pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SOUTHCENTRAL REGIONAL OFFICE
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0009920**
Facility Type		APS ID	**780559**
Major / Minor	**Major**	Authorization ID	**926487**

NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

Applicant and Facility Information

Applicant Name	**Exelon Generation Co. LLC**	Facility Name	**Exelon Three Mile Island Nuclear Station**
Applicant Address	PO Box 480 Route 441 South	Facility Address	Route 441 South P O Box 480
	Middletown, PA 17057-0480		Middletown, PA 17057
Applicant Contact	Scott Cogley	Facility Contact	
Applicant Phone	(717) 948-8881	Facility Phone	
Client ID	273620	Site ID	450833
SIC Code	4911	Municipality	Londonderry Township
SIC Description	Trans. & Utilities - Electric Services	County	Dauphin
Date Application Received	May 3, 2012	EPA Waived?	No
Date Application Accepted	May 8, 2012	If No, Reason	Major Facility
Purpose of Application	.Approval of chemical additives for cleaning newly installed boiler tubes		

Summary of Review

Exelon is completing repair of 'B' Auxiliary Boiler and requested approval of chemical additives used to clean new tubes after installation.

Recommend approval of additives by letter.

Approve	Return	Deny	Signatures	Date
X			Martin L. Ferry, P.E. / Environmental Engineer	June 12, 2013
			Jay E. Patel, P.E. / Environmental Engineer Manager	
			Maria D. Bebenek, P.E. / Environmental Manager	

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	43
Latitude	40° 9’ 8.00”	Longitude	76° 43’ 40.00”
Quad Name	Middletown	Quad Code	1732
Wastewater Description:	Discharge of treated water after cleaning new boiler tubes		
Receiving Waters	Susquehanna River	Stream Code	06685
NHD Com ID	56406043	RMI	59.15
Drainage Area	24,966	Yield (cfs/mi^2)	0.1328
Q_{7-10} Flow (cfs)	3,315.5	Q_{7-10} Basis	USGS 01570500
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-G	Chapter 93 Class.	WWF,MF
Existing Use	WWF,MF	Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	Columbia Water Company		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	3453
PWS RMI	42.83	Distance from Outfall (mi)	16.3

Changes Since Last Permit Issuance:

Other Comments:

Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	43
Latitude	40°09'08"	**Longitude**	76°43'40"
Wastewater Description:	Discharge of treated water after cleaning new boiler tubes		

The 'B' Auxiliary Boiler is being repaired with the final process being cleaning of newly installed boiler tubes of oil and grease remaining from manufacture and shipping. Cleaning process uses a solution of trisodium phosphate (500 to 750 lbs), sodium metasilicate (250 to 500 lbs) and Triton CF176 (50 to 75 lbs) (a surfactant). These chemicals dissolve or increase the solubility of oil & grease. Cleaning solution is flushed from boiler with about 6000 gallons of water that goes to boiler sump, treatment at IWTS (Outfall 701) and then Outfall 001 mixing with other wastewaters consisting of circulating cooling water, secondary service water, nuclear service water, other internal monitoring points 101, 401, 501, diesel cooling water and other minor sources,

Bonita Moore added these chemicals to the approved list of chemical additives. Discharge levels were determined based on the maximum usage rates and a maximum day discharge rate of 43 MGD from NPDES renewal application where:

concentration = lbs/(43 MGD*8.34)

Trisodium phosphate 2.09 mg/l
Metso Pentabead (sodium metasilicate) 1.39 mg/l
Triton CF-76 0.209 mg/l

These were modeled using Pentoxsd (printouts attached) with following allowable discharge concentrations indicating these chemicals usage rates are acceptable:

Trisodium phosphate 23.5 mg/l
Metso Pentabead (sodium metasilicate) 40.4 mg/l
Triton CF-76 0.420 mg/l

Another compound TSA-KSB CPD (a soft paste) is a lubricant for inserting the tubes although some will be washed from tubes during cleaning and was approved for a previous cleaning. The request proposed using 16 lbs of TSA-KSB CPD. Scott Cogley could not quantify the amount of lubricant released during boiler tube rinsing. The MSDS for TDS-KSB CPD reports the compound is made up of potassium soaps (<20%), fatty oils (<20%) and fatty acids (<10%). The remaining material is water. While no hazardous ingredients or toxicological hazards other than mild irritations are reported, the ecological information states it should be kept out of sewers or waterways. If accidental releases occur, the MSDS directions are to keep materials out of sewers and waterways and to clean up by recovering free product and absorbing remainder on an inert material. These directions also apply to oil compounds.

The discharge concentration is 0.045 mg/l based on 16 lbs and 43 MGD discharge. The PMFc of 0.84 and total streamflow of 3315.5 cfs yields a streamflow of 2,785 cfs for mixing resulting in an instream concentration of 0.001 mg/l assuming 100% of the applied additive is discharged. When considering only active ingredients, the instream concentration is <0.0005 mg/l. The wastewater will go through an oil/water separator and the IW treatment plant with reductions expected. Recommend approval of TDS-KSB CPD based on presence at a deminimus level.

Exelon — chemical additive

Triton CF-76 — 50-75 lbs — S.g. 1.04

max day discharge rate = 43 MGD

S.g. is insignificant at these levels

75 lbs = (Conc.)(43)(8.34)

✓ .209 mg/l = conc.

Trisodium phosphate

500 - 750 lbs

750 lbs = (Conc)(43)(8.34)

✓ 2.09 mg/l = conc.

Metso Pentahead

750 - 500 lbs

500 lbs = (conc.)(43)(8.34)

✓ 1.39 mg/l = conc.

TDS - KSB CPD

16# = (conc.)(43)(8.34)

0.045 mg/l = conc

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
6685	61.00	274.78	24955.00	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.1328	0	0	0	0	2.5	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
		0	0	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
Metso Pentabead	0	0	0.5	0.5	0	0	0	0	1	0
Trisodium Phosphate	0	0	0.5	0.5	0	0	0	0	1	0
Triton CF-76	0	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
6685	59.15	269.20	24966.00	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.1328	0	0	0	0	4	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
Exelon	PA0009920	0	48	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
Metso Pentabead	1390	0	0.5	0.5	0	0	0	0	1	0
Trisodium Phosphate	2090	0	0.5	0.5	0	0	0	0	1	0
Triton CF-76	209	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
07K	6685	SUSQUEHANNA RIVER

RMI	Name	Permit Number	Disc Flow (mgd)
59.15	Exelon	PA0009920	48.0000

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
Metso Pentabead	1390	INPUT	2168.624	40466.95	AFC
Trisodium Phosphate	2090	INPUT	3260.736	23511.29	AFC
Triton CF-76	209	INPUT	326.074	420.856	AFC

Ferry, Martin

From: Scott.Cogley@exeloncorp.com
Sent: Wednesday, May 29, 2013 8:07 PM
To: Ferry, Martin
Subject: Exelon TMI Boiler Chemical Use - New Product MSDS Boiler
Attachments: Scan from a Xerox WorkCentre.pdf

Martin:

As a follow-up to the Department's request, our vendor has selected another chemical to replace BASF Plurafac RA40 with a chemical additive where the manufacture has provided the appropriate Ecological Information in Section 12 of the MSDS.

The replacement chemical is DOW Chemical TRITON (TM) CF-76 SURFACTANT (MSDS Attached).

Section 12 of the MSDS includes Ecological Toxicity for Daphnia magna (water flea) as requested by the Department.

