89 Crawford Street
Leominster, Massachusetts 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

October 26, 2021

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP RGP Applications Coordinator
5 Post Office Square, Suite 100 (OEP06-4)
Boston, Massachusetts 02109-3912

Reference: **Notice of Intent (NOI) - Remediation General Permit (RGP)**
Temporary Construction Dewatering for Site Redevelopment
57-105 Coolidge Avenue
Watertown, Massachusetts 02472

Dear Sir/Madam:

On behalf of ARE-MA Region 77, LLC c/o CR Watertown Member LLC, as Manager (Client), Lockwood Remediation Technologies, LLC (LRT) has prepared this Notice of Intent (NOI) requesting a determination of coverage under the United States Environmental Protection Agency's (EPA's) Remediation General Permit (RGP), pursuant EPA's National Pollutant Discharge Elimination System (NPDES) program. This NOI was prepared in accordance with the general requirements of the NPDES RGP and related guidance documentation provided by EPA. The completed NOI Form is provided in **Appendix A**.

Site Information

This NOI has been prepared for the management groundwater that will be generated during dewatering activities for the construction of a 6-story building with a 6-story structured-parking garage connected by a pedestrian footbridge. The project is to take place across three parcels that comprise approximately 6.3 acres located on Coolidge Avenue in Watertown, Massachusetts (the Site). The Site is currently improved by the former Mount Auburn Club (MAC) fitness center, tennis courts and paved surface parking lots. The Site is bounded by Coolidge Avenue and Sawins Pond to the north, a hot mix asphalt batching facility to the west, wetlands to the south, and residential buildings to the east. The work is anticipated to be completed within twelve months. A Site Locus is provided as **Figure 1** and a Site Plan satisfying the requirements of RGP Appendix IV Part I.B and I.D is provided as **Figure 2**.

Work Summary

The work includes excavation proposed building foundations, landscaping, utilities, and stormwater systems will require excavations of soil of up to 25 feet below ground surface (bgs). Groundwater is anticipated to be encountered at approximately 7 to 18 feet bgs. For deeper excavations, dewatering will be required to maintain a dry and stable excavation. Groundwater that flows into the excavations during

construction activities that requires dewatering and cannot be discharged back into the ground will be treated prior to discharge to an existing storm drain such that the discharged effluent meets the effluent limitations established by NPDES Part 2.1 and Appendix V of the RGP Application. **Figure 3** includes a schematic of the proposed dewatering treatment system.

On July 29, 2021, Sanborn Head & Associates, the project's environmental consultant, collected samples to characterize the receiving and source waters in support of this NOI. The source water samples were collected from existing groundwater monitoring wells SH-1 and SH-GP-3W, which are representative of Site groundwater conditions. The receiving water was collected from Sawins Brook adjacent to the proposed outfall discharge location.

Discharge and Receiving Surface Water Information

A summary of the analytical results is provided in **Tables 1 and 2** included within **Appendix A**, and copies of the laboratory data reports are provided in **Appendix D**. Concentrations of Cadmium, Iron, VOCs, and SVOCs were detected in groundwater at concentrations above the respective NPDES RGP Effluent Limitations. To meet these standards, Source water will undergo treatment that includes bag filtration with carbon filtration, ion exchange, chemical aided settling and pH adjustment as needed prior to discharge. Details of the water treatment system are provided below.

Water Treatment System

A water treatment system schematic is provided as **Figure 3**. Cutsheets of the system components, product information and Safety Data Sheets (SDS) are included in **Appendix G**.

Source water will be pumped to a treatment system with a designed flow of up to 200 gallons per minute (gpm); the average effluent flow of the system is estimated to be 150 gpm, and the maximum flow will not exceed 200 gpm. Source water will enter one 18,000-gallon weir tank at the head of the system. From the weir tank, water will be pumped to a double multi-bag filter skid (with two multi-bag filters) discharge from the bag filters will be pumped through a flow meter/totalizer prior to discharge to storm sewer with a final outfall in the Sawins Brook. There will be contingency plans for Carbon, Ion Exchange Resin, chemical aided settling and pH adjustment to be implemented necessary to meet effluent limitations. The discharge location to the storm sewer system is located on Coolidge Avenue (Discharge Location 1) or existing drain manhole in the southern edge on property (location 2) as depicted on **Figure 2**. Effluent sampling will correspond with this discharge location.

Chemical and Additive Information

Based on groundwater samples collected from the site and in efforts to meet the expected effluent limitations, the following chemicals and additives have been proposed as contingency items for the treatment system: pH adjustment (sulfuric acid or sodium hydroxide), chemical aided settling system through coagulants/flocculants. Product names, chemical formulas, manufacturer information and Chemical Abstract Services (CAS) registry numbers have been provided on Safety Data Sheets (SDSs) included in **Appendix G**.

The pH adjustment system includes an automated feed system with a mix tank, chemical feed pumps and setpoint controls that maintain the pH to within discharge permit parameters. The maximum application concentration for sulfuric acid or sodium hydroxide would be 333 mg/L. The chemical aided settling system will be added in two parts, the coagulant (LRT-E-50) will be injected into the influent stream prior to entering the frac tanks while the flocculant (LRT-823) will be added directly into the frac tanks. The coagulant and flocculant continually dose as dewatering activities occur at the maximum dosage rate of 25 parts per million (ppm). Although dosage rate for the coagulant and flocculant will be 25ppm, the detected concentration in the post bag filter (carryover) has been recorded in the parts per trillion (ppt) range, (about 6 order of magnitude less than the dosing concentration). This is because nearly all the chemical becomes incorporated in the sludge and removed from the waste stream as solids from the frac and weir tanks.

The addition of pH conditioners and chemical aided settling system chemicals will 1) Not add any pollutant in concentrations which exceed permit effluent limitations; 2) Not result in the exceedance of any applicable water quality standard; and 3) Not add any pollutants that would justify the application of permit conditions that different from or absent in this permit. The addition of sulfuric acid or sodium hydroxide to control pH is a standard treatment for temporary construction dewatering and is not expected to exceed applicable permit limitations and water quality standards or alter conditions in the receiving water. No additional testing is considered necessary for use of this product or to demonstrate that use of this product will not adversely affect the receiving water.

Consultation with Federal Services

LRT reviewed online electronic data viewers and databases from the Massachusetts Geographical Information System (MassGIS), the Massachusetts Division of Fisheries and Wildlife (MassWildlife; Natural Heritage and Endangered Species Program), and the U.S. National Parks Service Natural Historic Places (NPS). Based on this review, the Site and the point where the proposed discharge reaches the receiving surface water body are not located within an Area of Critical Environmental Concern (ACEC). The Site and the proposed discharge point are not located within Habitats of Rare Wetland Wildlife, Habitats of Rare Species, Estimated Habitats of Rare Wildlife, or listed as a National Historic Place. Documentation is included in **Appendix E** and **Appendix F**.

Coverage under NPDES RGP

It is our opinion that the proposed discharge is eligible for coverage under the NPDES RGP. On behalf of ARE-MA Region 77, LLC c/o CR Watertown Member LLC, as Manager we are requesting coverage under the NPDES RGP for the discharge of treated wastewater to Sawins Brook in support of construction remediation dewatering activities that are to take place at 57-105 Coolidge Avenue.

The enclosed NOI form provides required information on the general site conditions, discharge, treatment system, receiving water, and consultation with federal services. For this project, the J. Derenzo Company is considered the Operator and has operational control over the construction plans and specifications, including the ability to make modifications to those plans and specifications.

Please feel free to contact us at 774-450-7177 if you have any questions or if you require additional information.

Sincerely,
Lockwood Remediation Technologies, LLC

Carlo Lombardo

Carlo Lombardo
Staff Scientist

Kim Gravelle

Kim Gravelle, P.G.
Senior Project Manager

Encl: Figure 1 - Locus Plan
Figure 2 - Site Plan
Figure 3 - Water Treatment System Schematic
Appendix A - NOI Form
Appendix B – Site Assessment Map
Appendix C – Calculations and Correspondence for the Dilution Factor
Appendix D – Laboratory Data
Appendix E – Correspondence with Federal Services
Appendix F – Historic Properties Information
Appendix G – Water Treatment System Cutsheets and SDSs

cc: Cathy Vakalopoulos – Mass DEP
Ted Tye – ARE-MA Region 77, LLC c/o National Development
Tom Perry – J. Derenzo Company
Kevin Stetson – Sanborn Head & Associates
M. Shuman – Watertown Public Works Department

TABLES

Table 1
Summary of Groundwater Analytical Data
57-105 Coolidge Avenue
Watertown, MA

	NPDES TBEL	NPDES WQBEL	Units	EFF	SH-1	SH-GP-3W
				7/29/2021	7/29/2021	7/29/2021
General Chemistry						
Hardness, Total	NS	NS	µg/L	**230000**	**340000**	**370000**
Hardness, Dissolved	NS	NS	µg/L	-	**330000**	**370000**
Total Suspended Solids	30	30	mg/L	<5	**25**	**41**
Chloride	Monitor Only	Monitor Only	µg/L	**500000**	**860000**	**530000**
Chlorine, Total Residual	200	11	µg/L	<50	<50	<50
Cyanide	178	0.0052 (Compliance Level = 0.005 mg/L)	µg/L	<20	<20	<20
pH	NS	NS	SU	**7.28**	**6.86**	**7.04**
Ammonia	Monitor Only	Monitor Only	µg/L	**220**	<50	**2900**
Chromium III	323	74	µg/L	<10	<10	<10
Chromium VI, Dissolved	NS	NS	µg/L	<10	<10	<10
Chromium VI, Total	NS	NS	µg/L	<10	<10	<10
Microextractables						
Dibromo-3-chloropropane (1,2-) (DBCP)	NS	NS	µg/L	<0.02	<0.02	<0.02
Dibromoethane (1,2-) (Ethylene Dibromide)	0.05	0.05	µg/L	<0.02	<0.02	<0.02
Total Metals						
Antimony, Total	206	640	µg/L	<0.5	**5.5**	**0.51**
Arsenic, Total	104	10	µg/L	**0.92**	**2.8**	**1.8**
Cadmium, Total	10.2	0.25	µg/L	<0.5	**5.7**	<0.5
Chromium, Total	NS	NS	µg/L	<0.5	**7.6**	**0.63**
Copper, Total	242	9	µg/L	**3.5**	**85**	**1.2**
Iron, Total	5000	1000	µg/L	**1600**	**5800**	**28000**
Lead, Total	160	2.5	µg/L	**2.2**	**160**	**0.84**
Mercury, Total			µg/L	<0.2	<0.2	<0.2
Nickel, Total	1450	52	µg/L	**1.7**	**8.1**	**1.9**
Selenium, Total	235.8	5	µg/L	**0.6**	<0.5	<0.5
Silver, Total	35.1	3.2	µg/L	<0.5	<0.5	<0.5
Zinc, Total	420	120	µg/L	**20**	**930**	**200**
Dissolved Metals						
Antimony, Dissolved	206	640	µg/L	-	**1.3**	<0.5
Arsenic, Dissolved	104	10	µg/L	-	<0.5	**1.8**
Cadmium, Dissolved	10.2	0.25	µg/L	-	**2.9**	<0.5
Chromium, Dissolved	NS	NS	µg/L	-	<0.5	<0.5
Copper, Dissolved	242	9	µg/L	-	**1.8**	<0.5
Iron, Dissolved	5000	1000	µg/L	-	<50	**28000**
Lead, Dissolved	160	2.5	µg/L	-	**3.7**	<0.5
Nickel, Dissolved	1450	52	µg/L	-	**1.9**	**1.9**
Selenium, Dissolved	235.8	5	µg/L	-	<0.5	<0.5
Silver, Dissolved	35.1	3.2	µg/L	-	<0.5	<0.5
Zinc, Dissolved	420	120	µg/L	-	**310**	**160**
Total Petroleum Hydrocarbons						
TPH	5.0	5.0	µg/L	<5000	<5000	<5000
Polychlorinated Biphenyls						
Aroclor 1016	See "Total PCBs"		µg/L	<0.2	<0.2	<0.2
Aroclor 1221	See "Total PCBs"		µg/L	<0.2	<0.2	<0.2
Aroclor 1232	See "Total PCBs"		µg/L	<0.2	<0.2	<0.2
Aroclor 1242	See "Total PCBs"		µg/L	<0.2	<0.2	<0.2
Aroclor 1248	See "Total PCBs"		µg/L	<0.2	<0.2	<0.2
Aroclor 1254	See "Total PCBs"		µg/L	<0.2	<0.2	<0.2
Aroclor 1260	See "Total PCBs"		µg/L	<0.2	<0.2	<0.2
Aroclor 1262	NS	NS	µg/L	<0.2	<0.2	<0.2
Aroclor 1268	NS	NS	µg/L	<0.2	<0.2	<0.2
Total PCBs	0.000064 (Compliance Level = 0.5 µg/L)		µg/L	ND	ND	ND
Volatile Organic Compounds						
Acetone	7970	7970	µg/L	<10	<10	**150**
Acrolein	NS	NS	µg/L	<50	<50	<50
Acrylonitrile	NS	NS	µg/L	<50	<50	<50
Benzene	5.0 See "Total BTEX"		µg/L	<1	<1	**810**
Bromodichloromethane	NS	NS	µg/L	<0.5	<0.5	<0.5
Bromoform	NS	NS	µg/L	<2	<2	<2
Bromomethane	NS	NS	µg/L	<2	<2	<2
Butanone (2-) (MEK)	NS	NS	µg/L	<10	<10	**66**
Carbon tetrachloride	4.4	1.6	µg/L	<1	<1	<1
Chlorobenzene (Monochlorobenzene)	NS	NS	µg/L	<1	<1	<1
Chloroethane	NS	NS	µg/L	<2	<2	**330**
Chloroethylvinyl ether (2-)	NS	NS	µg/L	<2	<2	<2

Table 1
Summary of Groundwater Analytical Data
57-105 Coolidge Avenue
Watertown, MA

