-5053 / 24hrs / 7 days a week

Material Safety Data Sheet

CC 312 - ASH H_2O

Section 1 Product Identification

Product/Chemical Name: CC 312
Chemical Formula: A Blend of Water Treatment Application Materials

Section 2 Composition / Information On Ingredients

Ingredient Name	CAS Number	% wt or % vol	OSHA PEL TWA STEL	ACGIH TLV TWA STEL	Other
1-Hydroxyethylidene-1, 1, Diphosphonic Acid	2089214	15-25	None Est.		
Polyacrylic Acid based Co-Polymers	None listed	10-20	None Est.		
Non Hazardous Ingredients		55-75			

Section 3 Hazards Identification

Potential Health Effects
Primary Entry Routes: Eye and Skin Contact.
Acute Effects: Irritation to eyes and skin.
Inhalation: High mist concentrations can cause irritation of eyes, nose, throat and lungs.
Eye: Irritation and/or burning sensation to eyes.
Skin: Prolonged or repeated contact may cause skin irritation.
Ingestion: Material is possibly harmful if swallowed.
Carcinogenicity: IARC, NTP, and OSHA do not list this product or its components as a carcinogen.
Medical Conditions Aggravated by Long-Term Exposure: No specific information provided on compounds at date of issue.
Chronic Effects: No studies have been conducted for this product.

HMIS Ratings:
Health = 1 **Fire = 0** **Reactivity = 0** **PPE = C**

Section 4 First Aid Measures

Inhalation: Remove to fresh air. Call a physician if any difficulties persist.
Eye Contact: Flush eyes with a large amount of water for 15 minutes. Seek medical attention immediately if any irritation persists. After first aid, get appropriate in-plant, paramedic or community medical support.
Skin Contact: Wash affected areas thoroughly with soap and water for at least 15 minutes. Seek medical attention if any irritation persists.
Ingestion: If swallowed, give 2 glasses of water to drink. DO NOT induce vomiting. After first aid, seek appropriate in-plant, paramedic, or community medical support. Never give anything by mouth to an unconscious person.
After first aid, get appropriate in-plant, paramedic, or community medical support.

Section 5 Fire Fighting Measures

Flash Point: Non-Flammable **Flash Point Method:** Not Applicable **Burning Rate:** Not Applicable
Autoignition Temperature: Does not burn. **LEL:** NIA **UEL:** NIA
Flammability Classification: Non-Flammable
Extinguishing Media: Water fog, Alcohol foam, Carbon Dioxide, Dry Chemical
Unusual Fire or Explosion Hazards: None known other than material can splatter above 100°C/212°F.

Material Safety Data Sheet
CC 312

Hazardous Combustion Products: Unknown but carbon monoxide may be released on burning.
Fire-Fighting Instructions: Do not release runoff from fire control methods to sewers or waterways.
Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full face piece operated in pressure-demand or positive-pressure mode.

Section 6 Accidental Release Measures

Spill/Leak Procedures:
Small Spills: Absorb spill with paper towel or similar absorbent; or flush to sewer or ground with large amounts of water.
Large Spills:
Containment: For large spills, dike far ahead of liquid spill for later disposal. Do not release into sewers or waterways. Absorb spill with vermiculite, oil dry or similar non-reactant absorbent.
Cleanup: Accumulate the absorbed materials and dispose of according to federal, state and local regulations.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 Handling and Storage

Handling Precautions: Use the recommended safety controls and personal protective equipment as outlined. Fully review all data before handling of the material itself. Avoid contact with skin or eyes. Avoid breathing dust or mist. Keep from contact with clothing and other combustible materials. Observe good personal hygiene and housekeeping practices.
Storage Requirements: Do not store this material near any strong acids, bases, oxidizers, flammables or any other type of reactive material. Do not expose the material to temperature extremes.
Regulatory Requirements: Store materials according to all local, state and federal guidelines that are established for non-regulated chemical products.

Section 8 Exposure Controls / Personal Protection

Engineering Controls:
Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.
Administrative Controls:
Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or nonroutine operations (cleaning spills, reactor vessel, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.
Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye-and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.
Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.
Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 Physical and Chemical Properties

Physical State: Liquid
Appearance and Odor: Light amber liquid, slight odor
Vapor Pressure: Same as water
Vapor Density (Air=1): Same as water
Specific Gravity (H_2O=1, at 4°C): 1.04
pH: 2-4

Water Solubility: Complete
Other Solubilities: Not Determined
Boiling Point: 212F
Freezing/Melting Point: Approx. 32F
% Volatile: 85%+/-
Evaporation Rate: 1.00

Material Safety Data Sheet
CC 312

Section 10 Stability and Reactivity

Stability: This product is stable at room temperature in closed containers under normal storage and handling conditions. However, avoid temperature extremes.
Polymerization: Hazardous polymerization will not occur.
Chemical Incompatibilities: Avoid contact with Strong Acids, Strong Alkalies, Oxidizers or any other type of reactive material.
Conditions to Avoid: Excessive temperatures, contact with any type of reactive chemicals.
Hazardous Decomposition Products: There are no known hazardous decomposition products for this material unless the material is burned in which case undetermined evolution of toxic gases may occur.

Section 11 Toxicological Information

Eye Effects: Irritation to eyes and possible burning if materials are not immediately rinsed from the eyes.
Acute Inhalation Effects: Might produce irritation to respiratory system.
Skin Effects: Irritation to skin.
Acute Oral Effects: Not tested for this blend.
Chronic Effects: No chronic effects are known to be attributable for this product.
Carcinogenicity: No carcinogenic effects are known to be applicable for the formulation components of this product.
Mutagenicity: No mutagenic effects are known to be applicable for the formulation components of this product.
Teratogenicity: No tests performed for this blend.

**See NIOSH, RTECS, for additional toxicity data.

Section 12 Ecological Information

Ecotoxicity: No specific data is available on this product. However, for the chemical components which make up this product, there may be specific data available and in the public domain. Consult the data available for each individual raw material component.
Environmental Fate: No studies have been conducted for this specific product.
Environmental Degradation: Not tested for this product blend.
Soil Absorption/Mobility: Not tested for this product blend.

Section 13 Disposal Considerations

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable federal, state and local regulations.
Disposal Regulatory Requirements:
Container Cleaning and Disposal: Triple rinse the empty containers with water before disposal to re-conditioner, land fill or garbage.

Section 14 Transport Information

DOT Transportation Data (49 CFR 172.101):
Shipping Name: Non Regulated Materials
Hazard Class:
ID No.:
Label Code: B
HMIS Label Code: 100C
Shipping Notations:

Packaging Authorizations
a) Exceptions:
b) Cargo Aircraft Only:

Emergency Response No: None Listed

Quantity Limitations
a) Passenger, Aircraft or Railcar:

Section 15 Regulatory Information

EPA Regulations:
RCRA Hazardous Waste Number: Product blend is not listed (40 CFR 261.33).
RCRA Hazardous Waste Classification (40 CFR 261.): Product blend is not classified.
CERCLA Hazardous Substance (40 CFR 302.4): Product blend is unlisted specific per RCRA, Sec. 3001; CWA, Sec. 311 (b)(4); CWA, Sec. 307 (a), CAA, Sec. 112.
CERCLA Reportable Quantity (RQ), lb(kg)
SARA 313Codes:
SARA Toxic Chemical (40 CFR 372.65): See CERCLA

Material Safety Data Sheet
CC 312

Sara 302/304 Extremely Hazardous Substance (40CFR 355)
SARA EHS (Extremely Hazardous Substance) (40 CFR 355):
Threshold Planning Quantity (TPQ):
Contains: Potassium Hydroxide

OSHA Regulations:
Air Contaminant (20 CFR 1910.1000, Table Z-1, Z-1-A): See Section 2.
OSHA Specifically Regulated Substance (29 CFR 1910.): See Section 2.
State Regulations: As a product blend the materials are generally not listed. Check with your local state regulatory board for more detailed information regarding the specific components of this product.

Section 16 Other Information

Date Reviewed: March 28, 2003

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******** **End of MSDS** ********

GGS 2850 MSDS SAFETY DATA SHEETS 2015

Consolidated Water Solutions

Affiliates in Water Treatment Technology

10100 "J" Street * Omaha, NE 68127; Toll: (800) 852-1150; Fax: (402) 697-7828; Website: www.consolidatedcompanies.com

Chemical Emergency Call Infotrac (800) 535-5053 / 24hrs / 7 days a week

Material Safety Data Sheet

CC 4200 R.O. Anti-scalant

Section 1 Product Identification

Product/Chemical Name: CC 4200
Revision Date: October 7th, 2008

Section 2 Composition / Information On Ingredients

Form: Liquid
Color: Clear

Ingredient Name	CAS Number	OSHA PEL	ACGIH TLV	Other Limits
Proprietary Information		Not Established	Not Established	Eye Irritant

The final components of this product have been reviewed and are confirmed to be listed on the US Toxic Substances Control Act (TSCA) chemical inventory. This product is not transport regulated.

Section 3 Hazards Identification

Routes of Entry: Inhalation, skin absorption, skin contact, eye contact, ingestion
Health Hazards (Acute and Chronic):
Eye contact: Unlikely to cause eye irritation or injury.
Skin contact: Unlikely to cause skin irritation or injury.
Ingestion: Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.
Inhalation: Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable.
Carcinogenicity: This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).
Signs and Symptoms of Exposure: No data.
Aggravated Medical Condition: No data.
Target Organs: No data.
Reproductive Hazard: There is no data available for assessing risk to the fetus from maternal exposure.

Section 4 First Aid Measures

Eyes: If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.
Skin: First aid is not normally required. However, it is recommended that exposed areas to be cleaned by washing with soap and water.
Ingestion: Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.
Inhalation: If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.
Notes to physician:
Hazards: No information available.
Treatment: No information available.

Material Safety Data Sheet
CC 4200

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Water spray, dry chemical, carbon dioxide
Hazardous Combustion Products: No data.
Precautions For Fire-Fighting: Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). Use water spray to cool fire exposed containers and structures until fire is out if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.
Flammability Class for Flammable Liquids: Combustible Liquid Class IIIB

Section 6 Accidental Release Measures

Steps in Case of Released Spill:

Personal precautions: For personal protection see section 8. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Environmental precautions: Prevent spreading over a wide area (e.g. by containment or oil barriers). Do not let product enter drains. Do not flush into surface water or sanitary sewer system.
Methods for cleaning up: Keep in suitable, closed containers for disposal. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Other information: Comply with all applicable federal, state, and local regulations.

Section 7 Handling and Storage

Handling: Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.
Storage: Store in a cool, dry, ventilated area.

Section 8 Exposure Controls / Personal Protection

General advice: These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.
Exposure controls: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.
Respiratory Protection: A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. Protecting provided by air-purifying respirators is limited. Use a positive pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known, or any other circumstances where an air-purifying respirator may not provide adequate protection.
Ventilation Local Exhaust: Ensure mists are removed.
Eye protection: Not required under normal conditions of use. Wear splash-proof safety goggles if material could be misted or splashed into eyes.
Skin and body protection: Wear normal work clothing including long pants, long-sleeved shirts and foot covering to prevent direct contact of the product with the skin. Launder clothing before reuse. If skin irritation develops, contact your facility health and safety professional or your local safety equipment supplier to determine the proper personal protective equipment for you use. Wear resistant gloves (consult your safety equipment supplier).

Material Safety Data Sheet
CC 4200

Section 9 Physical and Chemical Properties

Physical state:	Liquid
Form:	No data
Color:	Clear, amber
Odor:	Odorless
Boiling point/boiling range:	100.00 °C/ 212 °F
Melting point/range:	0 °C/ 32 °F
pH:	4
Flash point:	100 °C/ 212 °F
Evaporation rate:	No data
Explosion limits:	No data
Vapor pressure:	No data
Vapor density:	No data
Density:	1.025 g/cm3 @ 20° C/ 68°F
Solubility:	Completely soluble in water
Partition coefficient:	No data
Log Pow:	No data
Autoignition temperature:	No data

Section 10 Stability and Reactivity

Stability: Stable
Conditions to Avoid: None known
Incompatible products: None known
Hazardous Reactions: Product will not undergo hazardous polymerization.
Thermal decomposition: No data

Section 11 Toxicological Information

Acute oral toxicity: No data
Acute inhalation toxicity: No data
Acute dermal toxicity: No data

Section 12 Ecological Information

Aquatic toxicity

Acute and prolonged toxicity to fish

LC 50 Brachydanio rerio (zebra fish),: >100 mg/l

Acute toxicity to aquatic invertebrates

No data

Environmental fate and pathways:

: 12 mg/g
: 413 mg/g

Section 13 Disposal Considerations

Waste Disposal Method: Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

ection 14 Transport Information

angerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

Material Safety Data Sheet
CC 4200

Section 15 Regulatory Information

California Prop. 65: This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.
SARA Hazard Classification: No SARA Hazards
SARA 313 Component(s)

Reportable quantity- Components

	Health	Flammability	Reactivity	Other
HMIS	1	0	0	
NFPA	1	0	0	

Section 16 Other Information

Date Reviewed: February 7, 2011

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******** **End of MSDS** ********

2012
CS - 25

GGS 2829 H81 SAFETY DATA SHEETS

Section 1 - Chemical Product and Company Identification

H-O-H Water Technology, Inc.

500 South Vermont Street
Palatine, Illinois 60067
Phone Number: (847) 358-7400
www.hohwatertechnology.com

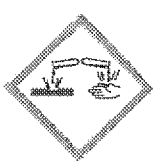
DATE PREPARED: .....June 1, 2015
DATE REVISED:.....NA
CHEMTREC PHONE#:.....1-800-424-9300
PREPARED BY: .....Theresa M. Cairns

PRODUCT NAME: ..... CS - 25
PRODUCT NUMBER:..... 0702500
CHEMICAL FAMILY: ..... Closed system treatment
CHEMICAL FORMULA: ..... Mixture
UN NUMBER: UN1760

Section 2 – Hazard Identification

Signal Word: Danger

GHS Pictogram(s)



Hazard Statement: ..... H314: Causes severe skin burns and eye damage
Precautionary Statement ..... P280: Wear protective gloves/protective clothing/eye protection/face protection
P262: Do not get in eyes, on skin, or on clothing
GHS Health Classification: ..... Skin Corrosion (1B) Serious Eye Damage (1)
GHS Physical Classification: ..... Substances Corrosive to Metal (1)
GHS Environmental Class:..... Unknown aquatic toxicity levels. No data available.

Health	2
Flammability	0
Reactivity	1
Personal Protection	D

Primary Entry Routes: ..... Skin and eye contact.

ACUTE EFFECTS:

Inhalation: ..... Causes severe irritation of the respiratory tract. Nasal, mucous and bronchial tissue may be burned or permanently damaged.

Eye: ..... Causes severe eye ulceration and conjunctivitis. Permanent eye damage may occur.

Skin: ..... Causes severe skin irritation and possible burns and dermatitis.

Ingestion:..... Causes ulceration, bleeding and scarring of the digestive tract. Shock, convulsions, coma and possible death may occur depending on the amount ingested.

Carcinogenicity: ..... This product contains no known or suspected carcinogens.

Chronic Effects: ..... Burns can be slow to heal, but there are no known chronic health hazards.

Section 3 – Composition Information on Ingredients

HAZARDOUS INGREDIENT	PERCENT	CAS NUMBER
Potassium hydroxide	10-20	1310-58-3
Sodium tetraborate	20-30	1330-43-4

Section 4 - First Aid Measures

Inhalation: ..... Remove subject to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Keep subject warm and at rest. Get immediate medical attention.

Eye Contact:.....Flush eyes with water for at least 15 minutes holding eyelids wide open. Get immediate medical attention.

Skin Contact:..... Flush exposed areas with water for 15 minutes. Treat for burns. Get medical attention. Remove exposed clothing and wash well before reuse.

Ingestion:..... Do not induce vomiting. If subject is conscious, give large amounts of water. Get immediate emergency medical attention. Never give anything by mouth to an unconscious person.

Section 5 – Fire-Fighting Measures

Flash Point (F): ..... None

Extinguishing Media: ..... Water fog or spray, foam, dry powder, carbon dioxide (CO_2).

Unusual Fire/Explosion Hazard: Under normal conditions this product will not support combustion or accelerate a fire. However, if contact with other chemicals or electrical services occurs during a fire, hazardous gases may be produced.

Fire Fighting Instructions:..... If possible remove container from fire area. Apply cooling water to container side. Do not release run off from fire control to the sewer or waterway.

Fire Fighting Equipment: ..... Self-contained breathing apparatus with full face piece.

Section 6 – Accidental Release Measures

Spills and Releases: ..... Remove all ignition sources. Contain spill and ventilate the area. Spill can be neutralized with dilute solutions of sulfuric, hydrochloric, or sulfamic acids. Collect spilled material into suitable containers for disposal.

Regulatory Requirements:..... Follow All OSHA Regulations and Standards (29 CFR 1910.120)

Section 7 – Handling and Storage

Handling Precautions: ..... Wear hand and foot protection when moving heavy drums. Protect containers against physical damage.

Storage Requirements:..... Store in a cool, dark well-ventilated area away from direct sunlight and other sources of radiant heat. Keep containers tightly closed when not in use.

Regulatory Requirements:..... Follow All OSHA Regulations and Standards (29 CFR 1910.120)

Section 8 – Exposure Controls / Personal Protection

HAZARDOUS INGREDIENT	OSHA PEL	ACGIH-TLV
Potassium hydroxide	2 mg/m3	2 mg/m3
Sodium tetraborate	10 mgm3	10 mg/m3

Ventilation:..... Use in well-ventilated area with local exhaust.

Respiratory Protection: ..... Not required for ordinary use. During emergency conditions or if a spill occurs, an appropriate OSHA approved air purifying respirator should be worn.

Protective Clothing/Equipment :Safety goggles and a face shield, non-slip vinyl or rubber gloves, protective footwear and an apron should be worn when handling drums.

Safety Stations:..... Safety showers and eyewash stations should be available in work areas.

Contaminated Equipment: ..... Wash all contaminated equipment and clothing before reuse.

Comments:.....Never eat, drink or smoke in work areas.

Section 9 – Physical and Chemical Properties

Physical State:..... Liquid

Appearance & Odor: ..... Clear to pale yellow liquid with no odor

Vapor Pressure ..... Same as water

Vapor Density (Air=1):..... No data available

Density (lbs/gal):..... 11.48

Specific Gravity: 1.376

Water Solubility:.....Miscible

Boiling Point:.....215°F

Freezing Point:.....No data available

% Volatile: .....No data available

Evaporation Rate: .....< 1

pH:.....13-14

Section 10 – Stability and Reactivity

Stability: ..... Stable under normal conditions.

Polymerization:..... Hazardous polymerization will not occur.

Chemical Incompatibilities: ..... Metals (such as aluminum, tin and zinc), acids, bromine and chlorine release agents, oxidizers.

Conditions to Avoid:..... None known

Section 11- Toxicological Information

Irritation:..... Eyes and skin. Inhalation and ingestion.
Acute Effects:..... Causes severe skin burns and eye damage. Moderate to severely corrosive to all body tissues with which it comes in contact.
Chronic Effects:..... Burns can be slow to heal, but there are no known chronic health hazards.
Carcinogenicity: ..... This product contains no known or suspected carcinogens.
Acute Inhalation Effects: ..... Causes severe irritation of the respiratory tract. Nasal, mucous and bronchial tissue may be burned or permanently damaged.
Lethal Dosage (LD50).....LD50 (oral-rat) = 273 mg/kg for pure potassium hydroxide.
LD50 (oral-rat) = 2660 mg/kg for pure sodium tetraborate.

Section 12 – Ecological Information

Ecotoxicity:..... No data available
Environmental Fate:..... No data available

Section 13 – Disposal Considerations

Disposal:..... Consult Federal, State and Local regulations pertaining to waste disposal.
Container Cleaning/Disposal ... Triple rinse empty containers before offering for disposal or salvage. Never reuse empty chemical containers.

Section 14 - Transportation Information

DOT Transportation Data

Shipping Name:..... CORROSIVE LIQUID, N.O.S.
Contains :..... (CONTAINS POTASSIUM HYDROXIDE)
Hazard Class:..... 8
ID No. / UN Code: UN1760
Packaging Group:..... II
Label:..... Corrosive
Reportable Quantity: ..... 6600 lbs.
Emergency Response Guide #:. 154

Section 15 – Regulatory Information

EPA Regulations

RCRA Hazardous Waste Number:.....D002 - corrosive waste
RCRA Hazardous Waste Classification:.....Acute. Corrosive to skin, eyes, and mucous membranes.
CERCLA Hazardous Substance:.....Potassium hydroxide is listed as a CERCLA hazardous substance by the EPA.
CERCLA Reportable Quantity (RQ): .....6600 lbs.
SARA 311/312:.....Immediate (acute) health hazard.
SARA Toxic Chemical:.....Potassium hydroxide, sodium tetraborate.

SARA EHS.....No components of this product are listed as an Extremely Hazardous Substance.

TSCA.....All components of this product are listed on the United States Toxic Substances Control Act (TSCA) Inventory.

OSHA Regulations

Air Contaminant :.....Not considered hazardous under The Clean Air Act.

OSHA Criteria:.....Not applicable.

Section 16 – Other Information

Disclaimer..... THIS PRODUCT'S HEALTH AND SAFETY INFORMATION IS PROVIDED TO ASSIST OUR CUSTOMERS IN ASSESSING COMPLIANCE WITH HEALTH, SAFETY AND ENVIRONMENTAL REGULATIONS. THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US, AND IS BELIEVED TO BE ACCURATE,

GGS 2830

CS - 78

Section 1 - Chemical Product and Company Identification

H-O-H Water Technology, Inc.

500 South Vermont Street
Palatine, Illinois 60067
Phone Number: (847) 358-7400
www.hohwatertechnology.com

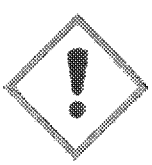
DATE PREPARED: .....June 1, 2015
DATE REVISED:.....NA
CHEMTREC PHONE#:.....1-800-424-9300
PREPARED BY: .....Theresa M. Cairns

PRODUCT NAME: ..... CS - 78
PRODUCT NUMBER:..... 0707800-03
CHEMICAL FAMILY: ..... Closed system treatment
CHEMICAL FORMULA: ..... Mixture
UN NUMBER: ..... Not applicable

Section 2 – Hazard Identification

Signal Word: ..... **Warning**

GHS Pictogram(s)



Hazard Statement: ..... H315 H320: Causes skin and eye irritation
Precautionary Statement ..... P280: Wear protective gloves/protective clothing/eye protection/face protection
P262: Do not get in eyes, on skin, or on clothing
GHS Health Classification: ..... Skin Irritation (2) Eye Irritation (2B)
GHS Physical Classification: ..... Substances Corrosive to Metal (1)
GHS Environmental Class:..... Unknown aquatic toxicity levels. No data available.

Health	1
Flammability	0
Reactivity	0
Personal Protection	C

Primary Entry Routes: ..... Skin and eye contact.

ACUTE EFFECTS:

Inhalation: ..... May cause irritation of the respiratory tract. Prolonged exposure could produce nasal or mucous tissue sores.

Eye: ..... Causes eye irritation with redness and possible ulceration of eyes and eyelids.

Skin: ..... Prolonged dermal contact may produce itching, dry skin, or possible mild irritation.

Ingestion:..... May cause irritation of the digestive tract.

Carcinogenicity: ..... This product contains no known or suspected carcinogens.

Chronic Effects:..... None Known

Section 3 – Composition Information on Ingredients

HAZARDOUS INGREDIENT	PERCENT	CAS NUMBER
Sodium molybdate	5-10	7631-95-0
Sodium tetraborate	1-2	1330-43-4

Section 4 - First Aid Measures

Inhalation: ..... Remove subject to fresh air. Have them cough and attempt to clear any material from the breathing tract. If breathing becomes difficult, get medical attention.

Eye Contact:.....Flush eyes with water for at least 15 minutes holding eyelids wide open. Get immediate medical attention.

Skin Contact:..... Flush with water and wash with soap and water. Remove contaminated clothing and wash well before reuse. If irritation develops, seek medical attention.

Ingestion:..... If subject is conscious, give large amounts of water before any attempt to induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention.

Section 5 – Fire-Fighting Measures

Flash Point (F): ..... None

Extinguishing Media: ..... Water fog or spray, foam, dry powder, carbon dioxide (CO_2).

Unusual Fire/Explosion Hazard: Under normal conditions this product will not support combustion or accelerate a fire. However, if contact with other chemicals or electrical services occurs during a fire, hazardous gases may be produced.

Fire Fighting Instructions:..... If possible remove container from fire area. Apply cooling water to container side. Do not release run off from fire control to the sewer or waterway.

Fire Fighting Equipment: ..... Self-contained breathing apparatus with full face piece.

Section 6 – Accidental Release Measures

Spills and Releases: ..... Remove all ignition sources. Contain spill and ventilate the area. Collect spilled material into suitable containers for disposal.

Regulatory Requirements:..... Follow All OSHA Regulations and Standards (29 CFR 1910.120)

Section 7 – Handling and Storage

Handling Precautions: ..... Wear hand and foot protection when moving heavy drums. Protect containers against physical damage.
Storage Requirements:..... Store in a cool, dark well-ventilated area away from direct sunlight and other sources of radiant heat. Keep containers tightly closed when not in use.
Regulatory Requirements:..... Follow All OSHA Regulations and Standards (29 CFR 1910.120)

Section 8 – Exposure Controls / Personal Protection

HAZARDOUS INGREDIENT	OSHA PEL	ACGIH-TLV
Sodium molybdate	5 mg/m3	5 mg/m3
Sodium tetraborate	10 mg/m3	10 mg/m3

Ventilation:..... Use in well-ventilated area with local exhaust.
Respiratory Protection: ..... Not required for ordinary use. During emergency conditions or if a spill occurs, an appropriate OSHA approved air purifying respirator should be worn.
Protective Clothing/Equipment :Safety glasses with side shields, non-slip vinyl or rubber gloves, protective footwear and an apron should be worn when handling drums.
Safety Stations:..... Safety showers and eyewash stations should be available in work areas.
Contaminated Equipment: ..... Wash all contaminated equipment and clothing before reuse.
Comments:.....Never eat, drink or smoke in work areas.

Section 9 – Physical and Chemical Properties

Physical State:..... Liquid
Appearance & Odor: ..... Red liquid with mild odor
Vapor Pressure ..... Same as water
Vapor Density (Air=1):..... No data available
Density (lbs/gal):..... 9.1818
Specific Gravity: 1.075

Water Solubility:.....Complete
Boiling Point: 215°F

Freezing Point:.....No data available
% Volatile: .....No data available
Evaporation Rate: .....< 1
pH:.....10-11

Section 10 – Stability and Reactivity

Stability: ..... Stable under normal conditions.
Polymerization:..... Hazardous polymerization will not occur.
Chemical Incompatibilities: ..... Strong mineral acids, other chemical treatment formulations.
Conditions to Avoid:..... None known

Section 11- Toxicological Information

Irritation:..... Eyes and skin. Inhalation and ingestion.
Acute Effects:..... Mild irritant

Chronic Effects: ..... None Known
Carcinogenicity: ..... This product contains no known or suspected carcinogens.
Acute Inhalation Effects: ..... May cause irritation of the respiratory tract. Prolonged exposure could produce nasal or mucous tissue sores.
Lethal Dosage (LD50).....LD50 (oral-rat) = 4000 mg/kg for pure sodium molybdate.
LD50 (oral-rat) = 2660 mg/kg for pure sodium tetraborate.