The vendor is planning on using in the range of 50 to 75 pounds of CF-76 (0.1 % to 0.15 % solution) for the chemical cleaning.

Please review and advise on the acceptability of the proposed chemical additive. The current schedule for this activity is now the third week of June 2013.

Thank You.

Using the same wastewater discharge data as submitted previously:

The wastewater flow will follow the normal NPDES permitted discharge pathway for boiler blowdown: Boiler Blowdown →→ Auxiliary Boiler Sump →→ IWTS Sump →→ Treatment via IWTS →→ IWTS Discharge via Outfall 701 →→ IWTS Discharge mix with Main Station Discharge Flow →→ Mixed Wastewater Discharge to Susquehanna River via Outfall 001.

The relevant volumes, sump capacities, and estimated discharge flow rates for the wastewater processing, treatment and discharge are as follows:

- Boiler "Boil-Out" Wastewater Volume = 6,000 gallons.
- IWTS Sump Volume = 300,000 gallons (assume 150,000 gallons for effective volume).
- IWTS Treatment System Release Rate at Outfall 701 = 50 gpm (long-term average daily discharge rate – NPDES Permit renewal application 2012).
- Main Station Discharge Release Rate at Outfall 001 = 13,000 gpm (long-term average daily discharge rate – NPDES Permit renewal application 2012).

Based upon the amounts of chemical additives expected to be used for the "boil-out" process and using the above assumptions for wastewater volumes and discharge flow rates the expected outfall effluent characteristics will be within the NPDES limitations summarized below. The discharge from IWTS (Outfall 701) will meet the existing NPDES permit effluent limitations and the water quality standard for phosphorous

will not be exceeded at the Main Station Discharge (Outfall 001). There are no effluent limitations associated with the wetting agent, however the concentration at Outfall 001 will be less than 1 mg/l and there will be no associated effect on the Main Station Discharge.

NPDES-Related Parameters	IWTS Discharge Outfall 701 Effluent	Main Station Discharge Outfall 001 Effluent	Comments
pH	6.0 to 9.0	6.0 to 9.0	Limitations Based on NPDES Permit
Total Suspended Solids	30 mg/l Ave. Monthly 100 mg/l Max. Daily	Not Applicable	Limitations Based on NPDES Permit
Oil & Grease	15 mg/l Ave. Monthly 20 mg/l Max. Daily 30 mg/l Inst. Max.	Not Applicable	Limitations Based on NPDES Permit
Phosphorous (as P)	Not Applicable	< 2 mg/l Ave. Monthly	Limitations Based on Water Quality Standards
Wetting Agent	Not Applicable	Not Applicable	No NPDES Permit Required Limitations

Material Safety Data Sheet

Dow Chemical Canada ULC

Product Name: TRITON(TM) CF-76 SURFACTANT

Issue Date: 2012.05.15
Print Date: 05 Oct 2012

Dow Chemical Canada ULC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name
TRITON(TM) CF-76 SURFACTANT

This product is distributed by
Canada Colors and Chemicals Limited
General Inquiry: (905) 459-1232
24 Hour Emergency: (416) 444-2112
CCC: Product Code: 940305
CCC: Product Name: TRITON CF-76

COMPANY IDENTIFICATION
Dow Chemical Canada ULC
A Subsidiary of The Dow Chemical Company
Suite 2100
450 - 1st Street S.W
Calgary, AB T2P 5H1
Canada

For MSDS updates and Product Information: 800-258-2436

Prepared By: Prepared for use in Canada by EH&S, Hazard Communications.
Revision 2012.05.15
Print Date: 10/5/2012

Customer Information Number: 800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: (989) 636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview
Color: Yellow
Physical State: Liquid.
Odor: Pungent
Hazards of product:

CAUTION! May cause eye irritation. May be harmful if absorbed through skin. May be harmful if swallowed. Isolate area. Slipping hazard.

Potential Health Effects

Eye Contact: May cause slight eye irritation. Corneal injury is unlikely.
Skin Contact: Brief contact may cause slight skin irritation with local redness.
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Inhalation: Brief exposure (minutes) is not likely to cause adverse effects.
Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.
Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.

3. Composition/information on ingredients

Component	CAS #	Amount W/W
4-Nonylphenoxy polyethoxy polypropoxy ethyl acetal	160799-28-0	<= 100.0 %

Amounts are presented as percentages by weight.

4. First-aid measures

Description of first aid measures

General advice: If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Inhalation: Move person to fresh air; if effects occur, consult a physician.
Skin Contact: Wash skin with plenty of water.
Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.
Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Suitable extinguishing media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.
Extinguishing Media to Avoid: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.
Unusual Fire and Explosion Hazards: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.
Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

See Section 9 for related Physical Properties

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard. Refer to Section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Sand. Dirt. Do not use water for cleanup. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling
General Handling: Avoid contact with eyes. Do not swallow. Wash thoroughly after handling. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage
No specific requirements. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact. The shelf life given is for unopened containers stored under moderate temperature conditions.

Shelf life: Use within
24 Months

8. Exposure Controls / Personal Protection

Exposure Limits

Consult local authorities for recommended exposure limits.
None established

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields).

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Styrene/butadiene rubber. Viton. Examples of acceptable glove barrier materials include: Polyvinyl alcohol ("PVA"). Natural rubber ("latex"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance	
Physical State	Liquid.
Color	Yellow
Odor	Pungent
Odor Threshold	No test data available
pH	10.3 *Calculated*
Melting Point	Not applicable to liquids
Freezing Point	3 °C *Calculated*
Boiling Point (760 mmHg)	> 200 °C *Calculated* .
Flash Point - Closed Cup	201 °C *ASTM D93*
Flash Point - Open Cup	251 °C *ASTM D93*
Evaporation Rate (Butyl Acetate = 1)	<0.01 *Calculated*
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits In Air	**Lower:** No test data available **Upper:** No test data available
Vapor Pressure	< 0.01 mmHg @ 20 °C *Calculated*
Vapor Density (air = 1)	>1.0 *Calculated*
Specific Gravity (H2O = 1)	1.04 20 °C/20 °C *Calculated*
Solubility in water (by weight)	100 % @ 20 °C *Calculated*
Partition coefficient, n-octanol/water (log Pow)	3.59 *Estimated.*
Autoignition Temperature	No test data available
Decomposition Temperature	No test data available

Kinematic Viscosity	284 cSt @ 25 °C *Calculated*
Explosive properties	no data available
Oxidizing properties	no data available
Molecular Weight	1460 g/mol *Calculated*

10. Stability and Reactivity

Reactivity
No dangerous reaction known under conditions of normal use.

Chemical stability
Thermally stable at recommended temperatures and pressures.

Possibility of hazardous reactions
Polymerization will not occur.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible Materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers. Strong reducing agents.

Hazardous decomposition products
Decomposition products depend upon temperature, air supply and the presence of other materials.

11. Toxicological Information

Acute Toxicity
Ingestion
LD50, rat, male > 1,000 mg/kg
LD50, rat, female 1,070 mg/kg
Dermal
LD50, rabbit, male 4,760 mg/kg
LD50, rabbit, female 11,300 mg/kg
Inhalation
As product: The LC50 has not been determined.
Eye damage/eye irritation
May cause slight eye irritation. Corneal injury is unlikely.
Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness.
Sensitization
Skin
No relevant information found.
Respiratory
No relevant information found.
Repeated Dose Toxicity
No relevant data found.
Chronic Toxicity and Carcinogenicity
No relevant data found.
Developmental Toxicity
No relevant data found.
Reproductive Toxicity
No relevant data found.
Genetic Toxicology
No relevant data found.