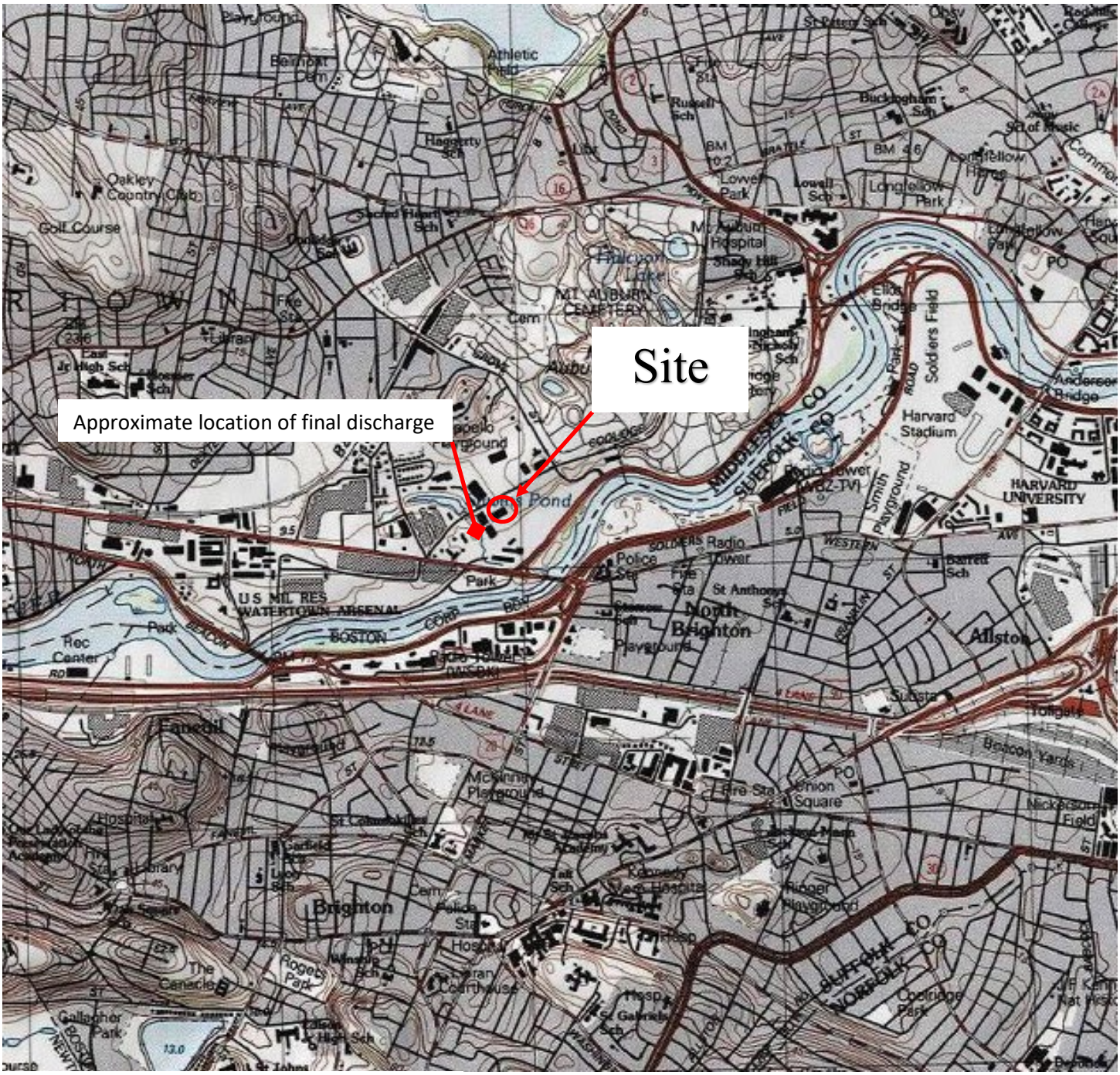
	NPDES TBEL	NPDES WQBEL	Units	EFF	SH-1	SH-GP-3W
				7/29/2021	7/29/2021	7/29/2021
General Chemistry						
Chloroform (Trichloromethane)	NS	NS	µg/L	<1	<1	<1
Chloromethane	NS	NS	µg/L	<2	<2	<2
Dibromochloromethane	NS	NS	µg/L	<1	<1	<1
Dichlorobenzene (1,2-)	600		µg/L	<1	<1	<1
Dichlorobenzene (1,3-)	320		µg/L	<1	<1	<1
Dichlorobenzene (1,4-)	5		µg/L	<1	<1	<1
Dichloroethane (1,1-)	70		µg/L	<1	<1	**210**
Dichloroethane (1,2-)	5		µg/L	<1	<1	<1
Dichloroethene (1,1-)	3.2		µg/L	<0.5	<0.5	**0.84**
Dichloroethene (cis-1,2-)	70		µg/L	<1	<1	**15**
Dichloroethene (trans-1,2-)	NS	NS	µg/L	<1	<1	<1
Dichloropropane (1,2-)	NS	NS	µg/L	<1	<1	<1
Dichloropropene (cis-1,3-)	NS	NS	µg/L	<0.5	<0.5	<0.5
Dichloropropene (trans-1,3-)	NS	NS	µg/L	<0.5	<0.5	<0.5
Dioxane (1,4-)	200		µg/L	<10	<10	<10
Ethanol	Monitor Only	Monitor Only	µg/L	<400	<400	< 8000
Ethylbenzene	See "Total BTEX"		µg/L	<1	<1	**810**
Hexanone (2-)	NS	NS	µg/L	<10	<10	<10
Methyl-2-pentanone (4-) (MIBK)	NS	NS	µg/L	<10	<10	**46**
Methylene Chloride (Dichloromethane)	4.6		µg/L	<1	<1	**140**
Methyl-tert Butyl Ether (MTBE)	70	20	µg/L	<1	<1	<1
Styrene	NS	NS	µg/L	<1	<1	<1
Tert Amyl Methyl Ether (TAME)	90		µg/L	<2	<2	<2
Tert Butyl Alcohol (TBA) (tert-Butanol)	120		µg/L	<30	<30	<30
Tetrachloroethane (1,1,2,2-)	NS	NS	µg/L	<1	<1	<1
Tetrachloroethene (PCE)	5	3.3	µg/L	<1	<1	**1.1**
Toluene	See "Total BTEX"		µg/L	<1	<1	**1500**
Trichloroethane (1,1,1-)	200		µg/L	<1	<1	**140**
Trichloroethane (1,1,2-)	5.0		µg/L	<1	<1	<1
Trichloroethene (TCE)	5.0		µg/L	<1	<1	**2.8**
Trichlorofluoromethane (CFC11)	NS	NS	µg/L	<2	<2	<2
Vinyl acetate	NS	NS	µg/L	<10	<10	<10
Vinyl chloride	2.0		µg/L	<1	<1	**8.2**
Xylene (m,p-)	See "Total BTEX"		µg/L	<1	<1	**3700**
Xylene (o-)	See "Total BTEX"		µg/L	<1	<1	**820**
Total BTEX	100		µg/L	ND	ND	**6830**
Semi-Volatile Organic Compounds						
Acenaphthene	See "Total Group 2 PAHs"		µg/L	<1	<1	<1
Acenaphthylene	See "Total Group 2 PAHs"		µg/L	<1	<1	<1
Acetophenone	NS	NS	µg/L	<10	<10	<10
Aniline	NS	NS	µg/L	<1	<1	**5**
Anthracene	See "Total Group 2 PAHs"		µg/L	<1	<1	<1
Azobenzene	NS	NS	µg/L	<1	<1	<1
Benzidine	NS	NS	µg/L	<5	<5	<5
Benzo(a)anthracene	See "Total Group 1 PAHs"	0.0038	µg/L	<1	<1	<1
Benzo(a)pyrene	See "Total Group 1 PAHs"	0.0038	µg/L	<1	<1	<1
Benzo(b)fluoranthene	See "Total Group 1 PAHs"	0.0038	µg/L	<1	<1	<1
Benzo(g,h,i)perylene	See "Total Group 2 PAHs"		µg/L	<1	<1	<1
Benzo(k)fluoranthene	See "Total Group 1 PAHs"	0.0038	µg/L	<1	<1	<1
Benzoic acid	NS	NS	µg/L	<50	<50	<50
Benzyl Alcohol	NS	NS	µg/L	<10	<10	<10
bis(2-Chloroethoxy)methane	NS	NS	µg/L	<1	<1	<1
bis(2-Chloroethyl)ether	NS	NS	µg/L	<1	<1	<1
bis(2-Chloroisopropyl)ether	NS	NS	µg/L	<1	<1	<1
bis(2-Ethylhexyl)phthalate (Di(ethylhexyl)phthalate)	101 See "Total Phthalates"	2.2 See "Total Phthalates"	µg/L	<5	<5	<5
Bromophenyl-phenylether (4-)	NS	NS	µg/L	<1	<1	<1
Butylbenzylphthalate	See "Total Phthalates"	See "Total Phthalates"	µg/L	<5	<5	<5
Carbazole	NS	NS	µg/L	<1	<1	**1**
Chloro-3-methylphenol (4-)	NS	NS	µg/L	<1	<1	<1
Chloroaniline (4-)	NS	NS	µg/L	<1	<1	<1
Chloronaphthalene (2-)	NS	NS	µg/L	<1	<1	<1
Chlorophenol (2-)	NS	NS	µg/L	<1	<1	<1
Chlorophenyl-phenylether (4-)	NS	NS	µg/L	<1	<1	<1
Chrysene	See "Total Group 1 PAHs"	0.0038	µg/L	<1	<1	<1
Decane (n-)	NS	NS	µg/L	<5	<5	<5
Dibenz(a,h)anthracene	See "Total Group 1 PAHs"	0.0038	µg/L	<1	<1	<1
Dibenzofuran	NS	NS	µg/L	<1	<1	<1

Table 1
Summary of Groundwater Analytical Data
57-105 Coolidge Avenue
Watertown, MA

	NPDES TBEL	NPDES WQBEL	Units	EFF	SH-1	SH-GP-3W
				7/29/2021	7/29/2021	7/29/2021
General Chemistry						
Dichloroaniline (2,3-)	NS	NS	µg/L	<1	<1	<1
Dichlorobenzene (1,2-)	600	600	µg/L	<1	<1	<1
Dichlorobenzene (1,3-)	320	320	µg/L	<1	<1	<1
Dichlorobenzene (1,4-)	5	5	µg/L	<1	<1	<1
Dichlorobenzidine (3,3'-)	NS	NS	µg/L	<1	<1	<1
Dichlorophenol (2,4-)	NS	NS	µg/L	<1	<1	<1
Diethylphthalate	See "Total Phthalates"	See "Total Phthalates"	µg/L	<5	<5	<5
Dimethylphenol (2,4-)	NS	NS	µg/L	<5	<5	**26**
Dimethylphthalate	See "Total Phthalates"	See "Total Phthalates"	µg/L	<1	<1	<1
Di-n-butylphthalate (Dibutylphthalate)	See "Total Phthalates"	See "Total Phthalates"	µg/L	<5	<5	<5
Dinitro-2-methylphenol (4,6-)	NS	NS	µg/L	<5	<5	<5
Dinitrophenol (2,4-)	NS	NS	µg/L	<10	<10	<10
Dinitrotoluene (2,4-)	NS	NS	µg/L	<2	<2	<2
Dinitrotoluene (2,6-)	NS	NS	µg/L	<2	<2	<2
Di-n-octylphthalate	See "Total Phthalates"	See "Total Phthalates"	µg/L	<5	<5	<5
Fluoranthene	See "Total Group 2 PAHs"		µg/L	<1	<1	<1
Fluorene	See "Total Group 2 PAHs"		µg/L	<1	<1	<1
Hexachlorobenzene	NS	NS	µg/L	<1	<1	<1
Hexachlorobutadiene	NS	NS	µg/L	<1	<1	<1
Hexachlorocyclopentadiene	NS	NS	µg/L	<5	<5	<5
Hexachloroethane	NS	NS	µg/L	<1	<1	<1
Indeno(1,2,3-cd)pyrene	See "Total Group 1 PAHs"	0.0038	µg/L	<1	<1	<1
Isophorone	NS	NS	µg/L	<1	<1	<1
Methylnaphthalene (1-)	NS	NS	µg/L	<1	<1	**4**
Methylnaphthalene (2-)	NS	NS	µg/L	<1	<1	**4.9**
Methylphenol (2-)	NS	NS	µg/L	<1	<1	**5.2**
Methylphenol (3,4-)	NS	NS	µg/L	<1	<1	**34**
Naphthalene	20 See "Total Group 2 PAHs"	20 See "Total Group 2 PAHs"	µg/L	<1	<1	**55**
Nitroaniline (2-)	NS	NS	µg/L	<5	<5	<5
Nitroaniline (3-)	NS	NS	µg/L	<5	<5	<5
Nitroaniline (4-)	NS	NS	µg/L	<5	<5	<5
Nitrobenzene	NS	NS	µg/L	<1	<1	<1
Nitrophenol (2-)	NS	NS	µg/L	<5	<5	<5
Nitrophenol (4-)	NS	NS	µg/L	<5	<5	<5
Nitrosodimethylamine (N-)	NS	NS	µg/L	<1	<1	<1
Nitroso-di-n-propylamine (N-)	NS	NS	µg/L	<0.5	<0.5	<0.5
Nitrosodiphenylamine (N-)	NS	NS	µg/L	<1	<1	<1
Octadecane (n-)	NS	NS	µg/L	<5	<5	<5
Pentachlorophenol	1	1	µg/L	<5	<5	<5
Phenanthrene	See "Total Group 2 PAHs"	See "Total Group 2 PAHs"	µg/L	<1	<1	<1
Phenol	1080	300	µg/L	<1	<1	**14**
Pyrene	See "Total Group 2 PAHs"	See "Total Group 2 PAHs"	µg/L	<1	<1	<1
Pyridine	NS	NS	µg/L	<5	<5	<5
Terpineol (alpha-)	NS	NS	µg/L	<5	<5	<5
Trichlorobenzene (1,2,4-)	NS	NS	µg/L	<1	<1	<1
Trichlorophenol (2,4,5-)	NS	NS	µg/L	<1	<1	<1
Trichlorophenol (2,4,6-)	NS	NS	µg/L	<1	<1	<1
Total Group 1 PAHs	1.0	As Individual PAHs	µg/L	ND	ND	ND
Total Group 2 PAHs	100		µg/L	ND	ND	**55**
Total Phthalates	190	NS	µg/L	ND	ND	ND

1. Samples were collected by Sanborn, Head & Associates, Inc. (Sanborn Head) on the indicated dates and were analyzed by Alpha Analytical Laboratories, Inc. of Westborough, MA.
2. Bolded values indicate detections above the laboratory reporting limits.
3. Abbreviations:
NPDES = National Pollutant Discharge Elimination System
TBEL = Technology based effluent limitation
WQBEL = Water quality based effluent limitation
MCP = Massachusetts Continentcy Plan
ug/L = micrograms per liter
mg/L = milligrams per liter
< indicates the analyte was not detected above the laboratory reporting limit shown
BDL = below detection limit
NS = No Standard

FIGURES



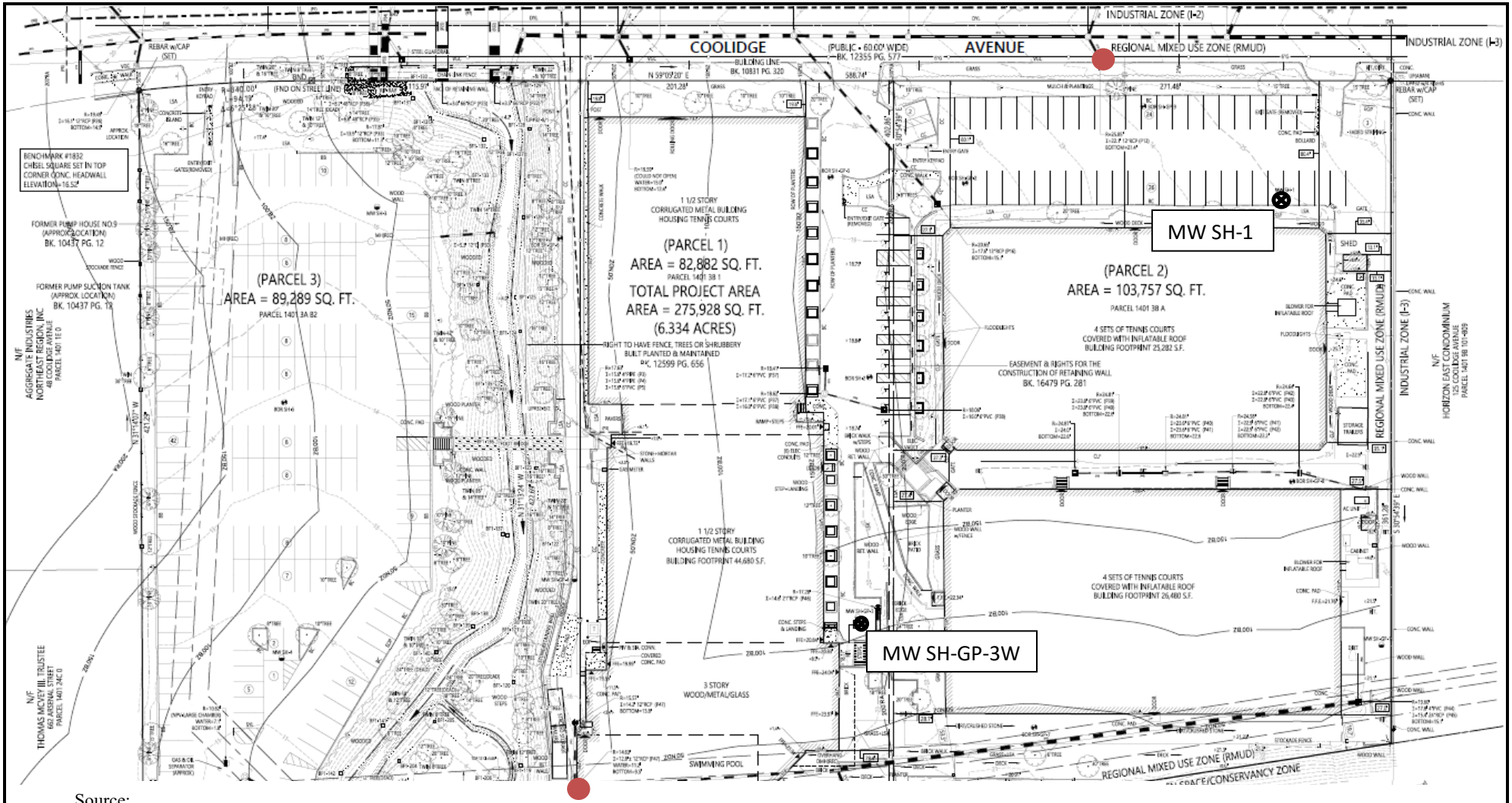
Source: ArcGIS Map Viewer

Notes:

1. Figure is not to scale.

89 Crawford Street
Leominster, Massachusetts 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

Figure 1 – Locus Plan
57-105 Coolidge Ave.
Watertown, MA



Source:

Notes

1. Figure is not to scale.

Key

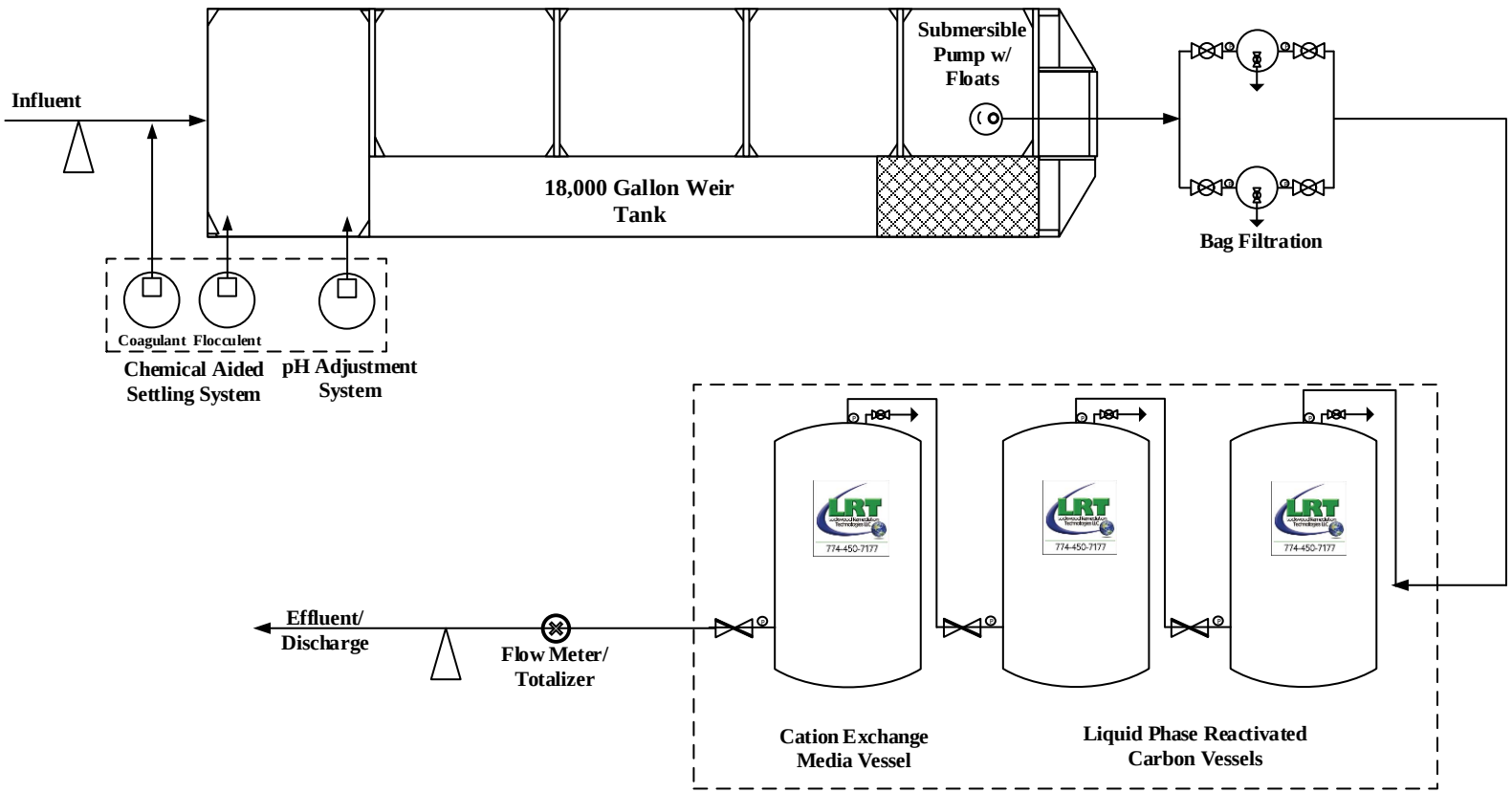
Monitoring Well ⊗

Discharge Location ●

Lockwood Remediation Technologies LLC

89 Crawford Street
Leominster, Massachusetts 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

Figure 2 –Site Plan
57-105 Coolidge Ave
Watertown, MA



Key:

- Piping/Hose
- Sample Port
- Ball Valve
- Butterfly Valve
- Pressure Gauge
- Contingency

Notes:

1.) Figure is not to scale
2.) System rated for 200 GPM

LRT Lockwood Remediation Technologies LLC	Lockwood Remediation Technologies, LLC 89 Crawford Street Leominster, MA 01453 Office: 774-450-7177 **DESIGNED BY:** LRT **DRAWN BY: CPL** **CHECKED BY:** **DATE: 10/4/2021**	**Water Treatment System Schematic**	57-105 Coolidge Ave. Watertown, MA	PROJECT No. 2-2281	FIGURE No. 3

APPENDIX A

NOTICE OF INTENT FORM

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:
99 Coolidge Ave</td><td colspan="3">Site address: 57-105 Coolidge Ave
Street:</td></tr>
<tr><td>City: Watertown</td><td>State: MA</td><td>Zip: 02472</td></tr>
<tr><td rowspan="3">2. Site owner
ARE-MA Region 77, LLC
c/o National Development

Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Ted Tye</td></tr>
<tr><td colspan="2">Telephone: (617)-559-5050</td><td>Email: tye@natdev.com</td></tr>
<tr><td colspan="3">Mailing address: 2310 Washington Street
Street:
City: Newton Lower Falls | State: MA | Zip: 02642</td></tr>
<tr><td rowspan="3">3. Site operator, if different than owner
J. Derenzo Company</td><td colspan="3">Contact Person: Tom Perry</td></tr>
<tr><td colspan="2">Telephone: (508)-989-5615</td><td>Email: tperry@jderenzo.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 338 Howard Street
City: Brockton | State: MA | Zip: 02302</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:
NA

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):
3-36538, 3-36539, and 3-36540
☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:
☐ CERCLA
☐ UIC Program
☐ 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):
Sawins Brook	MA72-32	NA

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

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

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. See Appendix B

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.	0.036 MGD
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.	1.125

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: 10/14/2021

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

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: ☐ Other; if so, specify:

2. Source water contaminants: TSS, Chloride, Cyanide, Ammonia, Antimony, Arsenic, Cadmium, Chromium III, Copper, Iron, Lead, Nickel, Zinc, VOCs, Total BTEX, Group 2 PAHs, SVOCs	
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): Sawins Brook	Outfall location(s): (Latitude, Longitude) 42.362999 N, -71.150849 W
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Municipal Storm System ☐ 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: 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): December 2021 - November 2022 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	

<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="4">☐ 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		✔	2	TM NH3	50	2,900	1,463	Report mg/L	---
Chloride		✔	2	300	5000	860,000	695,000	Report µg/l	---
Total Residual Chlorine	✔		2	4500-Cl-G	50	ND	ND	0.2 mg/L	11
Total Suspended Solids		✔	2	2540D	5000	41,000	33,000	30 mg/L	---
Antimony		✔	2	200.8	0.5	5.5	3.0	206 µg/L	640
Arsenic		✔	2	200.8	0.5	2.8	2.3	104 µg/L	10
Cadmium		✔	2	200.8	0.1	5.7	3.0	10.2 µg/L	3.4542
Chromium III		✔	2	200.8	0.5	7.6	4.1	323 µg/L	1438.7
Chromium VI	✔		2	7196A	10	ND	ND	323 µg/L	11.4
Copper		✔	2	200.8	0.1	85	43.1	242 µg/L	176
Iron		✔	2	200.8	50	28,000	16,900	5,000 µg/L	1000
Lead		✔	2	200.8	0.1	160	80.4	160 µg/L	252.89
Mercury	✔		2	7470/245.1	0.2	ND	ND	0.739 µg/L	0.91
Nickel		✔	2	200.8	0.1	8.1	5	1,450 µg/L	955.5
Selenium	✔		2	200.8	0.5	ND	ND	235.8 µg/L	5.0
Silver	✔		2	200.8	0.1	ND	ND	35.1 µg/L	1398.1
Zinc		✔	2	200.8	1	930	565	420 µg/L	2204.6
Cyanide	✔		2	D7511-09	50	ND	ND	178 mg/L	5.2
B. Non-Halogenated VOCs									
Total BTEX		✔	2	624	1	6,830	3,415	100 µg/L	---
Benzene		✔	2	624	1	810	405	5.0 µg/L	---
1,4 Dioxane	✔		2	624	10	ND	ND	200 µg/L	---
Acetone		✔	2	624	10	150	77.5	7.97 mg/L	---
Phenol		✔	2	625	1	14	7.3	1,080 µg/L	300

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	✔		2	624	1	ND	ND	4.4 µg/L	1.6
1,2 Dichlorobenzene	✔		2	624	1	ND	ND	600 µg/L	---
1,3 Dichlorobenzene	✔		2	624	1	ND	ND	320 µg/L	---
1,4 Dichlorobenzene	✔		2	624	1	ND	ND	5.0 µg/L	---
Total dichlorobenzene	✔		2	624	1	ND	ND	763 µg/L in NH	---
1,1 Dichloroethane		✔	2	624	1	210	105	70 µg/L	---
1,2 Dichloroethane	✔		2	624	1	ND	ND	5.0 µg/L	---
1,1 Dichloroethylene		✔	2	624	0.5	0.84	0.55	3.2 µg/L	---
Ethylene Dibromide	✔		2	8011/504	0.02	ND	ND	0.05 µg/L	---
Methylene Chloride		✔	2	624	1	140	70	4.6 µg/L	---
1,1,1 Trichloroethane		✔	2	624	1	140	70	200 µg/L	---
1,1,2 Trichloroethane	✔		2	624	1	ND	ND	5.0 µg/L	---
Trichloroethylene		✔	2	624	1	2.8	1.7	5.0 µg/L	---
Tetrachloroethylene		✔	2	624	1	1.1	0.8	5.0 µg/L	3.3
cis-1,2 Dichloroethylene		✔	2	624	1	15	7.8	70 µg/L	---
Vinyl Chloride		✔	2	624	1	8.2	4.4	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✔		2	625	5	ND	ND	190 µg/L	--
Diethylhexyl phthalate	✔		2	625	5	ND	ND	101 µg/L	2.2
Total Group I PAHs	✔		2	625	1	ND	ND	1.0 µg/L	---
Benzo(a)anthracene	✔		2	625	1	ND	ND	As Total PAHs	0.0038
Benzo(a)pyrene	✔		2	625	1	ND	ND		0.0038
Benzo(b)fluoranthene	✔		2	625	1	ND	ND		0.0038
Benzo(k)fluoranthene	✔		2	625	1	ND	ND		0.0038
Chrysene	✔		2	625	1	ND	ND		0.0038
Dibenzo(a,h)anthracene	✔		2	625	1	ND	ND		0.0038
Indeno(1,2,3-cd)pyrene	✔		2	625	1	ND	ND		0.0038

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		✔	2	625	1	55	27.5	100 µg/L	---
Naphthalene	✔		2	625	1	55	27.5	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✔		2	608.3	0.2	ND	ND	0.000064 µg/L	---
Pentachlorophenol	✔		2	625	5	ND	ND	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✔		2	1664B	5000	ND	ND	5.0 mg/L	---
Ethanol	✔		2	8260C	400	ND	ND	Report mg/L	---
Methyl-tert-Butyl Ether	✔		2	624	1	ND	ND	70 µg/L	20
tert-Butyl Alcohol	✔		2	624	30	ND	ND	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		2	624	2	ND	ND	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:									
pH			2	field		7.04 SU			
Temperature			2	field		3.5 C			
Hardness			2	200.8		370000			

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:

Bag Filtration. Contingent items include: Carbon Treatment, Ion Exchange Resin, Chemical Aided Settling and pH Adjustment

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

Source water will be pumped to a treatment system with a designed flow of up to 200 gallons per minute (gpm); the average effluent flow of the system is estimated to be 150 gpm, and the maximum flow will not exceed 200 gpm. Source water will enter one 18,000 gallon weir tank at the head of the system. From the weir tank, water will be pumped to a multi-bag filter skid. From the bag filters will be pumped through a flow meter/totalizer prior to discharge to storm sewer with a final outfall in the Sawins Brook. Contingency treatment items include: Liquid Phase Carbon, Ion Exchange, Chemical Aided Settling and pH adjustment to be implemented as necessary.

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: As needed: Liquid Activated Carbon, Ion Exchange Resin, Cjemical Aided Settling and pH adjustment

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: Bag Filtration Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	200
Provide the proposed maximum effluent flow in gpm.	200
Provide the average effluent flow in gpm.	150
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	N/A

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

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:
Contingent pH adjustment and chemical aided settling

2. Provide the following information for each chemical/additive, using attachments, if necessary:
Sulfuric acid or Sodium Hydroxide; LRT E-50 coagulant/LRT 9911 flocculant. See attachments for further information.
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?
(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

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

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.

Please see attached appendices and supplemental information.

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

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

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 developed and implemented upon initiation of discharge.	
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: 	Date: 10/26/2021
Print Name and Title: THOMAS G PERRY, PROJECT MANAGER	

APPENDIX B

MASSACHUSETTS CATEGORY 5 WATERS AND SITE ASSESSMENT MAP

MassDEP - Bureau of Waste Site Cleanup

Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

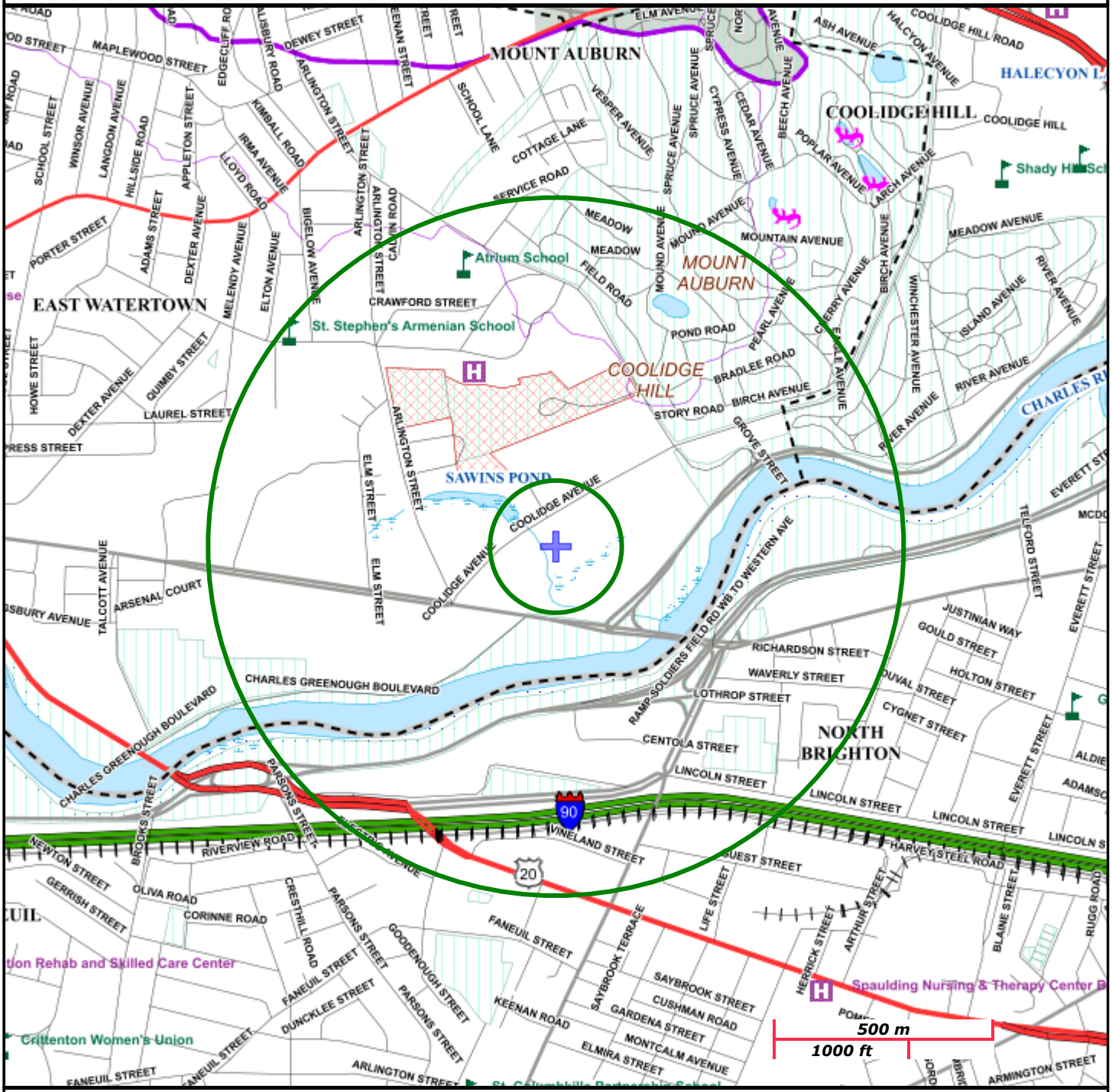
Site Information:

99 COOLIDGE AVE WATERTOWN, MA

NAD83 UTM Meters:
4692387mN , 322905mE (Zone: 19)
September 10, 2021

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.