Section 12 – Ecological Information

Ecotoxicity: ..... No data available
Environmental Fate:..... No data available

Section 13 – Disposal Considerations

Disposal:..... Consult Federal, State and Local regulations pertaining to waste disposal.
Container Cleaning/Disposal ... Triple rinse empty containers before offering for disposal or salvage. Never reuse empty chemical containers.

Section 14 - Transportation Information

DOT Transportation Data

Shipping Name:..... Not regulated by DOT
Contains :.....Not applicable
Hazard Class:..... Not applicable
ID No. / UN Code: ..... Not applicable
Packaging Group: ..... Not applicable
Label:..... Not regulated by DOT
Reportable Quantity: ..... Not applicable
Emergency Response Guide #:. Not applicable

Section 15 – Regulatory Information

EPA Regulations

RCRA Hazardous Waste Number:.....Not applicable
RCRA Hazardous Waste Classification:.....Acute, Irritating to skin and eyes.
CERCLA Hazardous Substance:.....No components of this product are listed as a CERCLA hazardous substance by the EPA.
CERCLA Reportable Quantity (RQ): .....Not applicable
SARA 311/312:.....Immediate (acute) health hazard.
SARA Toxic Chemical:.....Sodium molybdate, sodium tetraborate.
SARA EHS.....No components of this product are listed as an Extremely Hazardous Substance.
TSCA .....All components of this product are listed on the United States Toxic Substances Control Act (TSCA) Inventory.

OSHA Regulations

Air Contaminant :.....Not considered hazardous under The Clean Air Act.
OSHA Criteria:.....Not applicable.

Section 16 – Other Information

Disclaimer..... THIS PRODUCT'S HEALTH AND SAFETY INFORMATION IS PROVIDED TO ASSIST OUR CUSTOMERS IN ASSESSING COMPLIANCE WITH HEALTH, SAFETY AND ENVIRONMENTAL REGULATIONS. THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US, AND IS BELIEVED TO BE ACCURATE.

2015

GGS 2873

H81 SAFETY DATA SHEETS

Purchased through Harcos Chemical

ICL
Where needs take us

Safety Data Sheet

RESPONSIBLE CARE®
OUR COMMITMENT TO SUSTAINABILITY

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification

Product Name: DISODIUM PHOSPHATE ANHYDROUS
Reference Number: AST10007
Date: May 19, 2015

Use of the substance or preparation

Food Ingredient, water treatment

Company/Undertaking Identification

ICL PERFORMANCE PRODUCTS LP
622 Emerson Road - Suite 500
St. Louis, Missouri 63141

Emergency telephone

In USA call CHEMTREC: 1 800 424 9300

Outside the USA, including ships at sea, call CHEMTREC's international and maritime telephone number (collect calls accepted):+1 (703) 527-3887

In Canada call CANUTEC: 1 613 996 6666

General Information: +1 800 244 6169 (Worldwide)

2. HAZARDS IDENTIFICATION

Classification of the substance/preparation

GHS
This substance does not meet the criteria for classification under GHS.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Composition

Substance	CAS No.	%w/w
Disodium Phosphate Anhydrous	7558-79-4	100

4. FIRST AID MEASURES

General

Treatment is symptomatic and supportive. The product may cause eye and skin irritation. May cause abdominal discomfort if ingested in quantity.

Eye contact

Avoid contact with eyes. In case of contact with eyes, immediately flush the eyes with plenty of water. Seek medical attention if needed. This dry powder may cause foreign body irritation in some individuals.

Skin contact

Remove this material from skin with plenty of soap and water. Prolonged contact with dry powder may cause drying or chapping of the skin.

Inhalation

Inhalation of the dust may cause coughing and sneezing. Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. No significant health effects are expected if small amounts (less than a mouthful) are swallowed. Swallowing large amounts may cause abdominal discomfort and diarrhea.

5. FIRE FIGHTING MEASURES

Extinguishing media

Non-combustible. No special requirement. To extinguish fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

Unsuitable extinguishable media

Non-combustible. No special requirement.

Exposure hazards

No special considerations

Protective equipment

As a general precaution, firefighters and others exposed, wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Avoid unnecessary exposure and remove all material from eyes, skin and clothing.

Environmental precautions

Small quantities: Avoid discharge into the environment.
Large quantities: Avoid discharge into the environmental – See section 15

Method for cleaning up

Sweep, scoop or vacuum spill material, contaminated soil and other contaminated material and place in clean, dry containers for removal. If possible, complete cleanup on a dry basis. Residual material can be flushed with water.

7. HANDLING AND STORAGE

Handling:

Handle in accordance with good industrial hygiene and safety practices. Avoid contact with eyes. Wash hands immediately after handling. Remove material from clothing.

Engineering measures

Ensure adequate ventilation. The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment.

Storage

Store in cool, dry place to maintain product performance. Product is hygroscopic and should be stored in a dry area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure limit

ACGIH TLV	10 mg/m^3 (inhalable) 8-hr TWA, 3 mg/m^3 (respirable) 8-hr TWA
OSHA PEL	15 mg/m^3 (total dust) 8-hr TWA, 5 mg/m^3 (respirable) 8-hr TWA

OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for particulates not otherwise regulated (PNOR) and particulates not otherwise classified (PNOC) which are the least stringent exposure limits applicable to dusts.

Respiratory protection

Avoid breathing dust. In case of insufficient ventilation, use approved respiratory protective equipment as described in OSHA 29 CFR 1910.134 or European Standard EN149. A dust respirator is recommended.

Hand/Skin protection

Wear protective gloves is recommended; wash hands and contaminated skin thoroughly after handling.

Eye protection

Wear appropriate protective eyeglasses or chemical safety goggles as described in OSHA eye and face regulation in 29 CFR 1910.133 or European Standard EN166.

9. PHYSICAL AND CHEMICAL PROPERTIES

a) Appearance: White Crystals
b) Odor: None
c) Odor threshold: Undetermined.
d) pH: (as a 1% solution): 9.0
e) Melting point/freezing point: 243 – 245 ^{0}C
f) Initial boiling point and boiling range: Undetermined.
g) Flash point: Undetermined
h) Evaporation rate: Undetermined.
i) Flammability (solid, gas): Undetermined.
j) Upper/lower flammability or explosive limits: Undetermined.
k) Vapor pressure: Undetermined.
l) Vapor density: 4.9
m) Relative density: 1.679
n) Solubility(ies) : (g./100 g. H_2O): 1.7 @ 0 ^{0}C
11.5 @ 25 ^{0}C
51.7 @ 40 ^{0}C

78.8 @ 60 ^{0}C
102.4 @ 100 ^{0}C

o) Partition coefficient: n-octanol/water: Undetermined.
p) Auto-ignition temperature: Undetermined.
q) Decomposition temperature: Undetermined.
r) Viscosity: Undetermined.

Chemical Formula: Na_2HPO_4

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Product is stable under normal conditions of storage and handling. Store in a cool, dry place to maintain product performance.

Conditions to avoid

Store product in dry areas away from moisture. The product is hygroscopic.

Materials to avoid

Incompatible with acids, alkaloids, lead acetate, antipyrine, chloral hydrate, resorcinol and pyrogallol.

Hazardous decomposition

Oxides of sodium and phosphorus may form when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Laboratory data

Data from ICL Performance Products LP single-dose (acute) animal studies with this material are given below:

Oral - rat LD_{50}: 5,950 mg/kg; practically nontoxic
Dermal - rabbit LD_{50}: >7,940 mg/kg; practically nontoxic
Eye Irritation - rabbit: 4.2/110.0; slightly irritating
Skin Irritation - rabbit: 0.0/8.0 (24-hr. exp.); nonirritating
DOT skin corrosion - rabbit (4-hr. exp.): not corrosive

The dry powder or granules may cause foreign body irritation in some individuals. Prolonged contact with the dry powder may cause drying or chapping of the skin. Due to the high alkalinity of this product, prolonged contact with the eyes or skin may cause slight irritation. Inhalation of dust has been reported to produce a mild drying effect on the respiratory tract membranes of exposed workers. Excessive inhalation of dust may be annoying and can mechanically impede respiration.

Sodium phosphates have been used as therapeutic agents in medicinal preparations for their laxative effects. These phosphate salts are incompletely absorbed from the intestinal tract. Due to their osmotic activity, they draw water into the intestine and produce purging.

This product (in anhydrous and hydrated forms) has produced no genetic changes in standard tests using bacterial cells.

12. ECOLOGICAL INFORMATION

Environmental toxicity

Rainbow trout, Inland silversides and Mysid shrimp 96 hr. LC_{50} >100 mg/L, non-toxic. [FMC I89-1085, 1086 & 1087]

Daphnia magna: 48 hr. EC50 >100 mg/L, non-toxic. [FMC I89-1088]

No algal toxicity data was available for this material.

Environmental fate

Inorganic compounds in contact with the soil, sub-surface or surface waters may be taken up by plants and utilized as essential nutrients. Phosphates may also form precipitates, usually with calcium or magnesium. The resultant compounds are insoluble in water and become a part of the soil or sediment. The term biodegradability, as such, is not applicable to inorganic compounds.

13. DISPOSAL CONSIDERATIONS

This material when discarded is not a hazardous waste as that term is defined by the Resource, Conservation and Recovery Act (RCRA), 40 CFR 261. Dry material may be landfilled or recycled in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Road/Rail, Sea and Air

IMDG/UN	Environmentally hazardous substance, solid, N.O.S. (contains sodium phosphate, dibasic), UN 3077, 9, PG III*
ICAO/IATA passenger aircraft	UN 3077, Environmentally hazardous substance, solid, n.o.s., 9, PG III*
RID/ADR	Unknown
Canadian TDG	Environmentally hazardous substance, solid, n.o.s., UN 3077, Class 9, PG III*
US DOT	Environmentally hazardous substance, solid, n.o.s. (contains sodium phosphate, dibasic),UN 3077, 9, PG III*

+ Applies only to packages containing a Reportable Limit of 230 kg or more
* Applies only to a package containing a Reportable Quantity (RQ) of 5000 lbs or more.

15. REGULATORY INFORMATION

Chemical Inventory

USA TSCA:	Listed	Australia	Listed
Canada DSL:	Listed	Korea	Listed
EC:	Listed	Philippines	Listed
Japan	Listed	China	Listed

Other information

WHMIS Classification :Not Controlled

SARA Hazard Notification
Hazard Categories Under Title III Rules (40 CFR 370): Not Applicable
Section 302 Extremely Hazardous Substances: Not Applicable

Section 313 Toxic Chemical(s): Not Applicable

CERCLA Reportable Quantity: 5,000 lb. RQ of sodium phosphate, dibasic

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contain all the information required by the Canadian Controlled Products Regulation.

16. OTHER INFORMATION

	Health	Fire	Reactivity	Additional Information
Suggested NFPA Rating	1	0	0	
Suggested HMIS Rating	1	0	0	E E = safety glasses, gloves, dust respirator

Reason for revision: Revised section 1 and 9. Supersedes MSDS dated: March 7, 2014

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Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, ICL Performance Products LP makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ICL Performance Products LP be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS

dx/dpc

Safety Data Sheet

GGS 1656

2015

H81 SAFETY DATA SHEETS

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product identifier: DIXICHLOR MAX
Synonyms: Bleach, Sodium Hypochlorite, Sodium Hypochlorite 12.5%
Intended use: Swimming pool chlorinator, Hard surface cleaner, Water treatment chemical, Biocides
Uses Advised Against: None identified. This is a pesticide product, do not use in a pesticide application that is not included on the label.

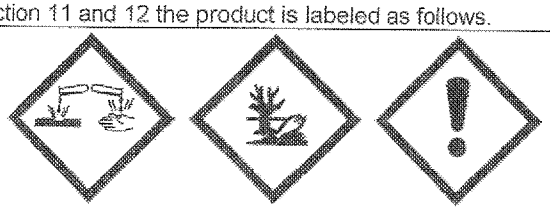
Company Identification
DPC Industries, Inc.
DPC Enterprises, LP
DXI Industries, Inc.
DX Terminals
PO Box 24600
Houston , TX 77229-4600

Emergency
CHEMTREC (USA) (800) 424-9300
24 hour Emergency Telephone No. (281) 457-4888
www.dxgroup.com

2. Hazard identification of the product

Physical hazards	Corrosive to metals	Category 1
Health hazards	Skin corrosion/irritation Serious eye damage/eye irritation Specific target organ toxicity, single exposure	Category 1 Category 1 Category 3 respiratory tract irritation
Environmental hazards	Hazardous to the aquatic environment, acute hazard Hazardous to the aquatic environment, long-term hazard	Category 1 Category 2

Label elements
Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.



Signal Word	**Danger**
Hazard Statements	Harmful in contact with skin. Causes severe skin burns and eye damage. Causes serious eye damage. Very toxic to aquatic life. Toxic to aquatic life with long lasting effects. May be corrosive to metals
Precautionary Statements	
Prevention	Do not breathe mist / vapors / spray. Wash thoroughly after handling. Avoid release to the environment. Wear protective gloves / eye protection / face protection. Use in well ventilated area.
Response	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN: Remove / Take off immediately all contaminated clothing. Wash with plenty of soap and water. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor / physician if you feel unwell. IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing. Immediately call a POISON CENTER or doctor / physician. Wash contaminated clothing before reuse. Collect spillage.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up. Protect from sunlight.
Disposal	Dispose of contents / container in accordance with local / national regulations.

Safety Data Sheet

3. Composition/information on ingredients

Synonyms: Bleach, Sodium Hypochlorite, Sodium Hypochlorite 12.5%

Ingredient	CAS Number	Percent (%)	NOTES
Sodium hypochlorite.	7681-52-9	12.5 - 15.6	Substance classified with a health or environmental hazard.
Sodium chloride	7647-14-5	9 - 10	Substance classified with a health or environmental hazard.
Sodium hydroxide	1310-73-2	0.5 - 2	Substance classified with a health or environmental hazard. Substance with a workplace exposure limit.

4. First Aid Measures

General	Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
Inhalation	Move victim to fresh air. Call emergency medical care. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.
Eyes	Irrigate copiously with clean fresh water for at least 10 minutes, holding the eyelids apart. Get medical attention. Remove contact lenses if present and easy to do - continue rinsing.
Skin	Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognized skin cleanser. Do NOT use solvents or thinners.
Ingestion	If accidentally swallowed obtain immediate medical attention. Rinse mouth. Keep at rest. Do NOT induce vomiting. If vomiting occurs, keep head low so that stomach content does not get into lungs.
Most important symptoms and effects, both acute and delayed	
Overview	Corrosive effects. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.
Indication of immediate medical attention and special treatment needed	Treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Recommended Extinguishing media	Alcohol resistant foam, CO^2, dry chemical powder, water spray. Do not use water jet.
Special hazards arising from the substance or mixture	Hydrogen chloride and chlorine. Chlorine gas rate of decomposition increases with the concentration with temperatures above 85 °F (30 °C). Do not breathe mist / vapors / spray.
Advice for fire-fighters	Wear positive pressure self-contained breathing apparatus (SCBA). Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection. Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.). Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. TOXIC; inhalation, ingestion or skin contact with material may cause severe injury or death. Contact with molten substance may cause severe burns to skin and eyes. Avoid any skin contact. Effects of contact or inhalation may be delayed. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution. **ERG Guide No.** 154

Safety Data Sheet

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Local authorities should be contacted if significant spill cannot be contained.
Environmental precautions	Do not allow spills to enter drains or watercourses.
Methods and material for containment and cleaning up	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills in original containers for re-use. For waste disposal, see Section 13 of the SDS.

7. Handling and storage

Precautions for safe handling	Wear appropriate personal protective equipment. Do not get in eyes, on skin, on clothing. Chemical attack increases with solution strength. Use with adequate ventilation. Observe good industrial hygiene practices. Do not apply heat or direct sunlight. Temperature and product concentration affect product quality and decomposition rates.
Conditions for safe storage, including any incompatibilities	Handle containers carefully to prevent damage and spillage. Keep container tightly closed. Store in a cool and well-ventilated place. Store in a corrosive resistant container. Consult container manufacturer for additional guidance. Store away from and do not mix with incompatible materials such as acids, ammonia, urea, oxidizers, organics and metals such as nickel, copper, tin, aluminum and iron.

8. Exposure controls and personal protection

Exposure Control Parameters

CAS No.	Ingestion	Source	Value
1310-73-2	Sodium hydroxide	OSHA	TWA 2 mg/m3
		ACGIH	Ceiling: 2 mg/m3
		NIOSH	C 2 mg/m3
7647-14-5	Sodium chloride	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
7681-52-9	Sodium hypochlorite.	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit

Individual protection measures, such as personal protective equipment

Respiratory	Use NIOSH/MSHA approved respirator, following manufacturer's recommendations when concentrations exceed permissible exposure limits.
Eyes	Wear face shield with safety glasses with side shields and/or safety goggles.
Skin	Chemical resistant clothing such as coveralls/apron boots should be worn. Chemical Impervious gloves.
Engineering Controls	Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn. Eye wash and safety shower must be available when handling this product
Other Work Practices	Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

Safety Data Sheet

9. Physical and chemical properties

Appearance	Clear, pale yellow, or greenish Liquid
Odor	Pungent, chlorine odor
Odor threshold	0.9 mg/m^3
pH	12 - 13
Melting point / freezing point	-3 °F (-19.4 °C)
Initial boiling point and boiling range	Decomposes above 230 °F (110 °C)
Flash Point	Nonflammable
Evaporation rate (Ether = 1)	Not Established
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	**Lower Explosive Limit:** Not Measured **Upper Explosive Limit:** Not Measured
Vapor pressure (mmHg)	17.5 (@ 20° C)
Vapor Density	Not Established
Specific Gravity	1.20 - 1.40
Solubility in Water	Complete
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature (°C)	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	Not Measured
VOC %	Not Measured
Other information	No other relevant information.

10. Stability and reactivity

Reactivity	Hazardous Polymerization will not occur.
Chemical stability	Stable under normal circumstances.
Possibility of hazardous reactions	No data available.
Conditions to avoid	Contact with incompatible materials. Acid contact will produce chlorine gas.
Incompatible materials	Any acidic material, ammonia, urea, oxidizers, organics and metals such as nickel, copper, tin, aluminum and iron.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Acute toxicity

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LC50, mg/L/4hr	Inhalation Dust/Mist LC50, mg/L/4hr	Inhalation Gas LC50, ppm
Sodium hypochlorite (7681-52-9)	5,000.00, Rat - Category: 5	10,000.00, Rabbit - Category: NA	10.50, Rat - Category: 4	No data available	No data available
Sodium chloride (7647-14-5)	1,350.00, Rabbit - Category: 4	100.00, Rat - Category: 2	40.00, Mouse - Category: NA	10,500.00, Rat - Category: NA	No data available
Sodium hydroxide (1310-73-2)	6,600.00, Mouse - Category: NA	1,350.00, Rabbit - Category: 4	600.00, Mouse - Category: NA	No data available	No data available

Safety Data Sheet

11. Toxicological information

Acute toxicity (cont.)

Item	Hazard
Acute Toxicity (mouth)	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract.
Acute Toxicity (skin)	Harmful in contact with skin.
Acute Toxicity (inhalation)	Vapors and spray mist may irritate throat and respiratory system and cause coughing.
Skin corrosion/irritation	Causes severe skin burns and eye damage.
Eye damage/irritation	Causes serious eye damage.
Sensitization (respiratory)	No data available.
Sensitization (skin)	No data available.
Germ toxicity	No data available.
Carcinogenicity	Not considered to be a carcinogen by IARC, ACGIH, NTP or OSHA.
Reproductive Toxicity	No data available.
Specific target organ systemic toxicity (single exposure)	May cause respiratory irritation.
Specific target organ systemic Toxicity (repeated exposure)	Not Applicable.
Aspiration hazard	Not classified; however droplets of product may be aspirated into lungs, through ingestion or vomiting and may cause serious chemical pneumonia.

12. Ecological information

Toxicity: Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Sodium hypochlorite (7681-52-9)	0.08, Pimephales promelas	0.032, Daphnia magna	0.40 (72 hr), Dunaliella primolecta
Sodium chloride (7647-14-5)	1,100.00, Freshwater Fish	3,310.00, Daphnia magna	Not Available
Sodium hydroxide (1310-73-2)	196.00, Poecilia reticulata	40.38, Ceriodaphnia dubia	Not Available

Persistence and degradability:	There is no data available on the preparation itself.
Bioaccumulative potential:	Not Measured
Mobility in soil:	No data available.
Results of PBT and vPvB assessment:	This product contains no PBT/vPvB chemicals.
Other adverse effects:	No other effects are expected.

13. Disposal considerations

Waste treatment methods:	Do not allow into drains or water courses. Wastes and emptied containers should be disposed of in accordance with regulations made under the Control of Pollution Act and the Environmental Protection Act. Using information provided in this data sheet, advice should be obtained from the Waste Regulation Authority, whether the special waste regulations apply.
Waste from material:	The waste determination should be made in discussion between the user and the waste disposal company.
Container Management:	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

Safety Data Sheet

14. Transport information

UN number:	UN1791
UN proper shipping name:	Hypochlorite solutions
Transport hazard class(es)	
DOT (Domestic Surface Transportation)	
DOT Proper Shipping Name:	Hypochlorite solutions
DOT Hazard Class: DOT Label:	8 8
UN / NA Number:	UN1791
DOT Packing Group:	III
CERCLA/DOT RQ:	100 lbs.
Environmental hazards:	IMDG Marine Pollutant: Yes (Sodium hypochlorite)
Special precautions for user:	Not Applicable

15. Regulatory information

Regulatory Overview:	The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory.	
WHMIS Classification	D2B E	
US EPA Tier II Hazards:	Fire:	No
	Sudden Release of Pressure:	No
	Reactive:	No
	Immediate (Acute):	Yes
	Delayed (Chronic):	No
SARA 302 Extremely Hazardous Substance:		No
SARA 311/312 Chemicals and RQs (lbs) (>0.1%) :		100
SARA 313 (TRI):		No
CAA Section 112 Hazardous Air Pollutant:		No
CAA Section 112R Risk Management Plan:		No
State Regulations	N.J. RTK Substances (>1%) :	Listed
	Penn RTK Substances (>1%) :	Listed
	California Prop 65:	Not Listed

16. Other information:

EPA Registration Number: 813-15
NSF Maximum Use Level (STD 60): Check BOL for facility Data. (37 to 84 mg/L)

Revision Information: This is the first revision of this SDS format, changes from previous revision not applicable.

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

THE USER IS CAUTIONED TO PERFORM HIS OWN HAZARD EVALUATION AND TO RELY ON HIS OWN DETERMINATIONS.

2015

GGS 2866

SAFETY DATA SHEET

H81 SAFETY DATA SHEETS

FCT Companies

Date Issued: 5/22/2015
Date Revised: 5/22/2015
Revision No: 1

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT CODE: FCT4008TT
PRODUCT TRADE NAME: FCT4008TT
COMMON NAMES/SYNONYMS: FCT4008TT COOLING WATER TREATMENT
CATEGORY: None
RECOMMENDED USE: COOLING WATER TREATMENT, For industrial use only, refer to label and technical data sheet or call number below

MANUFACTURER
FCT
1309 North 17th Ave., Greeley, CO 80631, Phone 970-346-8002

24 HR. EMERGENCY TELEPHONE NUMBERS
800-535-5053

Emergency Contact: INFO TRAC
E-Mail: customerservice@floridacirtech.com
Emergency Phone: 800-535-5053
Alternate Emergency Phone: 800-686-6504

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Clear Liquid

IMMEDIATE CONCERNS: Skin Corrosion/Irritation

POTENTIAL HEALTH EFFECTS

EYES: Causes severe irritation (tears, blurred vision and redness) May result in permanent eye damage.

SKIN: Causes severe skin irritation and tissue damage.

INGESTION: Causes damage to mouth, throat and stomach.

INHALATION: Vapors can cause severe irritation or burns to the nose, throat, mucus membrane and lungs.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

UNCLASSIFIED HAZARDS: Use good industrial practices when handling. Avoid eye, skin, and clothing contact.

SIGNAL WORD: Danger

Potential Carcinogens as listed by OSHA, IARC, or NTP: NONE

GHS Pictogram:

Hazard Statement(s)

H402	Harmful to aquatic life
H314	Causes severe skin burns and eye damage
H302	Harmful if swallowed
H318	Causes serious eye damage
H335	May cause respiratory irritation

Precautionary Statement(s)

P264	Wash … thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment.
P301+P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+ P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Common Names	CAS	Weight %age
2-Phosphonobutane-1,2,4-tricarboxylic acid	**2-Phosphonobutane-1,2,4-tricarboxylic acid**	37971-36-1	0.00 % - 10.00 %
Potassium Hydroxide	**Potassium Hydroxide**	1310-58-3	10.00 % - 30.00 %
Polymaleic Acid (PMA)	**Polymaleic Acid (PMA)**	26099-09-2	0.00 % - 10.00 %
Sodium Tolytriazole	**TT50S, Sodium Tolytriazole**	64665-57-2	1.00 % - 5.00 %

4. FIRST AID MEASURES

COMMON SYMPTOMS OF OVEREXPOSURE: No Applicable data available

EYES: Immediately flush with water for at least 15 minutes or until the chemical is removed. Get medical attention!

SKIN: Wash off immediately with soap and water. If clothing is contaminated, remove and launder before reuse.

INGESTION: If conscious, rinse mouth with water. Seek medical advice on whether to induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention.

INHALATION: Move to fresh air. Get medical attention if symptoms occur.

NOTES TO PHYSICIAN: Follow usual and customary procedures

ADDITIONAL INFORMATION: No Applicable data available

COMMENTS: No Applicable data available

5. FIRE FIGHTING MEASURES

FLASH POINT AND METHOD: No applicable data available

FLAMMABLE LIMITS: LEL : No applicable data available UEL: No applicable data available

GENERAL HAZARD: As with any chemical fire, combustion products of unknown toxicity are always possible.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam or water spray.

FIRE FIGHTING EQUIPMENT: Vapors and fumes may be irritating and toxic. Firefighters should wear selfNo applicable data availablecontained breathing apparatus and full fireNo applicable data availablefighting turnout gear.

SENSITIVE TO STATIC DISCHARGE: No applicable data available

COMMENTS: Standard procedure for chemical fires.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Neutralize spilled material. Pump spilled liquid into disposal container.

LARGE SPILL: Neutralize spilled material. Pump spilled liquid into disposal container.