12. Ecological Information

Toxicity

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, Pimephales promelas (fathead minnow), 96 h: 2.7 mg/l
Aquatic Invertebrate Acute Toxicity
EC50, Daphnia magna (Water flea), 48 h, immobilization: 10 - 50 mg/l
Toxicity to Micro-organisms
IC50; Bacteria, 16 h: > 5,000 mg/l

Persistence and Degradability

Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.
Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
< 5 %	< 5 %	14 %	

Bioaccumulative potential

Partition coefficient, n-octanol/water (log Pow): 3.59 Estimated.
Bioconcentration Factor (BCF): 103; Fish; Estimated.

Mobility in soil

Mobility in soil: No data available.

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

14. Transport Information

TDG Small container

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: 4-nonylphenoxy polyethoxy polypropoxy ethyl acetal
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

TDG Large container
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: 4-nonylphenoxy polyethoxy polypropoxy ethyl acetal
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

IMDG
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: 4-nonylphenoxy polyethoxy polypropoxy ethyl acetal
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III
EMS Number: F-A,S-F
Marine pollutant.: Yes

ICAO/IATA
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: 4-nonylphenoxy polyethoxy polypropoxy ethyl acetal
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III
Cargo Packing Instruction: 964
Passenger Packing Instruction: 964

15. Regulatory Information

US. Toxic Substances Control Act
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30
European Inventory of Existing Commercial Chemical Substances (EINECS)
This product is a polymer according to the definition in Directive 92/32/EEC (7th Amendment to Directive 67/548/EEC) and all of its starting materials and intentional additives are listed in the European Inventory of Existing Commercial Chemical Substances (EINECS) or in compliance with European (EU) chemical inventory requirements.
CEPA - Domestic Substances List (DSL)
All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.
Hazardous Products Act Information: CPR Compliance
This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Hazardous Products Act Information: WHMIS Classification

D2B	Eye or Skin Irritant

Hazardous Products Act Information: Hazardous Ingredients
This product contains the following ingredients which are Controlled Products and/or are on the Ingredient Disclosure List (Canadian HPA Section 13 and 14).

Component	CAS #	Amount W/W
4-Nonylphenoxy polyethoxy polypropoxy ethyl acetal	160799-28-0	>= 99.0 - <= 100.0 %

16. Other Information

Product Literature

Additional information on this and other products may be obtained by visiting our web page. Additional information on this product may be obtained by calling your sales or customer service contact. Ask for a product brochure.

Hazard Rating System

NFPA	Health	Fire	Reactivity
	1	1	0

Recommended Uses and Restrictions

Identified uses

Multi-purpose surfactant. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Revision

Identification Number: 2186 / 1002 / Issue Date 2012.05.15 / Version: 6.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
VOL/VOL	Volume/Volume

Dow Chemical Canada ULC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

Exelon Generation.

April 17, 2013
5532-2013-019

Mr. Martin Ferry, Permit Engineer
Water Quality Management Program
Pennsylvania Department of Environmental Protection
909 Elmerton Avenue
Harrisburg, PA 17110-8200

Dear Mr. Ferry:

SUBJECT: REQUEST FOR CHEMICAL USE APPROVAL
AUXILIARY BOILER CLEANING WASTEWATER
NPDES PERMIT PA 0009920

The purpose of this letter is to request Department approval to use three cleaning chemicals and to discharge wastewater associated with the "boil-out" of an Auxiliary Boiler following current boiler maintenance activities. The 'B' Auxiliary Boiler is currently being repaired and is scheduled for completion in May 2013. The final steps in returning the Auxiliary Boiler to service include a standard boiler tube cleaning process that uses a solution of trisodium phosphate, sodium metasilicate, and a surfactant wetting agent. The purpose of the "boil-out" procedure is to remove contaminants from newly installed boiler tubes. The primary contaminants of concern include the petroleum hydrocarbons applied to the boiler tubes during the manufacture and installation of the boiler tubes. Approximately 6000 gallons of cleaning solution will be used in the "boil-out" process followed by several water rinses of the boiler.

Exelon Generation Company, LLC proposes to dispose of the resulting wastewater through the existing plant sumps and drains system and the station Industrial Wastewater Treatment System (IWTS). The "boil-out" wastewater will be blown down from the 'B' Auxiliary Boiler to the boiler sump, treated at IWTS (Outfall 701), and then discharged to the Susquehanna River via the Main Station Outfall (Outfall 001). The existing Outfall 701 effluent limitations for pH, oil & grease, and total suspended solids will be complied with during the "boil-out" evolution. Additionally, the evolution will be controlled to assure compliance to the regulatory prescribed discharge limitation of 2 mg/l phosphorous as a monthly average at Outfall 001.

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Page 2 of 2

The attachment to this letter includes additional details of the "boil-out" procedure, applicable Material Safety Data Sheets (MSDSs), and other relevant information for the Department's review. Exelon is respectfully requesting a timely Department review of this submittal to support the scheduled "boil-out" on or about May 22, 2013.

Should the Department have questions concerning this request or require additional information please contact Scott Cogley, Senior Environmental Chemist, at (717) 948-8881 or e-mail at scott.cogley@exeloncorp.com.

Sincerely,

T. D. Alvey
Manager, Chemistry Environmental & Radwaste

TDA/src

Attachment

ATTACHMENT

Auxiliary Boiler "Boil-Out" Process Description

"Boil-out" Process Description Summary

Following the repairs and re-tubing of the 'B' Auxiliary Boiler the boiler is required to undergo a cleaning process know as a "boil-out". The primary purpose of the "boil-out" process is to remove petroleum hydrocarbon contaminants from the boiler tubes and the affected boiler surfaces. The typical process involves the partial filling of the boiler with water and chemicals; firing of the boiler over a period of twelve to thirty-six hours; and partial blowdown of the boiler every one-half hour to check boiler chemistry and cleaning status. Upon completion of the cleaning the boiler is cooled-down; the cleaning process wastewater is drained; and the boiler is then refilled, rinsed with clean water and drained.

The boiler capacity is approximately 6,000 gallons. There will be approximately 6,000 gallons of initial process wastewater generated and another 8,000 to 12,000 gallons generated from the boiler rinse activity. Additional clean water rinses could be required to achieve station cleanliness requirements.

The following chemical additives are anticipated to be used in the "boil-out" process:

- Tri-sodium phosphate - Cleaning chemical used to dissolve oils/greases.
  - Expected Usage Amount = 500 to 750 pounds.
  - Cleaning solution equivalent to 1 % - 1.5 %.
- Sodium Metasilicate, pentahydrate - Cleaning chemical used to dissolve oils/greases.
  - Expected Usage Amount = 250 to 500 pounds.
  - Cleaning solution equivalent to 0.5 % - 1.0 %
- Wetting Agent – Plurafac RA-40 Surfactant - Cleaning chemical used to increase the oil/grease solubility in the cleaning process.
  - Expected Usage Amount = 50 to 100 pounds.
  - Cleaning solution equivalent to 0.1 % - 0.2 %.

Material Safety Data Sheets (MSDS) for the cleaning additives are attached for information. Also attached is an MSDS for the petroleum-based product used onsite for the boiler maintenance activities (i.e., Richardsapex, Inc. TDS-KSB CPD). A total of approximately two gallons (≈ sixteen pounds) of this product will be used for re-tubing.