Category 4a waters listed alphabetically by major watershed
"TMDL is completed"

Water Body	Segment ID	Description	Size	Units	Pollutants Addressed By TMDL	EPA TMDL No.
Rosemary Brook	MA72-25	Headwaters, outlet Rosemary Lake, Needham to mouth at confluence with the Charles River, Wellesley.	3.30	Miles	Dissolved Oxygen	40317
					Phosphorus, Total	40317
South Meadow Brook	MA72-24	From emergence west of Parker Street, Newton to mouth at confluence with the Charles River, Newton (three culverted portions totaling approximately 2870 feet (0.54mile)).	1.70	Miles	(Bottom Deposits*)	
					(Debris*)	
					(Physical substrate habitat alterations*)	
					(Trash*)	
					Dissolved Oxygen	40317
					Escherichia Coli (E. Coli)	32377
					Phosphorus, Total	40317
					Turbidity	40317
Uncas Pond	MA72122	Franklin.	17.00	Acres	(Non-Native Aquatic Plants*)	
					Dissolved Oxygen	40319
Unnamed Tributary	MA72-32	Locally known as "Sawins Brook" - emerges east of Elm Street, Watertown to mouth at confluence with the Charles River, Watertown (one culverted portion approximately 360 feet (0.07mile)).	0.50	Miles	Escherichia Coli (E. Coli)	32382
Chicopee						
Lake Lashaway	MA36079	North Brookfield/East Brookfield.	274.00	Acres	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Long Pond	MA36083	Springfield.	14.00	Acres	Nutrient/Eutrophication Biological Indicators	722
Minechoag Pond	MA36093	Ludlow.	21.00	Acres	Nutrient/Eutrophication Biological Indicators	3629
Mona Lake	MA36094	Springfield.	11.00	Acres	Nutrient/Eutrophication Biological Indicators	3630
Pottapaug Pond	MA36125	Petersham/Hardwick.	568.00	Acres	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Quabbin Reservoir	MA36129	Petersham/Pelham/Ware/Hardwick/Shutesbury/Belchertown /New Salem.	24012	Acres	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Quacumquasit Pond	MA36131	Brookfield/East Brookfield/Sturbridge.	223.00	Acres	(Eurasian Water Milfoil, Myriophyllum spicatum*)	
					(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Spectacle Pond	MA36142	Wilbraham.	9.00	Acres	Nutrient/Eutrophication Biological Indicators	3631
Sugden Reservoir	MA36150	Spencer.	85.00	Acres	Nutrient/Eutrophication Biological Indicators	3633
Wickaboag Pond	MA36166	West Brookfield.	316.00	Acres	Turbidity	1332
Concord (SuAsCo)						
Ashland Reservoir	MA82003	Ashland.	168.00	Acres	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	42396

APPENDIX C

DILUTION CALCULATIONS

DILUTION CALCULATIONS
57-105 Coolidge Avenue
Watertown, MA

Calculate Dilution Factor (DF) for project based on 7 Day 10 Year (7Q10) Low Flow values

Calculate DF based on EPA formula $(Q_S + Q_D)/Q_D$, where Q_S is 7Q10 in million gallons per day (MGD) and Q_D is discharge flow in MGD

ASSUMPTIONS FOR 150 GPM SYSTEM
7Q10 is 0.176 cubic feet per second (cfs) - from StreamStats 4.6.1
A conversion of 7.48 is used to convert cubic feet to gallons
A design flow rate of 150 gallons per minute (gpm) is assumed

CALCULATIONS
7q10 Low Flow Value (Q_S)

$$Q_S = \frac{0.0558 ft^3}{sec} \times \frac{7.48 \text{ gallons}}{ft^3} \times \frac{86{,}400 \text{ sec}}{day} \times \frac{1 \text{ MG}}{1{,}000{,}000 \text{ gallons}} = 0.036 \text{ MGD}$$

Discharge Flow Rate (Q_D)

$$Q_D = \frac{200 \text{ gallons}}{min} \times \frac{1{,}440 \text{ min}}{day} \times \frac{1MG}{1{,}000{,}000 \text{ gallons}} = 0.288 \text{ MGD}$$

Dilution Factor (DF)

$$DF = \frac{Q_S + Q_D}{Q_D} = \frac{0.036 \text{ MGD} + 0.288 \text{ MDG}}{0.288 \text{ MGD}} = 1.125$$

From: Ruan, Xiaodan (DEP)
To: Carlo Lombardo
Cc: Kim Gravelle; Vakalopoulos, Catherine (DEP)
Subject: RE: Streamstats and Dilution Factor Verification
Date: Thursday, October 14, 2021 6:57:19 AM
Attachments: image001.png

Hi Carlo,

The 7Q10 of 0.0558 cfs (0.036 MGD) and the dilution factor calculation of 1.125 using a design flow of 200 gpm (0.288 MGD) for the proposed discharge to the unnamed tributary to Charles River is correct.

Here is water quality information to assist you with filling out the NOI:

> Waterbody and ID: Unnamed tributary, Locally known as "Sawins Brook" (MA72-32), within Charles River Watershed
> Classification: B, Warm water fishery
> Outstanding Resource Water?: No
> State's most recent Integrated List is located here: https://www.epa.gov/sites/production/files/2020-01/documents/2016-ma-303d-list-report.pdf, search for "MA72-32" to see the causes of impairments.
> TMDLs: There is one approved TMDL (pathogens) for this segment.

As you may know, if this is not a *current* MCP site, then in addition to submitting the NOI to EPA, you need to apply with MassDEP and submit a $500 fee (unless fee exempt, e.g., municipality) using ePLACE. Instructions on how to apply are located here: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent and information on how to get ePLACE technical assistance is available on the ePLACE Portal webpage: https://eplace.eea.mass.gov/citizenaccess/.

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
(857)-256-4172
xiaodan.ruan@mass.gov

From: Carlo Lombardo <CLombardo@lrt-llc.net>
Sent: Wednesday, October 13, 2021 9:21 AM
To: Keohane, Kathleen (DEP) <kathleen.keohane@state.ma.us>; Ruan, Xiaodan (DEP) <xiaodan.ruan@mass.gov>
Cc: Kim Gravelle <kgravelle@lrt-llc.net>

Subject: RE: Streamstats and Dilution Factor Verification

Good Morning,

Is there any update on verification and approval of our dilution calculations?

Thank you,

Carlo Lombardo
Staff Scientist

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453
C: 860-481-0701
O: 774-450-7177
F: 888-835-0617
clombardo@lrt-llc.net

From: Carlo Lombardo
Sent: Wednesday, October 6, 2021 9:34 AM
To: Keohane, Kathleen (DEP) <kathleen.keohane@state.ma.us>; xiaodan.ruan@state.ma.us
Cc: Kim Gravelle <kgravelle@lrt-llc.net>
Subject: RE: Streamstats and Dilution Factor Verification

Good Morning,

Upon review of the paperwork for this proposal I have realized our client used the wrong flow rate for their calculations. I have attached a corrected set of calculations to this email. I have also re-attached the streamstats documentation for redundancy. Please verify these corrected figures at your earliest convenience.

Thank you,

Carlo Lombardo
Staff Scientist

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453
C: 860-481-0701
O: 774-450-7177
F: 888-835-0617
clombardo@lrt-llc.net

From: Carlo Lombardo
Sent: Thursday, September 30, 2021 2:26 PM
To: Keohane, Kathleen (DEP) <kathleen.keohane@state.ma.us>; xiaodan.ruan@state.ma.us
Cc: Kim Gravelle <kgravelle@lrt-llc.net>
Subject: Streamstats and Dilution Factor Verification

Good Afternoon,

Attached are our calculations and documentation for a proposed discharge to MA72-32. Could you please verify our calculations at your earliest convenience?

Thank you,

Carlo Lombardo
Staff Scientist

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453
C: 860-481-0701
O: 774-450-7177
F: 888-835-0617
clombardo@lrt-llc.net

APPENDIX D

ANALYTICAL DATA REPORT

Eastern Analytical, Inc.
professional laboratory and drilling services

Matt Heil
Sanborn, Head & Associates, Inc. (BOS)
98 N. Washington Street, Suite 101
Boston , MA 02114

Laboratory Report for:

Eastern Analytical, Inc. ID: 229852
Client Identification: 99 Coolidge | 4788.01
Date Received: 7/29/2021

Enclosed are the analytical results per the Chain of Custody for sample(s) in the referenced project. All analyses were performed in accordance with our QA/QC Program, NELAP and other applicable state requirements. All quality control criteria was within acceptance criteria unless noted on the report pages. Results are for the exclusive use of the client named on this report and will not be released to a third party without consent.

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the written approval of the laboratory.

The following standard abbreviations and conventions apply to all EAI reports:
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Certifications:
Eastern Analytical, Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012), New York (12072), West Virginia (9910C) and Alabama (41620). Please refer to our website at www.easternanalytical.com for a copy of our certificates and accredited parameters.

References:
- EPA 600/4-79-020, 1983
- Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd edition or noted revision year.
- Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- Hach Water Analysis Handbook, 4th edition, 1992

If you have any questions regarding the results contained within, please feel free to contact customer service. Unless otherwise requested, we will dispose of the sample(s) 6 weeks from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 8.17.21 Date | 33 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Temperature upon receipt (°C): 3.5 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date/Time Sampled		Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
229852.01	SH-GP-3W	7/29/21	7/29/21	9:25	aqueous		Adheres to Sample Acceptance Policy
229852.02	SH-1	7/29/21	7/29/21	11:30	aqueous		Adheres to Sample Acceptance Policy
229852.03	EFF	7/29/21	7/29/21	12:45	aqueous		Adheres to Sample Acceptance Policy

All results contained in this report relate only to the above listed samples.

Unless otherwise noted:

- *Hold times, preservation, container types, and sample conditions adhered to EPA Protocol.*
- *Solid samples are reported on a dry weight basis, unless otherwise noted. pH/Corrosivity, Flashpoint, Ignitability, Paint Filter, Conductivity and Specific Gravity are always reported on an "as received" basis.*
- *Analysis of pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite were performed at the laboratory outside of the recommended 15 minute hold time.*
- *Samples collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures.*

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID:	SH-GP-3W	SH-1	EFF
Lab Sample ID:	229852.01	229852.02	229852.03
Matrix:	aqueous	aqueous	aqueous
Date Sampled:	7/29/21	7/29/21	7/29/21
Date Received:	7/29/21	7/29/21	7/29/21
Units:	ug/L	ug/L	ug/L
Date of Analysis:	7/30/21	7/30/21	7/30/21
Analyst:	JAK	JAK	JAK
Method:	624.1	624.1	624.1
Dilution Factor:	1	1	1
Chloromethane	< 2	< 2	< 2
Vinyl chloride	**8.2**	< 1	< 1
Bromomethane	< 2	< 2	< 2
Chloroethane	**330**	< 2	< 2
Trichlorofluoromethane	< 2	< 2	< 2
Acrolein	< 50	< 50	< 50
Acetone	**150**	< 10	< 10
1,1-Dichloroethene	**0.84**	< 0.5	< 0.5
tert-Butyl Alcohol (TBA)	< 30	< 30	< 30
Methylene chloride	**140**	< 1	< 1
Acrylonitrile	< 50	< 50	< 50
Methyl-t-butyl ether(MTBE)	< 1	< 1	< 1
tert-amyl methyl ether(TAME)	< 2	< 2	< 2
trans-1,2-Dichloroethene	< 1	< 1	< 1
Vinyl acetate	< 10	< 10	< 10
1,1-Dichloroethane	**210**	< 1	< 1
cis-1,2-Dichloroethene	**15**	< 1	< 1
2-Butanone(MEK)	**66**	< 10	< 10
Chloroform	< 1	< 1	< 1
1,1,1-Trichloroethane	**140**	< 1	< 1
Carbon tetrachloride	< 1	< 1	< 1
Benzene	**810**	< 1	< 1
1,2-Dichloroethane	< 1	< 1	< 1
Trichloroethene	**2.8**	< 1	< 1
1,2-Dichloropropane	< 1	< 1	< 1
Bromodichloromethane	< 0.5	< 0.5	< 0.5
2-Chloroethylvinylether	< 2	< 2	< 2
1,4-Dioxane	< 10	< 10	< 10
4-Methyl-2-pentanone(MIBK)	**46**	< 10	< 10
cis-1,3-Dichloropropene	< 0.5	< 0.5	< 0.5
Toluene	**1500**	< 1	< 1
trans-1,3-Dichloropropene	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	< 1	< 1	< 1
2-Hexanone	< 10	< 10	< 10
Tetrachloroethene	**1.1**	< 1	< 1
Dibromochloromethane	< 1	< 1	< 1
Chlorobenzene	< 1	< 1	< 1
Ethylbenzene	**810**	< 1	< 1
mp-Xylene	**3700**	< 1	< 1
o-Xylene	**820**	< 1	< 1
Styrene	< 1	< 1	< 1
Bromoform	< 2	< 2	< 2
1,1,2,2-Tetrachloroethane	< 1	< 1	< 1
1,3-Dichlorobenzene	< 1	< 1	< 1
1,4-Dichlorobenzene	< 1	< 1	< 1
1,2-Dichlorobenzene	< 1	< 1	< 1

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID:	SH-GP-3W	SH-1	EFF
Lab Sample ID:	229852.01	229852.02	229852.03
Matrix:	aqueous	aqueous	aqueous
Date Sampled:	7/29/21	7/29/21	7/29/21
Date Received:	7/29/21	7/29/21	7/29/21
Units:	ug/L	ug/L	ug/L
Date of Analysis:	7/30/21	7/30/21	7/30/21
Analyst:	JAK	JAK	JAK
Method:	624.1	624.1	624.1
Dilution Factor:	1	1	1
4-Bromofluorobenzene (surr)	**104 %R**	**98 %R**	**101 %R**
1,2-Dichlorobenzene-d4 (surr)	**100 %R**	**98 %R**	**98 %R**
Toluene-d8 (surr)	**101 %R**	**100 %R**	**99 %R**

Deviations from the Report:

SH-GP-3W Parameter: Chloroethane, Benzene, Toluene, Ethylbenzene, mp-Xylene, o-Xylene Date of Analysis: 8/5/2021

Dilution Factor: 10

QC REPORT

EAI ID#: **6376324**

Client:

Batch ID:

Client Designation:

Parameter Name	Blank (RL)	Blank (MDL)	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
Chloromethane	< 2	< .876	27 (136 %R)	25 (126 %R) (7 RPD)	7/30/2021	ug/L	1 - 205	60	624.1
Vinyl chloride	< 1	< .34	27 (137 %R)	26 (129 %R) (6 RPD)	7/30/2021	ug/L	5 - 195	66	624.1
Bromomethane	< 2	< .554	26 (128 %R)	25 (127 %R) (1 RPD)	7/30/2021	ug/L	15 - 185	61	624.1
Chloroethane	< 2	< .232	25 (124 %R)	23 (117 %R) (5 RPD)	7/30/2021	ug/L	40 - 160	78	624.1
Trichlorofluoromethane	< 2	< .375	24 (118 %R)	23 (113 %R) (5 RPD)	7/30/2021	ug/L	50 - 150	84	624.1
Acrolein	< 50	< .548	< 50 (102 %R)	< 50 (100 %R) (1 RPD)	7/30/2021	ug/L	60 - 140	60	624.1
Acetone	< 10	< 2.387	17 (85 %R)	16 (82 %R) (3 RPD)	7/30/2021	ug/L	40 - 160	20	624.1
1,1-Dichloroethene	< 0.5	< .37	21 (103 %R)	20 (98 %R) (5 RPD)	7/30/2021	ug/L	50 - 150	32	624.1
tert-Butyl Alcohol (TBA)	< 30	< 5.259	110 (111 %R)	110 (108 %R) (2 RPD)	7/30/2021	ug/L	70 - 130	20	624.1
Methylene chloride	< 1	< .545	20 (98 %R)	19 (95 %R) (4 RPD)	7/30/2021	ug/L	60 - 140	28	624.1
Acrylonitrile	< 50	< .302	< 50 (99 %R)	< 50 (97 %R) (2 RPD)	7/30/2021	ug/L	60 - 140	60	624.1
Methyl-t-butyl ether(MTBE)	< 1	< .519	20 (100 %R)	20 (98 %R) (2 RPD)	7/30/2021	ug/L	70 - 130	20	624.1
tert-amyl methyl ether(TAME)	< 2	< .225	21 (104 %R)	20 (101 %R) (3 RPD)	7/30/2021	ug/L	70 - 130	20	624.1
trans-1,2-Dichloroethene	< 1	< .298	21 (107 %R)	20 (102 %R) (5 RPD)	7/30/2021	ug/L	70 - 130	45	624.1
Vinyl acetate	< 10	< .557	22 (108 %R)	21 (107 %R) (1 RPD)	7/30/2021	ug/L	40 - 160	20	624.1
1,1-Dichloroethane	< 1	< .085	21 (106 %R)	20 (101 %R) (4 RPD)	7/30/2021	ug/L	70 - 130	40	624.1
cis-1,2-Dichloroethene	< 1	< .238	21 (106 %R)	20 (102 %R) (4 RPD)	7/30/2021	ug/L	70 - 130	20	624.1
2-Butanone(MEK)	< 10	< .206	19 (94 %R)	18 (92 %R) (3 RPD)	7/30/2021	ug/L	40 - 160	20	624.1
Chloroform	< 1	< .36	21 (106 %R)	20 (102 %R) (3 RPD)	7/30/2021	ug/L	70 - 135	54	624.1
1,1,1-Trichloroethane	< 1	< .227	22 (110 %R)	21 (107 %R) (4 RPD)	7/30/2021	ug/L	70 - 130	36	624.1
Carbon tetrachloride	< 1	< .261	22 (111 %R)	21 (106 %R) (4 RPD)	7/30/2021	ug/L	70 - 130	41	624.1
Benzene	< 1	< .312	21 (107 %R)	21 (103 %R) (4 RPD)	7/30/2021	ug/L	65 - 135	61	624.1
1,2-Dichloroethane	< 1	< .21	21 (105 %R)	20 (101 %R) (4 RPD)	7/30/2021	ug/L	70 - 130	49	624.1
Trichloroethene	< 1	< .359	22 (109 %R)	21 (104 %R) (5 RPD)	7/30/2021	ug/L	65 - 135	48	624.1
1,2-Dichloropropane	< 1	< .285	22 (108 %R)	21 (103 %R) (4 RPD)	7/30/2021	ug/L	35 - 165	55	624.1
Bromodichloromethane	< 0.5	< .079	22 (111 %R)	22 (108 %R) (3 RPD)	7/30/2021	ug/L	65 - 135	56	624.1
2-Chloroethylvinylether	< 2	< .493	22 (111 %R)	22 (108 %R) (3 RPD)	7/30/2021	ug/L	1 - 225	71	624.1
1,4-Dioxane	< 10	< 10	< 10 (113 %R)	< 10 (111 %R) (2 RPD)	7/30/2021	ug/L	40 - 160	20	624.1
4-Methyl-2-pentanone(MIBK)	< 10	< .411	19 (96 %R)	19 (94 %R) (3 RPD)	7/30/2021	ug/L	40 - 160	20	624.1
cis-1,3-Dichloropropene	< 0.5	< .101	22 (111 %R)	21 (106 %R) (4 RPD)	7/30/2021	ug/L	25 - 175	58	624.1
Toluene	< 1	< .19	21 (104 %R)	21 (103 %R) (1 RPD)	7/30/2021	ug/L	70 - 130	41	624.1
trans-1,3-Dichloropropene	< 0.5	< .08	22 (112 %R)	22 (110 %R) (2 RPD)	7/30/2021	ug/L	50 - 150	86	624.1
1,1,2-Trichloroethane	< 1	< .203	21 (103 %R)	20 (102 %R) (1 RPD)	7/30/2021	ug/L	70 - 130	45	624.1
2-Hexanone	< 10	< .28	18 (92 %R)	18 (91 %R) (1 RPD)	7/30/2021	ug/L	40 - 160	20	624.1
Tetrachloroethene	< 1	< .371	21 (104 %R)	20 (102 %R) (2 RPD)	7/30/2021	ug/L	70 - 130	39	624.1
Dibromochloromethane	< 1	< .225	20 (98 %R)	19 (97 %R) (1 RPD)	7/30/2021	ug/L	70 - 135	50	624.1
Chlorobenzene	< 1	< .247	21 (105 %R)	21 (103 %R) (2 RPD)	7/30/2021	ug/L	65 - 135	53	624.1
Ethylbenzene	< 1	< .213	22 (108 %R)	21 (105 %R) (2 RPD)	7/30/2021	ug/L	60 - 140	63	624.1
mp-Xylene	< 1	< .476	43 (107 %R)	41 (104 %R) (3 RPD)	7/30/2021	ug/L	70 - 130	20	624.1
o-Xylene	< 1	< .298	22 (109 %R)	21 (106 %R) (3 RPD)	7/30/2021	ug/L	70 - 130	20	624.1
Styrene	< 1	< .727	21 (103 %R)	20 (102 %R) (2 RPD)	7/30/2021	ug/L	70 - 130	20	624.1
Bromoform	< 2	< .282	20 (100 %R)	20 (98 %R) (2 RPD)	7/30/2021	ug/L	70 - 130	42	624.1
1,1,2,2-Tetrachloroethane	< 1	< .381	20 (101 %R)	20 (101 %R) (0 RPD)	7/30/2021	ug/L	60 - 140	61	624.1
1,3-Dichlorobenzene	< 1	< .426	21 (105 %R)	21 (105 %R) (0 RPD)	7/30/2021	ug/L	70 - 130	43	624.1
1,4-Dichlorobenzene	< 1	< .375	21 (105 %R)	21 (104 %R) (1 RPD)	7/30/2021	ug/L	65 - 135	57	624.1
1,2-Dichlorobenzene	< 1	< .218	21 (105 %R)	21 (105 %R) (0 RPD)	7/30/2021	ug/L	65 - 135	57	624.1

QC REPORT

EAI ID#: **6376324**

Client:

Batch ID:

Client Designation:

Parameter Name	Blank (RL)	Blank (MDL)	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
4-Bromofluorobenzene (surr)	101 %R		102 %R	100 %R	7/30/2021	% Rec	70 - 130		624.1
1,2-Dichlorobenzene-d4 (surr)	99 %R		101 %R	100 %R	7/30/2021	% Rec	70 - 130		624.1
Toluene-d8 (surr)	98 %R		97 %R	98 %R	7/30/2021	% Rec	70 - 130		624.1

*/! Flagged analyte recoveries deviated from the QA/QC limits. Data that impacts sample results are noted on the sample report.

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID:	SH-GP-3W	SH-1	EFF
Lab Sample ID:	229852.01	229852.02	229852.03
Matrix:	aqueous	aqueous	aqueous
Date Sampled:	7/29/21	7/29/21	7/29/21
Date Received:	7/29/21	7/29/21	7/29/21
Units:	ug/L	ug/L	ug/L
Date of Extraction/Prep:	7/30/21	7/30/21	7/30/21
Date of Analysis:	7/30/21	7/30/21	7/30/21
Analyst:	JMR	JMR	JMR
Method:	625.1	625.1	625.1
Dilution Factor:	1	1	1
alpha-Terpineol	< 5	< 5	< 5
Phenol	**14**	< 1	< 1
2-Chlorophenol	< 1	< 1	< 1
2,4-Dichlorophenol	< 1	< 1	< 1
2,4,5-Trichlorophenol	< 1	< 1	< 1
2,4,6-Trichlorophenol	< 1	< 1	< 1
Pentachlorophenol	< 5	< 5	< 5
2-Nitrophenol	< 5	< 5	< 5
4-Nitrophenol	< 5	< 5	< 5
2,4-Dinitrophenol	< 10	< 10	< 10
2-Methylphenol	**5.2**	< 1	< 1
3/4-Methylphenol	**34**	< 1	< 1
2,4-Dimethylphenol	**26**	< 5	< 5
4-Chloro-3-methylphenol	< 1	< 1	< 1
4,6-Dinitro-2-methylphenol	< 5	< 5	< 5
Benzoic Acid	< 50	< 50	< 50
N-Nitrosodimethylamine	< 1	< 1	< 1
n-Nitroso-di-n-propylamine	< 0.5	< 0.5	< 0.5
n-Nitrosodiphenylamine	< 1	< 1	< 1
bis(2-Chloroethyl)ether	< 1	< 1	< 1
bis(2-chloroisopropyl)ether	< 1	< 1	< 1
bis(2-Chloroethoxy)methane	< 1	< 1	< 1
1,3-Dichlorobenzene	< 1	< 1	< 1
Acetophenone	< 10	< 10	< 10
1,4-Dichlorobenzene	< 1	< 1	< 1
1,2-Dichlorobenzene	< 1	< 1	< 1
1,2,4-Trichlorobenzene	< 1	< 1	< 1
2-Chloronaphthalene	< 1	< 1	< 1
4-Chlorophenyl-phenylether	< 1	< 1	< 1
4-Bromophenyl-phenylether	< 1	< 1	< 1
Hexachloroethane	< 1	< 1	< 1
Hexachlorobutadiene	< 1	< 1	< 1
Hexachlorocyclopentadiene	< 5	< 5	< 5
Hexachlorobenzene	< 1	< 1	< 1
4-Chloroaniline	< 1	< 1	< 1
2,3-Dichloroaniline	< 1	< 1	< 1
2-Nitroaniline	< 5	< 5	< 5
3-Nitroaniline	< 5	< 5	< 5
4-Nitroaniline	< 5	< 5	< 5
Aniline	**5**	< 1	< 1
Benzyl alcohol	< 10	< 10	< 10
Nitrobenzene	< 1	< 1	< 1
Isophorone	< 1	< 1	< 1
2,4-Dinitrotoluene	< 2	< 2	< 2
2,6-Dinitrotoluene	< 2	< 2	< 2
Benzidine (estimated)	< 5	< 5	< 5
3,3'-Dichlorobenzidine	< 1	< 1	< 1

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID:	SH-GP-3W	SH-1	EFF
Lab Sample ID:	229852.01	229852.02	229852.03
Matrix:	aqueous	aqueous	aqueous
Date Sampled:	7/29/21	7/29/21	7/29/21
Date Received:	7/29/21	7/29/21	7/29/21
Units:	ug/L	ug/L	ug/L
Date of Extraction/Prep:	7/30/21	7/30/21	7/30/21
Date of Analysis:	7/30/21	7/30/21	7/30/21
Analyst:	JMR	JMR	JMR
Method:	625.1	625.1	625.1
Dilution Factor:	1	1	1
Pyridine	< 5	< 5	< 5
Azobenzene	< 1	< 1	< 1
Carbazole	**1**	< 1	< 1
Dimethylphthalate	< 1	< 1	< 1
Diethylphthalate	< 5	< 5	< 5
Di-n-butylphthalate	< 5	< 5	< 5
Butylbenzylphthalate	< 5	< 5	< 5
bis(2-Ethylhexyl)phthalate	< 5	< 5	< 5
Di-n-octylphthalate	< 5	< 5	< 5
Dibenzofuran	< 1	< 1	< 1
Naphthalene	**55**	< 1	< 1
2-Methylnaphthalene	**4.9**	< 1	< 1
1-Methylnaphthalene	**4**	< 1	< 1
Acenaphthylene	< 1	< 1	< 1
Acenaphthene	< 1	< 1	< 1
Fluorene	< 1	< 1	< 1
Phenanthrene	< 1	< 1	< 1
Anthracene	< 1	< 1	< 1
Fluoranthene	< 1	< 1	< 1
Pyrene	< 1	< 1	< 1
Benzo[a]anthracene	< 1	< 1	< 1
Chrysene	< 1	< 1	< 1
Benzo[b]fluoranthene	< 1	< 1	< 1
Benzo[k]fluoranthene	< 1	< 1	< 1
Benzo[a]pyrene	< 1	< 1	< 1
Indeno[1,2,3-cd]pyrene	< 1	< 1	< 1
Dibenz[a,h]anthracene	< 1	< 1	< 1
Benzo[g,h,i]perylene	< 1	< 1	< 1
n-Decane	< 5	< 5	< 5
n-Octadecane	< 5	< 5	< 5
2-Fluorophenol (surr)	**22 %R**	**39 %R**	**38 %R**
Phenol-d6 (surr)	**26 %R**	**29 %R**	**28 %R**
2,4,6-Tribromophenol (surr)	**77 %R**	**82 %R**	**79 %R**
Nitrobenzene-D5 (surr)	**67 %R**	**73 %R**	**72 %R**
2-Fluorobiphenyl (surr)	**72 %R**	**78 %R**	**76 %R**
p-Terphenyl-D14 (surr)	**73 %R**	**81 %R**	**79 %R**

QC REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Batch ID: 637631-43091/A072921E6251

