MASSACHUSETTS WATER RESOURCES AUTHORITY
Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

September 15, 2021

Shauna Little
U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP RGP Coordinator
5 Post Office Square -Suite 100 (OEP06-01)
Boston, MA 02109-3912

RE: Massachusetts Water Resources Authority
Remediation General Permit Norumbega Covered Storage Tank Cleaning

Dear Ms. Little:

The Massachusetts Water Resources Authority (MWRA) is seeking coverage under the Environmental Protection Agency's (EPA) Remediation General Permit (RGP) for discharges of potable water from MWRA's Norumbega Covered Storage Tank (NCST) to the Norumbega Reservoir in Weston, MA.

MWRA provides wholesale water and sewer services in service areas encompassing, in whole or in part, 61 communities in Massachusetts, including most of the metropolitan Boston area. Approximately 2.6 million people, or approximately 43 percent of the total population of Massachusetts, live in MWRA's service areas.

The NCST is located in the Town of Weston, Massachusetts. The 17-acre tank site is bounded by the Massachusetts Turnpike to the north, Schenck's Pond and the Norumbega Reservoir to the east, and the Hultman Aqueduct to the south and west. The tank, which provides 115 million gallons of usable covered storage, holds and protects treated drinking water in three parallel storage cells before distribution to over 2 million people in 35 cities and towns in the Metropolitan Boston area.

MWRA has developed a project plan to remove accumulated sediment from the NCST. This maintenance work is critical to maintain this important infrastructure and to maintain water quality. The project involves removing sediment that has collected in the tank and cleaning and inspecting each of the three cells in the tank, one at a time. On-site work activities, including discharges to the Norumbega (open) Reservoir, are anticipated to take approximately two to three months per cell. For operational purposes, it is currently planned that one cell will be cleaned and inspected each year over the course of approximately three years. The Norumbega Reservoir discharges to Schenck's Pond, which discharges to Seaverns Brook, which eventually

discharges into the Charles River.

Prior to cleaning a cell, MWRA will remove it from service. The potable water in the cell will be used/transferred to the other active cells of the tank, without disturbing the sediment in the bottom of the dewatered cell. The pumps and piping used to transfer the water will be flushed and disinfected before use. The potable water used for flushing and disinfection (estimated to be approximately 100,000 gallons of Category IV water) will be dechlorinated and the pH will be adjusted (as needed) before it is discharged into the Norumbega Reservoir.

The water and sediment that remains in the cell will be removed and treated. The process will involve addition of a polymer, selected by MWRA's contractor, to be added to the process stream to aid in sediment separation. After polymer addition, the process stream will be dewatered (i.e. the sediment will be separated from the water). The dewatering process will also be selected by the contractor, but will likely be a belt filter press, plate and frame filter press, gravity filter table, geotextile dewatering bag, or some combination of those processes. Following the dewatering process, the treated water will be dechlorinated and the pH will be adjusted (as needed) before discharge into Norumbega Reservoir. MWRA estimates that per cell, approximately 4.2 million gallons of Category VIII water will be treated and discharged to the Norumbega Reservoir over a period of weeks. The dewatered sediment will be properly disposed of in a landfill.

MWRA also anticipates that approximately 11 million gallons of potable water, per cell, may leak through the valves and into the cell being cleaned. This Category IV water will be dechlorinated and the pH adjusted (as needed) before it is discharged to the Norumbega Reservoir

Once the contractor has removed the sediment and cleaned the cell, it will be inspected and any necessary, immediate repairs made. After passing the inspection, the cell will be disinfected and returned to service. Approximately 2 million gallons of potable water will be used to disinfect each cell. This Category IV water will be dechlorinated and the pH adjusted (as needed) before it is discharged to the Norumbega Reservoir.

In total, MWRA estimates that approximately 51.9 million gallons of potable water will be treated and discharged to the Norumbega Reservoir (17.3 million gallons of water per cell) over the duration of the project. Daily flows will be less than 1 million gallons. A Best Management Practices Plan (BMPP) meeting the requirements of this general permit will be "developed and implemented upon initiation of discharge", per Part 2.5.1.c.iv.

If you require additional information or need clarification, please contact Betsy Reilley at Betsy.Reilley@mwra.com.

Sincerely,

Frederick A. Laskey
Executive Director

cc: Cathy Vakalopoulos, MassDEP
Xiaodan Ruan, MassDEP
Betsy Reilley, MWRA

II. Suggested Format for the Remediation General Permit Notice of Intent (NOI)

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
Norumbega Covered Storage Tank</td><td colspan="3">Site address: 55 Oak Street
Street:</td></tr>
<tr><td>City: Weston</td><td>State: MA</td><td>Zip: 02493</td></tr>
<tr><td rowspan="4">2. Site owner
Massachusetts Water Resources Authority

Owner is (check one): ☐ Federal ■ State/Tribal ☐ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Betsy Reilley - Director, Environmental Quality</td></tr>
<tr><td colspan="2">Telephone: 617-839-2997</td><td>Email: Betsy.Reilley@mwra.com</td></tr>
<tr><td colspan="3">Mailing address: 100 First Avenue, Charlestown Navy Yard
Street:</td></tr>
<tr><td>City: Boston</td><td>State: MA</td><td>Zip: 02129</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner</td><td colspan="3">Contact Person:</td></tr>
<tr><td colspan="2">Telephone:</td><td>Email:</td></tr>
<tr><td colspan="3">Mailing address:
Street:</td></tr>
<tr><td>City:</td><td>State:</td><td>Zip:</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:

NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP
☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:</td><td colspan="3">5. Other regulatory program(s) that apply to the site (check all that apply):
☐ MA Chapter 21e; list RTN(s):

☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:

☐ CERCLA
■ UIC Program (The eDEP transaction number is 1263171.)
☐ POTW Pretreatment
☐ CWA Section 404</td></tr>
</table>

B. Receiving water information:

1. Name of receiving water(s):	Waterbody identification of receiving water(s):	Classification of receiving water(s):
Norumbega Reservoir	MA72087	Class B

Receiving water is (check any that apply): ☐ Outstanding Resource Water ☐ Ocean Sanctuary ☐ territorial sea ☐ Wild and Scenic River

2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): ■ Yes ☐ No See Attachment A

Are sensitive receptors present near the site? (check one): ■ Yes ☐ No

If yes, specify: Norumbega Reservoir, Schenck's Pond, Seavern's Brook

3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. Norumbega Reservoir is listed as a Category 3, "no uses assessed", water in the Massachusetts 2016 Integrated List of Waters.

4. Indicate the seven day-ten-year low flow (7Q10) of the receiving water determined in accordance with the instructions in Appendix V for sites located in Massachusetts and Appendix VI for sites located in New Hampshire.	N/A
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	1:1

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ■ Yes ☐ No

If yes, indicate date confirmation received: 5/6/2021, See Attachment B

7. Has the operator attached a summary of receiving water sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No See Attachment C

C. Source water information:

1. Source water(s) is (check any that apply):

☐ Contaminated groundwater Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ☐ Yes ☐ No	☐ Contaminated surface water Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ☐ Yes ☐ No	☐ The receiving water ☐ A surface water other than the receiving water; if so, indicate waterbody:	■ Potable water; if so, indicate municipality or origin: MWRA, Carroll Water Treatment Plant ☐ Other; if so, specify:

2. Source water contaminants: None	
a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): ☐ Yes ☐ No If yes, indicate the contaminant(s) and the maximum concentration present in accordance with the instructions in Appendix VIII.	b. For a source water that is a surface water other than the receiving water, potable water or other, indicate any contaminants present at the maximum concentration in accordance with the instructions in Appendix VIII? (check one): ☐ Yes ☐ No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ■ Yes ☐ No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): ☐ Existing discharge ■ New discharge ☐ New source	
Outfall(s): 001 - Outfall into the tank's overflow spillway which leads directly to the Norumbega Reservoir	Outfall location(s): (Latitude, Longitude) approximately 42°19'58.72"N, 71°17'50.91"W
Discharges enter the receiving water(s) via (check any that apply): ■ Direct discharge to the receiving water ☐ Indirect discharge, if so, specify: ☐ A private storm sewer system ☐ A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: N/A, MWRA owns Norumbega Reservoir Has notification been provided to the owner of this system? (check one): ☐ Yes ☐ No Has the operator has received permission from the owner to use such system for discharges? (check one): ☐ Yes ☐ No, if so, explain, with an estimated timeframe for obtaining permission: Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ☐ No	
Provide the expected start and end dates of discharge(s) (month/year): start March 2022 and end December 2026 Indicate if the discharge is expected to occur over a duration of: ☐ less than 12 months ■ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ■ Yes ☐ No See Attachment A	

<table>
<tr><td>2. Activity Category: (check all that apply)</td><td colspan="2">3. Contamination Type Category: (check all that apply)</td></tr>
<tr><td rowspan="5">☐ I – Petroleum-Related Site Remediation
☐ II – Non-Petroleum-Related Site Remediation
☐ III – Contaminated Site Dewatering
■ IV – Dewatering of Pipelines and Tanks
☐ V – Aquifer Pump Testing
☐ VI – Well Development/Rehabilitation
☐ VII – Collection Structure Dewatering/Remediation
■ VIII – Dredge-Related Dewatering</td><td colspan="2">a. If Activity Category I or II: (check all that apply)

☐ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ F. Fuels Parameters</td></tr>
<tr><td colspan="2">b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</td></tr>
<tr><td>■ G. Sites with Known Contamination</td><td>☐ H. Sites with Unknown Contamination</td></tr>
<tr><td>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)

■ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ F. Fuels Parameters</td><td>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</td></tr>
</table>

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✔	1	EPA 350.1		422	422	Report mg/L	---
Chloride		✔	1	EPA 300.0		37900	37900	Report µg/l	---
Total Residual Chlorine		✔	1	SM 4500		2440	2440	0.2 mg/L	50 µg/L
Total Suspended Solids		✔	1	SM2540		<5000	<5000	30 mg/L	---
Antimony	✔		1	EPA 200.8		<0.5	<0.5	206 µg/L	640 µg/L
Arsenic	✔							104 µg/L	10 µg/L
Cadmium	✔							10.2 µg/L	0.0753 µg/L
Chromium III	✔							323 µg/L	21.0 µg/L
Chromium VI	✔							323 µg/L	11.4 µg/L
Copper		✔	1	EPA 200.8		3.21	3.21	242 µg/L	2.1 µg/L
Iron		✔	1	EPA 200.7		24.4	24.4	5,000 µg/L	1000 µg/L
Lead	✔		1	EPA 200.8		<0.075	<0.075	160 µg/L	0.35 µg/L
Mercury	✔							0.739 µg/L	0.91 µg/L
Nickel	✔		1	EPA 200.8		<0.5	<0.5	1,450 µg/L	12.1 µg/L
Selenium	✔							235.8 µg/L	5.0 µg/L
Silver	✔							35.1 µg/L	0.2 µg/L
Zinc	✔		1	EPA 200.8		<1	<1	420 µg/L	27.8 µg/L
Cyanide	✔							178 mg/L	5.2 µg/L
B. Non-Halogenated VOCs									
Total BTEX	✔							100 µg/L	---
Benzene	✔							5.0 µg/L	---
1,4 Dioxane	✔							200 µg/L	---
Acetone	✔							7.97 mg/L	---
Phenol	✔							1,080 µg/L	

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride	✔							4.4 µg/L	
1,2 Dichlorobenzene	✔							600 µg/L	---
1,3 Dichlorobenzene	✔							320 µg/L	---
1,4 Dichlorobenzene	✔							5.0 µg/L	---
Total dichlorobenzene	✔							763 µg/L in NH	---
1,1 Dichloroethane	✔							70 µg/L	---
1,2 Dichloroethane	✔							5.0 µg/L	---
1,1 Dichloroethylene	✔							3.2 µg/L	---
Ethylene Dibromide	✔							0.05 µg/L	---
Methylene Chloride	✔							4.6 µg/L	---
1,1,1 Trichloroethane	✔							200 µg/L	---
1,1,2 Trichloroethane	✔							5.0 µg/L	---
Trichloroethylene	✔							5.0 µg/L	---
Tetrachloroethylene	✔							5.0 µg/L	
cis-1,2 Dichloroethylene	✔							70 µg/L	---
Vinyl Chloride	✔							2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✔							190 µg/L	
Diethylhexyl phthalate	✔							101 µg/L	
Total Group I PAHs	✔							1.0 µg/L	---
Benzo(a)anthracene	✔							As Total PAHs	
Benzo(a)pyrene	✔								
Benzo(b)fluoranthene	✔								
Benzo(k)fluoranthene	✔								
Chrysene	✔								
Dibenzo(a,h)anthracene	✔								
Indeno(1,2,3-cd)pyrene	✔								

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs	✔							100 µg/L	---
Naphthalene	✔							20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✔							0.000064 µg/L	---
Pentachlorophenol	✔							1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✔							5.0 mg/L	---
Ethanol	✔							Report mg/L	---
Methyl-tert-Butyl Ether	✔							70 µg/L	
tert-Butyl Alcohol	✔							120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔							90 µg/L in MA 140 µg/L in NH	---
Other (i.e., pH, temperature, hardness, salinity, LC_{50}, additional pollutants present); if so, specify:									
Aluminum		✔	1	EPA 200.8		15.3	15.3		
Alkalinity		✔	1	SM 2320		40800	40800		
Beryllium	✔		1	EPA 200.8		<0.05	<0.05		
Calcium		✔	1	EPA 200.7		5460	5460		
Fluoride		✔	1	SM 4500		770	770		
Hardness		✔	1	EPA 200.7		17800	17800		
Potassium		✔	1	EPA 200.7		1090	1090		
Magnesium		✔	1	EPA 200.7		1020	1020		
Magnanese		✔	1	EPA 200.8		7.87	7.87		
Monochloramine		✔	1	HACH		2460	2460		
Ammonia Nitrogen (free)		✔	1	HACH		50	50		
Nitrate-Nitrite		✔	1	EPA 353.2		85.1	85.1		
Sodium		✔	1	EPA 200.7		38500	38500		

See Attachment D for additional parameters

E. Treatment system information

1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply)

☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ☐ Granulated Activated Carbon ("GAC")/Liquid Phase Carbon Adsorption
☐ Ion Exchange ■ Precipitation/Coagulation/Flocculation ■ Separation/Filtration ■ Other; if so, specify: Dechlorination and pH adjusement

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.