EMERGENCY PROCEDURES: For hazardous waste regulations call 800-424-9346, the RCRA Hotline. Personal precautions, protective equipment and emergency procedures: Evacuate area. Keep upwind of spill. Refer to section 7, Handling, for additional precautionary measures. Only trained and properly protected personnel must be involved in clean-up operations. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to

Section 8, Exposure Controls and personal protection.

GENERAL PROCEDURES: If possible, stop further leakage of the material. Contain spilled material by diking with non-flammable diking materials.

RELEASE NOTES: Collect as much as possible in a clean container for reuse (if not contaminated) or disposal (if contaminated). Prevent from entering into soil, ditches, sewers, waterways and/or ground water. See section 12 Ecological information.

SPECIAL PROTECTIVE EQUIPMENT: Isolate area. Use appropriate safety equipment. For additional information, refer to section 8, Exposure Controls and Personal Protection.

COMMENTS: See also section 13 for disposal information.

7. HANDLING AND STORAGE

HANDLING: Use good industrial practices when handling. Avoid eye, skin, and clothing contact. Do not inhale mist or vapors. Do not taste or swallow. Use only with adequate ventilation.

STORAGE: Keep container closed when not in use. Avoid elevated and freezing temperatures.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	OSHA PEL	OSHA STEL	ACGIH TWA	ACGIH STEL
2-Phosphonobutane-1,2,4-tricarboxylic acid	NE	NE	NE	NE
Potassium Hydroxide	NE	NE	2 mg/m3 Ceiling	NE
Polymaleic Acid (PMA)	NE	NE	NE	NE
Sodium Tolytriazole				

ENGINEERING CONTROLS: Work in well ventilated areas. Do not breathe vapors or mist. Ensure that existing ventilation is sufficient to prevent the circulation and/or accumulation of vapors in the air.

PERSONAL PROTECTIVE EQUIPMENT:

EYES AND FACE: Wear safety glasses when handling this material.

SKIN: Wear nitrile or latex gloves. Wear protective clothing.

RESPIRATORY: No special respiratory equipment is needed.

WORK HYGIENIC PRACTICES: Discard contaminated gloves after use. Have eye-wash facilities in the immediate vicinity. Work in adequately ventilated area. Do not breathe vapors or mist. Minimize any contact with any chemical.

COMMENTS: Eye wash station and safety shower should be available in immediate work area. To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment, in accordance with the OSHA PPE Standard (29 CFR 1910.132), be conducted before using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Form: Liquid

Appearance Color: Light brown

Odor: Slight

Odor Threshold: Not Determined

pH-value @ 68 °F: >12

Melting point: Not Determined

Boiling Point: <200F

Flash Point: Non Flammable

Flammability: no data available

Ignition temperature: no data available

Auto Igniting: no data available

Danger of explosion: no data available
Explosion Lower Limit: NE
Explosion Upper Limit: NE
Vapor pressure @ 68 °F: Not Determined
Relative Density: 1.2
Vapor Density: Not Determined
Evaporation Rate: Not Determined
Solubility in Water: Complete
Partition coefficient: no data available
Dynamic viscosity: no data available
Kinematic viscosity: no data available
Organic Content %age: no data available
Water %age: no data available
Solids Content %age: no data available
Other Informartion: no data available

10. STABILITY AND REACTIVITY

STABILITY: Stable
REACTIVITY: See sub-sections below.
POLYMERIZATION: Hazardous polymerization is not expected to occur under normal temperatures and pressures.
CONDITIONS TO AVOID: Elevated temperatures
POSSIBILITY OF HAZARDOUS REACTIONS: None expected.
INCOMPATIBLE MATERIALS: Strong alkalis, strong oxidizing and reducing agents
HAZARDOUS DECOMPOSITION MATERIALS: Upon thermal decomposition carbon oxides and nitrogen oxides may form

11. TOXICOLOGICAL INFORMATION

SKIN: Skin Corrosion/Irritation: Severely irritating., Skin Acute Toxicity: Not Determined
EYES: Severely irritating.
INHALATION: Not Determined
INGESTION: LD50(rat) > 5000 mg/Kg
CARCINOGENICITY
IARC: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
NTP: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
OSHA: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
DERMAL TOXICITY: Not Determined
MUTAGENICITY: One of the components of this product is considered a mutagen.
SENSITIZATION: Not a sensitizer
TERATOGENICITY: Not Determined
REPRODUCTIVE EFFECTS: Not Determined
TARGET ORGAN EFFECTS: Not Determined
ADDITIONAL INFORMATION: no additional information.

12. ENVIRONMENTAL INFORMATION

PRODUCT	TEST	DURATION	ORGANISM TYPE	TEST RESULTS

same as sds name	Fish- Acute Toxicity	96 hrs.	Rainbow Trout	> 1000 mg/L
same as sds name	Fish- Acute Toxicity	96 hrs.	Zebra Fish	> 1000 mg/L
same as sds name	Invertebrates- Acute Toxicity	96 hrs.	Brown Shrimp	LC50: >10000 mg/L, EC50: no applicable data available

ECOTOXICITY: no applicable data available

BIOACCUMULATION: No appreciable bioaccumulation is expected.

PERSISTENCE DEGRADABILITY: Degradation is expected under aerobic and anaerobic conditions.

MOBILITY: Not determined

ENVIRONMENTAL DATA: no applicable data available

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of in accordance with national, state and local regulations. It is the waste generator's responsibility to determine if a particular waste is hazardous under RCRA.

EMPTY CONTAINER: Empty Container Warning (Where applicable). Empty Containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty containers should be taken for recycling, recovery or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations.

DISPOSAL INSTRUCTIONS: The generation of waste should be avoided or minimized wherever possible and should at all times comply with the requirements of evironmental protection and waste disposal legislation and any regional local authority requirements.

WASTE FROM RESIDUES / UNUSED PRODUCTS: For hazardous waste regulations call 800-424-9346, the RCRA Hotline.

CONTAMINATED PACKAGING: For hazardous waste regulations call 800-424-9346, the RCRA Hotline.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (2-Phosphonobutane-1,2,4-tricarboxylic acid),

TECHNICAL NAME: no applicable data available

PRIMARY HAZARD CLASS/DIVISION: 8,

UN/NA NUMBER: UN3267,

PACKING GROUP: PGII

NAERG: N/A

LABEL: 8,

EMS NO: F-A, S-B

ADDITIONAL INFO: none

15. REGULATORY INFORMATION

UNITED STATES

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS: On the inventory, or in compliance with the inventory

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050) no applicable data available

CERCLA Hazardous Substance List (40 CFR 302.4): NO

Superfund amendments and reauthorization act of 1986 (SARA)

SARA 302 Extremely hazardous substance NO

SARA 304 Emergency release notification no applicable data available

SARA 311/312 Hazardous chemical no applicable data available

SARA 313 (TRI reporting) NO

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3) no applicable data available

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):no applicable data available

US state regulations

US. California Proposition 65: NO

US. New Jersey Worker and Community Right-to-Know Act: no applicable data available

US. Massachusetts RTK - Substance List: no applicable data available

US. Pennsylvania RTK - Hazardous Substances: no applicable data available

US. Rhode Island RTK: no applicable data available

Inventory Status:

Europe REACH: On the inventory, or in compliance with the inventory

USA TSCA: On the inventory, or in compliance with the inventory

Canada DSL: On the inventory, or in compliance with the inventory

Australia AICS: On the inventory, or in compliance with the inventory

New Zealand NZIOC: On the inventory, or in compliance with the inventory

Japan ENCS: On the inventory, or in compliance with the inventory

Korea KECI: On the inventory, or in compliance with the inventory

Philippines PICCS: On the inventory, or in compliance with the inventory

China IECSC: On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

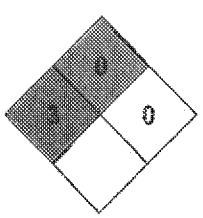
TITLE: EHS Management

PREPARED BY: FCT EHS and Compliance Dept.

HEALTH: 3

FIRE: 0

REACTIVITY: 0



MANUFACTURER SUPPLEMENTAL NOTES: no applicable data available

MANUFACTURER DISCLAIMER: The information contained herein is based on data believed to be accurate and is offered at no charge. No warranty is expressed or implied regarding the accuracy of this data. Liability is expressly disclaimed for loss or injury arising out of use of this information or the use of any materials designated. It is the user's responsibility for determining whether the product is suitable for its intended conditions of use.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%

AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect
EC	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Ac
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition,Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

2015

SAFETY DATA SHEET

FCT Companies

GGS 2867

H81 SAFETY DATA SHEETS

Date Issued: 5/22/2015
Date Revised: 5/22/2015
Revision No: 1

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT CODE: FCTBWT1305G
PRODUCT TRADE NAME: FCTBWT1305G
COMMON NAMES/SYNONYMS: FCTBWT1305G, Sodium Sulfite, Anhydrous
CATEGORY: NonHaz
RECOMMENDED USE: Sodium Sulfite, For industrial use only, refer to label and technical data sheet or call number below

MANUFACTURER
FCT
1309 North 17th Ave., Greeley, CO 80631, Phone 970-346-8002

24 HR. EMERGENCY TELEPHONE NUMBERS
800-535-5053

Emergency Contact: INFO TRAC
E-Mail: customerservice@floridacirtech.com
Emergency Phone: 800-535-5053
Alternate Emergency Phone: 800-686-6504

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Crystal or Powder

IMMEDIATE CONCERNS: No applicable data available

POTENTIAL HEALTH EFFECTS

EYES: Causes severe irritation (tears, blurred vision and redness) May result in permanent eye damage.

SKIN: Causes severe skin irritation and tissue damage.

INGESTION: May cause nausea and vomitting. May cause irritation to the mouth, throat and stomach.

INHALATION: May cause physical discomfort to the respiratory tract.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

UNCLASSIFIED HAZARDS: Contact with acids liberates toxic gas!

SIGNAL WORD: No signal word

Potential Carcinogens as listed by OSHA, IARC, or NTP: NONE

GHS Pictogram:

Hazard Statement(s)

Precautionary Statement(s)

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Common Names	CAS	Weight %age
Sodium Sulfite	Sodium Sulfite	7757-83-7	100.00 % - 100.00 %

4. FIRST AID MEASURES

COMMON SYMPTOMS OF OVEREXPOSURE: No Applicable data available

EYES: Immediately flush with water for at least 15 minutes or until the chemical is removed. Get medical attention!

SKIN: Wash off immediately with soap and water. If clothing is contaminated, remove and launder before reuse.

INGESTION: If conscious, rinse mouth with water. Seek medical advice on whether to induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention.

INHALATION: Move to fresh air. Get medical attention if symptoms occur.

NOTES TO PHYSICIAN: Follow usual and customary procedures

ADDITIONAL INFORMATION: No Applicable data available

COMMENTS: No Applicable data available

5. FIRE FIGHTING MEASURES

FLASH POINT AND METHOD: No applicable data available

FLAMMABLE LIMITS: LEL : No applicable data available UEL: No applicable data available

GENERAL HAZARD: As with any chemical fire, combustion products of unknown toxicity are always possible.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam or water spray.

FIRE FIGHTING EQUIPMENT: Vapors and fumes may be irritating and toxic. Firefighters should wear selfNo applicable data availablecontained breathing apparatus and full fireNo applicable data availablefighting turnout gear.

SENSITIVE TO STATIC DISCHARGE: No applicable data available

COMMENTS: Standard procedure for chemical fires.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Absorb spilled liquid in a suitable material. Sweep or vacuum material into disposal containers.

LARGE SPILL: Absorb spilled liquid in a suitable material. Sweep or vacuum material into disposal containers.

EMERGENCY PROCEDURES: For hazardous waste regulations call 800-424-9346, the RCRA Hotline. Personal precautions, protective equipment and emergency procedures: Evacuate area. Keep upwind of spill. Refer to section 7, Handling, for additional precautionary measures. Only trained and properly protected personnel must be involved in clean-up operations. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and personal protection.

GENERAL PROCEDURES:

RELEASE NOTES: Collect as much as possible in a clean container for reuse (if not contaminated) or disposal (if contamintated). Prevent from entering into soil, ditches, sewers, waterways and/or ground water. See section 12 Ecological information.

SPECIAL PROTECTIVE EQUIPMENT: Isolate area. Use appropriate safety equipment. For additional information, refer to section 8, Exposure Controls and Personal Protection.

COMMENTS: See also section 13 for disposal information.

7. HANDLING AND STORAGE

HANDLING: Use good industrial practices when handling. Avoid eye, skin, and clothing contact. Do not inhale mist or vapors. Do not taste or swallow. Use only with adequate ventilation.

STORAGE: Keep container closed when not in use. Avoid elevated and freezing temperatures.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	OSHA PEL	OSHA STEL	ACGIH TWA	ACGIH STEL

Sodium Sulfite	NE	NE	NE	NE

ENGINEERING CONTROLS: Work in well ventilated areas. Do not breathe vapors or mist. Ensure that existing ventilation is sufficient to prevent the circulation and/or accumulation of vapors in the air.

PERSONAL PROTECTIVE EQUIPMENT:

EYES AND FACE: Wear safety glasses when handling this material.

SKIN: Wear nitrile or latex gloves. Wear protective clothing.

RESPIRATORY: No special respiratory equipment is needed.

WORK HYGIENIC PRACTICES: Discard contaminated gloves after use. Have eye-wash facilities in the immediate vicinity. Work in adequately ventilated area. Do not breathe vapors or mist. Minimize any contact with any chemical.

COMMENTS: Eye wash station and safety shower should be available in immediate work area. To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment, in accordance with the OSHA PPE Standard (29 CFR 1910.132), be conducted before using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Form: Powder
Appearance Color: White
Odor: Odorless
Odor Threshold: Not Established
pH-value @ 68 °F: 9.8 (1% solution)
Melting point: 600 C
Boiling Point: Decomposes
Flash Point: no data available
Flammability: no data available
Ignition temperature: no data available
Auto Igniting: no data available
Danger of explosion: no data available
Explosion Lower Limit: NE
Explosion Upper Limit: NE
Vapor pressure @ 68 °F: N/A
Relative Density: 2.63 @ 20 C
Vapor Density: N/A
Evaporation Rate: N/A
Solubility in Water: 49.5g/100mL H2O @20 C
Partition coefficient: no data available
Dynamic viscosity: no data available
Kinematic viscosity: no data available
Organic Content %age: no data available
Water %age: no data available
Solids Content %age: no data available
Other Informartion: no data available

10. STABILITY AND REACTIVITY

STABILITY: Stable
REACTIVITY: See sub-sections below.
POLYMERIZATION: Hazardous polymerization is not expected to occur under normal temperatures and pressures.
CONDITIONS TO AVOID: Elevated temperatures

POSSIBILITY OF HAZARDOUS REACTIONS: None expected.

INCOMPATIBLE MATERIALS: Strong Oxidizers

HAZARDOUS DECOMPOSITION MATERIALS: Sulfur dioxide, sulfur trioxide, and iron oxide fumes

11. TOXICOLOGICAL INFORMATION

SKIN: Skin Corrosion/Irritation: Severely irritating., Skin Acute Toxicity: Not Determined

EYES: Severely irritating.

INHALATION: Not Determined

INGESTION: Not Determined

CARCINOGENICITY

IARC: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

NTP: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

OSHA: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

DERMAL TOXICITY: Not Determined

MUTAGENICITY: One of the components of this product is considered a mutagen.

SENSITIZATION: Not a sensitizer

TERATOGENICITY: None

REPRODUCTIVE EFFECTS: None

TARGET ORGAN EFFECTS: Not Determined

ADDITIONAL INFORMATION: no additional information.

12. ENVIRONMENTAL INFORMATION

PRODUCT	TEST	DURATION	ORGANISM TYPE	TEST RESULTS
same as sds name	-	No applicable data available	No applicable data available	No applicable data available

ECOTOXICITY: no applicable data available

BIOACCUMULATION: no applicable data available

PERSISTENCE DEGRADABILITY: no applicable data available

MOBILITY: no applicable data available

ENVIRONMENTAL DATA: no applicable data available

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of in accordance with national, state and local regulations. It is the waste generator's responsibility to determine if a particular waste is hazardous under RCRA.

EMPTY CONTAINER: Empty Container Warning (Where applicable). Empty Containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty containers should be taken for recycling, recovery or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations.

DISPOSAL INSTRUCTIONS: The generation of waste should be avoided or minimized wherever possible and should at all times comply with the requirements of evironmental protection and waste disposal legislation and any regional local authority requirements.

WASTE FROM RESIDUES / UNUSED PRODUCTS: For hazardous waste regulations call 800-424-9346, the RCRA Hotline.

CONTAMINATED PACKAGING: For hazardous waste regulations call 800-424-9346, the RCRA Hotline.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Environmentally hazardous substance, solid, n.o.s. (sodium sulfite)

TECHNICAL NAME: no applicable data available

PRIMARY HAZARD CLASS/DIVISION: 9,

UN/NA NUMBER: UN3077,

PACKING GROUP: PGIII

NAERG: 9L

LABEL: 9,

EMS NO: F-A, S-B

ADDITIONAL INFO: none

15. REGULATORY INFORMATION

UNITED STATES

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS: On the inventory, or in compliance with the inventory

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050) no applicable data available

CERCLA Hazardous Substance List (40 CFR 302.4): NO

Superfund amendments and reauthorization act of 1986 (SARA)

SARA 302 Extremely hazardous substance NO

SARA 304 Emergency release notification no applicable data available

SARA 311/312 Hazardous chemical no applicable data available

SARA 313 (TRI reporting) NO

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3) no applicable data available

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):no applicable data available

US state regulations

US. California Proposition 65: NO

US. New Jersey Worker and Community Right-to-Know Act: no applicable data available

US. Massachusetts RTK - Substance List: no applicable data available

US. Pennsylvania RTK - Hazardous Substances: no applicable data available

US. Rhode Island RTK: no applicable data available

Inventory Status:

Europe REACH: On the inventory, or in compliance with the inventory

USA TSCA: On the inventory, or in compliance with the inventory

Canada DSL: On the inventory, or in compliance with the inventory

Australia AICS: On the inventory, or in compliance with the inventory

New Zealand NZIOC: On the inventory, or in compliance with the inventory

Japan ENCS: On the inventory, or in compliance with the inventory

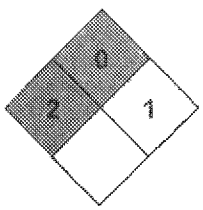
Korea KECI: On the inventory, or in compliance with the inventory

Philippines PICCS: On the inventory, or in compliance with the inventory

China IECSC: On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

TITLE: EHS Management
PREPARED BY: FCT EHS and Compliance Dept.
HEALTH: 2
FIRE: 0
REACTIVITY: 1



MANUFACTURER SUPPLEMENTAL NOTES: no applicable data available

MANUFACTURER DISCLAIMER: The information contained herein is based on data believed to be accurate and is offered at no charge. No warranty is expressed or implied regarding the accuracy of this data. Liability is expressly disclaimed for loss or injury arising out of use of this information or the use of any materials designated. It is the user's responsibility for determining whether the product is suitable for its intended conditions of use.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect
EC	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Ac
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition,Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

2015

SAFETY DATA SHEET GGS 2757

FCT Companies

H81 SAFETY DATA SHEETS

Date Issued: 5/22/2015
Date Revised: 5/22/2015
Revision No: 1

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT CODE: FCTTT50S CS-25
PRODUCT TRADE NAME: FCTTT50S
COMMON NAMES/SYNONYMS: FCTTT50S, Sodium Tolytriazole
CATEGORY: CWT
RECOMMENDED USE: COOLING WATER TREATMENT, For industrial use only, refer to label and technical data sheet or call number below

MANUFACTURER
FCT
1309 North 17th Ave., Greeley, CO 80631, Phone 970-346-8002

24 HR. EMERGENCY TELEPHONE NUMBERS
800-535-5053

Emergency Contact: INFO TRAC
E-Mail: customerservice@floridacirtech.com
Emergency Phone: 800-535-5053
Alternate Emergency Phone: 800-686-6504

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Brown liquid

IMMEDIATE CONCERNS: Skin Corrosion/Irritation

POTENTIAL HEALTH EFFECTS

EYES: Causes severe irritation (tears, blurred vision and redness) May result in permanent eye damage.

SKIN: Causes severe skin irritation and tissue damage.

INGESTION: Causes damage to mouth, throat and stomach.

INHALATION: May cause physical discomfort to the respiratory tract.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

UNCLASSIFIED HAZARDS: Use good industrial practices when handling. Avoid eye, skin, and clothing contact.

SIGNAL WORD: Danger

Potential Carcinogens as listed by OSHA, IARC, or NTP: NONE

GHS Pictogram:

Hazard Statement(s)

H402	Harmful to aquatic life
H314	Causes severe skin burns and eye damage
H302	Harmful if swallowed
H318	Causes serious eye damage

Precautionary Statement(s)

P501	Dispose of contents/container to...
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

P273	Avoid release to the environment.
P264	Wash ... thoroughly after handling.
P303+ P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+ P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+ P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P310	Immediately call a POISON CENTER or doctor/physician.
P405	Store locked up.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Common Names	CAS	Weight %age
Sodium Tolytriazole	**Sodium Tolytriazole**	64665-57-2	25.00 % - 50.00 %
Sodium Hydroxide	**Sodium Hydroxide**	1310-73-2	5.00 % - 5.00 %

4. FIRST AID MEASURES

COMMON SYMPTOMS OF OVEREXPOSURE: No Applicable data available

EYES: Immediately flush with water for at least 15 minutes or until the chemical is removed. Get medical attention!

SKIN: Wash off immediately with large amounts of water. Get medical attention if irritation develops. If clothing is contaminated, remove and launder before reuse.

INGESTION: Do not induce vomiting. Never give anything by mouth to an unconscious person. Get immediate medical attention.

INHALATION: Move to fresh air. Get medical attention if symptoms occur.

NOTES TO PHYSICIAN: Follow usual and customary procedures

ADDITIONAL INFORMATION: No Applicable data available

COMMENTS: No Applicable data available

5. FIRE FIGHTING MEASURES

FLASH POINT AND METHOD: No applicable data available

FLAMMABLE LIMITS: LEL : No applicable data available UEL: No applicable data available

GENERAL HAZARD: As with any chemical fire, combustion products of unknown toxicity are always possible.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam or water spray.

FIRE FIGHTING EQUIPMENT: Vapors and fumes may be irritating and toxic. Firefighters should wear selfNo applicable data availablecontained breathing apparatus and full fireNo applicable data availablefighting turnout gear.

SENSITIVE TO STATIC DISCHARGE: No applicable data available

COMMENTS: Standard procedure for chemical fires.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Neutralize spilled material. Pump spilled liquid into disposal container.

LARGE SPILL: Neutralize spilled material. Pump spilled liquid into disposal container.

EMERGENCY PROCEDURES: For hazardous waste regulations call 800-424-9346, the RCRA Hotline. Personal precautions, protective equipment and emergency procedures: Evacuate area. Keep upwind of spill. Refer to section 7. Handling, for additional precautionary measures. Only trained and properly protected personnel must be involved in clean-up operations. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to

Section 8, Exposure Controls and personal protection.

GENERAL PROCEDURES: If possible, stop further leakage of the material. Contain spilled material by diking with non-flammable diking materials.

RELEASE NOTES: Collect as much as possible in a clean container for reuse (if not contaminated) or disposal (if contamintated). Prevent from entering into soil, ditches, sewers, waterways and/or ground water. See section 12 Ecological information.

SPECIAL PROTECTIVE EQUIPMENT: Isolate area. Use appropriate safety equipment. For additional information, refer to section 8, Exposure Controls and Personal Protection.

COMMENTS: See also section 13 for disposal information.

7. HANDLING AND STORAGE

HANDLING: Use good industrial practices when handling. Avoid eye, skin, and clothing contact. Do not inhale mist or vapors. Do not taste or swallow. Use only with adequate ventilation.

STORAGE: Keep container closed when not in use. Avoid elevated and freezing temperatures.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	OSHA PEL	OSHA STEL	ACGIH TWA	ACGIH STEL
Sodium Tolytriazole	NE	NE	NE	NE
Sodium Hydroxide	2 mg/m3	NE	2 mg/m3	NE

ENGINEERING CONTROLS: Work in well ventilated areas. Do not breathe vapors or mist. Ensure that existing ventilation is sufficient to prevent the circulation and/or accumulation of vapors in the air.

PERSONAL PROTECTIVE EQUIPMENT:

EYES AND FACE: Wear safety glasses when handling this material.

SKIN: Wear nitrile or latex gloves. Wear protective clothing.

RESPIRATORY: No special respiratory equipment is needed.

WORK HYGIENIC PRACTICES: Discard contaminated gloves after use. Have eye-wash facilities in the immediate vicinity. Work in adequately ventilated area. Do not breathe vapors or mist. Minimize any contact with any chemical.

COMMENTS: Eye wash station and safety shower should be available in immediate work area. To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment, in accordance with the OSHA PPE Standard (29 CFR 1910.132), be conducted before using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Form: Liquid

Appearance Color: Brown

Odor: Slight

Odor Threshold: Not Determined

pH-value @ 68 °F: 10-12

Melting point: Not Determined

Boiling Point: 108 C

Flash Point: Not Established

Flammability: no data available

Ignition temperature: no data available

Auto Igniting: no data available

Danger of explosion: no data available

Explosion Lower Limit: NE

Explosion Upper Limit: NE
Vapor pressure @ 68 °F: .04
Relative Density: 1.19
Vapor Density: N/A
Evaporation Rate: N/A
Solubility in Water: Complete
Partition coefficient: no data available
Dynamic viscosity: no data available
Kinematic viscosity: no data available
Organic Content %age: no data available
Water %age: no data available
Solids Content %age: no data available
Other Informartion: no data available

10. STABILITY AND REACTIVITY

STABILITY: Stable
REACTIVITY: See sub-sections below.
POLYMERIZATION: Hazardous polymerization is not expected to occur under normal temperatures and pressures.
CONDITIONS TO AVOID: Elevated temperatures
POSSIBILITY OF HAZARDOUS REACTIONS: None expected.
INCOMPATIBLE MATERIALS: Strong Acids
HAZARDOUS DECOMPOSITION MATERIALS: Thermal decomposition may generate toxic and corrosive fumes of carbon oxides

11. TOXICOLOGICAL INFORMATION

SKIN: Skin Corrosion/Irritation: Severely irritating., Skin Acute Toxicity: Not Determined
EYES: Severely irritating.
INHALATION: Not Determined
INGESTION: Not Determined
CARCINOGENICITY
IARC: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
NTP: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
OSHA: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
DERMAL TOXICITY: Not Determined
MUTAGENICITY: Not Determined
SENSITIZATION: Not a sensitizer
TERATOGENICITY: Not Determined
REPRODUCTIVE EFFECTS: Not Determined
TARGET ORGAN EFFECTS: Not Determined
ADDITIONAL INFORMATION: no additional information.