Client Designation: **99 Coolidge | 4788.01**

Parameter Name	Blank (RL)	Blank (MDL)	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
alpha-Terpineol	< 5	< .17	19 (75 %R)	20 (82 %R) (8 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
Phenol	< 1	< .12	16 (32 %R)	17 (34 %R) (7 RPD)	7/29/2021	ug/L	5 - 120	64	625.1
2-Chlorophenol	< 1	< .2	33 (66 %R)	36 (72 %R) (8 RPD)	7/29/2021	ug/L	23 - 134	61	625.1
2,4-Dichlorophenol	< 1	< .31	36 (73 %R)	39 (77 %R) (6 RPD)	7/29/2021	ug/L	39 - 135	50	625.1
2,4,5-Trichlorophenol	< 1	< .33	37 (73 %R)	39 (77 %R) (5 RPD)	7/29/2021	ug/L	30 - 130	20	625.1
2,4,6-Trichlorophenol	< 1	< .48	37 (75 %R)	39 (79 %R) (5 RPD)	7/29/2021	ug/L	37 - 144	58	625.1
Pentachlorophenol	< 5	< 1.1	36 (71 %R)	39 (79 %R) (10 RPD)	7/29/2021	ug/L	14 - 176	86	625.1
2-Nitrophenol	< 5	< .44	36 (72 %R)	40 (80 %R) (10 RPD)	7/29/2021	ug/L	29 - 182	55	625.1
4-Nitrophenol	< 5	< .22	16 (32 %R)	17 (35 %R) (7 RPD)	7/29/2021	ug/L	1 - 132	131	625.1
2,4-Dinitrophenol	< 10	< 1.5	37 (73 %R)	41 (81 %R) (10 RPD)	7/29/2021	ug/L	1 - 191	132	625.1
2-Methylphenol	< 1	< .4	32 (64 %R)	34 (68 %R) (6 RPD)	7/29/2021	ug/L	30 - 130	20	625.1
3/4-Methylphenol	< 1	< .42	31 (63 %R)	33 (67 %R) (6 RPD)	7/29/2021	ug/L	30 - 130	20	625.1
2,4-Dimethylphenol	< 5	< 1.4	35 (70 %R)	37 (74 %R) (6 RPD)	7/29/2021	ug/L	32 - 120	58	625.1
4-Chloro-3-methylphenol	< 1	< .26	36 (73 %R)	39 (77 %R) (6 RPD)	7/29/2021	ug/L	22 - 147	73	625.1
4,6-Dinitro-2-methylphenol	< 5	< 3.3	40 (79 %R)	43 (87 %R) (9 RPD)	7/29/2021	ug/L	1 - 181	203	625.1
Benzoic Acid	< 50	< 5.7	< 50 (28 %R)	< 50 (28 %R) (2 RPD)	7/29/2021	ug/L	15 - 130	50	625.1
N-Nitrosodimethylamine	< 1	< .11	13 (50 %R)	14 (55 %R) (9 RPD)	7/29/2021	ug/L	15 - 140	20	625.1
n-Nitroso-di-n-propylamine	< 0.5	< .22	18 (74 %R)	20 (80 %R) (8 RPD)	7/29/2021	ug/L	1 - 230	87	625.1
n-Nitrosodiphenylamine	< 1	< .068	20 (79 %R)	21 (83 %R) (5 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
bis(2-Chloroethyl)ether	< 1	< .11	18 (72 %R)	20 (80 %R) (10 RPD)	7/29/2021	ug/L	12 - 158	108	625.1
bis(2-chloroisopropyl)ether	< 1	< .13	17 (70 %R)	19 (76 %R) (9 RPD)	7/29/2021	ug/L	36 - 166	76	625.1
bis(2-Chloroethoxy)methane	< 1	< .2	18 (73 %R)	20 (80 %R) (9 RPD)	7/29/2021	ug/L	33 - 184	54	625.1
1,3-Dichlorobenzene	< 1	< .15	16 (65 %R)	18 (73 %R) (11 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
Acetophenone	< 10	< 8.8	19 (75 %R)	20 (81 %R) (8 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
1,4-Dichlorobenzene	< 1	< .11	16 (66 %R)	18 (74 %R) (11 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
1,2-Dichlorobenzene	< 1	< .13	17 (67 %R)	19 (74 %R) (11 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
1,2,4-Trichlorobenzene	< 1	< .09	17 (68 %R)	19 (75 %R) (10 RPD)	7/29/2021	ug/L	44 - 142	50	625.1
2-Chloronaphthalene	< 1	< .11	19 (74 %R)	20 (79 %R) (6 RPD)	7/29/2021	ug/L	60 - 120	24	625.1
4-Chlorophenyl-phenylether	< 1	< .059	19 (78 %R)	21 (82 %R) (5 RPD)	7/29/2021	ug/L	25 - 158	61	625.1
4-Bromophenyl-phenylether	< 1	< .14	20 (79 %R)	21 (83 %R) (5 RPD)	7/29/2021	ug/L	53 - 127	43	625.1
Hexachloroethane	< 1	< .15	17 (68 %R)	19 (76 %R) (12 RPD)	7/29/2021	ug/L	40 - 120	52	625.1
Hexachlorobutadiene	< 1	< .073	17 (68 %R)	19 (75 %R) (10 RPD)	7/29/2021	ug/L	24 - 120	62	625.1
Hexachlorocyclopentadiene	< 5	< .21	17 (68 %R)	18 (73 %R) (8 RPD)	7/29/2021	ug/L	15 - 140	20	625.1
Hexachlorobenzene	< 1	< .12	20 (79 %R)	21 (84 %R) (7 RPD)	7/29/2021	ug/L	1 - 152	55	625.1
4-Chloroaniline	< 1	< .13	20 (80 %R)	21 (85 %R) (6 RPD)	7/29/2021	ug/L	15 - 140	20	625.1
2,3-Dichloroaniline	< 1	< .11	19 (76 %R)	20 (79 %R) (4 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
2-Nitroaniline	< 5	< .18	20 (80 %R)	21 (85 %R) (6 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
3-Nitroaniline	< 5	< .13	20 (81 %R)	21 (85 %R) (5 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
4-Nitroaniline	< 5	< .23	20 (81 %R)	21 (86 %R) (6 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
Aniline	< 1	< .13	17 (70 %R)	19 (75 %R) (7 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
Benzyl alcohol	< 10	< .35	18 (73 %R)	20 (78 %R) (7 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
Nitrobenzene	< 1	< .21	18 (73 %R)	20 (80 %R) (10 RPD)	7/29/2021	ug/L	35 - 180	62	625.1
Isophorone	< 1	< .16	19 (76 %R)	21 (83 %R) (8 RPD)	7/29/2021	ug/L	21 - 196	93	625.1
2,4-Dinitrotoluene	< 2	< .14	21 (82 %R)	22 (87 %R) (5 RPD)	7/29/2021	ug/L	39 - 139	42	625.1
2,6-Dinitrotoluene	< 2	< .14	20 (82 %R)	22 (86 %R) (5 RPD)	7/29/2021	ug/L	50 - 158	48	625.1
Benzidine (estimated)	< 5	< .41	16 (63 %R)	19 (78 %R) (21 RPD)	7/29/2021	ug/L	1 - 200	50	625.1

QC REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Batch ID: 637631-43091/A072921E6251

Client Designation: **99 Coolidge | 4788.01**

Parameter Name	Blank (RL)	Blank (MDL)	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
3,3'-Dichlorobenzidine	< 1	< .27	19 (77 %R)	20 (81 %R) (6 RPD)	7/29/2021	ug/L	1 - 262	108	625.1
Pyridine	< 5	< .18	10 (41 %R)	12 (47 %R) (14 RPD)	7/29/2021	ug/L	15 - 140	20	625.1
Azobenzene	< 1	< .14	20 (79 %R)	21 (83 %R) (5 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
Carbazole	< 1	< .12	20 (80 %R)	21 (83 %R) (4 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
Dimethylphthalate	< 1	< .11	19 (77 %R)	20 (81 %R) (5 RPD)	7/29/2021	ug/L	1 - 120	183	625.1
Diethylphthalate	< 5	< .11	20 (82 %R)	22 (86 %R) (5 RPD)	7/29/2021	ug/L	1 - 120	100	625.1
Di-n-butylphthalate	< 5	< .64	21 (85 %R)	22 (89 %R) (5 RPD)	7/29/2021	ug/L	1 - 120	47	625.1
Butylbenzylphthalate	< 5	< .14	21 (85 %R)	22 (90 %R) (6 RPD)	7/29/2021	ug/L	1 - 152	60	625.1
bis(2-Ethylhexyl)phthalate	< 5	< .27	21 (83 %R)	22 (89 %R) (6 RPD)	7/29/2021	ug/L	8 - 158	82	625.1
Di-n-octylphthalate	< 5	< .2	21 (83 %R)	22 (90 %R) (8 RPD)	7/29/2021	ug/L	4 - 146	69	625.1
Dibenzofuran	< 1	< .11	19 (76 %R)	20 (80 %R) (5 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
Naphthalene	< 1	< .088	17 (68 %R)	18 (74 %R) (8 RPD)	7/29/2021	ug/L	21 - 133	65	625.1
2-Methylnaphthalene	< 1	< .11	17 (70 %R)	19 (75 %R) (8 RPD)	7/29/2021	ug/L	40 - 140	65	625.1
1-Methylnaphthalene	< 1	< .12	18 (71 %R)	19 (76 %R) (7 RPD)	7/29/2021	ug/L	40 - 140	65	625.1
Acenaphthylene	< 1	< .11	17 (69 %R)	18 (73 %R) (5 RPD)	7/29/2021	ug/L	33 - 145	74	625.1
Acenaphthene	< 1	< .11	21 (84 %R)	22 (89 %R) (5 RPD)	7/29/2021	ug/L	47 - 145	48	625.1
Fluorene	< 1	< .093	18 (71 %R)	19 (75 %R) (5 RPD)	7/29/2021	ug/L	59 - 121	38	625.1
Phenanthrene	< 1	< .11	18 (71 %R)	19 (75 %R) (5 RPD)	7/29/2021	ug/L	54 - 120	39	625.1
Anthracene	< 1	< .13	18 (71 %R)	19 (75 %R) (5 RPD)	7/29/2021	ug/L	27 - 133	66	625.1
Fluoranthene	< 1	< .12	17 (70 %R)	18 (73 %R) (5 RPD)	7/29/2021	ug/L	26 - 137	66	625.1
Pyrene	< 1	< .11	18 (73 %R)	19 (76 %R) (4 RPD)	7/29/2021	ug/L	52 - 120	49	625.1
Benzo[a]anthracene	< 1	< .17	18 (72 %R)	19 (75 %R) (5 RPD)	7/29/2021	ug/L	33 - 143	53	625.1
Chrysene	< 1	< .14	18 (73 %R)	19 (77 %R) (5 RPD)	7/29/2021	ug/L	17 - 168	87	625.1
Benzo[b]fluoranthene	< 1	< .095	18 (74 %R)	19 (78 %R) (5 RPD)	7/29/2021	ug/L	24 - 159	71	625.1
Benzo[k]fluoranthene	< 1	< .14	18 (74 %R)	19 (78 %R) (5 RPD)	7/29/2021	ug/L	11 - 162	63	625.1
Benzo[a]pyrene	< 1	< .058	18 (74 %R)	19 (77 %R) (4 RPD)	7/29/2021	ug/L	17 - 163	72	625.1
Indeno[1,2,3-cd]pyrene	< 1	< .13	19 (74 %R)	19 (76 %R) (3 RPD)	7/29/2021	ug/L	1 - 171	99	625.1
Dibenz[a,h]anthracene	< 1	< .16	18 (74 %R)	19 (77 %R) (4 RPD)	7/29/2021	ug/L	1 - 227	126	625.1
Benzo[g,h,i]perylene	< 1	< .14	18 (72 %R)	19 (74 %R) (3 RPD)	7/29/2021	ug/L	1 - 219	97	625.1
n-Decane	< 5	< .16	15 (58 %R)	16 (65 %R) (12 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
n-Octadecane	< 5	< .5	20 (79 %R)	21 (84 %R) (7 RPD)	7/29/2021	ug/L	40 - 140	20	625.1
2-Fluorophenol (surr)	40 %R		42 %R	46 %R	7/29/2021	% Rec	15 - 110		625.1
Phenol-d6 (surr)	28 %R		30 %R	33 %R	7/29/2021	% Rec	15 - 110		625.1
2,4,6-Tribromophenol (surr)	72 %R		77 %R	82 %R	7/29/2021	% Rec	15 - 110		625.1
Nitrobenzene-D5 (surr)	74 %R		73 %R	81 %R	7/29/2021	% Rec	30 - 130		625.1
2-Fluorobiphenyl (surr)	74 %R		76 %R	80 %R	7/29/2021	% Rec	30 - 130		625.1
p-Terphenyl-D14 (surr)	76 %R		81 %R	86 %R	7/29/2021	% Rec	30 - 130		625.1

*/! Flagged analyte recoveries deviated from the QA/QC limits. Data that impacts sample results are noted on the sample report.

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID:	SH-GP-3W	SH-1	EFF
Lab Sample ID:	229852.01	229852.02	229852.03
Matrix:	aqueous	aqueous	aqueous
Date Sampled:	7/29/21	7/29/21	7/29/21
Date Received:	7/29/21	7/29/21	7/29/21
Units:	ug/L	ug/L	ug/L
Date of Extraction/Prep:	7/30/21	7/30/21	7/30/21
Date of Analysis:	7/30/21	7/30/21	7/30/21
Analyst:	AR	AR	AR
Method:	8011/504	8011/504	8011/504
Dilution Factor:	1	1	1
1,2-Dibromoethane(EDB)	< 0.02	< 0.02	< 0.02
Dibromochloropropane (DBCP)	< 0.02	< 0.02	< 0.02
1,1,1,2-Tetrachloroethane (surr)	**88 %R**	**98 %R**	**69 %R**

QC REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Batch ID: 637632-40386/A073021E5041

Client Designation: **99 Coolidge | 4788.01**

Parameter Name	Blank	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
1,2-Dibromoethane(EDB)	< 0.02	0.10 (101 %R)	0.11 (109 %R) (7 RPD)	7/30/2021	ug/L	70 - 130	20	8011/504
Dibromochloropropane (DBCP)	< 0.02	0.097 (97 %R)	0.11 (105 %R) (8 RPD)	7/30/2021	ug/L	70 - 130	20	8011/504
1,1,1,2-Tetrachloroethane (surr)	97 %R	97 %R	103 %R	7/30/2021	% Rec	65 - 135	20	8011/504

*/! Flagged analyte recoveries deviated from the QA/QC limits. Data that impacts sample results are noted on the sample report.

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID:	SH-GP-3W	SH-1	EFF
Lab Sample ID:	229852.01	229852.02	229852.03
Matrix:	aqueous	aqueous	aqueous
Date Sampled:	7/29/21	7/29/21	7/29/21
Date Received:	7/29/21	7/29/21	7/29/21
Units:	mg/L	mg/L	mg/L
Date of Extraction/Prep:	7/30/21	7/30/21	7/30/21
Date of Analysis:	7/30/21	7/30/21	7/30/21
Analyst:	JLB	JLB	JLB
Method:	1664B	1664B	1664B
Dilution Factor:	1	1	1
TPH(SGTHEM)	< 5	< 5	< 5

QC REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Batch ID: 637632-27919/A073021TPH161

Client Designation: **99 Coolidge | 4788.01**

Parameter Name	Blank	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
TPH(SGTHEM)	< 5	18 (89 %R)	17 (83 %R) (6 RPD)	7/30/2021	mg/L	64 - 132	34	1664B

*/! Flagged analyte recoveries deviated from the QA/QC limits. Data that impacts sample results are noted on the sample report.

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID:	SH-GP-3W	SH-1	EFF
Lab Sample ID:	229852.01	229852.02	229852.03
Matrix:	aqueous	aqueous	aqueous
Date Sampled:	7/29/21	7/29/21	7/29/21
Date Received:	7/29/21	7/29/21	7/29/21
Units:	ug/L	ug/L	ug/L
Date of Extraction/Prep:	8/3/21	8/3/21	8/3/21
Date of Analysis:	8/3/21	8/3/21	8/3/21
Analyst:	MB	MB	MB
Method:	608.3	608.3	608.3
Dilution Factor:	1	1	1
PCB-1016	< 0.2	< 0.2	< 0.2
PCB-1221	< 0.2	< 0.2	< 0.2
PCB-1232	< 0.2	< 0.2	< 0.2
PCB-1242	< 0.2	< 0.2	< 0.2
PCB-1248	< 0.2	< 0.2	< 0.2
PCB-1254	< 0.2	< 0.2	< 0.2
PCB-1260	< 0.2	< 0.2	< 0.2
PCB-1262	< 0.2	< 0.2	< 0.2
PCB-1268	< 0.2	< 0.2	< 0.2
TMX (surr)	**90 %R**	**87 %R**	**88 %R**
DCB (surr)	**94 %R**	**91 %R**	**90 %R**

Acid clean-up was performed on the samples and associated batch QC.

QC REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Batch ID: 637635-74356/A080321PB6081

Client Designation: **99 Coolidge | 4788.01**

Parameter Name	Blank	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
PCB-1016	< 0.2	2.0 (100 %R)	1.9 (95 %R) (5 RPD)	8/3/2021	ug/L	50 - 140	36	608.3
PCB-1221	< 0.2	< 0.2 (%R N/A)	< 0.2 (%R N/A) (RPD N/A)	8/3/2021	ug/L			608.3
PCB-1232	< 0.2	< 0.2 (%R N/A)	< 0.2 (%R N/A) (RPD N/A)	8/3/2021	ug/L			608.3
PCB-1242	< 0.2	< 0.2 (%R N/A)	< 0.2 (%R N/A) (RPD N/A)	8/3/2021	ug/L			608.3
PCB-1248	< 0.2	< 0.2 (%R N/A)	< 0.2 (%R N/A) (RPD N/A)	8/3/2021	ug/L			608.3
PCB-1254	< 0.2	< 0.2 (%R N/A)	< 0.2 (%R N/A) (RPD N/A)	8/3/2021	ug/L			608.3
PCB-1260	< 0.2	1.9 (94 %R)	1.8 (89 %R) (6 RPD)	8/3/2021	ug/L	8 - 140	38	608.3
PCB-1262	< 0.2	< 0.2 (%R N/A)	< 0.2 (%R N/A) (RPD N/A)	8/3/2021	ug/L			608.3
PCB-1268	< 0.2	< 0.2 (%R N/A)	< 0.2 (%R N/A) (RPD N/A)	8/3/2021	ug/L			608.3
TMX (surr)	85 %R	92 %R	90 %R	8/3/2021	% Rec	30 - 150		608.3
DCB (surr)	98 %R	103 %R	96 %R	8/3/2021	% Rec	30 - 150		608.3

*/! Flagged analyte recoveries deviated from the QA/QC limits. Data that impacts sample results are noted on the sample report.