The sediment and water will be pumped out of the Norumbega Covered Storage Tank and into an intermediate holding tank at grade. It will then be pumped into the treatment system, which will include addition of a flocculant (e.g. Aries 7384 or equal), rapid mixing, solids separation or filtration (e.g. belt or plate filter press, geotextile dewatering bags, clarifier/settling tank, or gravity filter table), addition of a dechlorinating chemical (e.g. Sodium bisulfite or equal), and pH adjustment (as needed).

Identify each major treatment component (check any that apply):

☐ Fractionation tanks■ Equalization tank ☐ Oil/water separator ■ Mechanical filter ☐ Media filter
■ Chemical feed tank ☐ Air stripping unit ■ Bag filter ■ Other; if so, specify: clarifier (settling tank)

Indicate if either of the following will occur (check any that apply):

☐ Chlorination ■ De-chlorination

3. Provide the **design flow capacity** in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: pumping out of tank (see additional information in Attachment E) Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	600
Provide the proposed maximum effluent flow in gpm. See Attachment E	2,000
Provide the average effluent flow in gpm.	694
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged: See Attachment E	39.3 MG

4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): ■ Yes ☐ No See Attachment F

F. Chemical and additive information

1. Indicate the type(s) of chemical or additive that will be applied to effluent prior to discharge or that may otherwise be present in the discharge(s): (check all that apply)

☐ Algaecides/biocides ☐ Antifoams ☐ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ■ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ■ pH conditioners ☐ Bioremedial agents, including microbes ■ Chlorine or chemicals containing chlorine ■ Other; if so, specify:
Dechlorinating chemical

2. Provide the following information for each chemical/additive, using attachments, if necessary:
See Attachment G
a. Product name, chemical formula, and manufacturer of the chemical/additive;
b. Purpose or use of the chemical/additive or remedial agent;
c. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each chemical/additive;
d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive;
e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks; and
f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).

3. Has the operator attached an explanation which demonstrates that the addition of such chemicals/additives may be authorized under this general permit in accordance with the instructions in F, above? (check one): ■ Yes ☐ No; if no, has the operator attached data that demonstrates each of the 126 priority pollutants in CWA Section 307(a) and 40 CFR Part 423.15(j)(1) are non-detect in discharges with the addition of the proposed chemical/additive? See Attachment G
(check one): ☐ Yes ☐ No

G. Endangered Species Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

☐ **FWS Criterion A**: No endangered or threatened species or critical habitat are in proximity to the discharges or related activities or come in contact with the "action area".

☐ **FWS Criterion B**: Formal or informal consultation with the FWS under section 7 of the ESA resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by FWS on a finding that the discharges and related activities are "not likely to adversely affect" listed species or critical habitat (informal consultation). Has the operator completed consultation with FWS? (check one): ☐ Yes ☐ No; if no, is consultation underway? (check one): ☐ Yes ☐ No

■ **FWS Criterion C**: Using the best scientific and commercial data available, the effect of the discharges and related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the operator and affirmed by EPA, that the discharges and related activities will have "no effect" on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the FWS. This determination was made by: (check one) ■ the operator ☐ EPA ☐ Other; if so, specify:

☐ **NMFS Criterion**: A determination made by EPA is affirmed by the operator that the discharges and related activities will have "no effect" or are "not likely to adversely affect" any federally threatened or endangered listed species or critical habitat under the jurisdiction of NMFS and will not result in any take of listed species. Has the operator previously completed consultation with NMFS? (check one): ☐ Yes ☐ No

2. Has the operator attached supporting documentation of ESA eligibility in accordance with the instructions in Appendix I, and G, above? (check one): ■ Yes ☐ No

See Attachment H

Does the supporting documentation include any written concurrence or finding provided by the Services? (check one): ☐ Yes ■ No; if yes, attach.

H. National Historic Preservation Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

☐ **Criterion A**: No historic properties are present. The discharges and discharge-related activities (e.g., BMPs) do not have the potential to cause effects on historic properties.

■ **Criterion B**: Historic properties are present. Discharges and discharge related activities do not have the potential to cause effects on historic properties.

☐ **Criterion C**: Historic properties are present. The discharges and discharge-related activities have the potential to have an effect or will have an adverse effect on historic properties.

2. Has the operator attached supporting documentation of NHPA eligibility in accordance with the instructions in H, above? (check one): ■ Yes ☐ No

See Attachment I

Does the supporting documentation include any written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (TPHO), or other tribal representative that outlines measures the operator will carry out to mitigate or prevent any adverse effects on historic properties? (check one): ☐ Yes ■ No

I. Supplemental information

Describe any supplemental information being provided with the NOI. Include attachments if required or otherwise necessary.

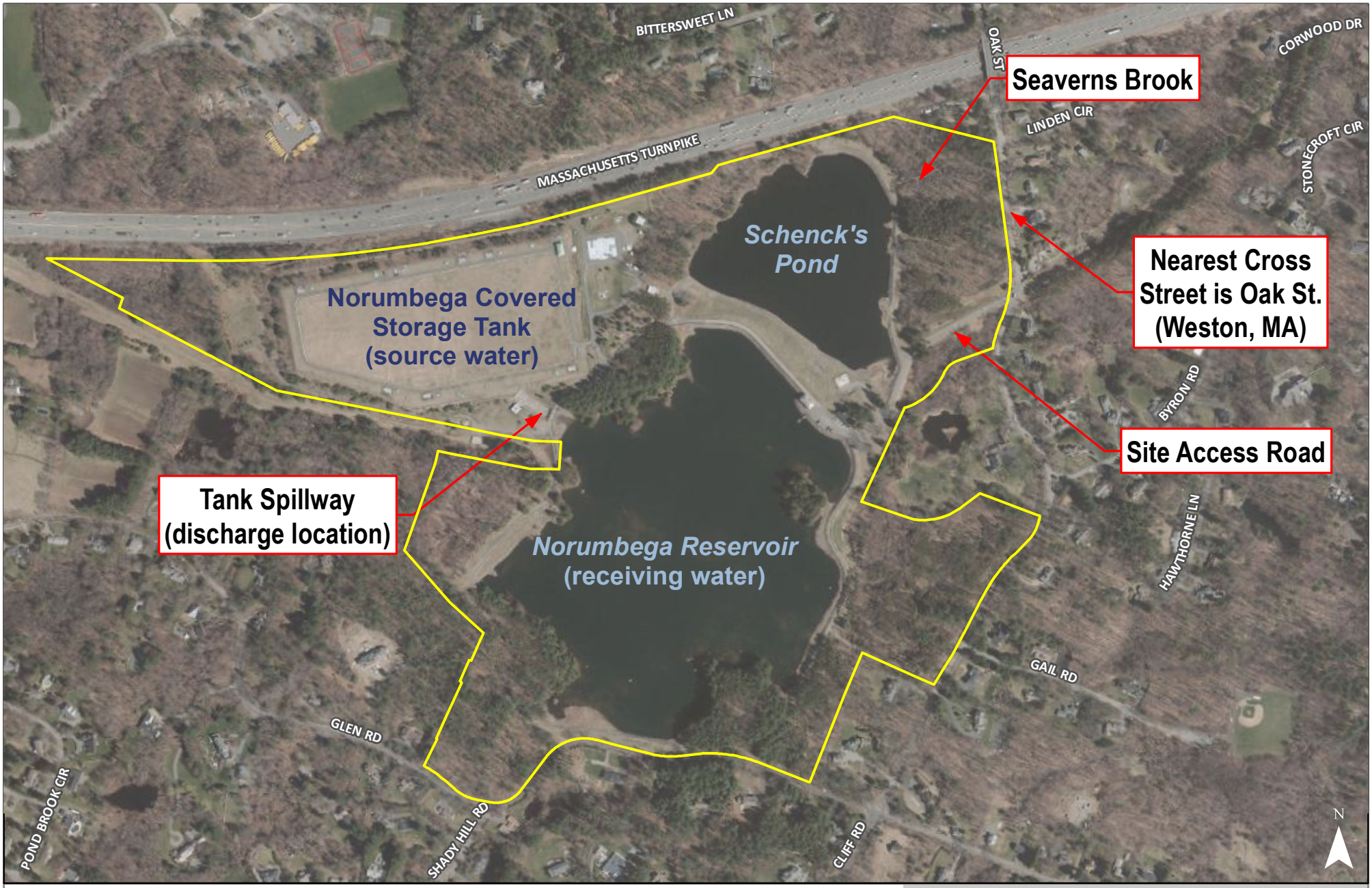
Additional information can be found in the cover letter.

Has the operator attached data, including any laboratory case narrative and chain of custody used to support the application? (check one): ■ Yes ☐ No See Attachment J

Has the operator attached the certification requirement for the Best Management Practices Plan (BMPP)? (check one): ■ Yes ☐ No See cover letter

J. Certification requirement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.	
BMPP certification statement: A BMPP meeting the requirements of this general permit will be implemented at the site.	
Notification provided to the appropriate State, including a copy of this NOI, if required.	Check one: Yes ■ No ☐
Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐
Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested.	Check one: Yes ☐ No ☐ NA ■
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.	Check one: Yes ☐ No ☐ NA ■
Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	Check one: Yes ☐ No ☐ NA ■
Signature: [signature]	Date: 9/21/21
Print Name and Title: Frederick A. Laskey, Executive Director	



Attachment A
Project Location Map and Site Plan

Date: 7/26/2021

0 150 300 600 Feet

Property Boundary* (multiple parcels)

*** MAP FOR REFERENCE ONLY**

Assessor's parcel mapping is a representation of property boundaries, not an authoritative source. The authoritative record of property boundaries is recorded at the registries of deeds and a legally authoritative map of property boundaries can only be produced by a professional land surveyor.

MwraGIS map2093-1

Attachment B
7Q10 and Dilution Factor Confirmation

From: Ruan, Xiaodan (DEP)
To: Smolow, Maret
Cc: Vakalopoulos, Catherine (DEP); Reilley, Betsy
Subject: [EXTERNAL] RE: MWRA RGP 7Q10 and Dilution Factor Confirmation for Norumbega Reservoir
Date: Thursday, May 06, 2021 10:59:33 PM

Hi Maret,
I can confirm the dilution factor of 1 for the Norumbega Reservoir for the proposed project at 55 Oak St in Weston, Massachusetts is correct.
Here is the water quality information you need to fill out the NOI, and you probably knew these already:

Waterbody and ID: Norumbega Reservoir (MA72087), within Charles River Watershed
Classification: B
Outstanding Resource Water?: no
State's most recent Integrated List is located here:
https://www.mass.gov/files/documents/2020/01/07/16ilwplist.pdf,
search for "MA72087", the Norumbega Reservoir is listed as Category 3 water - "No uses assessed."
Therefore, there is no information available on the impairments.
TMDLs: there is no TMDL for this segment.

As we mentioned, since this is not a current MCP site, in addition to submitting the NOI to EPA, you need to apply with MassDEP and submit a $500 fee using the ePLACE. The instructions are located here: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent. Technical assistance is available on the front page of the ePLACE application webpage.
Please let me know if you have any questions.
Thanks,
Xiaodan

Xiaodan Ruan
Environmental Engineer
Massachusetts Department of Environmental Protection
One Winter Street, Boston, MA 02108
(617) 654-6517
xiaodan.ruan@mass.gov

From: Smolow, Maret <Maret.Smolow@mwra.com>
Sent: Wednesday, May 5, 2021 8:52 AM
To: Ruan, Xiaodan (DEP) <xiaodan.ruan@mass.gov>
Cc: Vakalopoulos, Catherine (DEP) <catherine.vakalopoulos@mass.gov>; Reilley, Betsy <Betsy.Reilley@mwra.com>
Subject: MWRA RGP 7Q10 and Dilution Factor Confirmation for Norumbega Reservoir

the content is safe.

Good morning Ms. Ruan.