Wastewater Treatment and Discharge Summary

The "boil-out" wastewater and rinse water will be directed from the boiler via the normal blowdown point to the plant sumps and drains system and then to the Industrial Wastewater Treatment System (IWTS) for treatment and discharge under NPDES.

ATTACHMENT
Page 2 of 2

Wastewater Treatment and Discharge Summary (cont'd)

The wastewater flow will follow the normal NPDES permitted discharge pathway for boiler blowdown: Boiler Blowdown →→ Auxiliary Boiler Sump →→ IWTS Sump →→ Treatment via IWTS →→ IWTS Discharge via Outfall 701 →→ IWTS Discharge mix with Main Station Discharge Flow →→ Mixed Wastewater Discharge to Susquehanna River via Outfall 001.

The relevant volumes, sump capacities, and estimated discharge flow rates for the wastewater processing, treatment and discharge are as follows:

- Boiler "Boil-Out" Wastewater Volume = 6,000 gallons.
- IWTS Sump Volume = 300,000 gallons (assume 150,000 gallons for effective volume).
- IWTS Treatment System Release Rate at Outfall 701 = 50 gpm (long-term average daily discharge rate – NPDES Permit renewal application 2012).
- Main Station Discharge Release Rate at Outfall 001 = 13,000 gpm (long-term average daily discharge rate – NPDES Permit renewal application 2012).

Based upon the amounts of chemical additives expected to be used for the "boil-out" process and using the above assumptions for wastewater volumes and discharge flow rates the expected outfall effluent characteristics will be within the NPDES limitations summarized below. The discharge from IWTS (Outfall 701) will meet the existing NPDES permit effluent limitations and the water quality standard for phosphorous will not be exceeded at the Main Station Discharge (Outfall 001). There are no effluent limitations associated with the wetting agent, however the concentration at Outfall 001 will be less than 1 mg/l and there will be no associated effect on the Main Station Discharge.

NPDES-Related Parameters	IWTS Discharge Outfall 701 Effluent	Main Station Discharge Outfall 001 Effluent	Comments
pH	6.0 to 9.0	6.0 to 9.0	Limitations Based on NPDES Permit
Total Suspended Solids	30 mg/l Ave. Monthly 100 mg/l Max. Daily	Not Applicable	Limitations Based on NPDES Permit
Oil & Grease	15 mg/l Ave. Monthly 20 mg/l Max. Daily 30 mg/l Inst. Max.	Not Applicable	Limitations Based on NPDES Permit
Phosphorous (as P)	Not Applicable	< 2 mg/l Ave. Monthly	Limitations Based on Water Quality Standards
Wetting Agent	Not Applicable	Not Applicable	No NPDES Permit Required Limitations

Material Safety Data Sheets

Auxiliary Boiler "Boil-Out" Process Chemical Additives

GEHRING-MONTGOMERY, INC.

TER GROUP

Material Safety Data Sheet

Date of Revision: 12/2011 **TRISODIUM PHOSPHATE**

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Trisodium Phosphate dodecahydrate
Chemical Formula: $Na_3PO_4 \cdot 12H_2O$
CAS Number: 10101-89-0
Other Designations: TSP; trisodium orthophosphate; sodium phosphate, tribasic; tertiary sodium phosphate; trisodium phosphate
Derivation: Prepared by combining proper proportions of phosphoric acid and soda ash to form disodium phosphate, then adding caustic soda.
General Use: Used in softening water, tanning leather, manufacturing paper, clarifying sugar; in detergent mixtures, photographic developers, food additives, buffers, emulsifiers, dietary supplements, boiler water compounds, and industrial cleaners.
Emergency Telephone: (ChemTel) Contract MIS0000335; 800 255-3924; INTL 813 248-0585

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	EINECS/ELINCS	% wt *or* % vol
Trisodium Phosphate dodecahydrate	10101-89-0	231-509-8	100

Trace Impurities:

	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH
Ingredient	TWA	STEL	TWA	STEL	TWA	STEL	IDLH
Trisodium Phosphate	5 mg/m^3	none estab.	none estab.	none estab.	none estab.	none estab.	none estab.

Section 3 - Hazards Identification

☆☆☆☆☆ **Emergency Overview** ☆☆☆☆☆
MAY CAUSE EYE INJURY. CAUSES SKIN IRRITATION. MAY BE HARMFUL IF SWALLOWED.

HMIS	
H	1
F	0
R	2
PPE†	
†Sec. 8	

Potential Health Effects

Primary Entry Routes: Inhalation, ingestion or skin contact.
Target Organs: Skin, digestive tract.
Acute Effects
Inhalation: May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema.
Eye: May cause severe eye irritation. May result in corneal injury.
Skin: May cause severe irritation and possible burns.
Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.
Carcinogenicity: IARC, NTP, and OSHA do not list Trisodium Phosphate as a carcinogen.
Medical Conditions Aggravated by Long-Term Exposure:
Chronic Effects: Prolonged or repeated eye and skin contact causes irritation. Injury to the esophagus from scarring may occur. Alkali exposures may necessitate irrigation for extended duration.

Section 4 - First Aid Measures

Inhalation: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.
Skin Contact: Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

710 Louis Drive • Warminster, PA 18974 • Tel: 001 (215) 957-1234 • Fax: 001 (215) 957-1311 • www.gehring-montgomery.com

After first aid, get appropriate in-plant, paramedic, or community medical support.
Note to Physicians: Treat symptomatically and supportively.

Section 5 - Fire-Fighting Measures

Flash Point: noncombustible
Burning Rate: N/A
Autoignition Temperature: noncombustible
LEL: N/A
UEL: N/A
Flammability Classification: noncombustible

NFPA

Extinguishing Media: Use what is appropriate to the surrounding fire since this material is noncombustible.
Unusual Fire or Explosion Hazards: In a fire situation at high temperature, phosphates can emit highly toxic phosphorus oxides (PO_x) fumes.
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 facepiece operated in pressure-demand or positive-pressure mode.

Section 6 - Accidental Release Measures

Spill /Leak Procedures: Cleanup personnel should wear the necessary personal protective equipment to prevent skin or eye contact and dust inhalation.
Small Spills: Vacuum or sweep up material and place into a suitable disposal container.
Large Spills
Containment: Dike with inert absorbent material, as needed, to contain and limit spill area. Sweep, vacuum, or scoop the spilled solid, avoiding dust generation, into a suitable disposal container (with secure lid). Do not release into sewers or waterways.
Cleanup: Flush residues to drain with plenty of water.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Wash thoroughly after handling. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Storage Requirements: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls / Personal Protection

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

TRISODIUM PHOSPHATE 3

Section 9 - Physical and Chemical Properties

Physical State: solid
Appearance and Odor: white/off white crystals /powder/granules - odorless
Odor Threshold:
Vapor Pressure:
Vapor Density (Air=1):
Formula Weight: 380.12
Density:
Specific Gravity (H_2O=1, at 4 °C): 1.62 g/cm^3
pH:
Water Solubility: soluble
Other Solubilities:
Boiling Point: at 212 °F (100 °C) (decomposes)
Freezing/Melting Point: 163.9 to 170.1 °F (73.3 to 76.7 °C)
Viscosity:
Refractive Index:
Surface Tension:
% Volatile:
Evaporation Rate:

Section 10 - Stability and Reactivity

Stability: Trisodium Phosphate is stable at room temperature in closed containers under normal storage and handling conditions.
Polymerization: Hazardous polymerization will not occur.
Chemical Incompatibilities: This strong caustic material reacts violently with water and strong acids to generate heat.
Conditions to Avoid: Never heat to decomposition.
Hazardous Decomposition Products: Thermal oxidative decomposition of Trisodium Phosphate can produce highly toxic fumes of phosphorus oxides (PO_x) and sodium oxide (Na_2O).