12. ENVIRONMENTAL INFORMATION

PRODUCT	TEST	DURATION	ORGANISM TYPE	TEST RESULTS
same as sds name	-	No applicable data available	No applicable data available	No applicable data available

ECOTOXICITY: no applicable data available
BIOACCUMULATION: Not determined
PERSISTENCE DEGRADABILITY: Not determined
MOBILITY: Not determined
ENVIRONMENTAL DATA: no applicable data available

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of in accordance with national, state and local regulations. It is the waste generator's responsibility to determine if a particular waste is hazardous under RCRA.
EMPTY CONTAINER: Empty Container Warning (Where applicable). Empty Containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty containers should be taken for recycling, recovery or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations.
DISPOSAL INSTRUCTIONS: The generation of waste should be avoided or minimized wherever possible and should at all times comply with the requirements of evironmental protection and waste disposal legislation and any regional local authority requirements.
WASTE FROM RESIDUES / UNUSED PRODUCTS: For hazardous waste regulations call 800-424-9346, the RCRA Hotline.
CONTAMINATED PACKAGING: For hazardous waste regulations call 800-424-9346, the RCRA Hotline..

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)
PROPER SHIPPING NAME: CAUSTIC ALKALI LIQUIDS, N.O.S. (SODIUM HYDROXIDE, SODIUM TOLYTRIAZOLE),
TECHNICAL NAME: no applicable data available
PRIMARY HAZARD CLASS/DIVISION: 8,
UN/NA NUMBER: UN1719,
PACKING GROUP: PG II
NAERG: 154
LABEL: 8,
EMS NO: F-A, S-B
ADDITIONAL INFO: none

15. REGULATORY INFORMATION

UNITED STATES
TSCA (TOXIC SUBSTANCE CONTROL ACT)
TSCA STATUS: On the inventory, or in compliance with the inventory
US federal regulations
TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050) no applicable data available
CERCLA Hazardous Substance List (40 CFR 302.4): NO
Superfund amendments and reauthorization act of 1986 (SARA)
SARA 302 Extremely hazardous substance NO
SARA 304 Emergency release notification no applicable data available
SARA 311/312 Hazardous chemical no applicable data available
SARA 313 (TRI reporting) NO

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3) no applicable data available

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):no applicable data available

US state regulations

US. California Proposition 65: NO

US. New Jersey Worker and Community Right-to-Know Act: no applicable data available

US. Massachusetts RTK - Substance List: no applicable data available

US. Pennsylvania RTK - Hazardous Substances: no applicable data available

US. Rhode Island RTK: no applicable data available

Inventory Status:

Europe REACH: On the inventory, or in compliance with the inventory

USA TSCA: On the inventory, or in compliance with the inventory

Canada DSL: On the inventory, or in compliance with the inventory

Australia AICS: On the inventory, or in compliance with the inventory

New Zealand NZIOC: On the inventory, or in compliance with the inventory

Japan ENCS: On the inventory, or in compliance with the inventory

Korea KECI: On the inventory, or in compliance with the inventory

Philippines PICCS: On the inventory, or in compliance with the inventory

China IECSC: On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

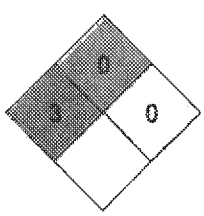
TITLE: EHS Management

PREPARED BY: FCT EHS and Compliance Dept.

HEALTH: 3

FIRE: 0

REACTIVITY: 0



MANUFACTURER SUPPLEMENTAL NOTES: no applicable data available

MANUFACTURER DISCLAIMER: The information contained herein is based on data believed to be accurate and is offered at no charge. No warranty is expressed or implied regarding the accuracy of this data. Liability is expressly disclaimed for loss or injury arising out of use of this information or the use of any materials designated. It is the user's responsibility for determining whether the product is suitable for its intended conditions of use.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect

EC	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Ac
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition,Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

GGS 2426 H81 SAFETY DATA SHEETS

2015

WATER engineering inc

SAFETY DATA SHEET

Formula 281

PRODUCT USE: Boiler Feedwater Treatment

REVISION DATE: August 2011

1. PRODUCT AND COMPANY INFORMATION

Water Engineering Inc.
1574 County Rd 10
Mead, NE 68041

24 HOUR EMERGENCY TELEPHONE: (800) 255-3924
ACCOUNT NUMBER: MIS0004338
TO REQUEST AN MSDS: Contact Product Manager
CUSTOMER SERVICE: (800) 476-5545

MSDS NUMBER: 281

PREPARED DATE: January 2004

2. HAZARDS CLASSIFICATION

OSHA REGULATORY STATUS: Non-Regulated Material
GHS CLASSIFICATION: Not applicable
GHS SYMBOL: Not applicable
GHS SIGNAL WORD: Not applicable
GHS HAZARD STATEMENT: Not applicable

EMERGENCY OVERVIEW:
COLOR: Clear
PHYSICAL FORM: Liquid
ODOR: No
SIGNAL WORD: Not applicable
MAJOR HEALTH HAZARDS: Can cause irritation of eyes, skin, nose, throat, and lungs. Possibly harmful if swallowed.
PHYSICAL HAZARDS: Data not available
ECOLOGICAL HAZARDS: Data not available
PRECAUTIONARY STATEMENTS: Data not available

POTENTIAL HEALTH EFFECTS:
INHALATION: High mist concentrations can cause irritation of eyes, nose, throat and lungs.
SKIN CONTACT: Prolonged or repeated contact may cause skin irritation.
EYE CONTACT: Irritation and/or burning sensation to eyes.
INGESTION: Material is possibly harmful if swallowed.

TARGET ORGANS: Not available
CHRONIC EFFECTS: No studies have been conducted for this product.

CARCINOGEN STATUS:
OSHA: No
NTP: No
IARC: No

See Section 11: TOXICOLOGICAL INFORMATION

3. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT: Carbohydrazide
CAS NUMBER: 497-18-7
PERCENTAGE: 5-15%

The remaining components are non-hazardous, proprietary information.

4. FIRST AID MEASURES

INHALATION: Remove to fresh air. Get medical attention if irritation persists or symptoms develop later.
SKIN CONTACT: Flush with water for at least 15 minutes while removing clothing. Continue to rinse until "slippery" feeling is gone. Get medical attention if irritation persists or burns develop.
EYE CONTACT: Immediately flush with copious amounts of water for 15 minutes. Hold eyelids open to ensure complete rinse. Remove contact lenses if worn. Get immediate medical attention.
INGESTION: DO NOT INDUCE VOMITING. Give water or milk to dilute. Never give anything by mouth to an unconscious person. Get immediate medical attention.

WATER

SAFETY DATA SHEET

Formula 281

PRODUCT USE: Boiler Feedwater Treatment **REVISION DATE:** August 2011

NOTE TO PHYSICIAN: Not available

5. FIRE FIGHTING HAZARDS

FIRE AND EXPOLOSION HAZARDS:	None known other than material can splatter above 100 °C/212 °F
EXTINQUISHING MEDIA:	Water fog, Alcohol foam, Carbon Dioxide, Dry Chemical
FIRE FIGHTING:	Do not release runoff from fire control methods to sewers or waterways.
SENSITIVITY TO MECHANICAL IMPACT:	Not available
SENSITIVITY TO STATIC DISCHARGE:	Not available
FLASH POINT:	Nonflammable
HAZARDOUS COMBUSTION PRODUCTS:	There are no known hazardous decomposition products for this material unless the material is burned in which case undetermined evolution of toxic gases may occur.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Small Spills: Absorb spill with paper towel or similar absorbent, or flush to sewer or ground with large amounts of water.

Large Spills: Dike to contain spill. Reclaim as mush as possible. Absorb remainder with inert materials. Flush residue away with water. Prevent wash water from entering natural waterways or public water supplies.

7. HANDLING AND STORAGE

STORAGE: Keep form freezing. Store only in original container and keep closed while not in use. Keep out of reach of children. Do not contaminate food or feed by storage of this product.

HANDLING: Read label before using. Avoid skin and eye contact. Read and follow label instructions. Do not contaminate food or feed by use of this product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS:	Not available
BIOLOGICAL LIMIT VALUES:	Not available
VENTILATION:	None normally required. Mechanical exhaust as needed if mist in air.
EYE PROTECTION:	Splash proof goggles or chemical safety glasses. Provide for full eye protection.
CLOTHING:	Wear proper clothing to minimize skin contact. Launder contaminated clothing before reuse. Do not wear clothing soaked with product.
GLOVES:	Rubber or neoprene
PROTECTIVE MATERIAL TYPES:	Not available
RESPIRATOR:	Use NIOSH approved dust or mist respirator if mist in air causes irritation or exceeds exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:		**VAPOR DENSITY:**	As water
COLOR:	Clear	**SPECIFIC GRAVITY (water=1.000):**	1.01-1.05
PHYSICAL FORM:	Liquid	**BULK DENSITY:**	Not available
ODOR:	No	**WATER SOLUBILITY:**	Complete
BOILING POINT:	212 °F	**pH:**	6.0-9.0
MELTING POINT:	Not available	**VOLATILITY:**	88% +/-
FLASH POINT:	Nonflammable	**ODOR THRESHOLD:**	Not available
DECOMPOSITION POINT:	Not available	**EVAPORATION RATE:**	As water
VAPOR PRESSURE:	As water	**COEFFICIENT OF WATER/OIL DISTRIBUTION:**	Not available

WATER engineering inc

SAFETY DATA SHEET

Formula 281

PRODUCT USE: Boiler Feedwater Treatment **REVISION DATE:** August 2011

10. STABILITY AND REACTIVITY

REACTIVITY:	Stable
CONDITIONS TO AVOID:	Excessive temperature, contact with any type of reactive chemicals
INCOMPATIBILITIES:	Avoid contact with Strong Acids, Strong Alkalies, Oxidizers or any other type of reactive material.
HAZARDOUS DECOMPOSITION:	There are no known hazardous decomposition products for this material unless the material is burned in which case undetermined evolution of toxic gases may occur.
POLYMERIZATION:	Not available

11. TOXICOLOGICAL INFORMATION

WEI BWT 281, Boiler Feedwater Treatment:

IRRITATION DATA:	Not available
TOXICITY DATA:	Not available
CARCINOGEN STATUS:	None listed under OSHA, IARC or NTP.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:	Not available
ALGAL TOXICITY:	Not available
FATE AND TRANSPORT:	Not available
BIODEGRATION:	Not available
PERSISTANCE:	Not available
BIOCONCENTRATION:	Not available
OTHER ECOLOGICAL INFORMATION:	Not available

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with Federal, State, and local regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME:	NON-REGULATED MATERIAL
ID NUMBER:	Not applicable
HAZARD CLASS OF DIVISION:	Not applicable
PACKING GROUP:	Not applicable
LABELING REQUIREMENTS:	Not applicable

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME:	NON-REGULATED MATERIAL
UN NUMBER:	Not applicable
CLASS:	Not applicable
PACKING GROUP/RISK GROUP:	Not applicable

15. REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

WATER

SAFETY DATA SHEET

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SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE:	NO
CHRONIC:	NO
FIRE:	NO
REACTIVE:	NO
SUDDEN RELEASE:	NO

SARA TITLE III SECTION 313 (40 CFR 372.65)

OSHA PROCESS SAFETY (29 CFR 1901.119):

OTHER U.S. REGULATIONS:

STATE REGULATIONS:
California Proposition 65:

NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW:
REPORTING REQUIREMENT:
(LIST CHEMICAL, CAS NUMBER, PERCENTAGE)

SPECIAL HEALTH HAZARD SUBSTANCE LIST:
(LIST CHEMICAL, CAS NUMBER, PERCENTAGE)

PENNSLYVANIA RIGHT TO KNOW:
REPORTING REQUIREMENT:
(LIST CHEMICAL, CAS NUMBER, PERCENTAGE)

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION:

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA):

TSCA 12(b) EXPORT NOTIFICATION:

CANADA INVENTORY (DSL/NDSL):

16. OTHER INFORMATION

NFPA RATINGS (SCALE 0-4):	HEALTH= 1	FIRE= 0	REACTIVITY= 0	C
HMIS RATINGS (SCALE 0-4):	HEALTH= 1	FIRE= 0	REACTIVITY= 0	C

Disclaimer:
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

The above information is not claiming characteristics of the product in term of legal claims of performance / guarantee. This information only describes safety measures and no liability may arise from the use or application of the product described herein. This information is given in good faith and based on our current knowledge of the product.

SAFETY DATA SHEET

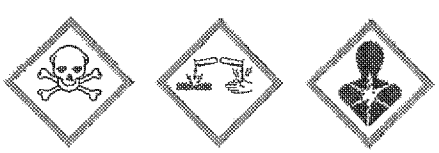
LANXESS
Energizing Chemistry

GGS 2680

Section 1. Identification

Product identifier	: HYDRAZINE HYDRATE 55%
Material Number	: 05528763
Identified uses	: Corrosion inhibitor. Reducing agent.
Supplier/Manufacturer	: LANXESS Corporation Product Safety & Regulatory Affairs 111 RIDC Park West Drive Pittsburgh, PA 15275-1112 USA For information: US/Canada (800) LANXESS International +1 412 809 1000
In case of emergency	: Chemtrec (800) 424-9300 International (703) 527-3887 Lanxess Emergency Phone (800) 410-3063.

Section 2. Hazards identification

HAZCOM Standard Status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Physical state	: Liquid.
Color	: Colorless to light yellow.
Classification of the substance or mixture	: ACUTE TOXICITY: ORAL - Category 4 ACUTE TOXICITY: INHALATION - Category 3 SKIN CORROSION/IRRITATION - Category 1 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 SKIN SENSITIZATION. - Category 1 CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [blood system and lungs] - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Narcotic effects] - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) [brain, kidneys and liver] - Category 2
Hazard pictograms	: 
Signal word	: Danger
Hazard statements	: Toxic if inhaled. Harmful if swallowed. Causes severe skin burns and eye damage. May cause an allergic skin reaction. Suspected of causing cancer. Causes damage to organs. (blood system, lungs) May cause drowsiness and dizziness. May cause damage to organs through prolonged or repeated exposure. (brain, kidneys, liver)
Hazard Not Otherwise Classified (HNOC)	: Causes digestive tract burns.
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/clothing and eye/face protection. Use only in a well-ventilated are not breathe vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF SWALLOWED: 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. IF ON SKIN: Wash with plenty of soap and water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Do not taste or swallow. Wash thoroughly after handling. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials and food and drink. Corrosive to digestive tractInhalation, skin absorption, or ingestion may cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen; a symptom of this may be cyanosis (purplish-blue coloring of skin, fingernails, and lips).

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	%	CAS number
Hydrazine	32 - 38%	302-01-2

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of first aid measures

Eye contact : Get medical attention immediately. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician. In case of contact, flush eyes with plenty of water for at least 30 minutes. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Call physician immediately.

Inhalation : Get medical attention immediately. 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. 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. If not breathing give artificial respiration using a pocket mask type resuscitator.

Skin contact : Get medical attention immediately. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with wate 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. In case of contact, flush skin with plenty of water for at least 30 minutes. Immediately remove contaminated clothing and shoes. IF exposed or concerned: Get medical attention.

Section 4. First aid measures

Ingestion : Get medical attention immediately. 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. 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.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Toxic if inhaled. Can cause central nervous system (CNS) depression. May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen.

Skin contact : Causes severe burns. May cause an allergic skin reaction.May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen.

Ingestion : Harmful if swallowed. Corrosive to the digestive tract. Causes burns. Can cause central nervous system (CNS) depression. May cause burns to mouth, throat and stomach.May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen.

Over-exposure signs/symptoms

Eye contact : Corrosive with symptoms of reddening, tearing, swelling, burning and possible permanent damage.

Inhalation : May cause pulmonary edema with symptoms of breathing difficulty and tightness of chest. A symptom of methemoglobin formation may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips). Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Skin contact : Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage.
Once sensitized, an allergic skin reaction may occur with reddening, swelling, and rash when subsequently exposed to very low levels. A symptom of methemoglobin formation may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips).

Ingestion : Corrosive with symptoms of coughing, burning, ulceration, and pain.
Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea.
May cause nervous system effects which can include symptoms of dizziness, incoordination, headache, numbness, and/or confusion.A symptom of methemoglobin formation may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips).

Potential chronic health effects

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.May cause cancer.

Notes to physician : Immediately give oxygen if victim turns blue (lips, ears, fingernails). Reversion of methemoglobin to hemoglobin can occur spontaneously after termination of exposure, thus moderate degrees of cyanosis need to be treated only by supportive measures. 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.

Protection of first-aiders : If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. 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. In case of fire, use wa spray (fog), foam or dry chemical.
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. Toxic and irritating gases/fumes may be given off during burning or thermal decomposition. Water runoff from fire fighting may be corrosive.
Hazardous thermal decomposition products	: Decomposition products may include the following materials: 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.Use cold water spray to cool fire-exposed containers to minimize risk of rupture.
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	: 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.
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 environmenta' pollution (sewers, waterways, soil or air).
Methods and materials for containment and cleaning up	: Contain small spills by diking and digging a containment pit sufficiently large to hold at least 10 times the spill volume. Dilute to approximately 10 times the volume with water. Add sufficient dry commercial calcium hypochlorite (dry chlorine, HTHR, dry bleach) to completely oxidize the hydrazine. Use 7-10 lbs per pound of hydrazine. Calcium hypochlorite or other oxidizing agents should never be allowed to mix with undiluted hydrazine solutions. The resulting reaction is very vigorous, releasing large amounts of heat and gas. Contaminated surfaces should be treated with household bleach or calcium hypochlorite solution to oxidize the residual hydrazine.Stop leak if without risk. Move containers from spill area. Approach release from upwind. 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. Prevent entry into sewers, water courses, basements or confined areas.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	: Do not store or transfer hydrazine solutions in open container, because hydrazine can be absorbed into the body by all common routes of exposure. Protective equipment must be used.Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read a understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. 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. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.

Section 7. Handling and storage

Remove contaminated clothing and protective equipment before entering eating areas. Workers should wash hands and face before eating, drinking and smoking. Put on appropriate personal protection equipment. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed.

Conditions for safe storage : 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. 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. Empty containers retain product residue and can be hazardous. Do not reuse container.

Section 8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Exposure limits
Hydrazine	**ACGIH TLV (United States, 3/2012).** **Absorbed through skin.** TWA: 0,01 ppm 8 hours. TWA: 0,01 mg/m³ 8 hours. **OSHA PEL (United States, 6/2010).** **Absorbed through skin.** TWA: 1 ppm 8 hours. TWA: 1,3 mg/m³ 8 hours.

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

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.

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. 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.Educate and train employees in the safe use and handling of this product.

Respiratory protection : A NIOSH approved positive pressure air-supplied respirator is required whenever airborne concentrations are not known overexceed the recommended exposure limit. For emergency and other conditions where the exposure limits may be greatly exceeded, use an approved, positive pressure self-contained breathing apparatus. This product has poor warning properties since the concentration at which the odor can be smelled is substantially higher than the airborne concentration standard/guideline. Observe OSHA regulations for respirator use (29 CFR 1910.134).

Skin protection : Chemical-resistant gloves. Recommended Polyvinyl chloride - PVC nitrile rubber or neoprene rubber Gloves After contamination with product change the gloves immediately and dispose of them according to relevant national and local regulations Permeation resistant clothing and foot protection.
Polyvinyl chloride (PVC/vinyl) apron

Eye/face protection : Chemical splash goggles or face shield.

Medical Surveillance : Not available.

Section 9. Physical and chemical properties

Physical state	:	Liquid.
Color	:	Colorless to light yellow.
Odor	:	Ammoniacal.
Odor threshold	:	Not available.
pH	:	>12 [Conc. (% w/w): 35%]
Boiling point	:	109,4 °C (1013 hPa)
Melting point	:	-65°C (-85°F)
Flash point	:	Closed cup: >100°C (>212°F) [DIN 51758]
Evaporation rate	:	Not available.
Explosion limits	:	Lower: 9,3% Upper: 83,4%
Vapor pressure	:	15 hPa (20°C)
Density	:	1,021 g/cm³
Specific gravity (Relative density)	:	Not available.
Solubility	:	Miscible in water.
Partition coefficient: n-octanol/water	:	Not available.
Vapor density	:	Not available.
Viscosity	:	Dynamic: 1,26 mPa·s
Auto-ignition temperature	:	Not available.
Decomposition temperature	:	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 extreme heat. Slow reaction with oxygen from the air is possible at room temperature. Sudden reaction and fire may result when mixed with oxidizing agents.
Incompatible materials	:	Oxidizing agents catalytic metals lead copper zinc cobalt silver certain alloys (such as bronze and brass)
Hazardous decomposition products	:	By catalytic influence or elevated temperatures: hydrogen ; nitrogen ; ammonia ; other toxic or flammable nitrogen compounds

Section 11. Toxicological information

Information on the likely routes of exposure	:	Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eye contact	:	Causes serious eye damage.
Inhalation	:	Toxic if inhaled. Can cause central nervous system (CNS) depression. May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen.
Skin contact	:	Causes severe burns. May cause an allergic skin reaction.May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen.
Ingestion	:	Harmful if swallowed. Corrosive to the digestive tract. Causes burns. Can cause central nervous system (CNS) depression. May cause burns to mouth, throat and stomach cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen.

Symptoms related to the physical, chemical and toxicological characteristics

Section 11. Toxicological information

Eye contact : Corrosive with symptoms of reddening, tearing, swelling, burning and possible permanent damage.

Inhalation : May cause pulmonary edema with symptoms of breathing difficulty and tightness of chest. A symptom of methemoglobin formation may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips). Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Skin contact : Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage.
Once sensitized, an allergic skin reaction may occur with reddening, swelling, and rash when subsequently exposed to very low levels. A symptom of methemoglobin formation may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips).

Ingestion : Corrosive with symptoms of coughing, burning, ulceration, and pain.
Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea.
May cause nervous system effects which can include symptoms of dizziness, incoordination, headache, numbness, and/or confusion.A symptom of methemoglobin formation may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips).

Potential chronic health effects

Short term exposure

Potential immediate effects : Not available.

Long term exposure

Potential delayed effects : Not available.

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.May cause cancer.

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.

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure	Test
Hydrazine	LD50 Oral LD50 Oral	Rat - Male Rat - Female	173 mg/kg 108 to 141 mg/kg	- -	- -
Hydrazine	LC50 Inhalation Vapor	Rat	759 mg/m³	4 hours	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
	Skin - Edema Skin - Erythema/Eschar	Rabbit Rabbit	0 to 2 2	4 hours 4 hours	72 hours 72 hours

Conclusion/Summary

Skin : Irritant.
: hydrazine: Corrosive.

Eyes : Hydrazine : Corrosive.

Sensitization

Section 11. Toxicological information

Product/ingredient name	Route of exposure	Species	Result
Hydrazine	skin	Human	Sensitizing

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Hydrazine	Sub-acute NOAEL Oral	Rat	1,92 mg/kg per day	28 days; 7 days per week

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Hydrazine	OECD 471 Bacterial Reverse Mutation Test; with metabolic activation and without metabolic activation	Experiment: In vitro Subject: Bacteria	Positive
	OECD 473 *In vitro* Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic	Positive
	OECD 476 *In vitro* Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic	Positive

Carcinogenicity

Conclusion/Summary : Hydrazine was tested for carcinogenicity by oral administration to mice in several experiments, producing mammary and lung tumours. When tested by oral administration or inhalation exposure in rats, it produced lung, liver and nasal tumour and a few colon tumours. In hamsters, it produced liver tumours and thyroid adeno following oral or inhalation exposure.The cancer risk of men exposed to hydrazine was investigated in two small cohort studies. In neither of these studies was an elevated risk observed for all cancers combined or for any specific cancer type.Hydrazine:In long-term animal tests carried out with several hydrazid compounds, indications of a mutagenic/carcinogenic potential of this substance group were noted.

Product/ingredient name	CAS #	IARC	NTP	OSHA
Hydrazine	302-01-2	2B Possibly carcinogenic to humans	Anticipated	Not classified.

Reproductive toxicity

Conclusion/Summary : Hydrazine:Did not show mutagenic or teratogenic effects in animal experiments.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Hydrazine	Category 1	All	blood system
		Not determined	lungs
	Category 3	Not applicable.	Narcotic effects

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Hydrazine	Category 2	Not determined	brain, kidneys and liver

Acute toxicity estimates

NPPDRH114_0000311
ED_005798_00000434-00150

Section 11. Toxicological information

Route	ATE value (Acute Toxicity Estimates)
Oral	308,6 mg/kg
Inhalation (vapors)	2,169 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Test	Result	Species	Exposure
Hydrazine	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute EC0 5,5 mg/l	Bacteria	3 hours
	-	Acute EC50 0,175 mg/l	Daphnia - Daphnia pulex	48 hours
	OECD EU C.3	Acute IC50 0,017 mg/l	Algae - Desmodesmus subspicatus	72 hours
	-	Acute LC50 0,61 mg/l	Fish - Lebistes reticulatus	96 hours
	OECD EU C.3	Chronic NOEC 0,006 mg/l	Algae - Desmodesmus subspicatus	48 hours
	OECD 211 *Daphnia Magna* Reproduction Test	Chronic NOEC 0,01 mg/l	Daphnia - Daphnia magna	21 days

Conclusion/Summary : Not available.

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Hydrazine	OECD 302B Inherent Biodegradability: Zahn-Wellens/ EMPA Test	88 % - 0,25 days	-	-

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Hydrazine	Fresh water <1 days	-	-

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Hydrazine	-0,16	-	low

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

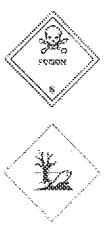
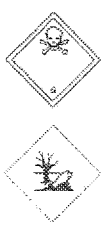
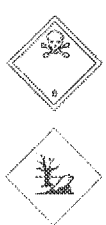
Disposal methods : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers 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. Waste disposal should be in accordance with existing federal state, provincial and or local

Section 13. Disposal considerations

environmental controls laws. Observe label precautions.

RCRA classification : U133: When discarded in its purchased form, this product is a listed RCRA hazardous waste and should be managed as a hazardous waste. (40 CFR 261.20-24) Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product, should be classified as a hazardous waste. (40 CFR 261.20-24)

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	UN3293	HYDRAZINE, AQUEOUS SOLUTION	6.1	III		IB3, T4, TP1
IMDG Class	UN3293	HYDRAZINE, AQUEOUS SOLUTION	6.1	III		**Emergency schedules (EmS)** F-A, S-A
IATA-DGR Class	UN3293	HYDRAZINE, AQUEOUS SOLUTION	6.1	III		**Passenger aircraft** 655: 60 L **Cargo aircraft** 663: 220 L

PG* : Packing group

RQ : 3 lbs

Section 15. Regulatory information

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

	Ingredient name	CAS number	Concentration (%)
SARA Title III Section 302 Extremely Hazardous Substances	Hydrazine	302-01-2	32 - 38%

	Ingredient name	CAS number	Concentration (%)
SARA Title III Section 313 Toxic Chemicals	Hydrazine	302-01-2	32 - 38%

	Ingredient name	CAS number	RQ
US EPA CERCLA Hazardous Subtances (40 CFR 302)	Hydrazine	302-01-2	1 lbs. (0.454 kg)

State regulations

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections on the SDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropraite agency in your state.