As discussed in our meetings on March 22 and May 4, 2021, MWRA is planning to apply for coverage under the Remediation General Permit (RGP) as part of a cleaning project at our Norumbega Covered Storage Tank (NCST) located at 55 Oak St in Weston, Massachusetts. MWRA will be dewatering the three cells of the NCST, one at a time, prior to cleaning and inspecting each cell. The dewatering water will be discharged into Norumbega Reservoir. MWRA may also need to discharge disinfection water into Norumbega Reservoir before returning each cell to service.

As recommended in Appendix V of the RGP, MWRA has used StreamStats to determine that the 7Q10 for Norumbega Reservoir is 0 and the dilution factor is 1. The low-flow StreamStats report is attached for reference.

MWRA is asking for confirmation of both the 7Q10 and dilution factor prior to submittal of our NOI.

Please let me know if you have any questions or need additional information.

Thank you.

Maret Smolow
Project Manager, NPDES
Massachusetts Water Resources Authority
Environmental Quality Department
O: (617) 788-4959
C: (857) 331-2594
Maret.Smolow@mwra.com

Attachment C
Receiving Water Data

DATE_COLLECTED	COMPONENT	RESULT	UNIT_OF_MEASURE	ANALYSIS_METHOD
27-May-21	Aluminum	21.9	ug/L	EPA 200.8
27-May-21	Alkalinity	15.2	mg/L	SM 2320 B
27-May-21	Beryllium	*ND (<0.0625)*	ug/L	EPA 200.8
27-May-21	Calcium	5100	ug/L	EPA 200.7
27-May-21	Chloride	13.1	mg/L	EPA 300.0
27-May-21	Copper	2.59	ug/L	EPA 200.8
27-May-21	Iron	30.8	ug/L	EPA 200.7
27-May-21	Fluoride	0.25	mg/L	SM 4500 F-C
27-May-21	Hardness	15.7	mg/L	EPA 200.7
27-May-21	Potassium	561	ug/L	EPA 200.7
27-May-21	Magnesium	728	ug/L	EPA 200.7
27-May-21	Manganese	15.4	ug/L	EPA 200.8
27-May-21	Ammonia Nitrogen	0.0328	mg/L	EPA 350.1
27-May-21	Nitrate-Nitrite	*ND (<0.005)*	mg/L	EPA 353.2
27-May-21	Sodium	9750	ug/L	EPA 200.7
27-May-21	Nickel	*ND (<0.625)*	ug/L	EPA 200.8
27-May-21	Orthophosphate	*ND (<0.0025)*	mg/L	EPA 353.2, 365.1
27-May-21	Lead	0.104	ug/L	EPA 200.8
27-May-21	Sulfate	2.91	mg/L	EPA 300.0
27-May-21	Antimony	*ND (<0.625)*	ug/L	EPA 200.8
27-May-21	Selenium	*ND (<0.625)*	ug/L	EPA 200.8
27-May-21	Silicon Dioxide	247	ug/L	EPA 200.7
27-May-21	Total Phosphorus	0.0116	mg/L	EPA 365.1
27-May-21	Total Suspended Solids	*ND (<5)*	mg/L	SM2540
27-May-21	Temperature	22.5	Deg-C	SM 2550B
27-May-21	Turbidity	1.1	NTU	SM 2130 B
27-May-21	Zinc	*ND (<1.25)*	ug/L	EPA 200.8
27-May-21	pH	7.77	S.U.	SM 4500H+B

ND = Non-detect

Attachment D
Additional Influent Data

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection Limit (µg/L)	Influent		Effluent Limitations	
						Daily maximum (µg/L)	Daily average (µg/L)	TBEL	WQBEL
Orthophosphate		X	1	EPA 353.2, 365.1		10.2	10.2		
Sulfate		X	1	EPA 300.0		6760	6760		
Silicon Dioxide		X	1	EPA 200.7		3580	3580		
Total Phosphorus		X	1	EPA 365.1		8.18	8.18		
Temperature (degC)		X	1	SM 2550B		13.9	13.9		
Total Coliform (MPN/100 mL)	X		1	SM 9223B		<1	<1		
Turbidity (NTU)		X	1	SM 2130		0.29	0.29		
pH (SU)		X	1	SM 4500H+B		9.61	9.61		
E. Coli (MPN/100 mL)	X		1	SM 9223B		<1	<1		
Heterotrophic Plate Count (CFU/mL)	X		1	SM9215B		<1	<1		

Attachment E

Additional Treatment System Information

The design flow capacity of the most limiting component of 600 gpm assumes that there are four vacuum trucks pumping out of the tank and into an intermediate holding tank at 150 gpm each.

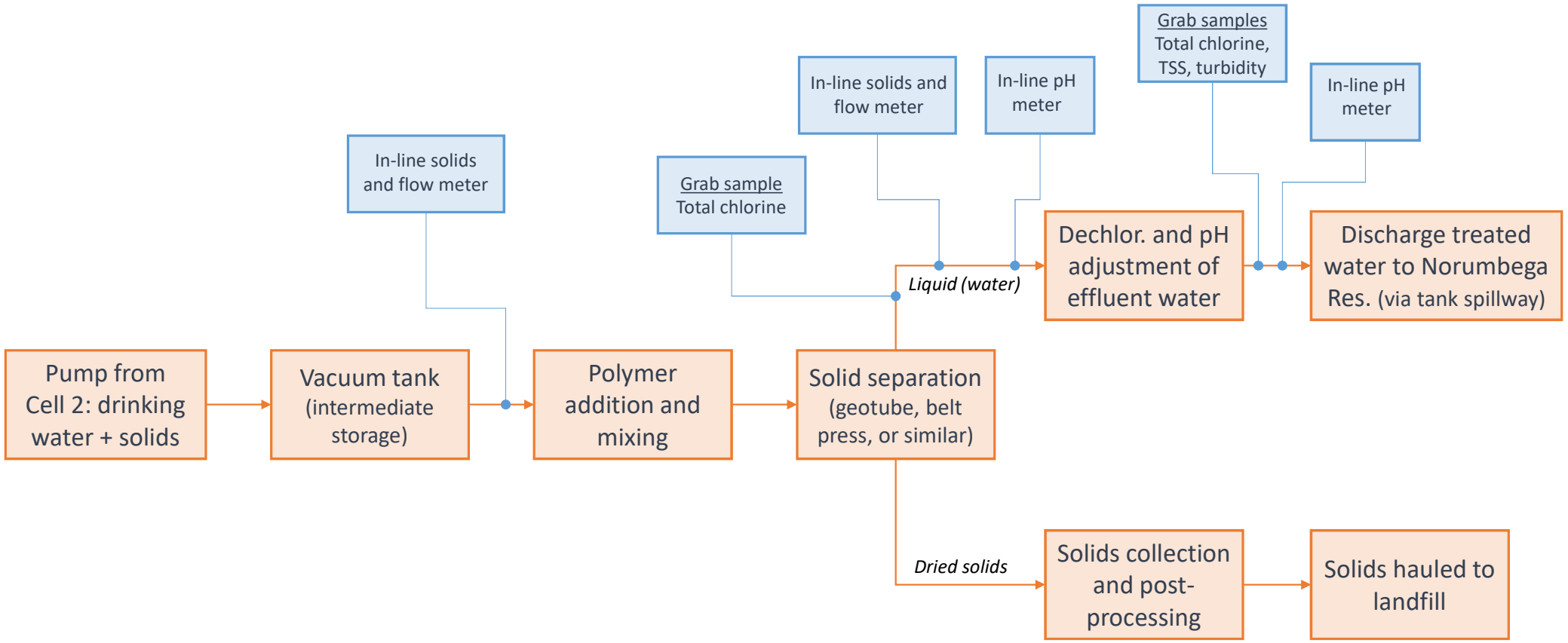
The proposed maximum effluent flow of 2,000 gpm is based on the tank dewatering pump capacity. This rate of discharge will happen infrequently and only for short durations when the dewatering piping is being flushed.

The average effluent flow of 694 gpm is higher than the design flow capacity of the limiting component because of the infrequent and short duration periods when the dewatering pump will discharge at 2,000 gpm.

Below is a summary table with a breakdown of the total estimated discharge volume.

Description	Category	Estimated Volume per Cell, gallons	Estimated Total Volume, gallons
The tank cell to be cleaned will be isolated and the potable water remaining in the tank cell will be recycled within the tank to another cell. The piping used to recycle the potable water within the tank needs to be disinfected before the potable water can be recycled. Water will be treated and discharged during this disinfection process.	IV	100,000	300,000
To clean the tank, potable water and sediment in the bottom of the tank cell will be removed and treated, and the treated water will be discharged during this process. Additional potable water will be used to aid in the cleaning process, which will also be removed, treated, and discharged.	VIII	4,200,000	12,600,000
Some leakage was observed through the valves that will be used to isolate the tank cell during preliminary field-testing. The potable water that leaks into the cell that is being cleaned will be treated and discharged during the work.	IV	11,000,000	33,000,000
Potable water that will be reintroduced to the tank and chlorinated to disinfect the tank before it is brought back online will be treated and discharged.	IV	2,000,000	6,000,000
TOTAL CATEGORY IV	IV	13,100,000	39,300,000
TOTAL CATEGORY VIII	VIII	4,200,000	12,600,000
TOTAL		17,300,000	51,900,000

Attachment F
Proposed Process Flow Diagram



Notes:

The final process and instrumentation selection will be proposed by the contractor and approved by MWRA to ensure compliance with all permit requirements.

Attachment G

Additional Chemical and Additive Information

The chemicals that will be applied to the effluent prior to discharge are listed below, along with the information requested in Section F, items 2 and 3. The contractor may propose alternative processes or chemicals, but they will be required to perform testing to ensure that they comply with the permit.

1. Flocculant - A flocculant will be added to flocculate, or attract, the fine particles suspended in the liquid. Preliminary bench-scale tests showed that a low molecular weight medium charged cationic emulsion polymer worked well to provide a floc that has application for subsequent sediment removal processes. The flocculant will be Aries 7384 or an approved equal. See below and attached for additional information
    a. Product name: Aries 7384 (Flocculant), chemical formula: not provided (trade secret), and manufacturer of the chemical/additive: Aries Chemical;
    b. Purpose or use of the chemical/additive or remedial agent: flocculation;
    c. Safety Data Sheet (SDS) and Chemical Abstracts Service (CAS) Registry number: see attached;
    d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive: the flocculant will be added continuously for approximately 8 hours per day at a volumetric dose of approximately 180 ppm;
    e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks: no known risks for storage or use; and
    f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)): refer to SDS, attached.

2. Dechlorinating chemical - A dechlorinating agent will be added to remove residual chlorine from the potable water. The dechlorinating agent will likely be Drewfloc 6134 or an approved equal.
    a. Product name: Drewfloc 6134 (sodium bisulfite), chemical formula: $NaHSO_3$, and manufacturer of the chemical/additive: Solenis;
    b. Purpose or use of the chemical/additive or remedial agent: dechlorination;
    c. Safety Data Sheet (SDS) and Chemical Abstracts Service (CAS) Registry number: see attached;
    d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive: it will be added continuously at a volumetric dose of approximately 300 ppm;
    e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks: no known risks for storage or use; and
    f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)): refer to SDS, attached.

3. pH Adjustment (increase pH) – It is not anticipated that this will be necessary, but a chemical might be added to increase or decrease the pH of the water. To increase the pH, sodium hydroxide (or an approved equal) will likely be used.
    a. Product name: Caustic Soda (sodium hydroxide), chemical formula: $NaOH$, and manufacturer of the chemical/additive: Univar;
    b. Purpose or use of the chemical/additive or remedial agent: increase pH;
    c. Safety Data Sheet (SDS) and Chemical Abstracts Service (CAS) Registry number: see attached;
    d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive: it will be added continuously at a volumetric dose necessary to bring the pH into an acceptable range. Continuous pH monitoring would be required upstream and downstream of the injection point.;
    e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks: no known risks for storage or use; and
    f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)): refer to SDS, attached.

4. pH Adjustment (decrease pH) – It is not anticipated that this will be necessary, but a chemical might be added to increase or decrease the pH of the water. To decrease the pH, a weak hydrochloric acid (or an approved equal) will likely be used.
    a. Product name: Hydrochloric Acid or ACS , chemical formula: HCl, and manufacturer of the chemical/additive: AquaPhoenix Scientific;
    b. Purpose or use of the chemical/additive or remedial agent: decrease pH;
    c. Safety Data Sheet (SDS) and Chemical Abstracts Service (CAS) Registry number: see attached;
    d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive: It will be added continuously at a volumetric dose necessary to bring the pH into an acceptable range. Continuous pH monitoring would be required upstream and downstream of the injection point.;
    e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks: no known risks for storage or use; and
    f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)): refer to SDS, attached.

The effluent, with the addition of a flocculant and dechlorinating chemical, is not expected to exceed applicable permit limitations and water quality standards or alter conditions in the receiving water. A preliminary review of dewatering applications utilizing geotextile dewatering structures and a mechanical dewatering clarifier and recess chamber technology to process sediment from Norumbega Covered Storage Tank was conducted in November 2020.