Section 11- Toxicological Information

Toxicity Data:*

Rabbit, intravenous, LD_{Lo}: 1580 mg/kg
Acute Inhalation Effects:
Human, inhalation, TC_{Lo}: ?? ppm

Acute Oral Effects:
Rat, oral, LD_{50}: 7400 mg/kg

Chronic Effects: no data available
Carcinogenicity: no data available
Mutagenicity: no data available
Teratogenicity: no data available

* See NIOSH, *RTECS* (TC9575000), for additional toxicity data.

Section 12 - Ecological Information

Ecotoxicity: Aquatic toxicity: 151 ppm/96 hr/mosquito fish/TLm/Turbid water; 126 ppm/96 hr/daphnia magna/TLm
Environmental Fate: no data available
Environmental Degradation: no data available
Soil Absorption/Mobility: no data available

Section 13 - Disposal Considerations

Disposal: Scrap material can be used for neutralizing acid wastes or buried in an approved landfill. If regulations permit, you may flush *small* amounts to drain with large excess of water. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.
Disposal Regulatory Requirements:
Container Cleaning and Disposal

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101): Not Regulated.*

*(If shipping package is equal to or exceeds 5000 lbs., then product is hazard class 9, shipping name: Environmentally Hazardous substance, Solid, n.o.s. (sodium Phosphate, Tribasic); UN3077.)

Shipping Name:
Shipping Symbols:
Hazard Class:
ID No.:
Packing Group:
Label:
Special Provisions (172.102):

Section 15 - Regulatory Information

US FEDERAL
TSCA
CAS# 10101-89-0 is not on the TSCA Inventory. It is a hydrate and exempt from TSCA Inventory requirements (40CFR720.3(u)(2)).
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA
Section 302 (RQ)
CAS# 10101-89-0: final RQ = 5000 pounds (2270 kg) (Listed under 'Sodiu
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 10101-89-0: acute.
Section 313
No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 10101-89-0 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
Sodium phosphate tribasic dode can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.
California No Significant Risk Level:
None of the chemicals in this product are listed.
European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: XI
Risk Phrases:
R 36/37/38 Irritating to eyes, respiratory system and skin.
Safety Phrases:
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 28 After contact with skin, wash immediately with plenty of ... (to be specified by the manufacturer).
WGK (Water Danger/Protection)
CAS# 10101-89-0: 1
Canada
None of the chemicals in this product are listed on the DSL/NDSL list.
This product has a WHMIS classification of D2B.
CAS# 10101-89-0 is not listed on Canada's Ingredient Disclosure List.

Section 16 - Other Information

Disclaimer: All information, recommendations and suggestions appearing herein are based upon sources believed to be reliable: However, it is the users responsibility to determine the safety, toxicity and suitability for its own use of this product. GEHRING-MONTGOMERY, INC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE USE BY OTHERS OF THIS PRODUCT.

PQ Corporation

MSDS

MATERIAL SAFETY DATA SHEET

Trade Name: **METSO PENTABEAD® 20 Sodium Metasilicate, pentahydrate**
Date Prepared: 09/12/06

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: METSO PENTABEAD® 20 Sodium Metasilicate, pentahydrate
Product description: Granular sodium metasilicate, pentahydrate
Manufacturer: PQ Corporation
P. O. Box 840
Valley Forge, PA 19482 USA
Telephone: 610-651-4200
In case of emergency call: 610-651-4200
For transportation emergency Call CHEMTREC: 800-424-9300

GEHRING-MONTGOMERY, INC.
710 Louis Drive Tel:(215)957-1234
Warminster, PA 18974 Fax:(215)957-1311

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical and Common Name	*CAS Registry Number*	*Wt. %*	*OSHA PEL*	*ACGIH TLV*
Silicic acid, disodium salt; Disodium trioxosilicate; Sodium metasilicate	6834-92-0	~58%	Not Established*	Not Established*
Water	7732-18-5	~42%	Not Established	Not Established

* Manufacturer's recommended exposure limit is 2 mg/m^3 Ceiling Limit.

3. HAZARDS IDENTIFICATION

Emergency Overview: White, odorless, granular powder. Corrosive to eyes, skin, and digestive tract. Dust corrosive to respiratory tract. Due to high pH of product, release into surface water is harmful to aquatic life. Noncombustible. Reacts with acids and some organics.

Eye contact: Corrosive. Causes eye burns.
Skin contact: Corrosive. Causes skin burns.
Inhalation: Dust corrosive to respiratory tract.
Ingestion: Corrosive. Causes burns to mouth, esophagus, and stomach.
Chronic hazards: No known chronic hazards. Not listed by NTP, IARC or OSHA as a carcinogen.
Physical hazards: Can etch glass if not promptly removed.

4. FIRST AID MEASURES

Eye: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Inhalation:	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion:	If swallowed, DO NOT induce vomiting. Get medical attention immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flammable limits:	This material is noncombustible.
Extinguishing Media:	This material is compatible with all extinguishing media.
Hazards to fire-fighters:	See Section 3 for information on hazards when this material is present in the area of a fire.
Fire-fighting equipment:	The following protective equipment for fire fighters is recommended when this material is present in the area of a fire: chemical goggles, body-covering protective clothing, chemical resistant gloves, and rubber boots.

6. ACCIDENTAL RELEASE MEASURES

Personal protection:	Wear chemical goggles, body-covering protective clothing, chemical resistant gloves, and rubber boots, NIOSH-approved dust respirator where dust occurs. See section 8.
Environmental Hazards:	Sinks and mixes with water. High pH of this material is harmful to aquatic life, see Section 12.
Small spill cleanup:	Carefully shovel or sweep up spilled material and place in suitable container. Avoid generating dust. Use appropriate Personal Protective Equipment (PPE). See section 8.
Large spill cleanup:	Keep unnecessary people away; isolate hazard area and deny entry. Do not touch or walk through spilled material. Carefully shovel or sweep up spilled material and place in suitable container. Avoid generating dust. Use appropriate Personal Protective Equipment (PPE). See section 8. In case of contact with water, prevent runoff from entering into storm sewers and ditches which lead to natural waterways. Neutralize contaminated area and flush with large quantities of water. Comply with applicable environmental regulations.
CERCLA RQ:	There is no CERCLA Reportable Quantity for this material. If a spill goes off site, notification of state and local authorities is recommended.

7. HANDLING AND STORAGE

Handling:	Do not get in eyes, on skin, or on clothing. Do not breathe dust. Keep container closed. Promptly clean up spills. Wash thoroughly after handling.
Storage:	Store at temperatures below 150°F (65°C). Keep containers closed. Store in clean, tightly closed steel, fiber, or plastic containers. Separate from acids, reactive metals, and ammonium salts. Do not store in aluminum, fiberglass, copper, brass, zinc or galvanized containers. This product can absorb water from the air. In case of high humidity or storage for extended periods of time, use plastic bags to enclose product containers to

avoid caking. Packaged inventory should be used on a first in, first out (FIFO) basis. Bulk storage bins should be painted white or aluminum to minimize sun-heat absorption which can cause melting of this material at about 160°F.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls:	Use only with adequate ventilation. Keep containers closed. Safety shower and eyewash fountain should be within direct access.
Respiratory protection:	Use a NIOSH-approved dust respirator where dust occurs. Observe OSHA regulations for respirator use (29 C.F.R. §1910.134)
Skin protection:	Wear body-covering protective clothing and gloves.
Eye protection:	Wear chemical goggles.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Granular powder.
Color:	White.
Odor:	Odorless or musty odor.
pH:	Approximately 14
Bulk density:	Approximately 49 lbs/ft^3 untamped, 59 lbs/ft^3 tamped.
Solubility in water:	Soluble.