Section 15. Regulatory information

Ingredient name	CAS number	State Code	Concentration (%)
Hydrazine	302-01-2	MA - S, NJ - HS, PA - RTK HS	32 - 38%
Water	7732-18-5		62 - 68%

Massachusetts Substances: MA - S
Massachusetts Extraordinary Hazardous Substances: MA - Extra HS
New Jersey Hazardous Substances: NJ - HS
Pennsylvania RTK Hazardous Substances: PA - RTK HS
Pennsylvania Special Hazardous Substances: PA - Special HS

California Prop. 65

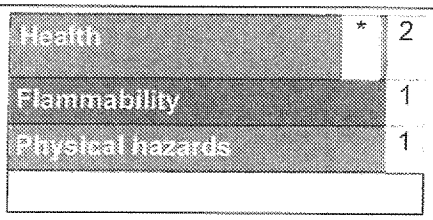
WARNING: This product contains a chemical known to the State of California to cause cancer.

Ingredient name	CAS #	Concentration (%)	Cancer	Reproductive
Hydrazine	302-01-2	32 - 38%	Yes	

U.S. Toxic Substances Control Act : Listed on the TSCA Inventory.

Section 16. Other information

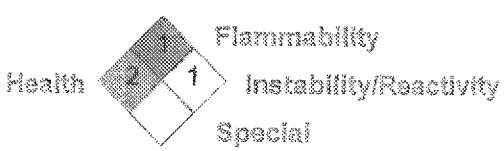
Hazardous Material Information System :



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

The customer is responsible for determining the PPE code for this material. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

National Fire Protection Association (U.S.A.) :



0= Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

LANXESS' method of hazard communication is comprised of Product Labels and Safety Data Sheets. HMIS and NFPA ratings are provided by LANXESS as a customer service.

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Date of issue : 12-16-2013
Date of previous issue : No previous validation
Version : 1
Product Safety and Regulatory Affairs

***Indicates information that has changed from previously issued version.**

Notice to reader

Section 16. Other information

This information is furnished without warranty, express or implied. This information is believed to be accurate to the best knowledge of LANXESS Corporation. The information in this SDS relates only to the specific material designated herein. LANXESS Corporation assumes no legal responsibility for use of or reliance upon the information in this SDS.

GGS 1014

Graver Techno

SAFETY DATA SHEET

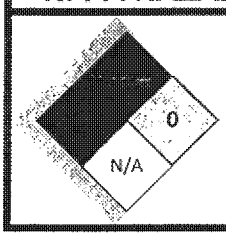
1. PRODUCT and COMPANY IDENTIFICATION

Product Name: Powdex® PAO
Product Form: Mixture
Ionic Form: Anion Exchange Resin Hydroxide Form
Supplier/Manufacturer: Graver Technologies, LLC 200 Lake Drive, Glasgow, DE 19702 +302-731-1700 +800-533-6623
Emergency Phone: +302-731-1700 +800-533-6623
Fax Number: +302-731-1707
Recommended Use: Ion exchange process

2. HAZARDS IDENTIFICATION

This material is classified as hazardous in accordance with the OSHA Hazard Communication Standard (21CFR 1920.1200).

Serious eye damage – Category 1

NFPA HAZARD RATING		
	4=Severe 3=Serious 2=Moderate 1=Slight 0=Minimal	Health Instability Special

Label elements

Signal Word: DANGER!

Hazards: Causes serious eye damage. H318

Precautionary Statements

Prevention: Wear protective gloves and eye/face protection. Wash hands thoroughly after handling.

Response: If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician..

Other Hazards: None known

Skin Contact: Prolonged or repeated exposure may cause skin irritation.

Ingestion: Single dose oral toxicity is believed to be low.

Inhalation: Vapors are unlikely due to physical properties. If product is allowed to completely dry, inhalation of particles may cause coughing or congestion.

Chronic Effects: No known significant effects.

3. COMPOSITION / INFORMATION on INGREDIENTS

This product is a mixture

Component	CAS No.	%	Classification
1) Trimethylamine functionalized, chloromethylated copolymer of styrene, ethylstyrene, and divinylbenzene in the hydroxide form.	69011-18-3	35 – 50	H318
2) Water	7732-18-5	50 – 65	

4. FIRST AID MEASURES

Eye: Flush with water, remove any contact lenses, and continue flushing for at least 30 minutes. A physician should treat chemical burns promptly.

Skin Contact: If irritation occurs, flush affected area with water. Get medical attention if irritation persists or other symptoms occur.

Ingestion: If swallowed, wash out mouth with water. Move to fresh air and if conscious give small quantities of water to drink. Do not induce vomiting unless directed by medical personnel. If adverse health effects persist or become severe, get medical attention.

Inhalation: Move any affected person to fresh air. If adverse health effects persist or become severe, get medical attention.

Systemic & Other Effects: No specific data available, however, repeated exposures are not anticipated to cause any significant adverse effects.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media: In case of fire, use dry chemical, foam, carbon dioxide, or water spray.

Fire Fighting Equipment: Wear appropriate protective equipment and positive pressure self-contained breathing apparatus.

Hazardous Combustion Products: Under normal conditions of use and storage, no hazardous combustion products are expected. Thermal decomposition products may include and are not limited to: Organic amines, nitrogen oxides, hydrocarbons, carbon monoxide, carbon dioxide, & benzene compounds.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Take no action that involves personal risk or without suitable training. Wear appropriate personal protective equipment and keep other personnel away from release area. Provide adequate ventilation. Spilled material may be slippery. See Sections 7 & 8 for more information.

Environmental Precautions: Do not disperse material and do not allow entry into sewers, waterways, or the ground. See Section 12 for more information.

Spills: Sweep up and recover if possible. Place in labeled containers. Dispose of according to national and local regulations. See Section 13 for more information.

7. HANDLING AND STORAGE

Handling: Wear appropriate personal protective equipment, described in Section 8. Do not get in eyes or on skin. Do not ingest material. Eating should not be allowed in areas where material is stored, handled, or processed. Wash hands thoroughly after handling and before eating. Keep material in original closed container until used. The maximum recommended operating temperature for this material is 60°C/140°F. **NOTE:** If these ion exchange resins are to be used in contact with strong oxidizing agents such as nitric acid, properly designed equipment is vital to prevent a rapid build-up of pressure and possible explosion. Consult a source knowledgeable in the handling of these materials before proceeding.

Storage: The minimum recommended storage temperature for this material is 3°C/38°F and the maximum is 40°C/104°F. Store original containers in a dry, well-ventilated area.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Exposure Limit Values: None established

Exposure Controls

Engineering Controls: Not required under normal operating conditions.

Protective Measures: Facilities where material is stored or used should be equipped with an eyewash facility.

Personal Protective Equipment (PPE)

Eye Protection: Safety goggles recommended.

Skin & Hand Protection: Avoid skin contact. When using this material, use skin protection (clean body-covering clothing). Use cotton or canvas gloves under limited contact conditions. Use chemically resistant gloves when prolonged or frequently repeated contact is expected to occur. If hands are cut or scratched, use chemical resistant gloves even for short term exposure. Preferred glove materials include: Polyvinyl chloride (PVC), Nitrile butadiene rubber (NBR), Neoprene.

Respiratory Protection: Not required under normal operating conditions.

Hygiene Measures: Wash hands after handling and before eating or using the lavatory.

9. PHYSICAL and CHEMICAL PROPERTIES

Appearance:	Powder
Color:	Light tan to dark brown
Odor:	Slight amine odor
Odor threshold:	No data available
pH:	9-11 aqueous slurry
Melting/freezing point:	Not applicable
Boiling point/range:	Not applicable
Flash point:	Not applicable
Evaporation rate (Butyl acetate=1):	< 1 Water
Flammability (solid, gas):	No data available
Upper/lower explosive limits:	Not applicable
Vapor pressure (mm Hg):	No data available
Vapor density (Air=1):	No data available
Relative density (water=1):	1.1 – 1.3
Solubility in water:	Insoluble
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	~500°C/932°F. Product is not combustible until moisture is removed, then resin starts to burn in flame at ~230°C/446°F.
Decomposition temperature:	No data available
Viscosity, kinematic:	Not applicable
Explosive properties:	No data available
Oxidizing properties:	No data available
Percent Volatility:	50 – 65% Water

10. STABILITY & REACTIVITY

Reactivity: No dangerous reactions known under normal use conditions.

Chemical stability: Stable under normal handling and storage conditions.

Hazardous polymerization: Product will not undergo polymerization.

Incompatibility/Conditions to Avoid: Oxidizing agents such as nitric acid attack organic ion exchange resin under certain conditions and could result in a slightly degraded resin up to an explosive reaction. Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

Hazardous Decomposition Products: Under normal conditions of use and storage, no hazardous decomposition products are expected. Thermal decomposition products may include and are not limited to: Organic amines, nitrogen oxides, hydrocarbons, carbon monoxide, carbon dioxide, & benzene compounds.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Ingestion: Typical for this family of materials – Oral LD_{50} (Rat) >5,000 mg/kg
Skin Contact: No data available
Inhalation: No data available
Eye contact: Risk of serious damage

Carcinogenicity: No data available
Mutagenicity: No data available
Teratogenicity: No data available
Specific target organ systemic toxicity (single exposure): No data available
Specific target organ systemic toxicity (repeated exposure): No data available

12. ECOLOGICAL INFORMATION

Toxicity: No specific data available
Not expected to be acutely toxic, but material may mechanically cause adverse effects if ingested by waterfowl or aquatic life.

Persistence & Degradability: No specific data available
This water-insoluble polymeric solid is expected to be inert in the environment. Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Bioaccumulative potential: No specific data available
No bioconcentration is expected because of the high molecular weight.

Mobility in soil: No specific data available
In the terrestrial environment, material is expected to remain in the soil. In the aquatic environment, material will sink and remain in the sediment.

Results of PBT and vPvB assessment: Not applicable

Other adverse affects: No specific data available

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER. Dispose unused resin in licensed landfill or incinerate according to all national, regional, and local regulations. For resin contaminated with hazardous material, dispose of mixture as hazardous material according to national, regional, and local regulations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

14. TRANSPORT INFORMATION

UN Number and name:	Not hazardous for transport
US DOT:	Not regulated for transport
IMO/IMDG:	Not regulated for transport
IATA/ICAO:	Not regulated for transport
ADR:	Not regulated for transport
RID:	Not regulated for transport
ADN:	Not regulated for transport

Packaging group:	Not applicable
Environmental hazard:	Not a marine pollutant

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

15. REGULATORY INFORMATION

Workplace Classifications: This material is classified as hazardous in accordance with OSHA Hazard Communication Standard (29CFR 1910.1200).

This product is not a 'Controlled Product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

Emergency Planning & Community Right-To-Know (SARA Title 3):

Section 311/312 Categorizations (40CFR 370) Acute health hazard.

Section 313 Information (40CFR 372) This material does not contain any chemical that exceeds the threshold, de minimis, reporting levels.

CERCLA Information (40CFR 302.4) Releases of this material to air, land, or water are not reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to state and local emergency planning committee under the Superfund Amendments and Reauthorization Act (SARA Title III Section 304).

EPA Resource Conservation and Recovery Act (RCRA) When a decision is made to discard this material as supplied, it does not meet RCRA's characteristic

definition of ignitability, corrosivity, or reactivity, and is not listed in 40CFR 261.33. It is the responsibility of the product user to determine whether a material containing the product or derived from the product should be classified as a hazardous waste, at the time of disposal.

Chemical Control Law Status All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard statements:

H318 Causes serious eye damage

Precautionary statements:

P280/P264 Wear protective gloves/protective clothing/eye protection/face protection. Wash hands thoroughly after handling.

P305/P351/P338/P310
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

SDS Identification No.: SD-PX-PAO

Effective Date: 07/31/15

Abbreviations:
OSHA – Occupational Safety and Health Administration
PBT – Persistent, Bioaccumulative and Toxic
vPvB – Very Persistent and Very Bioaccumulative

The information contained herein relates to the specific material as shipped. Graver Technologies believes that such information is accurate and reliable as of the effective date. No representation, guarantee or warranty, express or implied, is given. As local regulatory requirements may differ, the user is responsible for determining the conditions needed for safe use of the product and the suitability for their particular application. It is the user's responsibility to comply with all national and local laws. Consult Graver Technologies for further information.

GGS 2478

H81 SAFETY DATA SHEETS

Graver Technologies

SAFETY DATA SHEET

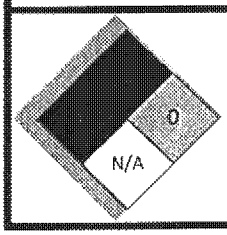
1. PRODUCT and COMPANY IDENTIFICATION

Product Name: Powdex® Premix™ 22N, 42N
Product Form: Mixture
Ionic Form: Cation (Ammonium Form) & Anion (Hydroxide Form) Exchange Resins
Supplier/Manufacturer: Graver Technologies, LLC 200 Lake Drive, Glasgow, DE 19702 +302-731-1700 +800-533-6623
Emergency Phone: +302-731-1700 +800-533-6623
Fax Number: +302-731-1707
Recommended Use: Ion exchange process

2. HAZARDS IDENTIFICATION

This material is classified as hazardous in accordance with the OSHA Hazard Communication Standard (21CFR 1920.1200).

Serious eye damage – Category 1

NFPA HAZARD RATING		
	4=Severe 3=Serious 2=Moderate 1=Slight 0=Minimal	Health Instability Special

Label elements

Signal Word: DANGER!

Hazards: Causes serious eye damage. H318

Precautionary Statements

Prevention: Wear protective gloves and eye/face protection. Wash hands thoroughly after handling.

Response: If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician..

Other Hazards: None known

Skin Contact: Prolonged or repeated exposure may cause skin irritation.

Ingestion: Single dose oral toxicity is believed to be low.

Inhalation: Vapors are unlikely due to physical properties. If product is allowed to completely dry, inhalation of particles may cause coughing or congestion.

Chronic Effects: No known significant effects.

3. COMPOSITION / INFORMATION on INGREDIENTS

This product is a mixture

Component	CAS No.	%	Classification
1) Sulfonated copolymer of styrene, ethylstyrene, and divinylbenzene in the ammonium form.	69011-21-8	15 – 30	Not hazardous
2) Trimethylamine functionalized, chloromethylated copolymer of styrene, ethylstyrene, and divinylbenzene in the hydroxide form.	69011-18-3	10 – 25	H318
3) Water	7732-18-5	55 – 70	

4. FIRST AID MEASURES

Eye: Flush with water, remove any contact lenses, and continue flushing for at least 30 minutes. A physician should treat chemical burns promptly.

Skin Contact: If irritation occurs, flush affected area with water. Get medical attention if irritation persists or other symptoms occur.

Ingestion: If swallowed, wash out mouth with water. Move to fresh air and if conscious give small quantities of water to drink. Do not induce vomiting unless directed by medical personnel. If adverse health effects persist or become severe, get medical attention.

Inhalation: Move any affected person to fresh air. If adverse health effects persist or become severe, get medical attention.

Systemic & Other Effects: No specific data available, however, repeated exposures are not anticipated to cause any significant adverse effects.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media: In case of fire, use dry chemical, foam, carbon dioxide, or water spray.

Fire Fighting Equipment: Wear appropriate protective equipment and positive pressure self-contained breathing apparatus.

Hazardous Combustion Products: Under normal conditions of use and storage, no hazardous combustion products are expected. Thermal decomposition products may include and are not limited to: Sulfur oxides, organic sulfonates, hydrocarbons, carbon monoxide, carbon dioxide, nitrogen oxides, organic amines, & benzene compounds.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Take no action that involves personal risk or without suitable training. Wear appropriate personal protective equipment and keep other personnel away from release area. Provide adequate ventilation. Spilled material may be slippery. See Sections 7 & 8 for more information.

Environmental Precautions: Do not disperse material and do not allow entry into sewers, waterways, or the ground. See Section 12 for more information.

Spills: Sweep up and recover if possible. Place in labeled containers. Dispose of according to national and local regulations. See Section 13 for more information.

7. HANDLING AND STORAGE

Handling: Wear appropriate personal protective equipment, described in Section 8. Do not get in eyes or on skin. Do not ingest material. Eating should not be allowed in areas where material is stored, handled, or processed. Wash hands thoroughly after handling and before eating. Keep material in original closed container until used. The maximum recommended operating temperature for this material is 60°C/140°F. **NOTE:** If these ion exchange resins are to be used in contact with strong oxidizing agents such as nitric acid, properly designed equipment is vital to prevent a rapid build-up of pressure and possible explosion. Consult a source knowledgeable in the handling of these materials before proceeding.

Storage: The minimum recommended storage temperature for this material is 3°C/38°F and the maximum is 40°C/104°F. Store original containers in a dry, well-ventilated area.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Exposure Limit Values: None established

Exposure Controls

Engineering Controls: Not required under normal operating conditions.

Protective Measures: Facilities where material is stored or used should be equipped with an eyewash facility.

Personal Protective Equipment (PPE)

Eye Protection: Safety goggles recommended.

Skin & Hand Protection: Avoid skin contact. When using this material, use skin protection (clean body-covering clothing). Use cotton or canvas gloves for the hands.

Respiratory Protection: Not required under normal operating conditions.

Hygiene Measures: Wash hands after handling and before eating or using the lavatory.

9. PHYSICAL and CHEMICAL PROPERTIES

Appearance:	Powder
Color:	Light tan to dark brown
Odor:	Odorless to slight amine odor
Odor threshold:	No data available
pH:	6-9.5 aqueous slurry
Melting/freezing point:	Not applicable
Boiling point/range:	Not applicable
Flash point:	Not applicable
Evaporation rate (Butyl acetate=1):	< 1 Water
Flammability (solid, gas):	No data available
Upper/lower explosive limits:	Not applicable
Vapor pressure (mm Hg):	No data available
Vapor density (Air=1):	No data available
Relative density (water=1):	1.1 – 1.3
Solubility in water:	Insoluble
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	~500°C/932°F. Product is not combustible until moisture is removed, then resin starts to burn in flame at ~230°C/446°F.
Decomposition temperature:	No data available
Viscosity, kinematic:	Not applicable
Explosive properties:	No data available
Oxidizing properties:	No data available
Percent Volatility:	55 – 70% Water

10. STABILITY & REACTIVITY

Reactivity: No dangerous reactions known under normal use conditions.

Chemical stability: Stable under normal handling and storage conditions.

Hazardous polymerization: Product will not undergo polymerization.

Incompatibility/Conditions to Avoid: Oxidizing agents such as nitric acid attack organic ion exchange resin under certain conditions and could result in a slightly degraded resin up to an explosive reaction. Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

Hazardous Decomposition Products: Under normal conditions of use and storage, no hazardous decomposition products are expected. Thermal decomposition products may include and are not limited to: Sulfur oxides, organic sulfonates, hydrocarbons, carbon monoxide, carbon dioxide, nitrogen oxides, organic amines, & benzene compounds.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Ingestion: Typical for this family of materials – Oral LD_{50} (Rat) >5,000 mg/kg
Skin Contact: No data available
Inhalation: No data available
Eye contact: Risk of serious damage

Carcinogenicity: No data available
Mutagenicity: No data available
Teratogenicity: No data available
Specific target organ systemic toxicity (single exposure): No data available
Specific target organ systemic toxicity (repeated exposure): No data available

12. ECOLOGICAL INFORMATION

Toxicity: No specific data available
Not expected to be acutely toxic, but material may mechanically cause adverse effects if ingested by waterfowl or aquatic life.

Persistence & Degradability: No specific data available
This water-insoluble polymeric solid is expected to be inert in the environment. Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Bioaccumulative potential: No specific data available
No bioconcentration is expected because of the high molecular weight.

Mobility in soil: No specific data available
In the terrestrial environment, material is expected to remain in the soil. In the aquatic environment, material will sink and remain in the sediment.

Results of PBT and vPvB assessment: Not applicable

Other adverse affects: No specific data available

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER. Dispose unused resin in licensed landfill or incinerate according to all national, regional, and local regulations. For resin contaminated with hazardous material, dispose of mixture as hazardous material according to national, regional, and local regulations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

14. TRANSPORT INFORMATION

UN Number and name:	Not hazardous for transport
US DOT:	Not regulated for transport
IMO/IMDG:	Not regulated for transport
IATA/ICAO:	Not regulated for transport
ADR:	Not regulated for transport
RID:	Not regulated for transport
ADN:	Not regulated for transport

Packaging group:	Not applicable
Environmental hazard:	Not a marine pollutant

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

15. REGULATORY INFORMATION

Workplace Classifications: This material is classified as hazardous in accordance with OSHA Hazard Communication Standard (29CFR 1910.1200).

This product is not a 'Controlled Product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

Emergency Planning & Community Right-To-Know (SARA Title 3):

Section 311/312 Categorizations (40CFR 370) Acute health hazard.

Section 313 Information (40CFR 372) This material does not contain any chemical that exceeds the threshold, de minimis, reporting levels.

CERCLA Information (40CFR 302.4) Releases of this material to air, land, or water are not reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to state and local emergency planning committee under the Superfund Amendments and Reauthorization Act (SARA Title III Section 304).

EPA Resource Conservation and Recovery Act (RCRA) When a decision is made to discard this material as supplied, it does not meet RCRA's characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40CFR 261.33. It

is the responsibility of the product user to determine whether a material containing the product or derived from the product should be classified as a hazardous waste, at the time of disposal.

Chemical Control Law Status All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard statements:

H318 Causes serious eye damage

Precautionary statements:

P280/P264 Wear protective gloves/protective clothing/eye protection/face protection. Wash hands thoroughly after handling.

P305/P351/P338/P310
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

SDS Identification No.: SD-PM-N1

Effective Date: 07/09/15

Abbreviations:
OSHA – Occupational Safety and Health Administration
PBT – Persistent, Bioaccumulative and Toxic
vPvB – Very Persistent and Very Bioaccumulative

The information contained herein relates to the specific material as shipped. Graver Technologies believes that such information is accurate and reliable as of the effective date. No representation, guarantee or warranty, express or implied, is given. As local regulatory requirements may differ, the user is responsible for determining the conditions needed for safe use of the product and the suitability for their particular application. It is the user's responsibility to comply with all national and local laws. Consult Graver Technologies for further information.

GGS 2076

Graver Technologies

MATERIAL SAFETY DATA SHEET

Emergency Phone: 800-533-6623
Information Phone: 800-533-6623
Fax Number: 973-690-5808

HAZARD RATING		
Toxicity	1	4=EXTREME
Fire	1	3=HIGH
Reactivity	0	2=MODERATE
Special	N/A	1=SLIGHT
		0=INSIGNIFICANT

PRODUCT IDENTIFICATION

Product Name: POWDEX® PREMIX™ 45H
Ionic Form: Cation/ Anion exchange resins (Hydrogen/ Hydroxide forms)
MSDS Code: MS-PM-45H
Effective Date: 6/13/02

1. COMPONENT INFORMATION

No.	CAS No.	AMT.(%)
1) Sulfonated copolymer of styrene and divinylbenzene in the hydrogen form	069011-20-7	12-27
2) Trimethylamine functionalized, chloromethylated copolymer of styrene and divinylbenzene in the hydroxide form.	069011-18-3	15-33
3) Water	007732-18-5	40-73

2. PHYSICAL DATA

MELTING POINT:	Not applicable
BOILING POINT:	Not applicable
VAPOR PRESSURE (mm Hg):	17mm Hg @20°C/68°F
VAPOR DENSITY (air=1):	Not applicable
SOLUBILITY IN WATER:	Insoluble
SPECIFIC GRAVITY (water=1):	1.1 -1.4
EVAPORATION RATE (Butyl acetate=1):	< 1 Water
PERCENT VOLATILITY:	40-73% Water
APPEARANCE:	Moist, Light yellow to beige powder
ODOR:	Amine odor

72 LOCKWOOD STREET, NEWARK, NEW JERSEY 07105

3. EXPOSURE LIMIT INFORMATION

	OSHA		ACGIH	
COMPONENT NO.	TWA	STEL	TLV	STEL
1	None	None	None	None
2	None	None	None	None
3	None	None	None	None

4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: Not Applicable

METHOD USED: Not Applicable

AUTO-IGNITION TEMPERATURE: 500°C/932°F. Product is not combustible until moisture is removed, then resin starts to burn in flame at 230°C/446°F.

LOWER EXPLOSIVE LIMIT: Not Applicable

UPPER EXPLOSIVE LIMIT: Not Applicable

FIRE FIGHTING EQUIPMENT: Wear positive pressure self-contained breathing apparatus.

EXTINGUISHING AGENTS: Use the following extinguishing media when fighting fires involving this material: 1) carbon dioxide 2) dry chemical 3) water spray

5. REACTIVITY DATA

STABILITY: Stable under normal handling and storage conditions. (see incompatibility statement).

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) WARNING: Oxidizing agents such as nitric acid attack organic ion exchange resin under certain conditions and could result in a slightly degraded resin up to an explosive reaction. Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may yield the following: Hydrochloric acid, naphthalene, benzaldehydes, phenol, carbon dioxide, water, organic amines, chlorine, nitrogen oxides, ammonia, methyl chloride.

5. REACTIVITY DATA (continued)

HAZARDOUS POLYMERIZATION: Product will not undergo polymerization.

6. ENVIRONMENTAL AND DISPOSAL INFORMATION

ACTION TO TAKE FOR SPILLS/LEAKS: Sweep up. Caution: May be slippery.

DISPOSAL METHOD: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER. Bury resin in licensed landfill, or burn in approved incinerator according to local, state, and federal regulations. For resin contaminated with hazardous material, dispose of mixture as hazardous material according to local, state, and federal regulations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. GRAVER TECHNOLOGIES, INC. HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL.

7. HEALTH HAZARD DATA

EYE: May cause severe eye irritation. May cause moderate corneal injury. Effects are likely to heal. Flush with water for a minimum of 15 minutes. Consult a physician if irritation persists.

SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation. If irritation occurs, wash affected area with water. Consult a physician if irritation persists.

SKIN ABSORPTION: Skin absorption is unlikely due to physical properties.

INGESTION: Single dose oral LD50 has not been determined. Single dose oral toxicity is believed to be low. No hazards anticipated from ingestion incidental to industrial exposure. If swallowed, call a physician.

INHALATION: Vapors are unlikely due to physical properties.

SYSTEM & OTHER EFFECTS: No specific data available, however, repeated exposures are not anticipated to cause any significant adverse effects.

8. PERSONAL PROTECTION MEASURES

EXPOSURE GUIDELINES: None established.

VENTILATION: Good general ventilation should be sufficient.

8. PERSONAL PROTECTION MEASURES (continued)

RESPIRATORY PROTECTION: A respiratory protection program meeting **OSHA 1910.134** and **ANSI Z88.2** requirements must be followed whenever workplace conditions warrant a respirator's use. None required under normal operating conditions.

EYE PROTECTION: Use safety glasses **ANSI Z87.1** or approved equivalent.