TSS results of the filtrate in each process after the flocculant was added are listed below:

- Geotextile bag - 17 mg/L TSS

- Gravity table thickener - 37 mg/L TSS
- Clarifier (represented in bench scale with vertical cone thickener) - 12 mg/L TSS
- Plate or belt filter press (represented in bench scale with recess chamber) - 8 mg/L TSS

Chlorine residual results after the dechlorinating agent was added to the effluent were 0.015 mg/L total residual chlorine.

Safety Data Sheet

Aries 7384

Section 1. Identification

Product Identifier	Aries 7384
Synonyms	Flocculant
Manufacturer Stock Numbers	N/A
Recommended use	Water treatment, process aid
Uses advised against	N/A

Manufacturer Contact

Address

Aries Chemical Incorporated
PO BOX 519
Beaver Falls, NY, 13305

Phone	Emergency Phone	Fax
(315) 346-1489	(800) 535-5053 INFOTRAC	(315) 346-1658

Email	Website
aries@arieschem.com	www.arieschem.com

Section 2. Hazards Identification

Classification	Final product is non-hazardous. - Category N/A
Signal Word	
Pictogram	
Hazard Statements	Final product is not classified as hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.
Precautionary Statements	
Response	IF IN EYES: Rinse eyes with water for 15 minutes, lifting eyelids often. Seek medical attention immediately. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF ON SKIN (or hair): Immediately remove contaminated clothing and flush skin thoroughly with water. Wash clothing before reuse. Seek medical attention if

	irritation persists. IF SWALLOWED: Drink water to dilute. Do NOT induce vomiting. Seek medical attention immediately.
Prevention	Avoid breathing dust/fume/gas/mist/ vapors/spray. Avoid contact with eyes, skin and clothing. Avoid release to the environment. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection.
Storage	Store away from sources of heat and ignition. Store in a cool, dry place. Do not allow to freeze as it will affect the physicial condition and may damage the material.
Disposal	Dispose of contents/containers in accordance with local, state and federal regulations.
General	Spills produce extremely slippery surfaces.
Ingredients of unknown toxicity	0%
Hazards not Otherwise Classified	No Data Available

Section 3. Ingredients

CAS	Ingredient Name	Weight %
64742-47-8	Distillates, petroleum, hydrotreated light	20% - 30%
69011-36-5	Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	<5 %

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-Aid Measures

Inhalation	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. If necessary, use artificial respiration to support vital functions. Get medical attention if you feel unwell.
Skin	IF ON SKIN: Wash off immediately with soap and plenty of water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Get medical attention if irritation develops and persists.
Eye	IF IN EYES: Get medical attention immediately. Call a physician or ophthalmologist. Flush eye with water for 20 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses, if present and easy to do, then resume rinsing.
Ingestion	IF SWALLOWED: do NOT induce vomiting. Rinse mouth with water. Call a physician immediately. Do not give anything by mouth unless instructed to do so by a poison center or a health care provider.

Section 5. Fire Fighting Measures

Suitable Extinguishing Media	Water, water spray, foam, carbon dioxide or dry powder
Unsuitable Extinguishing Media	None known.
Fire fighting instructions	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Move containers from fire area if possible to do so without risk to personnel. Cool exposed containers with water spray after extinguishing fire.
Specific hazards	Spills produce slippery surfaces and could present a physical hazard for firemen. Thermal decomposition (as may be experienced in a fire) may produce hydrogen chloride gas and/or may liberate oxides of nitrogen and carbon.
Additional Information	Unusual fire and explosion hazards: Thermal decomposition may release oxides of carbon and nitrogen, ammonia, hydrogen chloride. Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combustion in an oxygen deficient atmosphere.

Section 6. Accidental Release Measures

Personal precautions	Wear appropriate personal protection. (See Section 8). Wear breathing apparatus if exposed to vapors/dust/aerosols. Remove soiled clothing and launder before reuse. Avoid all skin contact with spilled material. Have emergency equipment readily available.
Clean-up	Forms slippery surfaces on floors, posing an accident risk. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Do not flush liquid into public sewer, water systems or surface waters.
Containment and clean-up	Soak up or wet vacuum spilled liquid. Neutralize residue with sodium bicarbonate or other neutralizing agent for dilute acids. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residues in a suitable container.
Clean-up	After removal, flush contaminated area thoroughly with water.

Section 7. Handling and Storage

Handling	Wear appropriate PPE when handling, including an approved respirator if mist or vapor levels exceed exposure limits. Contaminated surfaces will be extremely slippery. Avoid contact with skin and eyes. Do NOT handle, store or open near an open flame, sources of heat or sources of ignition - No smoking. Remove contaminated clothing and wash before reuse. Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly after handling. Wash hands before eating, drinking or smoking. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Eye wash and safety shower should be located nearby.
Storage	Store in a cool, dry, well-ventilated area away from incompatible materials. Material should be stored in secondary containers or in a diked area, as appropriate. Floors should be sealed to prevent absorption of this material. If appropriate, post warning signs in storage and use areas. Inspect all incoming

	containers before storage to ensure containers are properly labeled and undamaged. Store away from heat. Keep away from sources of ignition. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Store away from incompatible materials. Keep from freezing (below 5 deg C). Emergency eye wash and safety shower should be located nearby.
Additional Information	Incompatible materials: Oxidizing agents

Section 8. Exposure Controls/Personal Protection

Occupational Exposure Limits

Ingredient Name	ACGIH TLV	OSHA PEL	STEL
Distillates, petroleum, hydrotreated light	1200 mg/m3	1200 mg/m3	N/A
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	N/A	N/A	N/A

Personal Protective Equipment	Goggles, Gloves
Engineering controls	Ensure adequate ventilation, especially in confined areas. Use local exhaust if misting occurs. Natural ventilation is adequate in the absence of mists.
Eye protection	Safety glasses with side shields.
Hand/skin protection	Wear chemical resistant gloves and impermeable protective clothing.
Respiratory Protection	Normally no personal respiratory protection is necessary. In case of insufficient ventilation, wear suitable respiratory equipment. Check with protective equipment manufacturer's data.
General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Wash hands and face before breaks and immediately after handling the product. Launder contaminated or dirty clothing before reuse. Ensure that eyewash stations and safety showers are close to the workstation location.
Environmental Exposure Controls	Avoid release to the environment.

Section 9. Physical and Chemical Properties

Physical State	Liquid
Color	Milky/Viscous
Odor	Aliphatic
Odor Threshold	No data available.
Solubility	Completely miscible
Partition coefficient Water/n-octanol	Not applicable
VOC%	N/A
Viscosity	>20.5 mm2/s @ 40 C
Specific Gravity	N/A
Density lbs/Gal	N/A
Pounds per Cubic Foot	N/A
Flash Point	Does not flash
FP Method	N/A

pH	4 - 6 @ 5 g/L
Melting Point	<5 deg C
Boiling Point	>100 deg C
Boiling Range	No data available
LEL	N/A
UEL	N/A
Evaporation Rate	No data available
Flammability	Not applicable
Decomposition Temperature	>150 C
Auto-ignition Temperature	Not applicable
Vapor Pressure	2.3 kPa @ 20 C
Vapor Density	0.804 g/L @ 20 C

Additional Information	Specific gravity = 1.0 - 1.1

Section 10. Stability and Reactivity

Chemical stability	Solid is stable in air and light. Stable under normal conditions of storage and handling.
Reactivity	Stable under normal conditions.
Additional Information	-Conditions to avoid: Protect from frost, heat and sunlight. -Materials to avoid: Oxizing agents may cause exothermic reactions. -Hazardous decomposition products: Carbon and nitrogen oxides, ammonia, hydrogen chloride gas. Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combustion in an oxygen deficient atmosphere.

Section 11. Toxicological Information

Inhalation	This product is not expected to be toxic by inhalation.
Skin contact	Not irritating.
Eye Contact	Not irritating. (OECD 437)
Sensitization	Not sensitizing.
Mutagenicity	Not mutagenic.
Carcinogenicity	No components have been identified as carcinogenic by OSHA, NTP, or IARC.
Reproductive toxicity	Not toxic for reproduction.
Ingestion	No information available.
Aspiration hazard	No hazards resulting from the material as supplied.
Specific target organ toxicity - single exposure	No known effects.
Specific target organ toxicity - repeated exposure	No known effects.
Additional Information	Acute toxicity data: -Product: LD50/Oral/Rat: > 5,000 mg/kg LD50/Dermal/Rat: > 5,000 mg/kg

-Distillates (petroleum), hydrotreated light (64742-47-8):
LD50/Oral/Rat: > 5,000 mg/kg (OECD 401)
LD50/Dermal/Rabbit: > 5,000 mg/kg (OECD 402)
LC50/Inhalation/Rat/4hr = 4,951 mg/m^3 (OECD 403)
-Poly(oxy-1,2-ethanediyl), a-tridecyl-w-hydroxy-, branched (69011-36-5):
LD50/Oral/Rat: 500-2,000 mg/kg
LD50/Dermal/Rabbit: >2,000 mg/kg

Section 12. Ecological Information

Persistence and degradation	Readily biodegradable.
Bioaccumulative potential	This product is not expected to bioaccumulate.
Hydrolysis	At natural pHs (>6), the polymer degrades due to the hydrolysis to more than 70% in 28 days. The hydrolysis products are not harmful to aquatic organisms.
Mobility	No data available.
Additional Information	Acute toxicity data: LC50/Fish/96 hr: 10-100 mg/L (estimated) EC50/Daphnia magna/48 hr: 10-100 mg/L (estimated) Algal inhibition tests are not appropriate. The flocculation characteristics of the product interfere directly in the test medium preventing homogenous distribution which invalidates the test.

Section 13. Disposal

Disposal	Dispose of in accordance with federal, state and local regulations. Do not discharge into sewer or surface water.

Section 14. Transport Information

UN Number	N/A
UN Proper Shipping Name	Not classified as dangerous in the meaning of transport regulations.
DOT Classification	N/A
Packing Group	N/A

Section 15. Regulatory Information

TSCA	The ingredients of this product are either listed on or exempt from listing on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.
SARA Section 302 Extremely Hazardous Substances	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA Section 313	Hazardous Component(s) subject to reporting under 40 CFR 372 (SARA Title III, Sec. 313): None
CERCLA Section 103 Hazardous Substances	This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302).

Additional Information	STATE REGULATIONS -California Proposition 65: This product contains a chemical known to the state of California to cause cancer and birth defects or other reproductive harm: Acrylamide (79-06-1), <0.1% by wt.

Section 16. Other Information

Revision Date	12/8/2017
Version number	4
Reason for Revision	Updated in accordance with new version of manufacturer document.
Disclaimer	While Aries Chemical Inc. believes the data set forth herein is accurate as of the date hereof, Aries Chemical makes no warranty with respect thereto and expressly disclaims all liability for refinance thereon of such data and is offered solely for your consideration, investigation and verification.

SECTION 1. IDENTIFICATION

Product identifier

Trade name : Drew™ 6134
DECHLORINATING AGENT
™ Trademark, Solenis or its subsidiaries or affiliates, registered in various countries

Recommended use of the chemical and restrictions on use

Details of the supplier of the safety data sheet	**Emergency telephone number**
Solenis LLC 500 Hercules Road Wilmington, Delaware 19808 United States of America (USA) RegulatoryRequestsNA@solenis.com	1-844-SOLENIS (844-765-3647) **Product Information** Contact your local Solenis representative

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Corrosive to metals	:	Category 1
Acute toxicity (Oral)	:	Category 4
Skin irritation	:	Category 2
Eye irritation	:	Category 2A
Specific target organ toxicity - single exposure	:	Category 3 (Respiratory system)

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : H290 May be corrosive to metals.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Precautionary statements :

Prevention:

P234 Keep only in original container.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
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.
P390 Absorb spillage to prevent material damage.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P406 Store in corrosive resistant container with a resistant inner liner.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Classification	Concentration (%)
SODIUM BISULFITE	7631-90-5	Acute Tox. 4; H302	>= 30 - < 40

SECTION 4. FIRST AID MEASURES

General advice	:	Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance. Do not leave the victim unattended.
If inhaled	:	If breathed in, move person into fresh air. If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	Remove contaminated clothing. If irritation develops, get medical attention. If on skin, rinse well with water. Wash contaminated clothing before re-use.
In case of eye contact	:	Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. If eye irritation persists, consult a specialist.
If swallowed	:	Obtain medical attention. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	:	No symptoms known or expected. Harmful if swallowed. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation.
Notes to physician	:	No hazards which require special first aid measures.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water spray Foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	sodium sulphide residue Sulphur oxides Sodium oxides sulfur oxides

sodium monoxide
sulfur dioxide
toxic fumes

Specific extinguishing methods	:	Product is compatible with standard fire-fighting agents.
Further information	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Comply with all applicable federal, state, and local regulations.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Do not breathe vapours/dust. Container hazardous when empty. Avoid contact with skin and eyes. Smoking, eating and drinking should be prohibited in the application area. For personal protection see section 8. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
SODIUM BISULFITE	7631-90-5	TWA	5 mg/m3	ACGIH
		TWA	5 mg/m3	NIOSH REL

Engineering measures : 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.