10. STABILITY AND REACTIVITY

Stability:	This material is stable under all conditions of use and storage.
Conditions to avoid:	None.
Materials to avoid:	Generates heat when mixed with acid. May react with ammonium salt solutions resulting in evolution of ammonia gas. Flammable hydrogen gas may be produced on contact with aluminum, tin, lead, and zinc.
Hazardous decomposition products:	Carbon monoxide gas may be produced on contact with reducing sugars. Hydrogen.

11. TOXICOLOGICAL INFORMATION

Acute Data:	This material has not been tested for primary eye irritation potential. However, on the basis of its high degree of alkalinity, it is regarded as corrosive to the eyes.
	When this material was tested for skin corrosion/irritation potential according to OECD Guidelines Section 404, it produced dermal corrosion.
	The acute oral toxicity of this product has not been tested. When sodium silicates were tested on a 100% solids basis, their single dose acute oral LD_{50} in rats ranged from 1500 mg/kg to 3200 mg/kg. The acute oral lethality resulted from nonspecific causes.
Subchronic Data:	In a study of rats fed sodium silicate in drinking water for three months, at 200, 600 and 1800 ppm, changes were reported in the blood chemistry

	of some animals, but no specific changes to the organs of the animals due to sodium silicate administration were observed in any of the dosage groups. Another study reported adverse effects to the kidneys of dogs fed sodium silicate in their diet at 2.4g/kg/day for 4 weeks, whereas rats fed the same dosage did not develop any treatment-related effects. Decreased numbers of births and survival to weaning was reported for rats fed sodium silicate in their drinking water at 600 and 1200 ppm.
Special Studies:	Sodium silicate was not mutagenic to the bacterium E. Coli when tested in a mutagenicity bioassay. There are no known reports of carcinogenicity of sodium silicates. Frequent ingestion over extended periods of time of gram quantities of silicates is associated with the formation kidney stones and other siliceous urinary calculi in humans. Sodium silicate is not listed by IARC, NTP or OSHA as a carcinogen.

12. ECOLOGICAL INFORMATION

Eco toxicity:	The following data is reported for sodium silicates on a 100% solids basis: A 96 hour median tolerance for fish (Gambusia affinis) of 2320 ppm; a 96 hour median tolerance for water fleas (Daphnia magna) of 247 ppm; a 96 hour median tolerance for snail eggs (Lymnea) of 632 ppm; and a 96 hour median tolerance for Amphipods of 160 ppm.
Environmental Fate:	This material is not persistent in aquatic systems, but its high pH when undiluted or unneutralized is acutely harmful to aquatic life. Diluted material yields dissolved silica in a form that is indistinguishable from natural dissolved silica. It does not contribute to BOD. This material does not bioaccumulate except in species that use silica as a structural material such as diatoms and siliceous sponges. Where abnormally low natural silica concentrations exist (less than 0.1 ppm), dissolved silica may be a limiting nutrient for diatoms and a few other aquatic algal species. However, the addition of excess dissolved silica over the limiting concentration will not stimulate the growth of diatom populations; their growth rate is independent of silica concentration once the limiting concentration is exceeded. Neither silica nor sodium will appreciably bioconcentrate up the food chain.
Physical/Chemical:	Sinks and dissolves in water.

Trade Name: METSO PENTABEAD® 20 Sodium Metasilicate,pentahydrate
Date Prepared: 09/12/06
Page: 5 of 5

13. DISPOSAL CONSIDERATIONS

Classification: Disposed dry/solid material is not classified as a RCRA Hazardous waste. However, disposed water/wet solutions containing this material are classified as RCRA hazardous waste if they exhibit the corrosive characteristic (pH greater than or equal to12.5) as defined in EPA rules at 40 C.F.R. §261,22 (a)(1).

Disposal Method: Dispose in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT UN Status: This material is a regulated hazardous material.
UN PROPER SHIPPING NAME: Disodium trioxosilicate
UN HAZARD CLASS/DIVISION 8
UN IDENTIFICATION NUMBER: UN3253
UN PACKING GROUP: PG III

15. REGULATORY INFORMATION

CERCLA: No CERCLA Reportable Quantity has been established for this material.
SARA TITLE III: Not an Extremely Hazardous Substance under §302. Not a Toxic Chemical under §313. Hazard Categories under §§311/312: Acute
TSCA: All ingredients of this material are listed on the TSCA Inventory.
FDA: The use of sodium metasilicate is authorized by FDA as a boiler water additive for the production of steam that will contact food pursuant to 21 CFR §173.310; and as a GRAS substance pursuant to 21 CFR §184.1769afor use in washing and lye peeling of fruits, vegetables, and nuts; as a denuding agent for tripe; a hog scald agent in removing hair; and as a corrosion preventative in canned and bottled water.

16. OTHER INFORMATION

Prepared by: John G. Blumberg
Supersedes revision of: 01/24/06

THE INFORMATION ON THIS SAFETY DATA SHEET IS BELIEVED TO BE ACCURATE AND IT IS THE BEST INFORMATION AVAILABLE TO PQ CORPORATION THIS DOCUMENT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONS FOR HANDLING A CHEMICAL BY A PERSON TRAINED IN CHEMICAL HANDLING. PQ CORPORATION MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED WITH RESPECT TO SUCH INFORMATION OR THE PRODUCT TO WHICH IT RELATES, AND WE ASSUME NO LIABILITY RESULTING FROM THE USE OR HANDLING OF THE PRODUCT TO WHICH THIS SAFETY DATA SHEET RELATES. USERS AND HANDLERS OF THIS PRODUCT SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION PROVIDED HEREIN FOR THEIR OWN PURPOSES.

BASF
The Chemical Company

Safety Data Sheet
Plurafac® RA 40

Revision date : 2012/02/21 Page: 1/7
Version: 1.0 (30085021/SDS_GEN_US/EN)

1. Product and Company Identification

Company
BASF CORPORATION
100 Campus Drive
Florham Park, NJ 07932, USA

24 Hour Emergency Response Information
CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP

Synonyms: Alkoxylated Fatty Alcohol

2. Hazards Identification

Emergency overview

CAUTION:
INGESTION MAY CAUSE GASTRIC DISTURBANCES.
MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
Avoid contact with the skin, eyes and clothing.
Avoid inhalation of mists/vapours.
Provide local exhaust ventilation to control vapours/mists.
Wear NIOSH-certified chemical goggles.
Wear chemical resistant protective gloves.
Eye wash fountains and safety showers must be easily accessible.

State of matter: liquid
Colour: clear
Odour: mild, of polyol

Potential health effects

Primary routes of exposure:
Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquified gases.

Signs and symptoms of overexposure:
No significant symptoms are expected due to the non-classification of the product.

3. Composition / Information on Ingredients

CAS Number	Content (W/W)	Chemical name
68551-13-3	100.0 %	Alcohols, C12-15, ethoxylated propoxylated

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4. First-Aid Measures

General advice:
Remove contaminated clothing.