SKIN & HAND PROTECTION: Avoid skin contact. When using this substance, use skin protection (clean body-covering clothing). Cotton, latex, rubber or canvas gloves for the hands.

OTHER PROTECTIVE EQUIPMENT: Facilities storing or utilizing this material should be equipped with an eyewash facility.

9. STORAGE AND HANDLING INFORMATION

STORAGE CONDITIONS: The minimum recommended storage temperature for this material is 3°C/38°F. The maximum recommended storage temperature for this material is 60°C/140°F.

HANDLING PROCEDURES: The maximum recommended operating temperature for this material is 110°C/230°F. **NOTE:** This product is a powdered ion exchange resin and may produce slight eye irritation. However, the ground form of this resin should be treated as a severe eye irritant. Worker exposure to ground resins can be controlled with local exhaust ventilation at the point of dust generation, or the use of suitable personal protective equipment (dust/mist air-purifying respirator and safety goggles). Properly designed equipment is vital if these ion exchange resins are to be used in conjunction with strong oxidizing agents such as nitric acid to prevent a rapid build up of pressure and possible explosion. Consult a source knowledgeable in the handling of these materials before proceeding.

10. REGULATORY INFORMATION

WORKPLACE CLASSIFICATIONS: This product is considered non-hazardous under OSHA Hazard Communication Standard (29CFR 1910.1200).

This product is not a 'Controlled Product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

TRANSPORTATION CLASSIFICATIONS: US DOT Hazard Class - Non-regulated

EMERGENCY PLANNING & COMMUNITY RIGHT-TO-KNOW (SARA TITLE 3):

Section 311/312 Categorizations (40CFR 370) This product is not a hazardous chemical under 29CFR 1910.1200, and therefore is not covered by Title III of SARA.

Section 313 Information (40CFR 372) This product does not contain a chemical which is listed in Section 313 above de minimis concentrations.

CERCLA Information (40CFR 302.4) Releases of this material to air, land, or water are not reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to state and local emergency planning committee under the Superfund Amendments and Reauthorization Act (SARA Title III Section 304).

RCRA Information When a decision is made to discard this material as supplied, it does not meet RCRA's characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40CFR 261.33. The toxicity characteristic (TC), however, has not been evaluated by the Toxicity Characteristic Leaching Procedure (TCLP).

Chemical Control Law Status All components of this product are listed or are excluded from listing on the U.S. Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

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Abbreviations:

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
TLV - Threshold limit Value
TWA - Time Weighted Average
STEL - Short-Term Exposure Limit

The above information contained herein relates to the specific material identified. Graver Technologies believes that such information is accurate and reliable as of the date of this material safety data sheet, but no representation, guarantee or warranty, express or implied, is made as to the accuracy, reliability, or completeness of the information. Graver Technologies urges persons receiving this information to make their own determination as to the information's suitability and completeness for their particular application. Consult Graver Technologies for further information.

GGS 2762

Compass Minerals

MATERIAL SAFETY DATA SHEET
H81 MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Product Name	Sodium Chloride - Solar Salt
Product use	De-icer General industrial and water softening/conditioning purposes.
Manufacturer	Great Salt Lake Minerals Corporation A Compass Minerals Company 9900 West 109th Street, Suite 100 Overland Park, KS 66210 US Phone: 913-344-9200
CHEMTREC	1-800-424-9300

2. Hazards Identification

Emergency overview	CAUTION May cause eye and skin irritation.
Potential short term health effects	
Routes of exposure	Eye, Skin contact, Inhalation, Ingestion.
Eyes	May cause irritation.
Skin	May cause irritation.
Inhalation	Dusts of this product may cause irritation of the nose, throat, and respiratory tract.
Ingestion	May cause stomach distress, nausea or vomiting.
Target organs	Eyes. Skin. Respiratory system.
Chronic effects	Prolonged or repeated exposure can cause drying, defatting and dermatitis.
Signs and symptoms	Symptoms may include redness, edema, drying, defatting and cracking of the skin. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
OSHA Regulatory Status	This product is NOT known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
Potential environmental effects	See section 12.

3. Composition / Information on Ingredients

Ingredient(s)	CAS #	Percent
Sodium chloride	7647-14-5	90 - 100

4. First Aid Measures

First aid procedures	
Eye contact	Flush with cool water. Remove contact lenses, if applicable, and continue flushing. Obtain medical attention if irritation persists.
Skin contact	Brush away excess of dry material. Flush with water. Obtain medical attention if irritation persists.
Inhalation	If symptoms develop move victim to fresh air. If symptoms persist, obtain medical attention.
Ingestion	Do not induce vomiting. Never give anything by mouth if victim is unconscious, or is convulsing. Obtain medical attention.
Notes to physician	Symptoms may be delayed.
General advice	Avoid contact with eyes. Keep out of reach of children.

5. Fire Fighting Measures

Flammable properties	Not flammable by OSHA criteria. May be combustible at high temperatures.
Extinguishing media	
Suitable extinguishing media	Treat for surrounding material.
Unsuitable extinguishing media	Not available

Protection of firefighters	
Specific hazards arising from the chemical	Not available
Protective equipment for firefighters	Firefighters should wear full protective clothing including self contained breathing apparatus.
Hazardous combustion products	May include and are not limited to: Hydrogen chloride. Chlorine. Oxides of sodium.
Explosion data	
Sensitivity to mechanical impact	Not available
Sensitivity to static discharge	Not available

6. Accidental Release Measures

Personal precautions	Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak.
Environmental precautions	Prevent entry into waterways, sewers, basements or confined areas.
Methods for containment	None necessary.
Methods for cleaning up	Before attempting clean up, refer to hazard data given above. Use broom or dry vacuum to collect material for proper disposal without raising dust. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

7. Handling and Storage

Handling	Use good industrial hygiene practices in handling this material. Avoid breathing dusts from this material.
Storage	Keep out of reach of children. Keep containers tightly closed in a cool, well-ventilated place.

8. Exposure Controls / Personal Protection

Exposure limits

Ingredient(s)	Exposure Limits
Sodium chloride	**ACGIH-TLV** Not established **OSHA-PEL** Not established

Engineering controls	TWA PEL: No specific limits have been established for sodium chloride (a soluble substance). As a guideline, OSHA (United States) has established the following limits which are generally recognized for inert or nuisance dust. Particulates Not Otherwise Regulated (PNOR): 5mg/cu.m. Respirable Dust 8-Hour TWA PEL, 15mg/cu.m. Total Dust 8-Hour TWA PEL. TWA TLV: No specific limits have been established for sodium chloride (a soluble substance). As a guideline, ACGIH (United States) has established the following limits which are generally recognized for inert or nuisance dust. Particulates (insolubles) Not Otherwise Classified (PNOC): 10mg/cu.m. Inhalable Particulate 8-Hours TWA TLV, 3mg/cu.m. Respirable Particulate TWA TLV. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. If user operations generate dust, fumes, or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal protective equipment	
Eye / face protection	Safety glasses
Hand protection	Rubber gloves. Confirm with a reputable supplier first.
Skin and body protection	As required by employer code.
Respiratory protection	Where exposure guideline levels may be exceeded, use an approved NIOSH respirator or NIOSH-approved filtering facepiece.

General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. Wash hands before breaks and immediately after handling the product.

9. Physical and Chemical Properties

Appearance	Crystalline.
Color	White
Form	Crystals
Odor	Odorless
Odor threshold	Not available
Physical state	Solid
pH	6 - 8 (Neutral)
Melting point	1473.62 °F (800.9 °C)
Freezing point	Not available
Boiling point	2575.40 °F (1413 °C)
Pour point	Not available
Evaporation rate	Not available
Flash point	Not available
Auto-ignition temperature	Not available
Flammability limits in air, lower, % by volume	Not applicable
Flammability limits in air, upper, % by volume	Not applicable
Vapor pressure	0.1 KPa (1 MmHg) @ 865°C
Vapor density	Not applicable
Specific gravity	2.17 (H2O = 1)
Relative density	2.17 g/cm3
Octanol/water coefficient	Not available
Solubility (H2O)	36G/100g H2O @ 20°C
Viscosity	Not applicable
Percent volatile	0 % w/w
Molecular weight	58.4400 g/mole
Molecular formula	NaCl
Viscosity	Not applicable

10. Stability and Reactivity

Reactivity	Reactive with oxidizing agents, acids, lithium, bromine trifluoride.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Chemical stability	Stable under recommended storage conditions.
Conditions to avoid	Do not mix with incompatible materials.
Incompatible materials	Acids. Oxidizers.
Hazardous decomposition products	May include and are not limited to: Hydrogen chloride. Chlorine. sodium oxides

11. Toxicological Information

Component analysis - LC50

Ingredient(s)	LC50
Sodium chloride	> 21000 mg/m3 rat

Component analysis - Oral LD50

Ingredient(s)	LD50
Sodium chloride	3000 mg/kg rat; 4000 mg/kg mouse

Effects of acute exposure

Eye	May cause irritation.
Skin	May cause irritation.

Inhalation	Dusts of this product may cause irritation of the nose, throat, and respiratory tract.
Ingestion	May cause stomach distress, nausea or vomiting.
Sensitization	Not classified or listed by IARC, NTP, OSHA and ACGIH.
Chronic effects	Not classified or listed by IARC, NTP, OSHA and ACGIH.
Carcinogenicity	Not classified or listed by IARC, NTP, OSHA and ACGIH.
Mutagenicity	Not classified or listed by IARC, NTP, OSHA and ACGIH.
Reproductive effects	Not classified or listed by IARC, NTP, OSHA and ACGIH.
Teratogenicity	Not classified or listed by IARC, NTP, OSHA and ACGIH.
Name of Toxicologically Synergistic Products	Not available

12. Ecological Information

Ecotoxicity	May be harmful to freshwater aquatic species and to plants that are not saline tolerant.
Persistence / degradability	Not available
Bioaccumulation / accumulation	Not available
Mobility in environmental media	Not available
Environmental effects	Not available
Aquatic toxicity	Not available
Partition coefficient	Not available
Chemical fate information	Not available

13. Disposal Considerations

Disposal instructions	Waste must be disposed of in accordance with federal, state and local environmental control regulations.
Waste from residues / unused products	Not available
Contaminated packaging	Not available

14. Transport Information

U.S. Department of Transportation (DOT)

Not regulated as dangerous goods.

15. Regulatory Information

Occupational Safety and Health Administration (OSHA)

29 CFR 1910.1200 hazardous chemical	No
US Federal regulations	This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance	No
Section 311 hazardous chemical	No
Clean Air Act (CAA)	Not available
Clean Water Act (CWA)	Not available
State regulations	WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

Inventory status

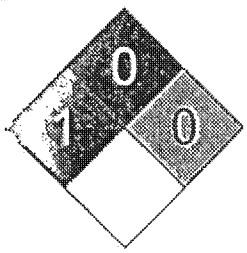
Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

16. Other Information

LEGEND HMIS/NFPA	
Severe	4
Serious	3
Moderate	2
Slight	1
Minimal	0

Health	/ 1
Flammability	0
Physical Hazard	0
Personal Protection	E



Disclaimer

Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

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Prepared by Dell Tech Laboratories Ltd. (519) 858-5021

Other information This MSDS conforms to the ANSI Z400.1/Z129.1-2010 Standard.

2015

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COMPANY IDENTITY: UNIVAR

PRODUCT IDENTITY: SULFURIC ACID 93%

SDS NUMBER: CDS-2441

SDS DATE: 01/15/2015

ORIGINAL: 01/15/2015

SAFETY DATA SHEET

THIS SAFETY DATA SHEET CONFORMS TO ANSI Z400.5, AND TO THE FORMAT REQUIREMENTS OF THE GLOBAL HARMONIZING SYSTEM.

THIS SDS COMPLIES WITH 29 CFR 1910.1200 (HAZARD COMMUNICATION STANDARD)

IMPORTANT:
READ THIS SDS BEFORE HANDLING & DISPOSING OF THIS PRODUCT.
PASS THIS INFORMATION ON TO EMPLOYEES, CUSTOMERS, & USERS OF THIS PRODUCT.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

top

PRODUCT IDENTITY: SULFURIC ACID 93%

PRODUCT USES: MINERAL ACID

COMPANY IDENTITY: UNIVAR
COMPANY ADDRESS: 17425 NE UNION HILL ROAD
COMPANY CITY: REDMOND, WA 98052

COMPANY PHONE: 1-425-889-3400

EMERGENCY PHONES:
CHEMTREC: 1-800-424-9300 (USA)

CANUTEC: 1-613-996-6666 (CANADA)

SECTION 2. HAZARDS IDENTIFICATION

top

CORROSION
EXCLAMATION MARK
HEALTH HAZARD

DANGER!

2.1 HAZARD STATEMENTS: (CAT = HAZARD CATEGORY)

(H200S) PHYSICAL:

CORROSIVE TO METALS:
H290: MAY BE CORROSIVE TO METALS.(CAT:1)

(H300S) HEALTH:

SKIN CORROSION/IRRITATION:
H314: CAUSES SEVERE SKIN BURNS AND EYE DAMAGE.(CAT:1)

(H300S) HEALTH:

ACUTE TOXICITY, INHALATION:
H332: HARMFUL IF INHALED.(CAT:4)

2.2 PRECAUTIONARY STATEMENTS:

EXPOSURE PREVENTION:
AVOID ALL CONTACT!
PREVENT DISPERSION OF MISTS OR DUST!

P100S = GENERAL, P200S = PREVENTION
P300S = RESPONSE, P400S = STORAGE, P500S = DISPOSAL

P234: KEEP ONLY IN ORIGINAL CONTAINER.

P260: DO NOT BREATHE DUST/FUME/GAS/MIST/VAPORS/SPRAY.

P262: DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

P264: WASH HANDS THOROUGHLY AFTER HANDLING.

P280:
WEAR PROTECTIVE GLOVES/PROTECTIVE CLOTHING/EYE PROTECTION/FACE PROTECTION.

P301+330+331:
IF SWALLOWED: RINSE MOUTH. DO NOT INDUCE VOMITING.

P303+361+353:

IF ON SKIN (OR HAIR):
REMOVE/TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING. RINSE SKIN WITH WATER/SHOWER.

P304+340:

IF INHALED:

REMOVE VICTIM TO FRESH AIR & KEEP AT REST IN A POSITION COMFORTABLE FOR BREATHING.

P305+351+338:

IF IN EYES:
RINSE CAUTIOUSLY WITH WATER FOR SEVERAL MINUTES.
REMOVE CONTACT LENSES IF PRESENT & EASY TO DO - CONTINUE RINSING.

P310: IMMEDIATELY CALL A POISON CENTER OR DOCTOR/PHYSICIAN.

P363: WASH CONTAMINATED CLOTHING BEFORE REUSE.

P390: ABSORB SPILLAGE TO PREVENT MATERIAL DAMAGE.

P404: STORE IN A CLOSED CONTAINER.

P405: STORE LOCKED UP.

P501: DISPOSE OF CONTENTS/CONTAINER TO AN APPROVED WASTE DISPOSAL PLANT.

SEE SECTIONS 8, 11 & 12 FOR TOXICOLOGICAL INFORMATION.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

top

MATERIAL	CAS#	EINECS#	WT %
SULFURIC ACID	7664-93-9	231-639-5	93
WATER	7732-18-5	231-791-2	7

TRACE COMPONENTS:
TRACE INGREDIENTS (IF ANY) ARE PRESENT IN <1% CONCENTRATION, (<0.1% FOR POTENTIAL CARCINOGENS, REPRODUCTIVE TOXINS, RESPIRATORY TRACT MUTAGENS, AND SENSITIZERS). NONE OF THE TRACE INGREDIENTS CONTRIBUTE SIGNIFICANT ADDITIONAL HAZARDS AT THE CONCENTRATIONS THAT MAY BE PRESENT IN THIS PRODUCT. ALL PERTINENT HAZARD INFORMATION HAS BEEN PROVIDED IN THIS DOCUMENT, PER THE REQUIREMENTS OF THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARD (29 CFR 1910.1200), U.S. STATE EQUIVALENTS, AND CANADIAN HAZARDOUS MATERIALS IDENTIFICATION SYSTEM STANDARD (CPR 4).

SECTION 4. FIRST AID MEASURES

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4.1 MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE & CHRONIC:
SEE SECTION 11 FOR SYMPTOMS/EFFECTS, ACUTE & CHRONIC.

4.2 GENERAL ADVICE:
FIRST AID RESPONDERS SHOULD PAY ATTENTION TO SELF-PROTECTION AND USE THE RECOMMENDED PROTECTIVE CLOTHING (CHEMICAL RESISTANT GLOVES, SPLASH PROTECTION). IF POTENTIAL FOR EXPOSURE EXISTS, REFER TO SECTION 8 FOR SPECIFIC PERSONAL PROTECTIVE EQUIPMENT.

4.3 EYE CONTACT:
IF THIS PRODUCT ENTERS THE EYES, CHECK FOR AND REMOVE ANY CONTACT LENSES. OPEN EYES WHILE UNDER GENTLY RUNNING WATER. USE SUFFICIENT FORCE TO OPEN EYELIDS. "ROLL" EYES TO EXPOSE MORE SURFACE. MINIMUM FLUSHING IS FOR 15 MINUTES. SEEK

IMMEDIATE MEDICAL ATTENTION.

4.4 SKIN CONTACT:
IF THE PRODUCT CONTAMINATES THE SKIN, IMMEDIATELY BEGIN DECONTAMINATION WITH RUNNING WATER. MINIMUM FLUSHING IS FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING, TAKING CARE NOT TO CONTAMINATE EYES. IF SKIN BECOMES IRRITATED AND IRRITATION PERSISTS, MEDICAL ATTENTION MAY BE NECESSARY. WASH CONTAMINATED CLOTHING BEFORE REUSE, DISCARD CONTAMINATED SHOES.

4.5 INHALATION:
AFTER HIGH VAPOR EXPOSURE, REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, GIVE OXYGEN. IF BREATHING HAS STOPPED, TRAINED PERSONNEL SHOULD IMMEDIATELY BEGIN ARTIFICIAL RESPIRATION. IF THE HEART HAS STOPPED, TRAINED PERSONNEL SHOULD IMMEDIATELY BEGIN CARDIOPULMONARY RESUSCITATION (CPR). SEEK IMMEDIATE MEDICAL ATTENTION.

4.6 SWALLOWING:
IF SWALLOWED, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. IF PROFESSIONAL ADVICE IS NOT AVAILABLE, GIVE TWO GLASSES OF WATER TO DRINK. DO NOT INDUCE VOMITING. NEVER INDUCE VOMITING OR GIVE LIQUIDS TO SOMEONE WHO IS UNCONSCIOUS, HAVING CONVULSIONS, OR UNABLE TO SWALLOW. SEEK IMMEDIATE MEDICAL ATTENTION.

4.7 RESCUERS:
VICTIMS OF CHEMICAL EXPOSURE MUST BE TAKEN FOR MEDICAL ATTENTION. RESCUERS SHOULD BE TAKEN FOR MEDICAL ATTENTION, IF NECESSARY. TAKE A COPY OF LABEL AND SDS TO PHYSICIAN OR HEALTH PROFESSIONAL WITH VICTIM.

4.8 NOTES TO PHYSICIAN:
THERE IS NO SPECIFIC ANTIDOTE. TREATMENT OF OVEREXPOSURE SHOULD BE DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION OF THE PATIENT. ANY MATERIAL ASPIRATED DURING VOMITING MAY CAUSE LUNG INJURY. THEREFORE, EMESIS SHOULD NOT BE INDUCED MECHANICALLY OR PHARMACOLOGICALLY. IF IT IS CONSIDERED NECESSARY TO EVACUATE THE STOMACH CONTENTS, THIS SHOULD BE DONE BY MEANS LEAST LIKELY TO CAUSE ASPIRATION (SUCH AS: GASTRIC LAVAGE AFTER ENDOTRACHEAL INTUBATION).

SECTION 5. FIRE FIGHTING MEASURES

top

5.1 FIRE & EXPLOSION PREVENTIVE MEASURES:
ISOLATE FROM ALKALIS, OXIDIZERS, ORGANICS, EXTREME HEAT AND OPEN FLAMES.

5.2 SUITABLE (& UNSUITABLE) EXTINGUISHING MEDIA:
USE EXTINGUISHING AGENT APPROPRIATE FOR SURROUNDING FIRE.

5.3 SPECIAL PROTECTIVE EQUIPMENT & PRECAUTIONS FOR FIRE FIGHTERS:
WATER SPRAY MAY BE INEFFECTIVE ON FIRE BUT CAN PROTECT FIRE-FIGHTERS & COOL CLOSED CONTAINERS. USE FOG NOZZLES IF WATER IS USED. DO NOT ENTER CONFINED FIRE-SPACE WITHOUT FULL BUNKER GEAR. (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES & RUBBER BOOTS).

5.4 SPECIFIC HAZARDS OF CHEMICAL & HAZARDOUS COMBUSTION PRODUCTS:

SLIGHTLY COMBUSTIBLE!

REACTS WITH MOST METALS PRODUCING HYDROGEN WHICH IS EXTREMELY FLAMMABLE & MAY EXPLODE. KEEP CONTAINER TIGHTLY CLOSED. ISOLATE FROM OXIDIZERS, ALKALIS, HEAT, & OPEN FLAME. APPLYING TO HOT SURFACES REQUIRES SPECIAL PRECAUTIONS. CLOSED CONTAINERS MAY EXPLODE IF EXPOSED TO EXTREME HEAT. CONTINUE ALL LABEL PRECAUTIONS!

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

UNCONTROLLED RELEASES SHOULD BE RESPONDED TO BY TRAINED PERSONNEL USING PRE-PLANNED PROCEDURES. PROPER PROTECTIVE EQUIPMENT SHOULD BE USED. IN CASE OF A SPILL, CLEAR THE AFFECTED AREA, PROTECT PEOPLE, AND RESPOND WITH TRAINED PERSONNEL. ELIMINATE ALL IGNITION SOURCES (NO SMOKING, FLARES, SPARKS, OR FLAMES IN IMMEDIATE AREA).

PREVENT ADDITIONAL DISCHARGE OF MATERIAL, IF POSSIBLE TO DO SO WITHOUT HAZARD.

FOR LARGE SPILLS, IMPLEMENT CLEANUP PROCEDURES AND, IF IN PUBLIC AREA, ADVISE AUTHORITIES.

6.2 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, EMERGENCY PROCEDURES:
THE PROPER PERSONAL PROTECTIVE EQUIPMENT FOR INCIDENTAL RELEASES (SUCH AS: 1 LITER OF THE PRODUCT RELEASED IN A WELL-VENTILATED AREA), USE IMPERMEABLE GLOVES, THEY SHOULD BE LEVEL B: TRIPLE-GLOVES (RUBBER GLOVES AND NITRILE GLOVES OVER LATEX GLOVES), CHEMICAL RESISTANT SUIT AND BOOTS, HARD-HAT, AND SELF-CONTAINED BREATHING APPARATUS SPECIFIC FOR THE MATERIAL HANDLED, GOGGLES, FACE SHIELD, AND APPROPRIATE BODY PROTECTION. IN THE EVENT OF A LARGE RELEASE, USE IMPERMEABLE GLOVES, SPECIFIC FOR THE MATERIAL HANDLED, CHEMICALLY RESISTANT SUIT AND BOOTS, AND HARD HAT. SELF-CONTAINED BREATHING APPARATUS OR RESPIRATOR MAY BE REQUIRED WHERE ENGINEERING CONTROLS ARE NOT ADEQUATE OR CONDITIONS FOR POTENTIAL EXPOSURE EXIST. WHEN RESPIRATORS ARE REQUIRED, SELECT NIOSH/MSHA APPROVED BASED ON ACTUAL OR POTENTIAL AIRBORNE CONCENTRATIONS IN ACCORDANCE WITH LATEST OSHA AND/OR ANSI RECOMMENDATIONS.

6.3 ENVIRONMENTAL PRECAUTIONS:
STOP SPILL AT SOURCE. CONSTRUCT TEMPORARY DIKES OF DIRT, SAND, OR ANY APPROPRIATE READILY AVAILABLE MATERIAL TO PREVENT SPREADING OF THE MATERIAL. CLOSE OR CAP VALVES AND/OR BLOCK OR PLUG HOLE IN LEAKING CONTAINER AND TRANSFER TO ANOTHER CONTAINER. KEEP FROM ENTERING STORM SEWERS AND DITCHES WHICH LEAD TO WATERWAYS, AND IF NECESSARY, CALL THE LOCAL FIRE OR POLICE DEPARTMENT FOR IMMEDIATE EMERGENCY ASSISTANCE.

6.4 METHODS AND MATERIAL FOR CONTAINMENT & CLEAN-UP:
ABSORB SPILLED LIQUID WITH POLYPADS OR OTHER SUITABLE ABSORBENT MATERIALS. IF NECESSARY, NEUTRALIZE USING SUITABLE BUFFERING MATERIAL, (ACID WITH SODA ASH OR BASE WITH PHOSPHORIC ACID), AND TEST AREA WITH LITMUS PAPER TO CONFIRM NEUTRALIZATION. CLEAN UP WITH NON-COMBUSTIBLE ABSORBENT (SUCH AS: SAND, SOIL, AND SO ON). SHOVEL UP AND PLACE ALL SPILL RESIDUE IN SUITABLE CONTAINERS. DISPOSE OF AT AN APPROPRIATE WASTE DISPOSAL FACILITY ACCORDING TO CURRENT APPLICABLE LAWS AND REGULATIONS AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL (SEE SECTION 13 - DISPOSAL CONSIDERATIONS).

SECTION 7. HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING:
ISOLATE FROM OXIDIZERS, ALKALIS, HEAT, & OPEN FLAME. USE ONLY WITH ADEQUATE VENTILATION. DO NOT GET IN EYES, ON SKIN OR CLOTHING. WEAR OSHA STANDARD FULL FACE SHIELD. CONSULT SAFETY EQUIPMENT SUPPLIER. WEAR GOGGLES, FACE SHIELD, GLOVES, APRON & FOOTWEAR IMPERVIOUS TO MATERIAL. WASH CLOTHING BEFORE REUSE. CONTINUE ALL LABEL PRECAUTIONS!

NEVER POUR WATER INTO THIS SUBSTANCE. WHEN DISSOLVING OR DILUTING, ALWAYS ADD IT SLOWLY TO THE WATER.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:
KEEP SEPARATED FROM STRONG OXIDANTS, STRONG BASES, COMBUSTIBLE & REDUCING SUBSTANCES, METALS, FOOD & FEEDSTUFFS, INCOMPATIBLE MATERIALS. MAY BE STORED IN STAINLESS STEEL CONTAINERS.

SEE: SECTION 10, <MATERIALS TO AVOID>. DO NOT STORE ABOVE 49 C/120 F.

KEEP CONTAINER TIGHTLY CLOSED & UPRIGHT WHEN NOT IN USE TO PREVENT LEAKAGE.

REACTS WITH MOST METALS PRODUCING HYDROGEN WHICH IS EXTREMELY FLAMMABLE & MAY EXPLODE.