Personal protective equipment

Hand protection

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

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 resistant gloves (consult your safety equipment supplier).
Wear as appropriate:
Impervious clothing
Safety shoes
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Discard gloves that show tears, pinholes, or signs of wear.

Hygiene measures : Wash hands before breaks and at the end of workday.
When using do not eat or drink.
When using do not smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour : light yellow

Odour : sulphurous

Odour Threshold : No data available

pH : 4.5

Melting point/freezing point	:	5 °C
Boiling point/boiling range	:	216 °F (1013 hPa)
Flash point	:	Not applicable
Evaporation rate	:	< 1 n-Butyl Acetate
Flammability (solid, gas)	:	No data available
Self-ignition	:	No data available
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapour pressure	:	14.00 mmHg (77.00 °F)
Relative vapour density	:	0.6 AIR=1
Relative density	:	1.34 (20 °C)
Density	:	1.34 g/cm3 (20 °C)
Solubility(ies)		
Water solubility	:	completely soluble
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Oxidizing properties	:	No data available
Molecular weight	:	105 g/mol
Metal corrosion rate	:	Corrosive to metals

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.

Chemical stability	:	Stable under recommended storage conditions.
Possibility of hazardous reactions	:	Product will not undergo hazardous polymerization.
Conditions to avoid	:	excessive heat Freezing temperatures. Heat, flames and sparks. Heat Exposure to air. Exposure to moisture
Incompatible materials	:	Acids Alkali metals Alkaline earth metals aluminum magnesium Oxidizing agents Strong bases water
Hazardous decomposition products	:	Sulphur oxides Sodium oxides sodium sulfide residue toxic fumes

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Harmful if swallowed.

Product:

Acute oral toxicity	:	LD50 (Rat): 1,420 mg/kg Acute toxicity estimate: 3,550 mg/kg
Acute inhalation toxicity	:	Remarks: Excessive heat or contact with acids, water and/or ice, releases sulfur dioxide gas which may be harmful or deadly if inhaled.
Acute dermal toxicity	:	Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method

Components:

SODIUM BISULFITE:

Acute oral toxicity	:	LD 50 (Rat): 2 g/kg
Acute dermal toxicity	:	LD 50 (Rat): > 2 g/kg

Skin corrosion/irritation

Causes skin irritation.

Product:

Remarks: May cause skin irritation and/or dermatitis.

Components:

SODIUM BISULFITE:

Result: Not irritating to skin

Serious eye damage/eye irritation

Causes serious eye irritation.

Product:

Remarks: Vapours may cause irritation to the eyes, respiratory system and the skin.
Solutions may be severely irritating or cause burns.

Components:

SODIUM BISULFITE:

Result: Mildly irritating to eyes

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Product:

Assessment: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

May cause allergic skin reaction.

Components:

SODIUM BISULFITE:

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Not classified based on available information.

STOT - single exposure

May cause respiratory irritation.

Product:

Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

STOT - repeated exposure

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

Further information

Product:

Remarks: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	:	LC 50 (Fish): Expected > 100 mg/l LC50 (Gambusia affinis (Mosquito fish)): 240 mg/l LC50 (Fathead minnow (Pimephales promelas)): 707 mg/l Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203 GLP: no
Toxicity to daphnia and other aquatic invertebrates	:	EC 50 (Aquatic invertebrates): Expected > 100 mg/l EC 50 (Daphnia magna (Water flea)): 701 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: no

Ecotoxicology Assessment

Acute aquatic toxicity : Not classified based on available information.

Chronic aquatic toxicity : Not classified based on available information.

Components:

SODIUM BISULFITE:

Toxicity to fish : LC 50 (Western mosquitofish (Gambusia affinis)): 240 mg/l
Exposure time: 96 h
Method: Static
Remarks: Mortality

Toxicity to daphnia and other aquatic invertebrates : LC 50 (Water flea (Daphnia magna)): 119 mg/l
Exposure time: 48 h
Method: Static
Remarks: Mortality

LC 50 (Water flea (Daphnia magna)): 89 mg/l
Exposure time: 96 h
Method: Static

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of in accordance with all applicable local, state and federal regulations.

Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International transport regulations

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.

U.S. DOT - ROAD

UN	2693	Bisulfites, aqueous solutions, n.o.s.	8	III	

U.S. DOT - RAIL

UN	2693	Bisulfites, aqueous solutions, n.o.s.	8	III	

U.S. DOT - INLAND WATERWAYS

UN	2693	Bisulfites, aqueous solutions, n.o.s.	8	III	

TRANSPORT CANADA - ROAD

UN	2693	BISULFITES, AQUEOUS SOLUTION, N.O.S. (SODIUM BISULFITE)	8	III	

TRANSPORT CANADA - RAIL

UN	2693	BISULFITES, AQUEOUS SOLUTION, N.O.S. (SODIUM BISULFITE)	8	III	

INTERNATIONAL MARITIME DANGEROUS GOODS

UN	2693	BISULPHITES, AQUEOUS SOLUTION, N.O.S. (SODIUM BISULFITE)	8	III	

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

UN	2693	Bisulphites, aqueous solution, n.o.s. (SODIUM BISULFITE)	8	III	

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

UN	2693	Bisulphites, aqueous solution, n.o.s. (SODIUM BISULFITE)	8	III	

MEXICAN REGULATION FOR THE LAND TRANSPORT OF HAZARDOUS MATERIALS AND WASTES

UN	2693	BISULPHITES, AQUEOUS SOLUTION, N.O.S. (SODIUM BISULFITE)	8	III

***ORM = ORM-D, CBL = COMBUSTIBLE LIQUID**

Marine pollutant		no

Dangerous 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.

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
SODIUM BISULFITE	7631-90-5	5000	13513

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity
This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Corrosive to metals
Acute toxicity (any route of exposure)
Serious eye damage or eye irritation
Specific target organ toxicity (single or repeated exposure)
Skin corrosion or irritation

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

DSL : All components of this product are on the Canadian DSL

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

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

KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	On TSCA Inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Further information
Revision Date: 02/18/2019

Full text of H-Statements

H302	:	Harmful if swallowed.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity

Further information

Other information	:	The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by the Solenis Environmental Health and Safety Department.

Sources of key data used to compile the Safety Data Sheet
Key literature references and sources of data
SOLENIS Internal data
SOLENIS internal data including own and sponsored test reports
The UNECE administers regional agreements implementing harmonised classification for labelling (GHS) and transport.

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide;

GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

US / EN

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

SAFETY DATA SHEET

1. Identification

Product identifier: CAUSTIC SODA 25 - 28%

Other means of identification

Synonyms: Sodium Hydroxide

SDS number: 000100000085

Recommended use and restriction on use

Recommended use: Not available.

Restrictions on use: Not known.

Emergency 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

Univar USA Inc Safety Data Sheet

SDS No:	
Version No:	001 2015-04-28
Order No:	

3075 Highland Pkwy, Ste 200, Downers Grove, IL 60515
(425) 889 3400

Emergency Assistance

For emergency assistance involving chemicals call
Chemtrec - (800) 424-9300

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	25%
Water		7732-18-5	75%

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

4. First-aid measures

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

Ingestion: 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.

Version: 1.0
Revision date: 04/28/2015

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

Precautions 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.

Version: 1.0
Revision date: 04/28/2015

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:	-25 °C
Initial boiling point and boiling range:	116 °C
Flash Point:	No data available.
Evaporation 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.

Version: 1.0
Revision date: 04/28/2015

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.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: ATEmix (): 325 mg/kg

Dermal

Product: No data available.

Inhalation

Product: No data available.

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.

Specific 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.

Mobility in soil: No data available.

Known or predicted distribution to environmental compartments

Sodium hydroxide No data available.

Water 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

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.

US 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

Version: 1.0
Revision date: 04/28/2015

Inventory Status: Australia AICS:	Not in compliance with the inventory.
Canada DSL Inventory List:	Not in compliance with the inventory.
EU EINECS List:	On or 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

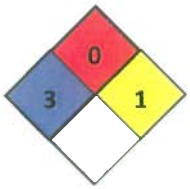
HMIS Hazard ID

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:	04/28/2015
Revision date:	No data available.
Version #:	1.0
Further information:	No data available.

Version: 1.0
Revision date: 04/28/2015

Univar USA Inc Safety Data Sheet

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

Notice

Univar USA Inc. ("Univar") expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this SDS 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 Univar 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, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's 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 their 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

Material Safety Data Sheet
Hydrochloric acid 32-38% solution

ACC# 11155

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydrochloric acid 32-38% solution
Catalog Numbers: A142-212, A142P-19, A142P-20, A144-212, A144-212LC, A144-500, A144-500LB, A144-500LC, A144-612GAL, A144C-212, A144C-212EA, A144P-19, A144P-20, A144S-212, A144S-212EA, A144S-500, A144SI-212, A466-1, A466-2, A466-250, A466-2LC, A466-500, A481-212, A481-212LC, A508-212, A508-212LC, A508-4, A508-500, A508SK-212, AS481-212LC, NC9373124, S71942SC, S71942SCND, S71943, S71943ND, S80038, SA49
Synonyms: Muriatic acid; Chlorohydric acid; Hydrogen chloride in aqueous solution.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	62-68	231-791-2
7647-01-0	Hydrogen chloride	32-38	231-595-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless to pale yellow liquid.
Danger! Causes eye and skin burns. Causes digestive and respiratory tract burns. May be fatal if inhaled or swallowed. Repeated or prolonged exposure may cause erosion of exposed teeth. Corrosive to metal.
Target Organs: Respiratory system, gastrointestinal system, teeth, eyes, skin.

Potential Health Effects

Eye: May cause irreversible eye injury. Vapor or mist may cause irritation and severe burns. Contact with liquid is corrosive to the eyes and causes severe burns.
Skin: Contact with liquid is corrosive and causes severe burns and ulceration. The severity of injury depends on the concentration of the solution and the duration of exposure.
Ingestion: Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract.
Inhalation: May be fatal if inhaled. May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract. Causes corrosive action on the mucous membranes.
Chronic: Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause erosion of teeth. Repeated exposure to low concentrations of HCl vapor or mist may cause bleeding of nose and gums. Chronic bronchitis and gastritis have also been reported.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid 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 aid immediately. Wash clothing before reuse.
Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.
Inhalation: POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Notes to Physician: Do NOT use sodium bicarbonate in an attempt to neutralize the acid.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Not flammable, but reacts with most metals to form flammable hydrogen gas. Use water spray to keep fire-exposed containers cool. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated.
Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Isolate area and deny entry. Provide ventilation. Spill may be carefully neutralized with lime (calcium oxide, CaO). A vapor suppressing foam may be used to reduce vapors. Approach spill from upwind.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Contents may develop pressure upon prolonged storage. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Discard contaminated shoes. Keep away from strong bases and metals. Use caution when opening. Do not use with metal spatula or other metal items. Do not breathe vapor or mist. Use only with adequate ventilation or respiratory protection.
Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Do not store in metal containers. Store away from alkalies. Separate from oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use a corrosion-resistant ventilation system.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
Hydrogen chloride	2 ppm Ceiling	50 ppm IDLH	5 ppm Ceiling; 7 mg/m3 Ceiling

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Hydrogen chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles and face shield.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless to pale yellow
Odor: strong, pungent
pH: 0.01
Vapor Pressure: 84 mm Hg @ 20 deg C
Vapor Density: 1.27 (air=1)
Evaporation Rate:> 1.00 (N-butyl acetate)
Viscosity: Not available.
Boiling Point: 83 deg C @ 760 mmHg
Freezing/Melting Point:-66 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density:1.19 (38%)
Molecular Formula:HCl.H2O
Molecular Weight:36.46

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Excess heat.
Incompatibilities with Other Materials: Metals, strong oxidizing agents, strong reducing agents, bases, acetic anhydride, alcohols, amines, sulfuric acid, vinyl acetate, epoxides (e.g. butyl glycidyl ether), chlorosulfonic acid, carbides, beta-propiolactone, ethyleneimine, propylene oxide, lithium silicides, 2-aminoethanol, 1,1-difluoroethylene, magnesium boride, mercuric sulfate, aldehydes, cyanides, sulfides, phosphides.
Hazardous Decomposition Products: Hydrogen chloride, chlorine, hydrogen gas.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000
CAS# 7647-01-0: MW4025000; MW4031000
LD50/LC50:
CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;
.