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID:	SH-GP-3W	SH-1	EFF
Lab Sample ID:	229852.01	229852.02	229852.03
Matrix:	aqueous	aqueous	aqueous
Date Sampled:	7/29/21	7/29/21	7/29/21
Date Received:	7/29/21	7/29/21	7/29/21

				Analysis				
				Units	**Date**	**Time**	**Method**	**Analyst**
Solids Suspended	**41**	**25**	< 5	mg/L	8/02/21	15:55	2540D-11	CF
Chloride	**530**	**860**	**500**	mg/L	7/30/21	9:49	4500CIE-11	KD
Cyanide Total	< 0.02	< 0.02	< 0.02	mg/L	8/04/21	10:59	ASTM D7511-09	KD
Ammonia-N	**2.9**	< 0.05	**0.22**	mg/L	8/03/21	9:50	TM NH3-001	SEL
Total Residual Chlorine	< 0.05	< 0.05	< 0.05	mg/L	7/29/21	18:00	4500CIG-00	CJJ
pH	**7.04**	**6.86**	**7.28**	SU	8/03/21	15:02	4500H+B-11	AMB

pH was analyzed past hold time.

QC REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Parameter Name	Blank	LCS	LCSD	Units	Date of Analysis	Limits	RPD	Method
Solids Suspended	< 5	94 (94 %R)	99 (99 %R) (5 RPD)	mg/L	8/2/21	90 - 110	20	2540D-11
Chloride	< 1	26 (102 %R)	25 (102 %R) (0 RPD)	mg/L	7/30/21	90 - 110	20	4500ClE-11
Cyanide Total	< 0.02	0.11 (113 %R)	0.11 (112 %R) (1 RPD)	mg/L	8/4/21	84 - 116	20	ASTM D7511-09
Ammonia-N	< 0.05	1.9 (95 %R)	1.9 (93 %R) (3 RPD)	mg/L	8/3/21	87 - 104	20	TM NH3-001
Total Residual Chlorine	< 0.05	0.05 (100 %R)	0.05 (100 %R) (0 RPD)	mg/L	7/29/21	80 - 120	20	4500ClG-00
pH		5.99 (100 %R)	6.0 (100 %R) (0 RPD)	SU	8/3/21	5.97 - 6.1	10	4500H+B-11

*/! Flagged analyte recoveries deviated from the QA/QC limits. Unless noted, flagged data does not impact the sample data.

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID:	SH-GP-3W	SH-1					
Lab Sample ID:	229852.01	229852.02					
Matrix:	aqueous	aqueous					
Date Sampled:	7/29/21	7/29/21					
Date Received:	7/29/21	7/29/21	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Chromium (VI)	< 10	< 10	AqDis	ug/L	7/29/21	7196A	RJ
Chromium (VI)	< 10	< 10	AqTot	ug/L	7/29/21	7196A	RJ
Antimony	**0.51**	**5.5**	AqTot	ug/L	7/30/21	200.8	DS
Arsenic	**1.8**	**2.8**	AqTot	ug/L	7/30/21	200.8	DS
Cadmium	< 0.5	**5.7**	AqTot	ug/L	7/30/21	200.8	DS
Chromium	**0.63**	**7.6**	AqTot	ug/L	7/30/21	200.8	DS
Copper	**1.2**	**85**	AqTot	ug/L	7/30/21	200.8	DS
Iron	**28000**	**5800**	AqTot	ug/L	7/30/21	200.8	DS
Lead	**0.84**	**160**	AqTot	ug/L	7/30/21	200.8	DS
Nickel	**1.9**	**8.1**	AqTot	ug/L	7/30/21	200.8	DS
Selenium	< 0.5	< 0.5	AqTot	ug/L	7/30/21	200.8	DS
Silver	< 0.5	< 0.5	AqTot	ug/L	7/30/21	200.8	DS
Zinc	**200**	**930**	AqTot	ug/L	7/30/21	200.8	DS
Total Hardness (as CaCO3)	**370**	**340**	AqTot	mg/L	7/30/21	200.8	DS
Chromium (III)	< 10	< 10	AqTot	ug/L	7/30/21	200.8	DS
Antimony	< 0.5	**1.3**	AqDis	ug/L	8/12/21	200.8	DS
Arsenic	**1.8**	< 0.5	AqDis	ug/L	8/12/21	200.8	DS
Cadmium	< 0.5	**2.9**	AqDis	ug/L	8/12/21	200.8	DS
Chromium	< 0.5	< 0.5	AqDis	ug/L	8/12/21	200.8	DS
Copper	< 0.5	**1.8**	AqDis	ug/L	8/12/21	200.8	DS
Iron	**28000**	< 50	AqDis	ug/L	8/12/21	200.8	DS
Lead	< 0.5	**3.7**	AqDis	ug/L	8/12/21	200.8	DS
Nickel	**1.9**	**1.9**	AqDis	ug/L	8/12/21	200.8	DS
Selenium	< 0.5	< 0.5	AqDis	ug/L	8/12/21	200.8	DS
Silver	< 0.5	< 0.5	AqDis	ug/L	8/12/21	200.8	DS
Zinc	**160**	**310**	AqDis	ug/L	8/12/21	200.8	DS
Total Hardness (as CaCO3)	**370**	**330**	AqDis	mg/L	8/12/21	200.8	DS

LABORATORY REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Sample ID: EFF

Lab Sample ID: 229852.03
Matrix: aqueous
Date Sampled: 7/29/21
Date Received: 7/29/21

		Analytical Matrix	Units	Date of Analysis	Method	Analyst
Chromium (VI)	< 10	AqDis	ug/L	7/29/21	7196A	RJ
Chromium (VI)	< 10	AqTot	ug/L	7/29/21	7196A	RJ
Antimony	< 0.5	AqTot	ug/L	7/30/21	200.8	DS
Arsenic	**0.92**	AqTot	ug/L	7/30/21	200.8	DS
Cadmium	< 0.5	AqTot	ug/L	7/30/21	200.8	DS
Chromium	< 0.5	AqTot	ug/L	7/30/21	200.8	DS
Copper	**3.5**	AqTot	ug/L	7/30/21	200.8	DS
Iron	**1600**	AqTot	ug/L	7/30/21	200.8	DS
Lead	**2.2**	AqTot	ug/L	7/30/21	200.8	DS
Nickel	**1.7**	AqTot	ug/L	7/30/21	200.8	DS
Selenium	**0.6**	AqTot	ug/L	7/30/21	200.8	DS
Silver	< 0.5	AqTot	ug/L	7/30/21	200.8	DS
Zinc	**20**	AqTot	ug/L	7/30/21	200.8	DS
Total Hardness (as CaCO3)	**230**	AqTot	mg/L	7/30/21	200.8	DS
Chromium (III)	< 10	AqTot	ug/L	7/30/21	200.8	DS

QC REPORT

EAI ID#: **229852**

Client: **Sanborn, Head & Associates, Inc. (BOS)**

Client Designation: **99 Coolidge | 4788.01**

Parameter Name	Blank	LCS	LCSD		Units	Date of Analysis	Limits	RPD	Method
Antimony	< 0.0005	1.1 (113 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Antimony	< 0.0005	0.20 (102 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Arsenic	< 0.0005	1.0 (104 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Arsenic	< 0.0005	0.21 (103 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Cadmium	< 0.0005	1.0 (101 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Cadmium	< 0.0005	0.21 (104 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Chromium	< 0.0005	1.0 (104 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Chromium	< 0.0005	0.20 (99 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Copper	< 0.0005	1.0 (101 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Copper	< 0.0005	0.20 (98 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Iron	< 0.05	11 (97 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Iron	< 0.05	9.8 (96 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Lead	< 0.0005	1.0 (102 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Lead	< 0.0005	0.19 (97 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Nickel	< 0.0005	0.96 (96 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Nickel	< 0.0005	0.20 (99 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Selenium	< 0.0005	1.0 (104 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Selenium	< 0.0005	0.21 (103 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Silver	< 0.0005	0.010 (101 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Silver	< 0.0005	0.18 (90 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Zinc	< 0.005	0.97 (97 %R)		NA	mg/L	7/30/21	85 - 115	20	200.8
Zinc	< 0.005	0.20 (100 %R)		NA	mg/L	8/12/21	85 - 115	20	200.8
Chromium (VI)	< 0.01	0.29 (94 %R)		NA	mg/L	7/29/21	85 - 115	20	7196A
Chromium (VI)	< 0.01	0.29 (94 %R)		NA	mg/L	7/29/21	85 - 115	20	7196A

*/! Flagged analyte recoveries deviated from the QA/QC limits. Unless noted, flagged data does not impact the sample data.

PHOENIX
Environmental Laboratories, Inc.

Monday, August 02, 2021

Attn: Front Office
Eastern Analytical
25 Chenell Drive
Concord, NH 03301

Project ID: 229852
SDG ID: GCI85386
Sample ID#s: CI85386 - CI85388

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

August 02, 2021

SDG I.D.: GCI85386

Project ID: 229852

Client Id	Lab Id	Matrix
SH-GP-3W	CI85386	WATER
SH-1	CI85387	WATER
EFF	CI85388	WATER

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2021

FOR: Attn: Front Office
Eastern Analytical
25 Chenell Drive
Concord, NH 03301

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		07/29/21	9:25
Location Code:	EASTANAL-NH	Received by:	CP	07/30/21	14:33
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	55415				

Laboratory Data

SDG ID: GCI85386
Phoenix ID: CI85386

Project ID: 229852
Client ID: SH-GP-3W

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Mercury	< 0.0002	0.0002	mg/L	1	08/02/21	AT	SW7470/E245.1
Mercury Digestion	Completed				08/01/21	AB/CG	SW7470/245.1
Ethanol	ND	8000	ug/L	20	07/30/21	MH	SW8260C

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

Volatile Comment:
Elevated reporting limits for volatiles due to the presence of target and/or non-target compounds.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
August 02, 2021
Reviewed and Released by: Rashmi Makol, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2021

FOR: Attn: Front Office
Eastern Analytical
25 Chenell Drive
Concord, NH 03301

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		07/29/21	11:30
Location Code:	EASTANAL-NH	Received by:	CP	07/30/21	14:33
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	55415				

Laboratory Data

SDG ID: GCI85386
Phoenix ID: CI85387

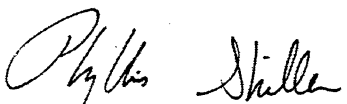
Project ID: 229852
Client ID: SH-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Mercury	< 0.0002	0.0002	mg/L	1	08/02/21	AT	SW7470/E245.1
Mercury Digestion	Completed				08/01/21	AB/CG	SW7470/245.1
Ethanol	ND	400	ug/L	1	07/30/21	MH	SW8260C

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
August 02, 2021
Reviewed and Released by: Rashmi Makol, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 02, 2021

FOR: Attn: Front Office
Eastern Analytical
25 Chenell Drive
Concord, NH 03301

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		07/29/21	12:45
Location Code:	EASTANAL-NH	Received by:	CP	07/30/21	14:33
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	55415				

Laboratory Data

SDG ID: GCI85386
Phoenix ID: CI85388

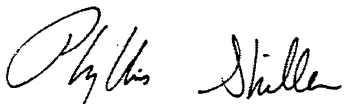
Project ID: 229852
Client ID: EFF

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Mercury	< 0.0002	0.0002	mg/L	1	08/02/21	AT	SW7470/E245.1
Mercury Digestion	Completed				08/01/21	AB/CG	SW7470/245.1
Ethanol	ND	400	ug/L	1	07/30/21	MH	SW8260C

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
August 02, 2021
Reviewed and Released by: Rashmi Makol, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

August 02, 2021

QA/QC Data

SDG I.D.: GCI85386

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 585892 (mg/L), QC Sample No: CI85544 (CI85386, CI85387, CI85388)													
Mercury - Water	BRL	0.0002	<0.0002	<0.0002	NC	112			111			75 - 125	30

Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 75-125%

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

August 02, 2021

QA/QC Data

SDG I.D.: GCI85386

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 585971 (ug/L), QC Sample No: CI85387 (CI85386 (20X) , CI85387, CI85388)										
Oxygenates - Water										
Ethanol	ND	200	92	88	4.4	98	99	1.0	70 - 130	30

Comment:

A blank MS/MSD was analyzed with this batch.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
August 02, 2021

Monday, August 02, 2021

Criteria: None

State: MA

Sample Criteria Exceedances Report

GCI85386 - EASTANAL-NH

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
*** No Data to Display ***								

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Comments

August 02, 2021 SDG I.D.: GCI85386

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

CHAIN-OF-CUSTODY RECORD WC IPK 2.7

Eastern Analytical, Inc.
professional laboratory and drilling services

EAI ID# 229852 Page 1/2

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
SH-GP-3W	7/29/2021 9:25	aqueous	Subcontract - Mercury Cold Vapor (PEL) (3 containers)	85386
SH-GP-3W	7/29/2021 9:25	aqueous	Subcontract - Ethanol Method 8260B	
SH-1	7/29/2021 11:30	aqueous	Subcontract - Mercury Cold Vapor (PEL) (3 containers)	85387
SH-1	7/29/2021 11:30	aqueous	Subcontract - Ethanol Method 8260B	

EAI ID# 229852 **Project State: MA**
Project ID: 5731

Company Phoenix Environmental Labs
Address 587 East Middle Turnpike
Address Manchester , CT 06040
Account #
Phone # (860) 645-1102

Results Needed: **Preferred Date: Standard**
RUSH Due Date: _____

QC Deliverables
☐ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

Notes about project:
Email login confirmation, pdf of results and invoice to customerservice@easternanalytical.com.

5 DAY TAT
MA RGP Project:
Report Ethanol in mg/L Units

PO #:55415 **EAI ID# 229852**

Data Deliverable (circle)
Excel NH EMD EQuIS ME EGAD

Call prior to analyzing, if RUSH charges will be applied.

Samples Collected by: 7-30-21 @ 1000

Relinquished by	Date/Time	Received by
	7/30/21 11:25	
	7/30/21 14:33	

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301 Phone: (603)228-0525 1-800-287-0525 customerservice@easternanalytical.com

CHAIN-OF-CUSTODY RECORD

WC IPK 2.7

Eastern Analytical, Inc.
professional laboratory and drilling services

EAI ID# 229852 Page 2/2

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
EFF	7/29/2021 12:45	aqueous	Subcontract - Mercury Cold Vapor (PEL) (3 containers)	85388
EFF	7/29/2021 12:45	aqueous	Subcontract - Ethanol Method 8260B	

EAI ID# 229852 **Project State: MA**

Project ID: 5731

Company Phoenix Environmental Labs
Address 587 East Middle Turnpike
Address Manchester , CT 06040
Account #
Phone # (860) 645-1102

Results Needed: Preferred Date: Standard

RUSH Due Date: _____

QC Deliverables

☐ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ MA MCP

Notes about project:

Email login confirmation, pdf of results and invoice to customerservice@easternanalytical.com.

5 DAY TAT
MA RGP Project:
Report Ethanol in mg/L Units

PO #:55415 **EAI ID# 229852**

Data Deliverable (circle)

Excel NH EMD EQuIS ME EGAD

Call prior to analyzing, if RUSH charges will be applied.

Samples Collected by: 7-30-21 @ 1000

Relinquished by	Date/Time	Received by
	7-30-21 @ 11:35	
Relinquished by	Date/Time	Received by
	7/30/21 14:35	

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301 Phone: (603)228-0525 1-800-287-0525 customerservice@easternanalytical.com

Page 1 of 1

CHAIN-OF-CUSTODY RECORD

L 229852 J

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

SAMPLE I.D.	SAMPLING DATE/TIME *IF COMPOSITE, INDICATE BOTH START & FINISH DATE/TIME	MATRIX (SEE BELOW)	GRAB/*COMPOSITE	VOC: 524.2 / 524.2 MTBE ONLY	VOC: 8260 / 624 / VTICS	VOC: 1, 4 DIOXANE	VOC: 8021	VOC: 8015 GRO / MAVPH	SVOC: 8270 / 625 ABN / PAH / EDB / DBCP	SVOC: TPH8100 / L1 / L2	SVOC: 8015 DRO / MAEPH	SVOC: PEST 608 / PEST 8081 / PCB 608 / PCB 8082	SVOC: OIL & GREASE 1664 / TPH 1664	TCLP: TCLP 1311 / VOC / ABN / PEST / METALS / HERB	INORGANICS: BOD / TSS / CBOD / TDS	INORGANICS: BR / NO2 / CL / NO3 / F / SO4 NO3NO2	INORGANICS: TKN / NH3 / T. PHOS. / O. PHOS. / TN	INORGANICS: PH / SPEC. CON. / T. RES. / T. ALK. / CHLORINE	INORGANICS: COD / PHENOLS / TOC / DOC	INORGANICS: TOTAL CYANIDE / TOTAL SULFIDE	INORGANICS: REACTIVE CYANIDE / REACTIVE SULFIDE / FLASHPOINT / IGNITABILITY	MICRO: TOTAL COLIFORM / FECAL COLIFORM / E. COLI	MICRO: ENTEROCOCCI / HETEROTROPHIC PLATE COUNT	METALS: DISSOLVED METALS (LIST BELOW)	METALS: TOTAL METALS (LIST BELOW)	OTHER: NPDES RGP	OTHER	OTHER	OTHER	# OF CONTAINERS	NOTES MEOH VIAL #
*SH-3	7/29/21 925	GW	C																						H		X				**
SH-1	7/29/21 1130	GW	C																						H		X				**
EFF	7/29/21 1245	SW	C																						H		X				

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: Matt Heil

COMPANY: Sanborn Head

ADDRESS: 7 North Washington St.