WEAR FULL FACE SHIELD, GLOVES & FULL PROTECTIVE CLOTHING WHEN OPENING OR HANDLING. WHEN EMPTY, DRAIN COMPLETELY, REPLACE BUNGS SECURELY.

7.3 NONBULK:

CONTAINERS:
STORE CONTAINERS IN A COOL, DRY LOCATION, AWAY FROM DIRECT SUNLIGHT, SOURCES OF INTENSE HEAT, OR WHERE FREEZING IS POSSIBLE. MATERIAL SHOULD BE STORED IN SECONDARY CONTAINERS OR IN A DIKED AREA, AS APPROPRIATE. STORE CONTAINERS AWAY FROM INCOMPATIBLE CHEMICALS (SEE SECTION 10, STABILITY AND REACTIVITY). POST WARNING AND "NO SMOKING" SIGNS IN STORAGE AND USE AREAS, AS APPROPRIATE. EMPTY CONTAINERS SHOULD BE HANDLED WITH CARE. NEVER STORE FOOD, FEED, OR DRINKING WATER IN CONTAINERS WHICH HELD THIS PRODUCT.

7.4 BULK CONTAINERS:
ALL TANKS AND PIPELINES WHICH CONTAIN THIS MATERIAL MUST BE LABELED. PERFORM ROUTINE MAINTENANCE ON TANKS OR PIPELINES WHICH CONTAIN THIS PRODUCT. REPORT ALL LEAKS IMMEDIATELY TO THE PROPER PERSONNEL.

7.5 TANK CAR SHIPMENTS:
TANK CARS CARRYINC THIS PRODUCT SHOULD BE LOADED AND UNLOADED IN STRICT ACCORDANCE WITH TANK-CAR MANUFACTURER'S RECOMMENDATION AND ALL ESTABLISHED ON-SITE SAFETY PROCEDURES. APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE USED (SEE SECTION 8, ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT.). ALL LOADING AND UNLOADING EQUIPMENT MUST BE INSPECTED, PRIOR TO EACH USE. LOADING AND UNLOADING OPERATIONS MUST BE ATTENDED, AT ALL TIMES. TANK CARS MUST BE LEVEL, BRAKES MUST BE SET OR WHEELS MUST BE LOCKED OR BLOCKED PRIOR TO LOADING OR UNLOADING. TANK CAR (FOR LOADING) OR STORAGE TANKS (FOR UNLOADING) MUST BE VERIFIED TO BE CORRECT FOR RECEIVING THIS PRODUCT AND BE PROPERLY PREPARED, PRIOR TO STARTING THE TRANSFER OPERATIONS. HOSES MUST BE VERIFIED TO BE IN THE CORRECT POSITIONS, BEFORE STARTING TRANSFER OPERATIONS. A SAMPLE (IF REQUIRED) MUST BE TAKEN AND VERIFIED (IF REQUIRED) PRIOR TO STARTING TRANSFER OPERATIONS. ALL LINES MUST BE BLOWN-DOWN AND PURGED BEFORE DISCONNECTING THEM FROM THE TANK CAR OR VESSEL.

7.6 PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:
FOLLOW PRACTICES INDICATED IN SECTION 6 (ACCIDENTAL RELEASE MEASURES). MAKE CERTAIN APPLICATION EQUIPMENT IS LOCKED AND TAGGED-OUT SAFELY. ALWAYS USE THIS PRODUCT IN AREAS WHERE ADEQUATE VENTILATION IS PROVIDED. COLLECT ALL RINSATES AND DISPOSE OF ACCORDING TO APPLICABLE FEDERAL, STATE, PROVINCIAL, OR LOCAL PROCEDURES.

7.7 EMPTY CONTAINER WARNING:
EMPTY CONTAINERS MAY CONTAIN RESIDUE AND CAN BE DANGEROUS. DO NOT ATTEMPT TO REFILL OR CLEAN CONTAINERS WITHOUT PROPER INSTRUCTIONS. EMPTY DRUMS SHOULD BE

COMPLETELY DRAINED AND SAFELY STORED UNTIL APPROPRIATELY RECONDITIONED OR DISPOSED. EMPTY CONTAINERS SHOULD BE TAKEN FOR RECYCLING, RECOVERY, OR DISPOSAL THROUGH SUITABLY QUALIFIED OR LICENSED CONTRACTOR AND IN ACCORDANCE WITH GOVERNMENTAL REGULATIONS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY BURST AND CAUSE INJURY OR DEATH.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 EXPOSURE LIMITS:

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)	IDLH (NIOSH)
SULFURIC ACID	7664-93-9	231-639-5	1.0 MG/M3	1.0 MG/M3	15 MG/M3
WATER	7732-18-5	231-791-2	NONE KNOWN	NONE KNOWN	

THIS PRODUCT CONTAINS NO EPA HAZARDOUS AIR POLLUTANTS (HAP) IN AMOUNTS >0.1%.

8.2 APPROPRIATE ENGINEERING CONTROLS:

RESPIRATORY EXPOSURE CONTROLS:
AIRBORNE CONCENTRATIONS SHOULD BE KEPT TO LOWEST LEVELS POSSIBLE. IF VAPOR, DUST OR MIST IS GENERATED AND THE OCCUPATIONAL EXPOSURE LIMIT OF THE PRODUCT, OR ANY COMPONENT OF THE PRODUCT, IS EXCEEDED, USE APPROPRIATE NIOSH OR MSHA APPROVED AIR PURIFYING OR AIR-SUPPLIED RESPIRATOR AUTHORIZED IN 29 CFR 1910.134, EUROPEAN STANDARD EN 149, OR APPLICABLE STATE REGULATIONS, AFTER DETERMINING THE AIRBORNE CONCENTRATION OF THE CONTAMINANT. AIR SUPPLIED RESPIRATORS SHOULD ALWAYS BE WORN WHEN AIRBORNE CONCENTRATION OF THE CONTAMINANT OR OXYGEN CONTENT IS UNKNOWN. MAINTAIN AIRBORNE CONTAMINANT CONCENTRATIONS BELOW EXPOSURE LIMITS. IF ADEQUATE VENTILATION IS NOT AVAILABLE OR THERE IS POTENTIAL FOR AIRBORNE EXPOSURE ABOVE THE EXPOSURE LIMITS, A RESPIRATOR MAY BE WORN UP TO THE RESPIRATOR EXPOSURE LIMITATIONS, CHECK WITH RESPIRATOR EQUIPMENT MANUFACTURER'S RECOMMENDATIONS/LIMITATIONS. FOR PARTICULATES, A PARTICULATE RESPIRATOR (NIOSH TYPE N95 OR BETTER FILTERS) MAY BE WORN. IF OIL PARTICLES (SUCH AS: LUBRICANTS, CUTTING FLUIDS, GLYCERINE, AND SO ON) ARE PRESENT, USE A NIOSH TYPE R OR P FILTER. FOR A HIGHER LEVEL OF PROTECTION, USE POSITIVE PRESSURE SUPPLIED AIR RESPIRATION PROTECTION OR SELF-CONTAINED BREATHING APPARATUS OR IF OXYGEN LEVELS ARE BELOW 19.5% OR ARE UNKNOWN.

EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS:
POSITIVE PRESSURE, FULL-FACE PIECE SELF-CONTAINED BREATHING APPARATUS; OR POSITIVE PRESSURE, FULL-FACE PIECE SELF-CONTAINED BREATHING APPARATUS WITH AN AUXILLIARY POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS.

VENTILATION:
LOCAL EXHAUST: NECESSARY
MECHANICAL (GENERAL): NECESSARY
SPECIAL: NONE
OTHER: NONE

PLEASE REFER TO ACGIH DOCUMENT, "INDUSTRIAL VENTILATION, A MANUAL OF RECOMMENDED PRACTICES", MOST RECENT EDITION, FOR DETAILS.

8.3 INDIVIDUAL PROTECTION MEASURES, SUCH AS PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION:
SAFETY EYEWEAR COMPLYING WITH AN APPROVED STANDARD SHOULD BE USED WHEN A RISK

ASSESSMENT INDICATES THIS IS NECESSARY TO AVOID EXPOSURE TO LIQUID SPLASHES, MISTS OR DUSTS. IF CONTACT IS POSSIBLE, CHEMICAL SPLASH GOGGLES SHOULD BE WORN, WHEN A HIGHER DEGREE OF PROTECTION IS NECESSARY, USE SPLASH GOGGLES OR SAFETY GLASSES. FACE-SHIELDS ARE RECOMMENDED WHEN THE OPERATION CAN GENERATE SPLASHES, SPRAYS OR MISTS.

HAND PROTECTION: USE GLOVES CHEMICALLY RESISTANT TO THIS MATERIAL.

PREFERRED EXAMPLES:
BUTYL RUBBER, CHLORINATED POLYETHYLENE, POLYETHYLENE, ETHYL VINYL ALCOHOL LAMINATE ("EVAL"), POLYVINYL ALCOHOL ("PVA").

EXAMPLES OF ACCEPTABLE GLOVE BARRIER MATERIALS INCLUDE:
NATURAL RUBBER ("LATEX"), NEOPRENE, NITRILE/BUTADIENE RUBBER ("NITRIL") OR ("NBR"), POLYVINYL CHLORIDE ("PVC") OR "VINYL"), VITON. CHEMICAL-RESISTANT, IMPERVIOUS GLOVES COMPLYING WITH AN APPROVED STANDARD SHOULD BE WORN AT ALL TIMES WHEN HANDLING CHEMICAL PRODUCTS IF A RISK ASSESSMENT INDICATES THIS IS NECESSARY. CONSIDERING THE PARAMETERS SPECIFIED BY THE GLOVE MANUFACTURER, CHECK DURING USE THAT THE GLOVES ARE STILL RETAINING THEIR PROTECTIVE PROPERTIES. IT SHOULD BE NOTED THAT THE TIME TO BREAKTHROUGH FOR ANY GLOVE MATERIAL MAY BE DIFFERENT FOR DIFFERENT GLOVE MANUFACTURERS. IN THE CASE OF MIXTURES, CONSISTING OF SEVERAL SUBSTANCES, THE PROTECTION TIME OF THE GLOVES CANNOT BE ACCURATELY ESTIMATED.

BODY PROTECTION:
USE BODY PROTECTION APPROPRIATE FOR TASK. COVER-ALL, RUBBER APRONS, OR CHEMICAL PROTECTIVE CLOTHING MADE FROM IMPERVIOUS MATERIALS ARE GENERALLY ACCEPTABLE, DEPENDING ON THE TASK.

WORK & HYGIENIC PRACTICES:
WASH HANDS, FOREARMS AND FACE THOROUGHLY AFTER HANDLING CHEMICAL PRODUCTS, BEFORE EATING, SMOKING AND USING TOILET FACILITIES AND AT THE END OF THE WORKING PERIOD. PROVIDE READILY ACCESSIBLE EYE WASH STATIONS & SAFETY SHOWERS. REMOVE CLOTHING THAT BECOMES CONTAMINATED. DESTROY CONTAMINATED LEATHER ARTICLES. LAUNDER OR DISCARD CONTAMINATED CLOTHING.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES

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APPEARANCE: OILY LIQUID, WATER-WHITE TO SLIGHTLY YELLOW

ODOR: NONE

ODOR THRESHOLD: NOT AVAILABLE

PH (NEUTRALITY): <1

MELTING POINT/FREEZING POINT: -29 C / -20 F

BOILING RANGE (IBP, DRY POINT): 276 TO 281 C / 528 TO 538 F

FLASH POINT (TEST METHOD): NOT APPLICABLE

EVAPORATION RATE (N-BUTYL ACETATE=1): NOT APPLICABLE

FLAMMABILITY CLASSIFICATION: NONCOMBUSTIBLE

LOWER FLAMMABLE LIMIT IN AIR (% BY VOL): 10.0 (LOWEST COMPONENT)
UPPER FLAMMABLE LIMIT IN AIR (% BY VOL): NOT AVAILABLE

VAPOR PRESSURE (MM OF Hg)@20 C: <0.3

VAPOR DENSITY (AIR=1): 3.4

GRAVITY @ 68/68F / 20/20C:

DENSITY: 1.830

SPECIFIC GRAVITY (WATER=1): 1.835

POUNDS/GALLON: 15.3

WATER SOLUBILITY: COMPLETE

PARTITION COEFFICIENT (N-OCTANE/WATER): NOT AVAILABLE

AUTO IGNITION TEMPERATURE: NOT APPLICABLE

DECOMPOSITION TEMPERATURE: NOT AVAILABLE

VOCS (>0.044 LBS/SQ IN): 0.0 VOL% / 0.0 G/L / 0.000 LBS/GAL

TOTAL VOC'S (TVOC)*: 0.0 VOL% / 0.0 G/L / 0.000 LBS/GAL

NONEXEMPT VOC'S (CVOC)*: 0.0 VOL% / 0.0 G/L / 0.000 LBS/GAL

HAZARDOUS AIR POLLUTANTS (HAPS): 0.0 WT% / 0.0 G/L / 0.000 LBS/GAL

NONEXEMPT VOC PARTIAL PRESSURE (MM OF Hg @ 20 C): 0.0

VISCOSITY @ 100 C (ASTM D445): 514.0

VISCOSITY @ 20 C (ASTM D445): NOT AVAILABLE

* USING CARB (CALIFORNIA AIR RESOURCES BOARD RULES).

SECTION 10. STABILITY & REACTIVITY

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10.1 REACTIVITY & CHEMICAL STABILITY:
STABLE UNDER NORMAL CONDITIONS, BUT REACTS WITH MOST METALS PRODUCING HYDROGEN WHICH IS EXTREMELY FLAMMABLE & MAY EXPLODE.

10.2 POSSIBILITY OF HAZARDOUS REACTIONS & CONDITIONS TO AVOID:
ISOLATE FROM SOURCES OF IGNITION, HEAT, & OPEN FLAME. REACTS VIGOROUSLY WITH WATER.

10.3 INCOMPATIBLE MATERIALS:

THE SUBSTANCE IS A STRONG ACID, REACTS VIOLENTLY WITH BASES AND IS CORROSIVE.

UPON HEATING, IRRITATING AND TOXIC FUMES ARE FORMED INCLUDING SULFUR OXIDES.

THE SUBSTANCE IS A STRONG OXIDANT & REACTS VIOLENTLY WITH COMBUSTIBLE & REDUCING MATERIALS.

CORROSIVE TO MOST COMMON METALS, FORMING FLAMMABLE/EXPLOSIVE GAS (HYDROGEN). SULFURIC ACID REACTS VIOLENTLY WITH WATER & ORGANIC MATERIALS WITH MUCH HEAT. HAZARDOUS GASES ARE EVOLVED ON CONTACT WITH CHEMICALS SUCH AS CYANIDES, SULFIDES, AND CARBIDES.

10.4 HAZARDOUS DECOMPOSITION PRODUCTS:
UPON HEATING, IRRITATING AND TOXIC FUMES ARE FORMED INCLUDING SULFUR OXIDES.

10.5 HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

SECTION 11. TOXICOLOGICAL INFORMATION

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11.1 ACUTE HAZARDS:

11.11 EYE & SKIN CONTACT:
SEVERE BURNS TO SKIN, DEFATTING, DERMATITIS.
ANIMAL TESTING INDICATES THIS MATERIAL IS CORROSIVE TO THE EYE.
SEVERE BURNS TO EYES, REDNESS, TEARING, BLURRED VISION.
LIQUID CAN CAUSE SEVERE SKIN & EYE BURNS. WASH THOROUGHLY AFTER HANDLING.

11.12 INHALATION: SEVERE RESPIRATORY TRACT IRRITATION MAY OCCUR. VAPOR HARMFUL.

11.13 SWALLOWING: HARMFUL OR FATAL IF SWALLOWED.

11.2 SUBCHRONIC HAZARDS/CONDITIONS AGGRAVATED:

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
PRE-EXISTING DISORDERS OF ANY TARGET ORGANS MENTIONED IN THIS DOCUMENT CAN BE AGGRAVATED BY OVER-EXPOSURE BY ROUTES OF ENTRY TO COMPONENTS OF THIS PRODUCT. PERSONS WITH THESE DISORDERS SHOULD AVOID USE OF THIS PRODUCT.

11.3 CHRONIC HAZARDS:

11.31 CANCER, REPRODUCTIVE & OTHER CHRONIC HAZARDS:
PROVEN CARCINOGEN, HUMAN, GROUP 1 (IARC), SUSPECTED CARCINOGEN, HUMAN, GROUP A2 (ACGIH).

11.32 TARGET ORGANS: MAY CAUSE DAMAGE TO TARGET ORGANS, BASED ON ANIMAL DATA.

11.33 IRRITANCY: IRRITATING TO CONTAMINATED TISSUE.

11.34 SENSITIZATION: NO COMPONENT IS KNOWN AS A SENSITIZER.

11.35 MUTAGENICITY: NO KNOWN REPORTS OF MUTAGENIC EFFECTS IN HUMANS.

11.36 EMBRYOTOXICITY: NO KNOWN REPORTS OF EMBRYOTOXIC EFFECTS IN HUMANS.

11.37 TERATOGENICITY: NO KNOWN REPORTS OF TERATOGENIC EFFECTS IN HUMANS.

11.38 REPRODUCTIVE TOXICITY:
NO KNOWN REPORTS OF REPRODUCTIVE EFFECTS IN HUMANS.

A MUTAGEN IS A CHEMICAL WHICH CAUSES PERMANENT CHANGES TO GENETIC MATERIAL (DNA) SUCH THAT THE CHANGES WILL PROPAGATE ACROSS GENERATIONAL LINES. AN EMBRYOTOXIN IS A CHEMICAL WHICH CAUSES DAMAGE TO A DEVELOPING EMBRYO (SUCH AS: WITHIN THE FIRST 8 WEEKS OF PREGNANCY IN HUMANS), BUT THE DAMAGE DOES NOT PROPAGATE ACROSS GENERATIONAL LINES. A TERATOGEN IS A CHEMICAL WHICH CAUSES DAMAGE TO A DEVELOPING FETUS, BUT THE DAMAGE DOES NOT PROPAGATE ACROSS GENERATIONAL LINES. A REPRODUCTIVE TOXIN IS ANY SUBSTANCE WHICH INTERFERES IN ANY WAY WITH THE REPRODUCTIVE PROCESS.

11.4 MAMMALIAN TOXICITY INFORMATION:
LD50 (ORAL, ACUTE): 2140 MG/KG (RAT)

LC50 / 2 HOURS: 510 MG/M3 (RAT), 320 MG/M3 (MOUSE)

SECTION 12. ECOLOGICAL INFORMATION

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12.1 ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

12.2 EFFECT OF MATERIAL ON PLANTS AND ANIMALS:
THIS PRODUCT MAY BE HARMFUL OR FATAL TO PLANT AND ANIMAL LIFE IF RELEASED INTO THE ENVIRONMENT. REFER TO SECTION 11 (TOXICOLOGICAL INFORMATION) FOR FURTHER DATA ON THE EFFECTS OF THIS PRODUCT'S COMPONENTS ON TEST ANIMALS.

12.3 EFFECT OF MATERIAL ON AQUATIC LIFE:
THE SUBSTANCE IS HARMFUL TO AQUATIC ORGANISMS.

LC50 / 48 HOURS: 49 MG/L, TAP WATER, 20 C (BLUEGILL SUNFISH)

LC50 / 48 HOURS: 100 - 330 MG/L, AERATED WATER (FLOUNDER)

12.4 MOBILITY IN SOIL: MOBILITY OF THIS MATERIAL HAS NOT BEEN DETERMINED.

12.5 DEGRADABILITY: THIS PRODUCT IS COMPLETELY BIODEGRADABLE.

12.6 ACCUMULATION: BIOACCUMULATION OF THIS PRODUCT HAS NOT BEEN DETERMINED.

SECTION 13. DISPOSAL CONSIDERATIONS

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PROCESSING, USE OR CONTAMINATION MAY CHANGE THE WASTE DISPOSAL REQUIREMENTS. DO NOT DISPOSE OF ON LAND, IN SURFACE WATERS, OR IN STORM DRAINS. WASTE SHOULD BE RECYCLED OR DISPOSED OF IN ACCORDANCE WITH REGULATIONS. LARGE AMOUNTS SHOULD BE COLLECTED FOR REUSE OR CONSIGNED TO LICENSED HAZARDOUS WASTE HAULERS FOR DISPOSAL. ALL DISPOSAL MUST BE IN ACCORDANCE WITH ALL FEDERAL, STATE, PROVINCIAL, AND LOCAL REGULATIONS. IF IN DOUBT, CONTACT PROPER AGENCIES.

EPA CHARACTERISTIC: D002

SECTION 14. TRANSPORT INFORMATION

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MARINE POLLUTANT: NO

DOT/TDG SHIP NAME: UN1830, SULFURIC ACID, 8, PG-II

DRUM LABEL: (CORROSIVE)

IATA / ICAO: UN1830, SULFURIC ACID, 8, PG-II

IMO / IMDG: UN1830, SULFURIC ACID, 8, PG-II

EMERGENCY RESPONSE GUIDEBOOK NUMBER: 137

CORROSION
EXCLAMATION MARK
HEALTH HAZARD

SECTION 15. REGULATORY INFORMATION

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15.1 EPA REGULATION:

SARA SECTION 311/312 HAZARDS: ACUTE HEALTH, CHRONIC HEALTH, REACTIVITY

ALL COMPONENTS OF THIS PRODUCT ARE ON THE TSCA LIST.

SARA TITLE III SECTION 313 SUPPLIER NOTIFICATION:
THIS PRODUCT CONTAINS THE INDICATED <*> TOXIC CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING & COMMUNITY RIGHT-TO-KNOW ACT OF 1986 & OF 40 CFR 372. THIS INFORMATION MUST BE INCLUDED IN ALL MSDSS THAT ARE COPIED AND DISTRIBUTED FOR THIS MATERIAL.

SARA TITLE III INGREDIENTS	CAS#	EINECS#	WT%	(REG.SECTION)	RQ(LBS)
*SULFURIC ACID	7664-93-9	231-639-5	93	(302, 311, 312, 313)	1000

15.2 STATE REGULATIONS:

CALIFORNIA SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT (PROPOSITION 65):
THIS PRODUCT CONTAINS NO CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY.

15.3 INTERNATIONAL REGULATIONS:

THE IDENTIFIED COMPONENTS OF THIS PRODUCT ARE LISTED ON THE CHEMICAL INVENTORIES OF THE FOLLOWING COUNTRIES:
AUSTRALIA (AICS), CANADA (DSL OR NDSL), CHINA (IECSC), EUROPE (EINECS, ELINCS), JAPAN (METI/CSCL, MHLW/ISHL), SOUTH KOREA (KECI), NEW ZEALAND (NZIOC), PHILIPPINES (PICCS), SWITZERLAND (SWISS), TAIWAN (NECSI), USA (TSCA).

15.4 CANADA: WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS):
D2B: IRRITATING TO SKIN / EYES.
E: CORROSIVE MATERIAL.

THIS PRODUCT WAS CLASSIFIED USING THE HAZARD CRITERIA OF THE CONTROLLED PRODUCTS REGULATIONS (CPR). THIS DOCUMENT CONTAINS ALL INFORMATION REQUIRED BY THE CPR.

SECTION 16. OTHER INFORMATION

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16.1 HAZARD RATINGS:

HEALTH (NFPA)	3
HEALTH (HMIS)	3
FLAMMABILITY	0
PHYSICAL HAZARD	2

(PERSONAL PROTECTION RATING TO BE SUPPLIED BY USER BASED ON USE CONDITIONS.)
THIS INFORMATION IS INTENDED SOLELY FOR THE USE OF INDIVIDUALS TRAINED IN THE NFPA & HMIS HAZARD RATING SYSTEMS.

16.2 EMPLOYEE TRAINING:
SEE SECTION 2 FOR RISK & SAFETY STATEMENTS. EMPLOYEES SHOULD BE MADE AWARE OF ALL HAZARDS OF THIS MATERIAL (AS STATED IN THIS SDS) BEFORE HANDLING IT.

16.3 SDS DATE: 01/15/2015

GGS 2869 2015

SAFETY DATA SHEET

H81 SAFETY DATA SHEETS

FCT Companies

Date Issued: 5/22/2015
Date Revised: 5/22/2015
Revision No: 1

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT CODE: TSP
PRODUCT TRADE NAME: TSP
COMMON NAMES/SYNONYMS: TSP, TriSodium Phosphate
CATEGORY: FCTWRaw
RECOMMENDED USE: TriSodium Phosphate, For industrial use only, refer to label and technical data sheet or call number below

MANUFACTURER
FCT
1309 North 17th Ave., Greeley, CO 80631, Phone 970-346-8002

24 HR. EMERGENCY TELEPHONE NUMBERS
800-535-5053

Emergency Contact: INFO TRAC
E-Mail: customerservice@floridacirtech.com
Emergency Phone: 800-535-5053
Alternate Emergency Phone: 800-686-6504

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: white crystalline powder
IMMEDIATE CONCERNS: No applicable data available

POTENTIAL HEALTH EFFECTS

EYES: May cause slight irritation.
SKIN: Prolonged contact may cause mild skin irritation.
INGESTION: Swallowing this material is not likely to be harmful
INHALATION: May cause physical discomfort to the respiratory tract.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

UNCLASSIFIED HAZARDS: Use good industrial practices when handling. Avoid eye, skin, and clothing contact.
SIGNAL WORD: Warning
Potential Carcinogens as listed by OSHA, IARC, or NTP: NONE
GHS Pictogram:

Hazard Statement(s)

H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation

Precautionary Statement(s)

P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P264	Wash ... thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

P302+ P352	IF ON SKIN: Wash with plenty of soap and water.
P304+ P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+ P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P332+ P313	If skin irritation occurs: Get medical advice/attention.
P337+ P313	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Common Names	CAS	Weight %age
Tri Sodium Phosphate	Tri Sodium Phosphate	7601-54-9	100.00 % - 100.00 %

4. FIRST AID MEASURES

COMMON SYMPTOMS OF OVEREXPOSURE: No Applicable data available

EYES: Immediately flush with water for at least 15 minutes or until the chemical is removed.

SKIN: Wash off immediately with soap and water. If clothing is contaminated, remove and launder before reuse.

INGESTION: If conscious, rinse mouth with water. Seek medical advice on whether to induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention.

INHALATION: Move to fresh air. Get medical attention if symptoms occur.

NOTES TO PHYSICIAN: Follow usual and customary procedures

ADDITIONAL INFORMATION: No Applicable data available

COMMENTS: No Applicable data available

5. FIRE FIGHTING MEASURES

FLASH POINT AND METHOD: No applicable data available

FLAMMABLE LIMITS: LEL : No applicable data available UEL: No applicable data available

GENERAL HAZARD: As with any chemical fire, combustion products of unknown toxicity are always possible.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam or water spray.

FIRE FIGHTING EQUIPMENT: Vapors and fumes may be irritating and toxic. Firefighters should wear selfNo applicable data availablecontained breathing apparatus and full fireNo applicable data availablefighting turnout gear.