If inhaled:
Remove the affected individual into fresh air and keep the person calm. Seek medical attention.

If on skin:
Wash thoroughly with soap and water.

If irritation develops, seek medical attention.

If in eyes:
Wash affected eyes for at least 15 minutes under running water with eyelids held open.

Seek medical attention.

If swallowed:
Rinse mouth and then drink plenty of water. Do not induce vomiting. Immediate medical attention required.

Note to physician
Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Flash point:	255 °C	(ASTM D92)
Autoignition:		No data available.

Suitable extinguishing media:
water spray, dry powder, foam

Unsuitable extinguishing media for safety reasons:
water jet

Hazards during fire-fighting:
harmful vapours
Evolution of fumes/fog. The substances/groups of substances mentioned can be released in case of fire.

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:
The degree of risk is governed by the burning substance and the fire conditions. Contaminated extinguishing water must be disposed of in accordance with official regulations.

6. Accidental release measures

Personal precautions:
Use personal protective clothing. Information regarding personal protective measures see, chapter 8.

Environmental precautions:
Do not discharge into drains/surface waters/groundwater.

Cleanup:
Place absorbed material in the same container as the spilled substance/product for disposal.
For small amounts: Pick up with absorbent material (e.g. sand, sawdust, general-purpose binder). Dispose of absorbed material in accordance with regulations.
For large amounts: Pump off product.

Further information:
High risk of slipping due to leakage/spillage of product.

7. Handling and Storage

Storage

General advice:
Keep container tightly closed and dry; store in a cool place.

Storage incompatibility:
General advice: Segregate from acids and bases. Segregate from strong oxidizing agents.

8. Exposure Controls and Personal Protection

Advice on system design:
Provide adequate exhaust ventilation to control work place concentrations.

Personal protective equipment

Respiratory protection:
Wear respiratory protection if ventilation is inadequate. Breathing protection if breathable aerosols/dust are formed.

Hand protection:
Chemical resistant protective gloves

Consult with glove manufacturer for testing data.

Eye protection:
Safety glasses with side-shields.

Body protection:
Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:
Wear protective clothing as necessary to minimize contact. Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Take off immediately all contaminated clothing. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

Form:	liquid	
Odour:	mild, of polyol	
Colour:	clear	
pH value:	5 - 6.5	
Freezing point:	approx. -26 °C	(1,013 hPa)
Boiling point:	> 149 °C	
Vapour pressure:	< 0.35 mmHg	(20 °C)
Density:	0.97 g/cm3	(25 °C) (8.09 lbs/gallon)
Relative density:	0.97	(25 °C)

Partitioning coefficient n-octanol/water (log Pow):	5.96	(calculated)
Viscosity, dynamic:	80 mPa.s	(25 °C)
Solubility in water:		soluble

10. Stability and Reactivity

Conditions to avoid:
No conditions known that should be avoided.

Substances to avoid:
strong oxidizing agents

Hazardous reactions:
No hazardous reactions when stored and handled according to instructions.
The product is chemically stable.

Decomposition products:
Hazardous decomposition products: No hazardous decomposition products known.

Corrosion to metals:
No corrosive effect on metal.

11. Toxicological information

Acute toxicity

Oral:
Type of value: LD50
Species: rat
Value: > 2,000 mg/kg

Irritation / corrosion

Skin:
Species: rabbit
Result: non-irritant
Method: OECD Guideline 404

Eye:
Species: rabbit
Result: non-irritant
Method: OECD Guideline 405

Other Information:

The product has not been tested. The statements on toxicology have been derived from products of a similar structure and composition.

12. Ecological Information

Fish

Acute:
Leuciscus idus/LC50 (96 h): 0.1 - 1 mg/l

Aquatic invertebrates

Acute:

EC50 (48 h): 0.1 - 1 mg/l

Aquatic plants

Toxicity to aquatic plants:
EC50 (72 h): 0.1 - 1 mg/l

Microorganisms

Toxicity to microorganisms:
bacterium/EC10 (0.5 h): > 10,000 mg/l

Degradability / Persistence
Biological / Abiological Degradation

Test method:	mod. OECD 303A
Method of analysis:	Bismuth-active substance
Degree of elimination:	>= 90 %

Test method:	OECD 301B; ISO 9439; 92/69/EEC, C.4-C
Method of analysis:	CO2 formation relative to the theoretical value
Degree of elimination:	> 60 % (28.000000 d)
Evaluation:	Readily biodegradable.

Other adverse effects:

Inhibition of degradation activity in activated sludge is not to be anticipated during correct introduction of low concentrations.
The product has not been tested. The statements on ecotoxicology have been derived from products of a similar structure and composition.

13. Disposal considerations

Waste disposal of substance:
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.

Container disposal:
Dispose of in a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

14. Transport Information

Land transport
USDOT

Not classified as a dangerous good under transport regulations

Sea transport
IMDG

Hazard class:	9
Packing group:	III
ID number:	UN 3082
Hazard label:	9, EHSM
Marine pollutant:	YES
Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains FATTY ALCOHOL ALCOXYLATE)

Air transport
IATA/ICAO

Hazard class:	9
Packing group:	III
ID number:	UN 3082
Hazard label:	9, EHSM
Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains FATTY ALCOHOL ALCOXYLATE)

15. Regulatory Information

Federal Regulations

Registration status:
Chemical TSCA, US released / listed

OSHA hazard category: Not hazardous;

EPCRA 311/312 (Hazard categories): Not hazardous;

CERCLA RQ	CAS Number	Chemical name
100 LBS	75-56-9; 123-91-1	Propylene oxide; 1,4-dioxane
10 LBS	75-21-8	Ethylene Oxide

State regulations

CA Prop. 65:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

16. Other Information

NFPA Hazard codes:
Health : 1 Fire: 1 Reactivity: 0 Special:

HMIS III rating
Health: 1 Flammability: 1 Physical hazard: 0

NFPA and HMIS use a numbering scale ranging from 0 to 4 to indicate the degree of hazard. A value of zero means that the substance possesses essentially no hazard; a rating of four indicates extreme danger. Although similar, the two rating systems are intended for different purposes, and use different criteria. The NFPA system was developed to provide an on-the-spot alert to the hazards of a material, and their severity, to emergency responders. The HMIS system was designed to communicate workplace hazard information to employees who handle hazardous chemicals.

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

MSDS Prepared by:
BASF NA Product Regulations

Safety Data Sheet
Plurafac® RA 40

msds@basf.com
MSDS Prepared on: 2012/02/21

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END OF DATA SHEET

Material Safety Data Sheet for TDS-KSB CPD - (5/24/2011) Page 1 of 5

4202-24 MAIN STREET
PHILADELPHIA, PA 19127-1698
USA
Phone: 215 487-1100 Fax: 215 487-3090
Email:Information@RichardsApex.com

MATERIAL SAFETY DATA SHEET

SECTION 1. Product and Company Identification

Product Name:	**TDS-KSB CPD**	Emergency Tel. No. US/CANADA:	**1-800-633-8253**
Manufacturer:	**RICHARDSAPEX, INCORPORATED**	Emergency Tel. No. INTERNATIONAL:	**+1-801-629-0667**
Address:	**4202-24 MAIN STREET**	Tel. No. for Information:	**1-215-487-1100**
	PHILADELPHIA, PA. 19127-1698	Date Prepared:	**5/24/2011**
	USA	Date Supercedes:	**4/13/2008**

SECTION 2. Composition / Information on Ingredients

HAZARDOUS:
No Hazardous Ingredients.