CAS# 7647-01-0:
Inhalation, mouse: LC50 = 1108 ppm/1H;
Inhalation, mouse: LC50 = 20487 mg/m3/5M;
Inhalation, mouse: LC50 = 3940 mg/m3/30M;
Inhalation, mouse: LC50 = 8300 mg/m3/30M;
Inhalation, rat: LC50 = 3124 ppm/1H;
Inhalation, rat: LC50 = 60938 mg/m3/5M;
Inhalation, rat: LC50 = 7004 mg/m3/30M;
Inhalation, rat: LC50 = 45000 mg/m3/5M;
Inhalation, rat: LC50 = 8300 mg/m3/30M;
Oral, rabbit: LD50 = 900 mg/kg;
.
Inhalation LC50 (aerosol) rat: 8300mg/m3/30M; Oral LDLo Man: 2857 ug/kg; Oral LDLo Woman: 420 uL/kg; Inhalation LCLo Human: 1300 ppm/30M.
Carcinogenicity:
CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7647-01-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: Female rats were exposed to 450 mg/m3 of HCl for 1 hour either prior to mating or on day 9 of pregnancy. Developmental effects were observed in the offspring. However, this exposure caused toxic effects, including mortality, in the mothers.
Reproductive Effects: No information available.
Mutagenicity: See actual entry in RTECS for complete information.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: 3.6 mg/L; 48Hr; Lethal (unspecified)Fish: Bluegill/Sunfish: LC50; 96 Hr; pH 3.0-3.5 No data available.
Environmental: Will exhibit extensive evaporation from soil surfaces. Upon transport through the soil, hydrochloric acid will dissolve some of the soil materials (especially those with carbonate bases) and the acid will neutralize to some degree.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	HYDROCHLORIC ACID	HYDROCHLORIC ACID
Hazard Class:	8	8
UN Number:	UN1789	UN1789
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.
CAS# 7647-01-0 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7647-01-0: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 7647-01-0: 500 lb TPQ (gas only)

SARA Codes

CAS # 7647-01-0: immediate.

Section 313

This material contains Hydrogen chloride (CAS# 7647-01-0, 32-38%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7647-01-0 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7647-01-0 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:

CAS# 7647-01-0 is considered highly hazardous by OSHA.

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
CAS# 7647-01-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

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:

C

Risk Phrases:

R 34 Causes burns.
R 37 Irritating to respiratory system.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 7647-01-0: 1

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 7647-01-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of E, D1A.

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

Canadian Ingredient Disclosure List

CAS# 7647-01-0 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 7/06/1999
Revision #20 Date: 4/01/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Attachment H
Endangered Species Act Eligibility Determination

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2021-SLI-2257
Event Code: 05E1NE00-2021-E-07072
Project Name: Norumbega Tank Cleaning

April 06, 2021

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2021-SLI-2257
Event Code: 05E1NE00-2021-E-07072
Project Name: Norumbega Tank Cleaning
Project Type: WATER SUPPLY / DELIVERY
Project Description: The project involves removing sediment that has collected in the tank and cleaning each cell, one at a time, over the course of approximately three years. On site work activities, including discharges to the Norumbega Reservoir, are anticipated to take approximately two to three months for each cell. For operational purposes, one cell will be cleaned each year over the course of approximately three years.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.3318852,-71.2948952938616,14z

Counties: Middlesex County, Massachusetts

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9045

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

The Northern Long-eared Bat

The Northern Long-eared Bat (Myotis septentrionalis) (NLEB) is one of the species of bats most impacted by the disease White-nose Syndrome (WNS).

Due to severe population declines caused by WNS, the U.S. Fish & Wildlife Service (USFWS) listed the Northern Long-eared Bat as a Threatened species under the Endangered Species Act (ESA, 50 CFR 17.11) on April 2, 2015. NLEB is also listed as Endangered under the Massachusetts Endangered Species Act (MESA, M.G.L. c. 131 A).

Northern Long-eared Bat, Endangered. Photo by USFWS

Prohibited tree removal

Projects that result in tree removal activities shall comply with the 4(d) rule under the ESA (effective 2/16/2016), which states:

"Incidental take resulting from tree removal is prohibited if: 1) Occurs within 0.25 mile radius of known northern long-eared bat hibernacula or 2) cuts or destroys known occupied maternity roost trees, or any other trees within a 150-foot radius from the known maternity tree during the pup season (June 1 through July 31)."

For more information on the Northern Long Eared Bat and the 4(d) rule, please visit: **http://www.fws.gov/midwest/endangered/mammals/nleb/** (http://www.fws.gov/midwest/endangered/mammals/nleb/). Please note that if your proposed project or activity is also within Priority Habitat as codified under the MESA, a separate **MESA review will be required** (/service-details/ma-endangered-species-act-mesa-overview).

To assist project proponents with the review processes described above, we are providing the following map for known locations of winter hibernacula and maternity roost trees. Please note that this map only includes regulated sites. Please contact the **USFWS** (http://www.fws.gov/newengland/index.htm)for additional information on project compliance with the ESA for the Northern Long-eared Bat.

A **full screen map** (https://mass-eoeea.maps.arcgis.com/apps/Viewer/index.html?appid=de59364ebbb348a9b0de55f6febdfd52)is also available and contains additional information, including the type of habitat (hibernacula or maternity roost tree) and whether the location is mapped as Priority Habitat.

Please note that this map is updated as new information is received. ***Last Updated June 12, 2019*** *(current as of January 2021).*

CONTACT

Natural Heritage & Endangered Species Program

Address

MassWildlife Field Headquarters
1 Rabbit Hill Road, Westborough, MA 01581
Directions (https://maps.google.com/?q=1+Rabbit+Hill+Road%2C+Westborough%2C+MA+01581)

Phone

Main (508) 389-6360 (tel:5083896360)
Open M-F, 8am-4:30pm

Regulatory Review Inquiries (508) 389-6357 (tel:5083896357)
North/Central/Western Massachusetts

(508) 389-6385 (tel:5083896385)
Southeastern Massachusetts/Cape & Islands

RELATED

MA Endangered Species Act (MESA) Regulatory Review (/ma-endangered-species-act-mesa-regulatory-review)

Forestry and rare species review (/info-details/forestry-and-rare-species-review)

Request rare species information (/how-to/request-rare-species-information)

Bat Mortality in Massachusetts (/service-details/bat-mortality-in-massachusetts)

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Weston; Street No: 55; Street Name: Oak St; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
WSN.555	Hultman Aqueduct Chemical Feed Facility	55 Oak St	Weston	1988

Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No:	WSN.555
Historic Name:	Hultman Aqueduct Chemical Feed Facility
Common Name:	Hultman Aqueduct Headquarters
Address:	55 Oak St
City/Town:	Weston
Village/Neighborhood:	
Local No:	
Year Constructed:	1988
Architect(s):	Fay, Spofford and Thorndike
Architectural Style(s):	No style
Use(s):	Administration Office; Other Engineering; Utilities Other
Significance:	Architecture; Engineering; Politics Government
Area(s):	WSN.O: Hultman Aqueduct
Designation(s):	
Building Materials(s):	Roof: Asphalt Shingle Wall: Cast Concrete; Concrete Cinderblock Foundation: Concrete Unspecified

Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

Sect A

Assessor's number	USGS Quad	Area(s)	Form Number
	NATICK	O	555

FORM B - BUILDING

Massachusetts Historical Commission
80 Boylston Street
Boston, Massachusetts 02116

wn Weston
ce *(neighborhood or village)*

ldress 55 Oak Street

storic Name Chemical Feed Facility /Headquarters

es: Present Chemical Feed Facility /Headquarters / Offices
Original Chemical Feed Facility /Headquarter

te of Construction
38/[1989 on Building Certificate]

urce Communication - Tim Gillis, Director of Metropoliton Operations, MWRA. July 1994; Building Certificate

yle/Form Utilitarian

chitect/Builder
Fay Spofford and Thorndike, Inc.

Exterior Material

Foundation Concrete

Wall/Trim Cast Concrete

Roof Hipped - asphalt

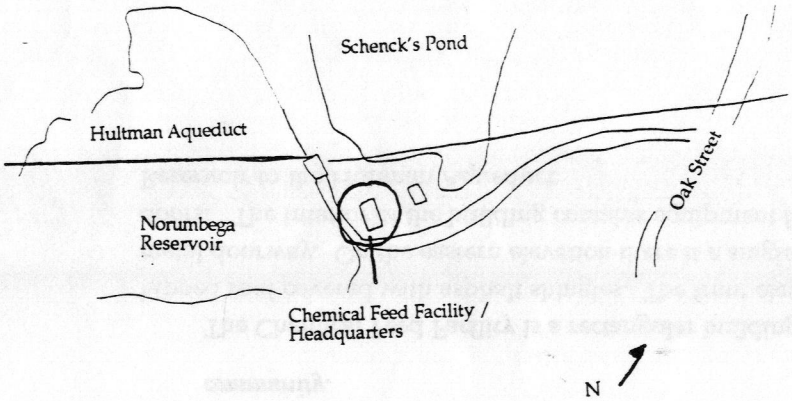
Outbuildings/Secondary Structures

Major Alterations ***(with dates)***

Condition Good

Moved ☒ **no** ☐ **yes** **Date**

Acreage Part of an 50 acre preserve



Recorded by John Nanian
Organization Boston Affiliates, Inc.
Date September 1994

Setting Rural, on the shore of the Norumbega Reservior

WSN.555

BUILDING FORM

ARCHITECTURAL DESCRIPTION ☐ *see continuation sheet*

Describe architectural features. Evaluate the characteristics of this building in terms of other buildings in the community.

The Chemical Feed Facility is a rectangular building, made of cast concrete with a concrete foundation. It has a hipped roof covered with asphalt shingles. The front elevation has two loading doors, and three sash windows and metal doorway. On the eastern elevation there is a single metal door. The remaining elevations have no windows or doors. The interior of the building contains equipment for monitoring chemicals and water flow from the Norumbega Reservoir to the Hultman Aqueduct.

HISTORICAL NARRATIVE ☐ *See continuation sheet*

Discuss the history of the building. Explain its association with local (or state) history. Include uses of the building and the role(s) of the owner/occupants played within the community.

The Chemical Feed Facility was constructed in 1988 and dedicated in 1989. It contains equipment for monitoring chemical used to purify the water and for monitoring the flow of water from the Norumbega Reservoir to the Hultman Aqueduct.

BIBLIOGRAPHY and /or REFERENCES ☐ *See continuation sheet*

Tim Gillis, Director of Metropoliton Operations, MWRA, July 1994.

☐ Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criterion Statement form.*

Attachment J

Sediment Samples

As mentioned in the cover letter, MWRA plans to remove accumulated sediment from the Norumbega Covered Storage Tank. This maintenance work is critical to maintain this important infrastructure and to maintain water quality. The project involves removing sediment that has collected in the tank and cleaning and inspecting each cell, one at a time, over the course of approximately three years.

In April, May, and June of 2017, MWRA collected and tested samples of this sediment. Those results are attached.

Norumbega Covered Storage Tank - Cell 1 - Sediment Sample 1

Date	Component	Result	Unit
5/23/2017	Ignitability	>160.0	Deg-F
5/23/2017	Reactive CN	<20	mg/kg
5/23/2017	Reactive Sulfide	<50	mg/kg
5/23/2017	Hg Final	<0.0130	ug/L
5/23/2017	Ag Final	2.20	ug/L
5/23/2017	As Final	<7.00	ug/L
5/23/2017	Ba Final	1880	ug/L
5/23/2017	Cd Final	29.1	ug/L
5/23/2017	Cr Final	<1.80	ug/L
5/23/2017	Pb Final	12.0	ug/L
5/23/2017	Se Final	<12	ug/L
5/23/2017	pH (leachate)	7.20	S.U.
5/23/2017	1,1-Dichloroethene	<100	ug/L
5/23/2017	1,2-Dichloroethane	<100	ug/L
5/23/2017	1,4-Dichlorobenzene	<100	ug/L
5/23/2017	2,4,5-TP (Silvex)	<14	ug/L
5/23/2017	2,4,5-Trichlorophenol	<120	ug/L
5/23/2017	2,4,6-Trichlorophenol	<50	ug/L
5/23/2017	2,4-D	<14	ug/L
5/23/2017	2,4-Dinitrotoluene	<50	ug/L
5/23/2017	2-Butanone	<300	ug/L
5/23/2017	2-Methylphenol	<50	ug/L
5/23/2017	4-Methylphenol (Includes 3-Methylphenol)	<50	ug/L
5/23/2017	Benzene	<100	ug/L
5/23/2017	Carbon tetrachloride	<100	ug/L
5/23/2017	Chlordane (Technical)	<2.5	ug/L
5/23/2017	Chlorobenzene	<100	ug/L
5/23/2017	Chloroform	<100	ug/L
5/23/2017	Cresol	<50	ug/L
5/23/2017	Endrin	<0.50	ug/L
5/23/2017	Heptachlor	<0.25	ug/L
5/23/2017	Heptachlor epoxide	<0.25	ug/L
5/23/2017	Hexachlorobenzene	<50	ug/L
5/23/2017	Hexachlorobutadiene	<50	ug/L
5/23/2017	Hexachloroethane	<50	ug/L
5/23/2017	Methoxychlor	<2.5	ug/L
5/23/2017	Nitrobenzene	<50	ug/L
5/23/2017	Pentachlorophenol	<120	ug/L
5/23/2017	Pyridine	<250	ug/L
5/23/2017	Tetrachloroethene	<100	ug/L
5/23/2017	Toxaphene	<5.0	ug/L
5/23/2017	Trichloroethene	<100	ug/L
5/23/2017	Vinyl chloride	<100	ug/L
5/23/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 1 - Sediment Sample 2