SENSITIVE TO STATIC DISCHARGE: No applicable data available

COMMENTS: Standard procedure for chemical fires.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Absorb spilled liquid in a suitable material. Sweep or vacuum material into disposal containers.

LARGE SPILL: Absorb spilled liquid in a suitable material. Sweep or vacuum material into disposal containers.

EMERGENCY PROCEDURES: For hazardous waste regulations call 800-424-9346, the RCRA Hotline. Personal precautions, protective equipment and emergency procedures: Evacuate area. Keep upwind of spill. Refer to section 7, Handling, for additional precautionary measures. Only trained and properly protected personnel must be involved in clean-up operations. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and personal protection.

GENERAL PROCEDURES: If possible, stop further leakage of the material. Contain spilled material by diking with non-

flammable diking materials.

RELEASE NOTES: Collect as much as possible in a clean container for reuse (if not contaminated) or disposal (if contamintated). Prevent from entering into soil, ditches, sewers, waterways and/or ground water. See section 12 Ecological information.

SPECIAL PROTECTIVE EQUIPMENT: Isolate area. Use appropriate safety equipment. For additional information, refer to section 8, Exposure Controls and Personal Protection.

COMMENTS: See also section 13 for disposal information.

7. HANDLING AND STORAGE

HANDLING: Use good industrial practices when handling. Avoid eye, skin, and clothing contact. Do not inhale mist or vapors. Do not taste or swallow. Use only with adequate ventilation.

STORAGE: Keep container closed when not in use. Avoid elevated and freezing temperatures.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	OSHA PEL	OSHA STEL	ACGIH TWA	ACGIH STEL
Tri Sodium Phosphate	15 mg/M3	NE	10 mg/M3	NE

ENGINEERING CONTROLS: Work in well ventilated areas. Do not breathe vapors or mist. Ensure that existing ventilation is sufficient to prevent the circulation and/or accumulation of vapors in the air.

PERSONAL PROTECTIVE EQUIPMENT:

EYES AND FACE: Wear safety glasses when handling this material.

SKIN: Wear nitrile or latex gloves. Wear protective clothing.

RESPIRATORY: No special respiratory equipment is needed.

WORK HYGIENIC PRACTICES: Discard contaminated gloves after use. Have eye-wash facilities in the immediate vicinity. Work in adequately ventilated area. Do not breathe vapors or mist. Minimize any contact with any chemical.

COMMENTS: Eye wash station and safety shower should be available in immediate work area. To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment, in accordance with the OSHA PPE Standard (29 CFR 1910.132), be conducted before using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Form: CRYSTALS

Appearance Color: White

Odor: None

Odor Threshold: Not Determined

pH-value @ 68 °F: 11.5

Melting point: 1340 F

Boiling Point: Not Established

Flash Point: Non Flammable

Flammability: no data available

Ignition temperature: no data available

Auto Igniting: no data available

Danger of explosion: no data available

Explosion Lower Limit: NE

Explosion Upper Limit: NE

Vapor pressure @ 68 °F: Not Determined

Relative Density: 2.5

Vapor Density: N/A
Evaporation Rate: N/A
Solubility in Water: 9.1 gr/L (25 C)
Partition coefficient: no data available
Dynamic viscosity: no data available
Kinematic viscosity: no data available
Organic Content %age: no data available
Water %age: no data available
Solids Content %age: no data available
Other Informartion: no data available

10. STABILITY AND REACTIVITY

STABILITY: Stable
REACTIVITY: See sub-sections below.
POLYMERIZATION: Hazardous polymerization is not expected to occur under normal temperatures and pressures.
CONDITIONS TO AVOID: Excessive moisture
POSSIBILITY OF HAZARDOUS REACTIONS: None expected.
INCOMPATIBLE MATERIALS: Strong Acids
HAZARDOUS DECOMPOSITION MATERIALS: Oxides of sodium and phosphorus may form when heated decomposition

11. TOXICOLOGICAL INFORMATION

SKIN: Skin Corrosion/Irritation: Not irritating., Skin Acute Toxicity: LD50(Rabbit) = 7940 mg/Kg
EYES: Mildly irritating.
INHALATION: Not Determined
INGESTION: LD50(rat) = 4250 mg/Kg
CARCINOGENICITY
IARC: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
NTP: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
OSHA: None of the components of this product are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.
DERMAL TOXICITY: LD50(Rabbit) = 7940 mg/Kg
MUTAGENICITY: Not Determined
SENSITIZATION: Not a sensitizer
TERATOGENICITY: Not Determined
REPRODUCTIVE EFFECTS: Not Determined
TARGET ORGAN EFFECTS: Not Determined
ADDITIONAL INFORMATION: no additional information.

12. ENVIRONMENTAL INFORMATION

PRODUCT	TEST	DURATION	ORGANISM TYPE	TEST RESULTS
same as sds name	Fish- Acute Toxicity	96 hrs.	Rainbow Trout	120 mg/L
same as sds name	Fish- Acute Toxicity	96 hrs.	Sunfish	220 mg/L
same as sds name	Invertebrates- Acute Toxicity	48 hrs.	Daphnia Magna	LC50: , EC50: 177 mg/L

ECOTOXICITY: no applicable data available

BIOACCUMULATION: Not determined
PERSISTENCE DEGRADABILITY: Degradation is expected under aerobic and anaerobic conditions.
MOBILITY: Not expected to be very mobile.
ENVIRONMENTAL DATA: no applicable data available

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of in accordance with national, state and local regulations. It is the waste generator's responsibility to determine if a particular waste is hazardous under RCRA.
EMPTY CONTAINER: Empty Container Warning (Where applicable). Empty Containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty containers should be taken for recycling, recovery or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations.
DISPOSAL INSTRUCTIONS: The generation of waste should be avoided or minimized wherever possible and should at all times comply with the requirements of evironmental protection and waste disposal legislation and any regional local authority requirements.
WASTE FROM RESIDUES / UNUSED PRODUCTS: For hazardous waste regulations call 800-424-9346, the RCRA Hotline.
CONTAMINATED PACKAGING: For hazardous waste regulations call 800-424-9346, the RCRA Hotline.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)
PROPER SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Sodium Phosphate, Tribasic),
TECHNICAL NAME: no applicable data available
PRIMARY HAZARD CLASS/DIVISION: 9,
UN/NA NUMBER: UN3077,
PACKING GROUP: PGIII
NAERG: N/A
LABEL: 9,
EMS NO: Not Applicable
ADDITIONAL INFO: none

15. REGULATORY INFORMATION

UNITED STATES
TSCA (TOXIC SUBSTANCE CONTROL ACT)
TSCA STATUS: On the inventory, or in compliance with the inventory
US federal regulations
TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050) no applicable data available
CERCLA Hazardous Substance List (40 CFR 302.4): YES RQ=5000
Superfund amendments and reauthorization act of 1986 (SARA)
SARA 302 Extremely hazardous substance NO
SARA 304 Emergency release notification no applicable data available
SARA 311/312 Hazardous chemical no applicable data available
SARA 313 (TRI reporting) NO

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3) no applicable data available

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):no applicable data available

US state regulations

US. California Proposition 65: NO

US. New Jersey Worker and Community Right-to-Know Act: no applicable data available

US. Massachusetts RTK - Substance List: no applicable data available

US. Pennsylvania RTK - Hazardous Substances: no applicable data available

US. Rhode Island RTK: no applicable data available

Inventory Status:

Europe REACH: On the inventory, or in compliance with the inventory

USA TSCA: On the inventory, or in compliance with the inventory

Canada DSL: On the inventory, or in compliance with the inventory

Australia AICS: On the inventory, or in compliance with the inventory

New Zealand NZIOC: On the inventory, or in compliance with the inventory

Japan ENCS: On the inventory, or in compliance with the inventory

Korea KECI: On the inventory, or in compliance with the inventory

Philippines PICCS: On the inventory, or in compliance with the inventory

China IECSC: On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

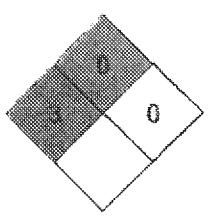
TITLE: EHS Management

PREPARED BY: FCT EHS and Compliance Dept.

HEALTH: 3

FIRE: 0

REACTIVITY: 0



MANUFACTURER SUPPLEMENTAL NOTES: no applicable data available

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Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect

EC	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Ac
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition,Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

DMR Summary Data

Discharge Monitoring Report (DMR) summary data provided for the period beginning with the previous NPDES application: October, 2011 through December, 2015.

Monitoring Period	Flow (MGD)		TRC (mg/L)		Oil & Grease (mg/L)		Temperature (°F)		pH (SU)		Total Phosphorus (mg/L)	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Min	Max	Avg	Max
Oct-11	654.61	678.99	< 0.0012	< 0.0012	< 5.10	5.37	73.7	79.0	7.95	8.19		
Nov-11	529.36	657.22	< 0.0012	< 0.0012	< 4.92	< 4.95	63.8	72.2	7.57	8.06	< 0.100	< 0.100
Dec-11	468.22	490.18	< 0.0012	< 0.0012	< 4.82	< 4.85	57.3	63.6	7.98	8.11		
Jan-12	444.95	478.69	< 0.0012	< 0.0012	< 5.00	< 5.11	55.2	60.0	8.41	8.62		
Feb-12	436.90	447.29	< 0.0012	< 0.0012	< 4.90	< 4.90	57.9	62.9	7.99	8.16	< 0.100	< 0.100
Mar-12	478.12	674.79	< 0.0012	< 0.0012	< 4.80	< 4.90	66.2	76.4	8.25	8.38		
Apr-12	563.93	675.17	< 0.0012	< 0.0012	< 5.00	< 5.00	69.2	77.9	8.23	8.51		
May-12	355.42	373.47	< 0.0012	< 0.0012	< 5.00	< 5.20	76.0	84.1	8.12	8.26	< 0.100	< 0.100
Jun-12	354.23	370.58	< 0.0012	< 0.0012	< 4.80	< 4.90	79.3	86.7	8.18	8.27		
Jul-12	603.15	672.82	< 0.0012	< 0.0012	< 5.00	< 5.10	83.8	89.2	7.88	8.17		
Aug-12	658.09	674.46	< 0.0012	< 0.0012	< 5.00	< 5.20	85.2	89.6	7.59	8.10	< 0.100	< 0.100
Sep-12	658.41	677.54	< 0.0012	< 0.0012	< 4.80	< 4.80	81.4	89.1	8.08	8.21		
Oct-12	620.95	674.19	< 0.0012	< 0.0012	< 4.90	< 5.10	71.1	82.7	8.16	8.31		
Nov-12	511.48	536.97	< 0.0012	< 0.0012	< 4.90	< 5.10	67.1	74.6	7.48	7.86	< 0.100	< 0.100
Dec-12	450.94	470.34	< 0.0012	< 0.0012	< 4.80	< 4.80	59.7	65.9	8.03	8.18		
Jan-13	449.33	469.08	< 0.0012	< 0.0012	< 5.10	< 5.20	57.9	63.5	8.23	8.33		
Feb-13	454.98	476.86	< 0.0012	< 0.0012	< 5.00	< 5.00	59.1	64.9	7.84	8.09	< 0.100	< 0.100
Mar-13	463.81	480.80	< 0.0012	< 0.0012	< 5.00	< 5.00	64.0	72.1	8.15	8.29		
Apr-13	326.93	549.33	< 0.0012	< 0.0012	< 5.00	< 5.00	61.9	75.5	8.23	8.38		
May-13	411.34	717.39	< 0.0012	< 0.0012	< 5.00	< 5.00	73.5	83.7	8.27	8.47	< 0.100	< 0.100
Jun-13	698.11	711.63	< 0.0012	< 0.0012	< 5.00	< 5.00	82.2	88.2	8.04	8.26		
Jul-13	695.16	709.78	< 0.0012	< 0.0012	< 5.00	< 5.00	83.4	87.9	8.31	8.40		
Aug-13	690.51	711.56	< 0.0012	< 0.0012	< 5.00	< 5.00	88.1	91.3	8.07	8.31	< 0.100	< 0.100
Sep-13	671.46	686.42	< 0.0012	< 0.0012	< 5.00	< 5.00	84.9	91.3	8.34	8.58		
Oct-13	547.07	675.65	< 0.0012	< 0.0012	< 5.00	< 5.00	71.5	83.1	8.74	8.88		
Nov-13	460.69	517.42	< 0.0012	< 0.0012	< 5.06	5.25	63.4	70.9	8.66	8.82	< 0.100	< 0.100
Dec-13	428.72	456.77	< 0.0012	< 0.0012	< 5.00	< 5.00	56.9	62.9	8.43	8.58		
Jan-14	416.38	430.91	< 0.0012	< 0.0012	< 5.00	< 5.00	55.6	59.0	8.52	8.80		
Feb-14	429.99	454.45	< 0.0012	< 0.0012	< 5.00	< 5.00	57.8	62.8	8.58	8.80	< 0.100	< 0.100
Mar-14	435.65	463.66	< 0.0012	< 0.0012	< 5.00	< 5.00	60.7	68.3	8.73	8.81		
Apr-14	419.98	676.17	< 0.0012	< 0.0012	< 5.00	< 5.00	61.4	70.9	8.65	8.80		
May-14	442.88	712.92	< 0.0012	< 0.0012	< 5.01	5.05	70.9	89.0	8.44	8.74	< 0.100	< 0.100
Jun-14	707.22	759.86	< 0.0012	< 0.0012	< 4.82	< 4.90	84.5	92.0	8.32	8.42		
Jul-14	685.18	727.64	< 0.0012	< 0.0012	< 5.03	< 5.40	84.3	92.2	8.10	8.54		
Aug-14	677.23	688.06	< 0.0012	< 0.0012	< 4.96	< 5.00	86.1	90.1	8.12	8.35	< 0.100	< 0.100
Sep-14	681.90	694.08	< 0.0012	< 0.0012	< 4.98	< 5.22	80.4	86.6	8.26	8.38		
Oct-14	673.14	701.17	< 0.0012	< 0.0012	< 5.93	< 8.80	74.8	84.3	8.35	8.57		

Gerald Gentleman Station Outfall 001

Nov-14	476.11	674.73	< 0.0012	< 0.0012	< 5.53	7.37	57.8	68.6	8.38	8.58	< 0.100	< 0.100
Dec-14	456.97	491.14	< 0.0012	< 0.0012	< 5.70	7.86	56.9	65.3	8.37	8.55		
Jan-15	449.93	515.29	< 0.0012	< 0.0012	< 5.12	5.52	56.0	61.3	8.33	8.55		
Feb-15	445.58	565.27	< 0.0012	< 0.0012	< 4.96	< 5.05	58.3	65.9	8.37	8.62	< 0.100	< 0.100
Mar-15	448.82	486.51	< 0.0012	< 0.0012	< 4.86	< 5.00	64.2	72.5	8.50	8.76		
Apr-15	431.50	533.30	< 0.0012	< 0.0012	< 4.96	< 5.00	66.0	72.5	8.56	8.79		
May-15	432.00	692.22	< 0.0012	< 0.0012	< 4.98	< 5.00	71.8	80.7	8.27	8.60	< 0.100	< 0.100
Jun-15	672.71	695.22	< 0.0012	< 0.0012	< 5.15	6.19	83.6	90.8	8.24	8.29		
Jul-15	656.06	671.70	< 0.0012	< 0.0012	< 5.02	5.26	82.8	87.4	8.10	8.39		
Aug-15	633.11	671.14	< 0.0012	< 0.0012	< 4.90	< 5.00	79.2	85.7	8.04	8.24	< 0.100	< 0.100
Sep-15	628.52	654.41	< 0.0012	< 0.0012	< 4.78	< 4.85	77.1	82.3	8.10	8.18		
Oct-15	632.91	655.80	< 0.0012	< 0.0012	< 5.22	6.22	70.6	77.1	8.12	8.33	* < 0.100	* < 0.100
Nov-15	589.22	643.74	< 0.0012	< 0.0012	< 4.54	< 4.75	62.2	71.0	8.37	8.57		
Dec-15	444.70	557.03	< 0.0012	< 0.0012	< 5.18	7.38	56.1	64.3	8.32	8.59		
	Average	**Maximum**	**Average**	**Maximum**	**Average**	**Maximum**	**Average**	**Maximum**	**Minimum**	**Maximum**	**Avg**	**Max**
	530.48	759.86	< 0.0012	< 0.0012	< 5.01	< 8.80	69.7	92.2	7.48	8.88	< 0.100	< 0.100

* = Calculated and reported on a net basis according to requirements set forth in Part I A. Outfall 001 Table 1. of NPDES permit

Gerald Gentleman Station Outfall 001 - WET				
Monitoring Period	Ceriodaphnia		Pimephales	
	Average	Max	Average	Max
October 2011 - September 2012	< 1	< 1	< 1	< 1
October 2012 - September 2013	< 1	< 1	< 1	< 1
October 2013 - September 2014	< 1	< 1	< 1	< 1
October 2014 - September 2015	< 1	< 1	< 1	< 1
	Average	Max	Average	Max
	< 1	< 1	< 1	< 1

Gerald Gentleman Station Outfall 002 - Evaporation Pond																				
Monitoring Period	Flow (MGD)		Petroleum Oil (mg/L)		TSS (mg/L)		Chloride (mg/L)		Conductivity (µmhos/cm)		TRC (mg/L)		CBOD (mg/L)(kg/day)		Total Copper (mg/L)(kg/day)		Total Iron (mg/L)(kg/day)		pH (SU)	
	Avg	Max	Min	Max	Min	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
Oct-11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nov-11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dec-11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jan-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Feb-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mar-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Apr-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jun-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jul-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aug-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sep-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oct-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nov-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dec-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jan-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Feb-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mar-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Apr-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jun-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jul-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aug-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sep-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oct-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nov-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dec-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jan-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Feb-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mar-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Apr-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jun-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jul-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aug-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sep-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oct-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nov-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dec-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jan-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Feb-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mar-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Apr-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jun-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Jul-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aug-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sep-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oct-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nov-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dec-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = No Discharge

Gerald Gentleman Station Outfall 002 - Metals																		
Monitoring Period	Arsenic (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Copper (mg/L)		Lead (mg/L)		Mercury (mg/L)		Nickel (mg/L)		Selenium (mg/L)		Zinc (mg/L)	
	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max
October 2011 - September 2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
October 2012 - September 2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
October 2013 - September 2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
October 2014 - September 2015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = No Discharge

Gerald Gentleman Station Outfall 002 - WET				
Monitoring Period	Ceriodaphnia (TUa)		Pimephales (TUa)	
	Average	Max	Average	Max
October 2011 - September 2012	ND	ND	ND	ND
October 2012 - September 2013	ND	ND	ND	ND
October 2013 - September 2014	ND	ND	ND	ND
October 2014 - September 2015	ND	ND	ND	ND

ND = No Discharge

Gerald Gentleman Station Outfall 003 - Coal Pile Pond						
Monitoring Period	Flow (MGD)		Duration of Discharge (hours)		Petroleum Oil (mg/L)	
	Avg	Max	Avg	Max	Avg	Max
Oct-11	ND	ND	ND	ND	ND	ND
Nov-11	ND	ND	ND	ND	ND	ND
Dec-11	ND	ND	ND	ND	ND	ND
Jan-12	ND	ND	ND	ND	ND	ND
Feb-12	ND	ND	ND	ND	ND	ND
Mar-12	ND	ND	ND	ND	ND	ND
Apr-12	ND	ND	ND	ND	ND	ND
May-12	ND	ND	ND	ND	ND	ND
Jun-12	ND	ND	ND	ND	ND	ND
Jul-12	ND	ND	ND	ND	ND	ND
Aug-12	ND	ND	ND	ND	ND	ND
Sep-12	ND	ND	ND	ND	ND	ND
Oct-12	ND	ND	ND	ND	ND	ND
Nov-12	ND	ND	ND	ND	ND	ND
Dec-12	ND	ND	ND	ND	ND	ND
Jan-13	ND	ND	ND	ND	ND	ND
Feb-13	ND	ND	ND	ND	ND	ND
Mar-13	ND	ND	ND	ND	ND	ND
Apr-13	ND	ND	ND	ND	ND	ND
May-13	ND	ND	ND	ND	ND	ND
Jun-13	ND	ND	ND	ND	ND	ND
Jul-13	ND	ND	ND	ND	ND	ND
Aug-13	ND	ND	ND	ND	ND	ND
Sep-13	ND	ND	ND	ND	ND	ND
Oct-13	ND	ND	ND	ND	ND	ND
Nov-13	ND	ND	ND	ND	ND	ND
Dec-13	ND	ND	ND	ND	ND	ND
Jan-14	ND	ND	ND	ND	ND	ND
Feb-14	ND	ND	ND	ND	ND	ND
Mar-14	ND	ND	ND	ND	ND	ND

Apr-14	ND	ND	ND	ND	ND	ND
May-14	ND	ND	ND	ND	ND	ND
Jun-14	ND	ND	ND	ND	ND	ND
Jul-14	ND	ND	ND	ND	ND	ND
Aug-14	ND	ND	ND	ND	ND	ND
Sep-14	ND	ND	ND	ND	ND	ND
Oct-14	ND	ND	ND	ND	ND	ND
Nov-14	ND	ND	ND	ND	ND	ND
Dec-14	ND	ND	ND	ND	ND	ND
Jan-15	ND	ND	ND	ND	ND	ND
Feb-15	ND	ND	ND	ND	ND	ND
Mar-15	ND	ND	ND	ND	ND	ND
Apr-15	ND	ND	ND	ND	ND	ND
May-15	ND	ND	ND	ND	ND	ND
Jun-15	ND	ND	ND	ND	ND	ND
Jul-15	ND	ND	ND	ND	ND	ND
Aug-15	ND	ND	ND	ND	ND	ND
Sep-15	ND	ND	ND	ND	ND	ND
Oct-15	ND	ND	ND	ND	ND	ND
Nov-15	ND	ND	ND	ND	ND	ND
Dec-15	ND	ND	ND	ND	ND	ND

ND = No Discharge

Gerald Gentleman Station Outfall L01 - RO Reject Water								
Monitoring Period	Flow (MGD)		TSS (mg/L)		Oil and Grease (mg/L)		pH (SU)	
	Average	Max	Average	Max	Average	Max	Min	Max
October 2011 - December 2011	0.164	0.295	3.0	3.0	< 5.0	< 5.0	7.30	7.55
January 2012 - March 2012	0.166	0.259	3.0	3.0	< 5.1	< 5.1	7.57	7.57
April 2012 - June 2012	0.092	0.353	1.0	1.0	5.4	5.4	7.57	7.57
July 2012 - September 2012	0.161	0.336	2.0	2.0	< 5.0	< 5.0	7.60	7.60
October 2012 - December 2012	0.174	0.411	< 5.0	< 5.0	< 5.1	< 5.1	7.57	7.57
January 2013 - March 2013	0.132	0.254	< 5.0	< 5.0	< 5.1	< 5.1	7.11	7.11
April 2013 - June 2013	0.168	0.554	< 5.0	< 5.0	< 5.0	< 5.0	7.60	7.60
July 2013 - September 2013	0.165	0.317	< 5.0	< 5.0	< 5.0	< 5.0	7.70	7.70
October 2013 - December 2013	0.193	0.409	< 5.0	< 5.0	< 5.0	< 5.0	7.54	7.54
January 2014 - March 2014	0.177	0.331	< 5.0	< 5.0	< 5.0	< 5.0	7.62	7.62
April 2014 - June 2014	0.130	0.350	< 5.0	< 5.0	< 5.0	< 5.0	7.86	7.86
July 2014 - September 2014	0.132	0.244	< 5.0	< 5.0	< 5.1	< 5.1	7.68	7.68
October 2014 - December 2014	0.142	0.266	< 5.0	< 5.0	< 5.1	< 5.1	7.85	7.85
January 2015 - March 2015	0.172	0.343	< 5.0	< 5.0	7.8	7.8	7.49	7.49
April 2015 - June 2015	0.158	0.350	< 5.0	< 5.0	5.7	5.7	7.85	7.85
July 2015 - September 2015	0.155	0.457	< 5.0	< 5.0	< 5.0	< 5.0	7.60	7.60
October 2015 - December 2015	0.164	0.317	< 5.0	< 5.0	< 5.0	< 5.0	7.69	7.69
	Average	Max	Average	Max	Average	Max	Min	Max
	0.156	0.554	< 4.4	< 5.0	< 5.3	7.8	7.11	7.86

ND = No Discharge

Gerald Gentleman Station Outfall L01 - RO Reject Water

Gerald Gentleman Station Outfall L02 - Zeolite Softener Reject Water

Monitoring Period	Flow (MGD)		TSS (mg/L)		Oil and Grease (mg/L)		pH (SU)	
	Average	Max	Average	Max	Average	Max	Min	Max
October 2011 - December 2011	0.016	0.016	3.00	3.00	< 5.11	< 5.11	7.35	7.42
January 2012 - March 2012	0.020	0.022	3.00	3.00	< 4.95	< 4.95	7.20	7.20
April 2012 - June 2012	0.022	0.022	1.00	1.00	< 5.30	< 5.30	7.25	7.25
July 2012 - September 2012	0.022	0.022	2.00	2.00	< 5.00	< 5.00	7.36	7.36
October 2012 - December 2012	0.022	0.022	< 5.00	< 5.00	< 5.10	< 5.10	7.41	7.41
January 2013 - March 2013	0.022	0.022	< 5.00	< 5.00	< 5.00	< 5.00	6.67	6.67
April 2013 - June 2013	0.015	0.022	< 5.00	< 5.00	< 5.00	< 5.00	7.71	7.71
July 2013 - September 2013	0.022	0.022	< 5.00	< 5.00	< 5.00	< 5.00	7.42	7.42
October 2013 - December 2013	0.022	0.022	21.00	21.00	< 5.00	< 5.00	7.49	7.49
January 2014 - March 2014	0.022	0.022	< 5.00	< 5.00	< 5.00	< 5.00	7.41	7.41
April 2014 - June 2014	0.022	0.022	< 5.00	< 5.00	< 5.00	< 5.00	7.22	7.22
July 2014 - September 2014	0.022	0.022	< 5.00	< 5.00	< 5.52	< 5.52	7.34	7.34
October 2014 - December 2014	0.022	0.022	< 5.00	< 5.00	< 5.22	< 5.22	7.31	7.31
January 2015 - March 2015	0.022	0.022	< 5.00	< 5.00	< 5.05	< 5.05	7.24	7.24
April 2015 - June 2015	0.022	0.022	9.00	9.00	< 4.95	< 4.95	7.73	7.73
July 2015 - September 2015	0.022	0.022	< 5.00	< 5.00	< 4.95	< 4.95	7.24	7.24
October 2015 - December 2015	0.022	0.022	< 5.00	< 5.00	< 4.95	< 4.95	7.71	7.71
	Average	Max	Average	Max	Average	Max	Min	Max
	0.021	0.022	< 5.53	21.00	< 5.06	< 5.52	6.67	7.73

Gerald Gentleman Station Outfall L02 - Zeolite Softener Reject Water