NON-HAZARDOUS:

Chemical Name	CAS	Percent
WATER	7732-18-5	<50
POTASSIUM SOAPS	MIXTURE	<20
FATTY OILS	61789-97-7, 68440-15-3	<20
FATTY ACIDS	112-80-1	<10

Chemical Nature: WATER SOLUBLE MIXTURE

SECTION 3. Hazards Identification

Most Important Hazards: MAY CAUSE MILD IRRITATION TO SKIN OR EYES. INHALATION OR INGESTION MAY CAUSE IRRITATION, HEADACHE, DIZZINESS OR NAUSEA.

Specific Hazards: SPILLED MATERIAL CAN BE SLIPPERY

SECTION 4. First-Aid Measures

Inhalation:	REMOVE TO FRESH AIR. IF BREATHING DIFFICULTY PERSISTS, SEEK MEDICAL ATTENTION.
Skin Contact:	WASH SKIN WITH SOAP AND WATER.;IF ANY IRRITATION OCCURS OR PERSISTS, SEEK MEDICAL ATTENTION.
Eye Contact:	FLUSH EYES WITH WATER FOR 15 MINUTES. IF IRRITATION OCCURS OR PERSISTS, SEEK MEDICAL AID.
Ingestion:	IF A LARGE QUANTITY IS SWALLOWED SEEK MEDICAL AID.

SECTION 5. Fire-Fighting Measures

Flash Point:	>400 F FOR ANHYDROUS MATERIAL
Extinguishing Media:	DRY CHEMICAL, FOAM, OR CO2.
Specific Hazards:	NFPA: HEALTH:0 FIRE:1 REACTIVITY:0 :-
Protection of Firefighters:	WEAR SELF-CONTAINED BREATHING APPARATUS TO PROTECT FROM DECOMPOSITION PRODUCTS WHEN FIGHTING FIRE IN CONFINED SPACES.

SECTION 6. Accidental Release Measures

Personal Protection:	SEE SECTIONS 8 AND 10. USE PROPER PERSONAL PROTECTIVE EQUIPMENT.
Environmental Precautions:	KEEP MATERIALS OUT OF SEWERS AND WATERWAYS.
Methods for Clean up:	RECOVER FREE PRODUCT. ABSORB REMAINDER ON AN INERT MATERIAL.

SECTION 7. Handling and Storage

HANDLING:

Technical Measures:	AVOID PROLONGED BODY CONTACT.
Precautions:	DO NOT TAKE INTERNALLY. WASH THOROUGHLY AFTER HANDLING.
Safe Handling Advice:	NORMAL GOOD PLANT/PERSONAL HOUSEKEEPING

STORAGE:

Technical Measures:	KEEP CONTAINERS TIGHTLY CLOSED.
Storage Conditions:	AVOID EXTREMES IN TEMPERATURE
Incompatable Products:	STRONG OXIDIZERS.

PACKAGING MATERIALS:

Recommended:	ORIGINAL SHIPPING CONTAINER.
Unsuitable:	CONTAINERS NOT DESIGNED FOR HEAVY PASTE.

SECTION 8. Exposure Controls, Personal Protection

Engineering Measures:	ADEQUATE ROOM VENTILATION.
Control Parameters:	NONE KNOWN

PERSONAL PROTECTIVE EQUIPMENT:

Respiratory Protection:	RESPIRATORY PROTECTION NOT NORMALLY REQUIRED UNLESS PRODUCT IS HEATED OR MISTED. USE NIOSH APPROVED RESPIRATORY PROTECTION IF NEEDED.
Hand Protection:	USE NEOPRENE OR RUBBER GLOVES IF SENSITIVE.
Eye Protection:	EYE PROTECTION NOT NORMALLY REQUIRED;USE SAFETY GLASSES OR GOGGLES.
Skin and Body Protection:	NOT NORMALLY REQUIRED. IF NECESSARY TO PREVENT SKIN CONTACT, USE RUBBER SAFETY SHOES, LONG SLEEVE SHIRT, AND PLASTIC HARD HAT.
Exposure Guidelines:	NONE ESTABLISHED.

SECTION 9. Physical and Chemical Properties

Appearance:	SMOOTH SOFT PASTE
Physical State:	LIQUID
Color:	CREAM TO SLIGHT YELLOW
Odor:	FATTY
pH:	TYPICAL 9.4 OF A 10% SOLUTION
Flashpoint:	>400 F FOR ANHYDROUS MATERIAL
Explosion Properties: UEL:	NOT APPLICABLE
Density:	TYPICALLY 0.98 g/cm3 (8.18 lbs /Gallon)
Solubility in Water:	COMPLETE
Boiling Point:	NOT APPLICABLE
VOC (%):	Null

SECTION 10. Stability and Reactivity

Stability:	STABLE UNDER NORMAL AMBIENT AND ANTICIPATED STORAGE AND HANDLING CONDITIONS.

Possible Hazardous Reactions:

Conditions to Avoid: HIGH TEMPERATURES OR FREEZING.

Materials to Avoid: STRONG OXIDIZERS

Hazardous Decomposition Products: OXIDES OF CARBON

SECTION 11. Toxicological Information

Acute Toxicity: NO DATA AVAILABLE;PLEASE REFER TO SECTON 3 FOR POTENTIAL HEALTH EFFECTS.

Local Effects: PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN AND EYE IRRITATION.

SECTION 12. Ecological Information

Environmental Effects: KEEP MATERIAL OUT OF SEWERS AND WATERWAYS.

SECTION 13. Disposal Considerations

Waste from Residues: DISPOSE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL GOVERNMENT REGULATIONS.

Contaminated Packaging: EMPTY CONTAINERS CAN RETAIN PRODUCT RESIDUE. DO NOT CUT, WELD, BRAZE, SOLDER, DRILL, OR EXPOSE CONTAINER TO HEAT OR OTHER SOURCES OF IGNITION. DISPOSE IN ACCORDANCE WITH ALL STATE, LOCAL, AND FEDERAL GOVERNMENT REGULATIONS.

Local Regulations: CHECK WITH LOCAL / NATIONAL AUTHORITIES.

SECTION 14. Transport Information

Land Transport: (Railroad/Road) RID/ADR/DOT: NOT REGULATED

Ocean Transport: (IMDG): NOT REGULATED.

Air Transport: NOT REGULATED.

(ICAO-TI, IATA-DGR):

SECTION 15. Regulatory Information

Regulations:	NON-REGULATED
HMIS Hazard Rating:	HEALTH:0 FLAMMABILITY:1 PHYSICAL HAZARD:0 PERSONAL PROTECTION:B

SECTION 16. Other Information

THE INFORMATION PRESENTED HEREIN, WHILE NOT GUARANTEED, IS TO THE BEST OF OUR KNOWLEDGE TRUE AND ACCURATE. NO WARRANTY OR GUARANTEE EXPRESS OR IMPLIED IS MADE REGARDING THE PERFORMANCE OR STABILITY OF ANY PRODUCT, SINCE THE MANNER OF USE AND CONDITIONS OF STORAGE AND HANDLING ARE BEYOND OUR CONTROL. NO SUGGESTION FOR PRODUCT USE, NOR ANYTHING CONTAINED HEREIN, SHALL BE CONSTRUED AS A RECOMMENDATION FOR ITS USE IN INFRINGEMENT OF ANY EXISTING PATENT, REGULATION OR LAW.