Date	Component	Result	Unit
5/23/2017	Ignitability	>160.0	Deg-F
5/23/2017	Reactive CN	<20	mg/kg
5/23/2017	Reactive Sulfide	<50	mg/kg
5/23/2017	Hg Final	<0.0130	ug/L
5/23/2017	Ag Final	<1.40	ug/L
5/23/2017	As Final	<7.00	ug/L
5/23/2017	Ba Final	1310	ug/L
5/23/2017	Cd Final	11.6	ug/L
5/23/2017	Cr Final	<1.80	ug/L
5/23/2017	Pb Final	<5.50	ug/L
5/23/2017	Se Final	<12	ug/L
5/23/2017	pH (leachate)	7.00	S.U.
5/23/2017	1,1-Dichloroethene	<100	ug/L
5/23/2017	1,2-Dichloroethane	<100	ug/L
5/23/2017	1,4-Dichlorobenzene	<100	ug/L
5/23/2017	2,4,5-TP (Silvex)	<14	ug/L
5/23/2017	2,4,5-Trichlorophenol	<120	ug/L
5/23/2017	2,4,6-Trichlorophenol	<50	ug/L
5/23/2017	2,4-D	<14	ug/L
5/23/2017	2,4-Dinitrotoluene	<50	ug/L
5/23/2017	2-Butanone	<300	ug/L
5/23/2017	2-Methylphenol	<50	ug/L
5/23/2017	4-Methylphenol (Includes 3-Methylphenol)	<50	ug/L
5/23/2017	Benzene	<100	ug/L
5/23/2017	Carbon tetrachloride	<100	ug/L
5/23/2017	Chlordane (Technical)	<2.5	ug/L
5/23/2017	Chlorobenzene	<100	ug/L
5/23/2017	Chloroform	<100	ug/L
5/23/2017	Cresol	<50	ug/L
5/23/2017	Endrin	<0.50	ug/L
5/23/2017	Heptachlor	<0.25	ug/L
5/23/2017	Heptachlor epoxide	<0.25	ug/L
5/23/2017	Hexachlorobenzene	<50	ug/L
5/23/2017	Hexachlorobutadiene	<50	ug/L
5/23/2017	Hexachloroethane	<50	ug/L
5/23/2017	Methoxychlor	<2.5	ug/L
5/23/2017	Nitrobenzene	<50	ug/L
5/23/2017	Pentachlorophenol	<120	ug/L
5/23/2017	Pyridine	<250	ug/L
5/23/2017	Tetrachloroethene	<100	ug/L
5/23/2017	Toxaphene	<5.0	ug/L
5/23/2017	Trichloroethene	<100	ug/L
5/23/2017	Vinyl chloride	<100	ug/L
5/23/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 1 - Sediment Sample 3

Date	Component	Result	Unit
5/24/2017	Ignitability	>160.0	Deg-F
5/24/2017	Reactive CN	<20	mg/kg
5/24/2017	Reactive Sulfide	<50	mg/kg
5/24/2017	Hg Final	<0.0130	ug/L
5/24/2017	Ag Final	<1.40	ug/L
5/24/2017	As Final	<7.00	ug/L
5/24/2017	Ba Final	1170	ug/L
5/24/2017	Cd Final	22.8	ug/L
5/24/2017	Cr Final	<1.80	ug/L
5/24/2017	Pb Final	6.50	ug/L
5/24/2017	Se Final	<12	ug/L
5/24/2017	pH (leachate)	8.10	S.U.
5/24/2017	2,4,5-TP (Silvex)	<14	ug/L
5/24/2017	2,4,5-Trichlorophenol	<120	ug/L
5/24/2017	2,4,6-Trichlorophenol	<50	ug/L
5/24/2017	2,4-D	<14	ug/L
5/24/2017	2,4-Dinitrotoluene	<50	ug/L
5/24/2017	2-Methylphenol	<50	ug/L
5/24/2017	4-Methylphenol (Includes 3-Methylphenol)	<50	ug/L
5/24/2017	Chlordane (Technical)	<2.5	ug/L
5/24/2017	Cresol	<50	ug/L
5/24/2017	Endrin	<0.50	ug/L
5/24/2017	Heptachlor	<0.25	ug/L
5/24/2017	Heptachlor epoxide	<0.25	ug/L
5/24/2017	Hexachlorobenzene	<50	ug/L
5/24/2017	Hexachlorobutadiene	<50	ug/L
5/24/2017	Hexachloroethane	<50	ug/L
5/24/2017	Methoxychlor	<2.5	ug/L
5/24/2017	Nitrobenzene	<50	ug/L
5/24/2017	Pentachlorophenol	<120	ug/L
5/24/2017	Pyridine	<250	ug/L
5/24/2017	Toxaphene	<5.0	ug/L
5/24/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 2 - Sediment Sample 1

Date	Component	Result	Unit
5/4/2017	Ignitability	>160.0	Deg-F
5/4/2017	Reactive CN	<20	mg/kg
5/4/2017	Reactive Sulfide	<50	mg/kg
5/4/2017	Hg Final	<0.0130	ug/L
5/4/2017	Ag Final	2.40	ug/L
5/4/2017	As Final	<7.00	ug/L
5/4/2017	Ba Final	1620	ug/L
5/4/2017	Cd Final	16.2	ug/L
5/4/2017	Cr Final	4.30	ug/L
5/4/2017	Pb Final	<5.50	ug/L
5/4/2017	Se Final	<12	ug/L
5/4/2017	pH (leachate)	7.70	S.U.
5/4/2017	1,1-Dichloroethene	<100	ug/L
5/4/2017	1,2-Dichloroethane	<100	ug/L
5/4/2017	1,4-Dichlorobenzene	<100	ug/L
5/4/2017	2,4,5-TP (Silvex)	<14	ug/L
5/4/2017	2,4,5-Trichlorophenol	<120	ug/L
5/4/2017	2,4,6-Trichlorophenol	<50	ug/L
5/4/2017	2,4-D	<14	ug/L
5/4/2017	2,4-Dinitrotoluene	<50	ug/L
5/4/2017	2-Butanone	<300	ug/L
5/4/2017	2-Methylphenol	<50	ug/L
5/4/2017	4-Methylphenol (Includes 3-Methylphenol)	<50	ug/L
5/4/2017	Benzene	<100	ug/L
5/4/2017	Carbon tetrachloride	<100	ug/L
5/4/2017	Chlordane (Technical)	<2.5	ug/L
5/4/2017	Chlorobenzene	<100	ug/L
5/4/2017	Chloroform	<100	ug/L
5/4/2017	Cresol	<50	ug/L
5/4/2017	Endrin	<0.50	ug/L
5/4/2017	Heptachlor	<0.25	ug/L
5/4/2017	Heptachlor epoxide	<0.25	ug/L
5/4/2017	Hexachlorobenzene	<50	ug/L
5/4/2017	Hexachlorobutadiene	<50	ug/L
5/4/2017	Hexachloroethane	<50	ug/L
5/4/2017	Methoxychlor	<2.5	ug/L
5/4/2017	Nitrobenzene	<50	ug/L
5/4/2017	Pentachlorophenol	<120	ug/L
5/4/2017	Pyridine	<250	ug/L
5/4/2017	Tetrachloroethene	<100	ug/L
5/4/2017	Toxaphene	<5.0	ug/L
5/4/2017	Trichloroethene	<100	ug/L
5/4/2017	Vinyl chloride	<100	ug/L
5/4/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 2 - Sediment Sample 2

Date	Component	Result	Unit
5/4/2017	Ignitability	>160.0	Deg-F
5/4/2017	Reactive CN	<20	mg/kg
5/4/2017	Reactive Sulfide	<50	mg/kg
5/4/2017	Hg Final	<0.0130	ug/L
5/4/2017	Ag Final	8.40	ug/L
5/4/2017	As Final	18.0	ug/L
5/4/2017	Ba Final	1650	ug/L
5/4/2017	Cd Final	32.0	ug/L
5/4/2017	Cr Final	<1.80	ug/L
5/4/2017	Pb Final	50.0	ug/L
5/4/2017	Se Final	<12	ug/L
5/4/2017	pH (leachate)	7.40	S.U.
5/4/2017	1,1-Dichloroethene	<100	ug/L
5/4/2017	1,2-Dichloroethane	<100	ug/L
5/4/2017	1,4-Dichlorobenzene	<100	ug/L
5/4/2017	2,4,5-TP (Silvex)	<14	ug/L
5/4/2017	2,4,5-Trichlorophenol	<120	ug/L
5/4/2017	2,4,6-Trichlorophenol	<50	ug/L
5/4/2017	2,4-D	<14	ug/L
5/4/2017	2,4-Dinitrotoluene	<50	ug/L
5/4/2017	2-Butanone	<300	ug/L
5/4/2017	2-Methylphenol	<50	ug/L
5/4/2017	4-Methylphenol (Includes 3-Methylphenol)	<50	ug/L
5/4/2017	Benzene	<100	ug/L
5/4/2017	Carbon tetrachloride	<100	ug/L
5/4/2017	Chlordane (Technical)	<2.5	ug/L
5/4/2017	Chlorobenzene	<100	ug/L
5/4/2017	Chloroform	<100	ug/L
5/4/2017	Cresol	<50	ug/L
5/4/2017	Endrin	<0.50	ug/L
5/4/2017	Heptachlor	<0.25	ug/L
5/4/2017	Heptachlor epoxide	<0.25	ug/L
5/4/2017	Hexachlorobenzene	<50	ug/L
5/4/2017	Hexachlorobutadiene	<50	ug/L
5/4/2017	Hexachloroethane	<50	ug/L
5/4/2017	Methoxychlor	<2.5	ug/L
5/4/2017	Nitrobenzene	<50	ug/L
5/4/2017	Pentachlorophenol	<120	ug/L
5/4/2017	Pyridine	<250	ug/L
5/4/2017	Tetrachloroethene	<100	ug/L
5/4/2017	Toxaphene	<5.0	ug/L
5/4/2017	Trichloroethene	<100	ug/L
5/4/2017	Vinyl chloride	<100	ug/L
5/4/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 2 - Sediment Sample 3

Date	Component	Result	Unit
5/5/2017	Ignitability	>160.0	Deg-F
5/5/2017	Reactive CN	<20	mg/kg
5/5/2017	Reactive Sulfide	<50	mg/kg
5/5/2017	Hg Final	<0.0130	ug/L
5/5/2017	Ag Final	<1.40	ug/L
5/5/2017	As Final	<7.00	ug/L
5/5/2017	Ba Final	1370	ug/L
5/5/2017	Cd Final	16.4	ug/L
5/5/2017	Cr Final	4.70	ug/L
5/5/2017	Pb Final	<5.50	ug/L
5/5/2017	Se Final	<12	ug/L
5/5/2017	pH (leachate)	7.60	S.U.
5/5/2017	1,1-Dichloroethene	<100	ug/L
5/5/2017	1,2-Dichloroethane	<100	ug/L
5/5/2017	1,4-Dichlorobenzene	<100	ug/L
5/5/2017	2,4,5-TP (Silvex)	<14	ug/L
5/5/2017	2,4,5-Trichlorophenol	<250	ug/L
5/5/2017	2,4,6-Trichlorophenol	<100	ug/L
5/5/2017	2,4-D	<14	ug/L
5/5/2017	2,4-Dinitrotoluene	<100	ug/L
5/5/2017	2-Butanone	<300	ug/L
5/5/2017	2-Methylphenol	<100	ug/L
5/5/2017	4-Methylphenol (Includes 3-Methylphenol)	<100	ug/L
5/5/2017	Benzene	<100	ug/L
5/5/2017	Carbon tetrachloride	<100	ug/L
5/5/2017	Chlordane (Technical)	<2.5	ug/L
5/5/2017	Chlorobenzene	<100	ug/L
5/5/2017	Chloroform	<100	ug/L
5/5/2017	Cresol	<100	ug/L
5/5/2017	Endrin	<0.50	ug/L
5/5/2017	Heptachlor	<0.25	ug/L
5/5/2017	Heptachlor epoxide	<0.25	ug/L
5/5/2017	Hexachlorobenzene	<100	ug/L
5/5/2017	Hexachlorobutadiene	<100	ug/L
5/5/2017	Hexachloroethane	<100	ug/L
5/5/2017	Methoxychlor	<2.5	ug/L
5/5/2017	Nitrobenzene	<100	ug/L
5/5/2017	Pentachlorophenol	<250	ug/L
5/5/2017	Pyridine	<500	ug/L
5/5/2017	Tetrachloroethene	<100	ug/L
5/5/2017	Toxaphene	<5.0	ug/L
5/5/2017	Trichloroethene	<100	ug/L
5/5/2017	Vinyl chloride	<100	ug/L
5/5/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 2 - Sediment Sample 4

Date	Component	Result	Unit
5/5/2017	Ignitability	>160.0	Deg-F
5/5/2017	Reactive CN	<20	mg/kg
5/5/2017	Reactive Sulfide	<50	mg/kg
5/5/2017	Hg Final	<0.0130	ug/L
5/5/2017	Ag Final	<1.40	ug/L
5/5/2017	As Final	<7.00	ug/L
5/5/2017	Ba Final	1430	ug/L
5/5/2017	Cd Final	15.0	ug/L
5/5/2017	Cr Final	7.60	ug/L
5/5/2017	Pb Final	<5.50	ug/L
5/5/2017	Se Final	<12	ug/L
5/5/2017	pH (leachate)	7.90	S.U.
5/5/2017	1,1-Dichloroethene	<100	ug/L
5/5/2017	1,2-Dichloroethane	<100	ug/L
5/5/2017	1,4-Dichlorobenzene	<100	ug/L
5/5/2017	2,4,5-TP (Silvex)	<14	ug/L
5/5/2017	2,4,5-Trichlorophenol	<250	ug/L
5/5/2017	2,4,6-Trichlorophenol	<100	ug/L
5/5/2017	2,4-D	<14	ug/L
5/5/2017	2,4-Dinitrotoluene	<100	ug/L
5/5/2017	2-Butanone	<300	ug/L
5/5/2017	2-Methylphenol	<100	ug/L
5/5/2017	4-Methylphenol (Includes 3-Methylphenol)	<100	ug/L
5/5/2017	Benzene	<100	ug/L
5/5/2017	Carbon tetrachloride	<100	ug/L
5/5/2017	Chlordane (Technical)	<2.5	ug/L
5/5/2017	Chlorobenzene	<100	ug/L
5/5/2017	Chloroform	<100	ug/L
5/5/2017	Cresol	<100	ug/L
5/5/2017	Endrin	<0.50	ug/L
5/5/2017	Heptachlor	<0.25	ug/L
5/5/2017	Heptachlor epoxide	<0.25	ug/L
5/5/2017	Hexachlorobenzene	<100	ug/L
5/5/2017	Hexachlorobutadiene	<100	ug/L
5/5/2017	Hexachloroethane	<100	ug/L
5/5/2017	Methoxychlor	<2.5	ug/L
5/5/2017	Nitrobenzene	<100	ug/L
5/5/2017	Pentachlorophenol	<250	ug/L
5/5/2017	Pyridine	<500	ug/L
5/5/2017	Tetrachloroethene	<100	ug/L
5/5/2017	Toxaphene	<5.0	ug/L
5/5/2017	Trichloroethene	<100	ug/L
5/5/2017	Vinyl chloride	<100	ug/L
5/5/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 3 - Sediment Sample 1

Date	Component	Result	Unit
4/26/2017	Ignitability	>160.0	Deg-F
4/26/2017	Reactive CN	<21	mg/kg
4/26/2017	Reactive Sulfide	<50	mg/kg
4/26/2017	Hg Final	0.0490	ug/L
4/26/2017	Ag Final	<1.40	ug/L
4/26/2017	As Final	<7.00	ug/L
4/26/2017	Ba Final	892	ug/L
4/26/2017	Cd Final	11.3	ug/L
4/26/2017	Cr Final	2.80	ug/L
4/26/2017	Pb Final	<5.50	ug/L
4/26/2017	Se Final	<12	ug/L
4/26/2017	pH (leachate)	6.50	S.U.
4/26/2017	1,1-Dichloroethene	<100	ug/L
4/26/2017	1,2-Dichloroethane	<100	ug/L
4/26/2017	1,4-Dichlorobenzene	<100	ug/L
4/26/2017	2,4,5-TP (Silvex)	<14	ug/L
4/26/2017	2,4,5-Trichlorophenol	<120	ug/L
4/26/2017	2,4,6-Trichlorophenol	<50	ug/L
4/26/2017	2,4-D	<14	ug/L
4/26/2017	2,4-Dinitrotoluene	<50	ug/L
4/26/2017	2-Butanone	<300	ug/L
4/26/2017	2-Methylphenol	<50	ug/L
4/26/2017	4-Methylphenol (Includes 3-Methylphenol)	<50	ug/L
4/26/2017	Benzene	<100	ug/L
4/26/2017	Carbon tetrachloride	<100	ug/L
4/26/2017	Chlordane (Technical)	<2.5	ug/L
4/26/2017	Chlorobenzene	<100	ug/L
4/26/2017	Chloroform	<100	ug/L
4/26/2017	Cresol	<50	ug/L
4/26/2017	Endrin	<0.50	ug/L
4/26/2017	Heptachlor	<0.25	ug/L
4/26/2017	Heptachlor epoxide	<0.25	ug/L
4/26/2017	Hexachlorobenzene	<50	ug/L
4/26/2017	Hexachlorobutadiene	<50	ug/L
4/26/2017	Hexachloroethane	<50	ug/L
4/26/2017	Methoxychlor	<2.5	ug/L
4/26/2017	Nitrobenzene	<50	ug/L
4/26/2017	Pentachlorophenol	<120	ug/L
4/26/2017	Pyridine	<250	ug/L
4/26/2017	Tetrachloroethene	<100	ug/L
4/26/2017	Toxaphene	<5.0	ug/L
4/26/2017	Trichloroethene	<100	ug/L
4/26/2017	Vinyl chloride	<100	ug/L
4/26/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 3 - Sediment Sample 2

Date	Component	Result	Unit
4/27/2017	Settleable Solids	400.0	mL/L/hr
4/27/2017	Ignitability	>160.0	Deg-F
4/27/2017	Reactive CN	<20	mg/kg
4/27/2017	Reactive Sulfide	<50	mg/kg
4/27/2017	Hg Final	<0.0130	ug/L
4/27/2017	Ag Final	3.90	ug/L
4/27/2017	As Final	<7.00	ug/L
4/27/2017	Ba Final	922	ug/L
4/27/2017	Cd Final	14.0	ug/L
4/27/2017	Cr Final	<1.80	ug/L
4/27/2017	Pb Final	6.10	ug/L
4/27/2017	Se Final	<12	ug/L
4/27/2017	pH (leachate)	7.40	S.U.
4/27/2017	1,1-Dichloroethene	<100	ug/L
4/27/2017	1,2-Dichloroethane	<100	ug/L
4/27/2017	1,4-Dichlorobenzene	<100	ug/L
4/27/2017	2,4,5-TP (Silvex)	<14	ug/L
4/27/2017	2,4,5-Trichlorophenol	<120	ug/L
4/27/2017	2,4,6-Trichlorophenol	<50	ug/L
4/27/2017	2,4-D	<14	ug/L
4/27/2017	2,4-Dinitrotoluene	<50	ug/L
4/27/2017	2-Butanone	<300	ug/L
4/27/2017	2-Methylphenol	<50	ug/L
4/27/2017	4-Methylphenol (Includes 3-Methylphenol)	<50	ug/L
4/27/2017	Benzene	<100	ug/L
4/27/2017	Carbon tetrachloride	<100	ug/L
4/27/2017	Chlordane (Technical)	<2.5	ug/L
4/27/2017	Chlorobenzene	<100	ug/L
4/27/2017	Chloroform	<100	ug/L
4/27/2017	Cresol	<50	ug/L
4/27/2017	Endrin	<0.50	ug/L
4/27/2017	Heptachlor	<0.25	ug/L
4/27/2017	Heptachlor epoxide	<0.25	ug/L
4/27/2017	Hexachlorobenzene	<50	ug/L
4/27/2017	Hexachlorobutadiene	<50	ug/L
4/27/2017	Hexachloroethane	<50	ug/L
4/27/2017	Methoxychlor	<2.5	ug/L
4/27/2017	Nitrobenzene	<50	ug/L
4/27/2017	Pentachlorophenol	<120	ug/L
4/27/2017	Pyridine	<250	ug/L
4/27/2017	Tetrachloroethene	<100	ug/L
4/27/2017	Toxaphene	<5.0	ug/L
4/27/2017	Trichloroethene	<100	ug/L
4/27/2017	Vinyl chloride	<100	ug/L
4/27/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 3 - Sediment Sample 3

Date	Component	Result	Unit
4/28/2017	Ignitability	>160.0	Deg-F
4/28/2017	Reactive CN	<20	mg/kg
4/28/2017	Reactive Sulfide	<50	mg/kg
4/28/2017	Hg Final	<0.0130	ug/L
4/28/2017	Ag Final	<1.40	ug/L
4/28/2017	As Final	10.0	ug/L
4/28/2017	Ba Final	2500	ug/L
4/28/2017	Cd Final	3.50	ug/L
4/28/2017	Cr Final	3.10	ug/L
4/28/2017	Pb Final	40.0	ug/L
4/28/2017	Se Final	<12	ug/L
4/28/2017	pH (leachate)	8.10	S.U.
4/28/2017	1,1-Dichloroethene	<100	ug/L
4/28/2017	1,2-Dichloroethane	<100	ug/L
4/28/2017	1,4-Dichlorobenzene	<100	ug/L
4/28/2017	2,4,5-TP (Silvex)	<14	ug/L
4/28/2017	2,4,5-Trichlorophenol	<120	ug/L
4/28/2017	2,4,6-Trichlorophenol	<50	ug/L
4/28/2017	2,4-D	<14	ug/L
4/28/2017	2,4-Dinitrotoluene	<50	ug/L
4/28/2017	2-Butanone	<300	ug/L
4/28/2017	2-Methylphenol	<50	ug/L
4/28/2017	4-Methylphenol (Includes 3-Methylphenol)	<50	ug/L
4/28/2017	Benzene	<100	ug/L
4/28/2017	Carbon tetrachloride	<100	ug/L
4/28/2017	Chlordane (Technical)	<2.5	ug/L
4/28/2017	Chlorobenzene	<100	ug/L
4/28/2017	Chloroform	<100	ug/L
4/28/2017	Cresol	<50	ug/L
4/28/2017	Endrin	<0.50	ug/L
4/28/2017	Heptachlor	<0.25	ug/L
4/28/2017	Heptachlor epoxide	<0.25	ug/L
4/28/2017	Hexachlorobenzene	<50	ug/L
4/28/2017	Hexachlorobutadiene	<50	ug/L
4/28/2017	Hexachloroethane	<50	ug/L
4/28/2017	Methoxychlor	<2.5	ug/L
4/28/2017	Nitrobenzene	<50	ug/L
4/28/2017	Pentachlorophenol	<120	ug/L
4/28/2017	Pyridine	<250	ug/L
4/28/2017	Tetrachloroethene	<100	ug/L
4/28/2017	Toxaphene	<5.0	ug/L
4/28/2017	Trichloroethene	<100	ug/L
4/28/2017	Vinyl chloride	<100	ug/L
4/28/2017	gamma-BHC (Lindane)	<0.25	ug/L

Norumbega Covered Storage Tank - Cell 3 - Sediment Sample 4

Date	Component	Result	Unit
5/1/2017	Settleable Solids	245.0	mL/L/hr
5/1/2017	Settleable Solids	500.0	mL/L/hr
5/1/2017	Ignitability	>160.0	Deg-F
5/1/2017	Reactive CN	<20	mg/kg
5/1/2017	Reactive Sulfide	<50	mg/kg
5/1/2017	Hg Final	<0.0130	ug/L
5/1/2017	Ag Final	1.50	ug/L
5/1/2017	As Final	<7.00	ug/L
5/1/2017	Ba Final	1070	ug/L
5/1/2017	Cd Final	15.0	ug/L
5/1/2017	Cr Final	<1.80	ug/L
5/1/2017	Pb Final	<5.50	ug/L
5/1/2017	Se Final	<12	ug/L
5/1/2017	pH (leachate)	7.60	S.U.
5/1/2017	1,1-Dichloroethene	<100	ug/L
5/1/2017	1,2-Dichloroethane	<100	ug/L
5/1/2017	1,4-Dichlorobenzene	<100	ug/L
5/1/2017	2,4,5-TP (Silvex)	<14	ug/L
5/1/2017	2,4,5-Trichlorophenol	<120	ug/L
5/1/2017	2,4,6-Trichlorophenol	<50	ug/L
5/1/2017	2,4-D	<14	ug/L
5/1/2017	2,4-Dinitrotoluene	<50	ug/L
5/1/2017	2-Butanone	<300	ug/L
5/1/2017	2-Methylphenol	<50	ug/L
5/1/2017	4-Methylphenol (Includes 3-Methylphenol)	<50	ug/L
5/1/2017	Benzene	<100	ug/L
5/1/2017	Carbon tetrachloride	<100	ug/L
5/1/2017	Chlordane (Technical)	<2.5	ug/L
5/1/2017	Chlorobenzene	<100	ug/L
5/1/2017	Chloroform	<100	ug/L
5/1/2017	Cresol	<50	ug/L
5/1/2017	Endrin	<0.50	ug/L
5/1/2017	Heptachlor	<0.25	ug/L
5/1/2017	Heptachlor epoxide	<0.25	ug/L
5/1/2017	Hexachlorobenzene	<50	ug/L
5/1/2017	Hexachlorobutadiene	<50	ug/L
5/1/2017	Hexachloroethane	<50	ug/L
5/1/2017	Methoxychlor	<2.5	ug/L
5/1/2017	Nitrobenzene	<50	ug/L
5/1/2017	Pentachlorophenol	<120	ug/L
5/1/2017	Pyridine	<250	ug/L
5/1/2017	Tetrachloroethene	<100	ug/L
5/1/2017	Toxaphene	<5.0	ug/L
5/1/2017	Trichloroethene	<100	ug/L
5/1/2017	Vinyl chloride	<100	ug/L
5/1/2017	gamma-BHC (Lindane)	<0.25	ug/L