CITY: Boston STATE: MA ZIP:

PHONE: 978 577-1621 EXT.:

E-MAIL: mheil@sanbornhead.com

SITE NAME: 99 Coolidge

PROJECT #: 4788.01

STATE: NH (MA) ME VT OTHER:

REGULATORY PROGRAM: (NPDES: RGP) POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER:

QUOTE #: PO #:

QA/QC REPORTING

A B C

MA MCP

TEMP: °C

ICE? (YES) NO

REPORTING OPTIONS

PRELIMS: YES OR NO

ELECTRONIC OPTIONS

PDF EXCEL

EQUIS

OTHER

TURN AROUND TIME

24hr* 48hr*

3-4 Days*

(5 Day) 7 Day

10 Day

*Pre-approval Required

SAMPLER(S): S. LaMarre

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
S. LaMarre	7-29-21	1310	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
	7-29-21	1505	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:

METALS: 8 RCRA 13 PP FE, MN PB, CU

OTHER METALS:

SAMPLES FIELD FILTERED? [X] YES [ ] NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)

Hold dissolved metals

* See NPDES RGP list attached

* per client: SH-GP-3W

** Analyze for dissolved metals per client 8/2/21

SITE HISTORY:

SUSPECTED CONTAMINATION:

FIELD READINGS: pH - 8/2/21

Eastern Analytical, Inc.
professional laboratory and drilling services
51 Antrim Avenue | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

(WHITE: Lab Copy GREEN: Customer Copy)

Nitrogen, Ammonia	1671	Indeno(1,2,3-cd)pyrene	625.1
Chloride	4500CLE-11	Naphthalene	625.1
Total Residual Chlorine	4500CLE-11	PCBs	608.3
Total Suspended Solids	2540D-11	Pentachlorophenol	625.1
Antimony	200.8	Total Petroleum Hydrocarbons	1664
Arsenic	200.8	Ethanol	1671
Cadmium	200.8	Methyl-tert-Butyl Ether	624.1
Chromium, Total		tert-Butyl Alcohol	624.1
Chromium III	200.8	tert-Amyl Methyl Ether	624.1
Chromium VI	7196A	Hardness as CaCO3	200.8
Copper	200.8	pH	
Iron	200.8	Toluene	624.1
Lead	200.8	Ethylbenzene	624.1
Mercury	SW7470/E	p/m-Xylene	624.1
Nickel	200.8	o-xylene	624.1
Selenium	200.8	Xylenes, Total	624.1
Silver	200.8	Acenaphthene	625.1
Zinc	200.8	Fluoranthene	625.1
Cyanide	OIA-1677-	Acenaphthylene	625.1
Benzene	624.1	Anthracene	625.1
1,4 Dioxane	624.1-SIM	Benzo(ghi)perylene	625.1
Acetone	624.1	Fluorene	625.1
Phenol	624.1	Phenanthrene	625.1
Carbon Tetrachloride	624.1	Pyrene	625.1
1,2 Dichlorobenzene	624.1	Butyl benzyl phthalate	625.1
1,3 Dichlorobenzene	624.1	Di-n-butylphthalate	625.1
1,4 Dichlorobenzene	624.1	Di-n-octylphthalate	625.1
Total dichlorobenzene	624.1	Diethyl phthalate	625.1
1,1 Dichloroethane	624.1	Dimethyl phthalate	625.1
1,2 Dichloroethane	624.1		
1,1 Dichloroethylene (1,1-Dichloroethene)	624.1		
Ethylene Dibromide	624.1		
Methylene Chloride	624.1		
1,1,1 Trichloroethane	624.1		
1,1,2 Trichloroethane	624.1		
Trichloroethylene (Trichloroethene)	624.1		
Tetrachloroethylene (Tetrachloroethene)	624.1		
cis-1,2 Dichloroethylene	624.1		
Vinyl Chloride	624.1		
Diethylhexyl phthalate (Bis(2-ethylhexyl)phthalate)	625.1		
Benzo(a)anthracene	625.1		
Benzo(a)pyrene	625.1		
Benzo(b)fluoranthene	625.1		
Benzo(k)fluoranthene	625.1		
Chrysene	625.1		
Dibenzo(a,h)anthracene	625.1		

Phenol s/b 625.1 not 624.1
Ethanol 8260 - do not have
standard lab performs 1670 a
last [illegible] [illegible] 7/29/21

Document1

APPENDIX E

FEDERAL CORRESPONDENCE

Documentation of the Results of the ESA Eligibility Determination:

Using information in Appendix II of the NPDES RGP, the project located at 99 Coolidge Avenue, Watertown, MA is eligible for coverage under this general permit under FWS Criterion A. This project is located in Middlesex County. No designated critical habitats were listed in the project area. An Endangered Species Consultation was conducted on the U.S. Fish & Wildlife Service New England Field Office ECOS IPaC webpage for the Site:

No Endangered species found at this location.

From: Roosevelt Mesa - NOAA Affiliate
To: Shannon LaMarre
Subject: Re: Information for RGP
Date: Thursday, September 16, 2021 2:36:34 PM

Good afternoon Shannon,
Thank you for your email.

As a reminder, the lead federal action agency is ultimately the one responsible for making any effect vs. no effect determination for ESA section 7 purposes. That being said, a "no effect" determination might be appropriate in this case considering the location of the referenced project, where we would not expect listed species under our jurisdiction to occur. There are three scenarios under which a "no effect" determination would be recommended:

1) No species/critical habitat present.
2) No species/critical habitat present *when* (e.g., time of year restrictions applied to the in-water work) the in-water work is occurring (and no permanent impacts to their habitat).
3) Species/critical habitat may be present, but there's no plausible route to affect.

In this case, you'd be focusing on number 1. As mentioned above, we would not expect ESA-listed species to be present in the action area. Also, there is no designated critical habitat in or nearby the action area.

You can find additional resources and general information on No Effect Determinations at the following link:
https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-no-effect-determinations-greater-atlantic-region

Let me know if you have any questions.

Best regards,
Roosevelt

On Tue, Sep 14, 2021 at 3:53 PM NMFS.GAR ESA.Section7 - NOAA Service Account <nmfs.gar.esa.section7@noaa.gov> wrote:

> ---------- Forwarded message ---------
> From: **Shannon LaMarre** <slamarre@sanbornhead.com>
> Date: Tue, Sep 14, 2021 at 3:05 PM
> Subject: Information for RGP
> To: nmfs.gar.esa.section7@noaa.gov <nmfs.gar.esa.section7@noaa.gov>
>
> Good afternoon,
>
> I am writing to request information to be included as part of a Notice of Intent (NOI) for a

Remediation General Permit (RGP). The NOI is for construction dewatering during excavation activities at 57 Coolidge Ave in Watertown, MA, 02472.

Effluent will be discharged to the Sawins Brook (Which ultimately flows into the Charles River) in Watertown, MA by means of the existing storm drain located at the Site (approximately 42.362999 N, -71.150849 W).

Approximate Location of Discharge to the Sawins Brook River:

Lat: 42.362999 N, Long: -71.150849 W

As part of the application to the USEPA for the RGP, we need to determine if this proposed temporary discharge has the potential to adversely affect any federally listed species in the reach of the Sawins Pond/ Charles River downstream of the discharge point.

Attached are:

1. the species list requested from the USFWS, which identified no threatened/endangered/candidate species or critical habitats in the area.
2. The Section 7 Mapper showing no species/critical habitat present

Please let me know if you require any further information.

Thank you,

Shannon LaMarre, EIT
Senior Project Engineer

EIT in MA

SANBORN | HEAD & ASSOCIATES, INC.

D 857.327.9749 | 98 N. Washington Street, Suite 101, Boston, MA 02114

--

Roosevelt Mesa *(he/him/his)*
Environmental Specialist
Integrated Statistics, Inc. | In support of NOAA Fisheries
Greater Atlantic Regional Fisheries Office
Protected Resources Division
Email: roosevelt.mesa@noaa.gov

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: September 13, 2021
Consultation Code: 05E1NE00-2021-SLI-4737
Event Code: 05E1NE00-2021-E-14536
Project Name: 57 Coolidge Ave

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-4737
Event Code: Some(05E1NE00-2021-E-14536)
Project Name: 57 Coolidge Ave
Project Type: DEVELOPMENT
Project Description: 57 Coolidge Ave, Watertown, MA. 6.3 acres, construction of a 6-story building with a 6-story parking garage connected by a pedestrian footbridge, end of September.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.363649699999996,-71.15047486624272,14z

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.

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

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

APPENDIX F

NATIONAL REGISTER OF HISTORICAL PLACES, MIDDLESEX COUNTY, MASSACHUSETTS

Documentation of the National Historic Preservation Act Eligibility Determination:

As part of this permit, a determination was made as to whether there were any historic properties or places listed on the national register in the path of the discharge or in the vicinity of the construction of treatment systems or BMPs related to the discharge. A search on the Massachusetts Cultural Resource Information System Database and the National Register of Historic Places did not list any potential historic properties on or near the project site in the databases. Therefore, the proposed discharge will not have the potential to cause effects on historical properties.

Massachusetts Cultural Resource Information System

MACRIS

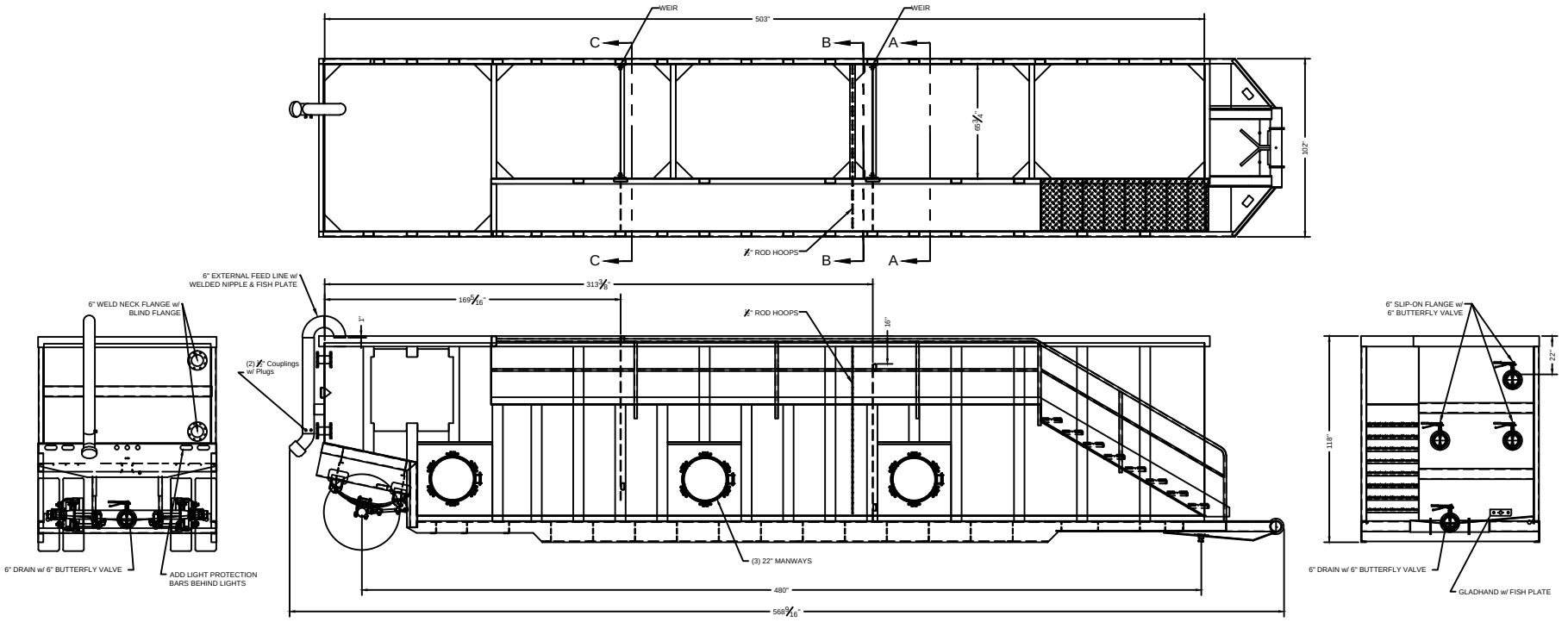
MACRIS Search Results

Search Criteria: Town(s): Watertown; Street No: 99; Street Name: Coolidge Ave; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year

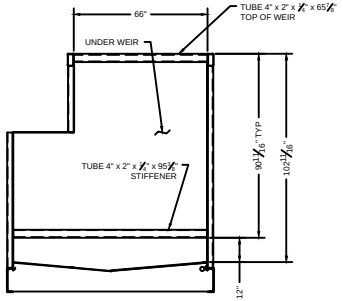
APPENDIX G

WATER TREATMENT SYSTEM CUTSHEETS
SDS SHEETS

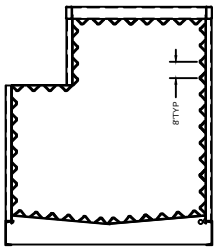


STANDARD SPECIFICATION

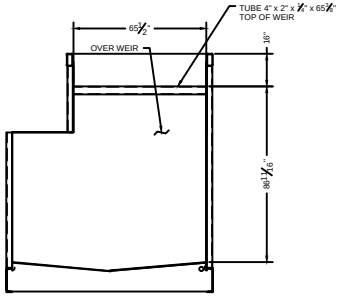
CAPACITY: .... 18,480 GALLONS (440 BBL)
SIDE SHEETS: .... 1/4" A36 PLATE
FRONT SHEET: .... 1/4" A36 PLATE
REAR SHEET: .... 1/4" A36 PLATE
FLOOR: .... 1/4" A36 PLATE
MAIN FLOOR RAILS: .... 12" x 20.7# STRUCTURAL CHANNEL
FLOOR CROSSMEMBERS: .... 1/4" A36 PLATE
SIDE STAKES: .... ONE PIECE 3/16" A36 PLATE
SUSPENSION: .... 3 LEAF SPRING, 22,500 LBS. CACPACITY
AXLE: .... 77.5" TRACK, 22,500 LBS. CAPACITY
TIRES: .... 11R22.5 RADIAL
WHEELS: .... 8.25 x 22.5 STEEL
MANWAYS: .... 3 - 22" DIA. CURB SIDE
VALVES: .... 3 - 6" BUTTERFLY VALVE (FRONT)
1 - 6" DRAIN BUTTERFLY VALVE (FRONT)
1 - 6" DRAIN BUTTERFLY VALVE (REAR)
2 - 6" BLIND FLANGE CONNECTION (REAR)
INLET PIPING: .... 1 - 6" PIPE SYSTEM (REAR)
BLAST: .... (INTERIOR) SSPC-SP-10 (NEAR WHITE)
(EXTERIOR) SSPC-SP-6 (COMMERCIAL BLAST)
PAINT: .... (INTERIOR) EPOXYPHENOLIC 100% SOLID 20.0 MILS D.F.T.
(EXTERIOR) FINISH COAT POLURETHANE 4.0 TO 5.0 D.F.T.



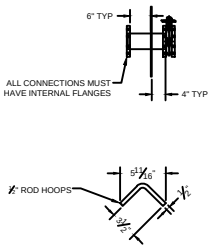
SECTION VIEW "C-C"



SECTION VIEW "B-B"



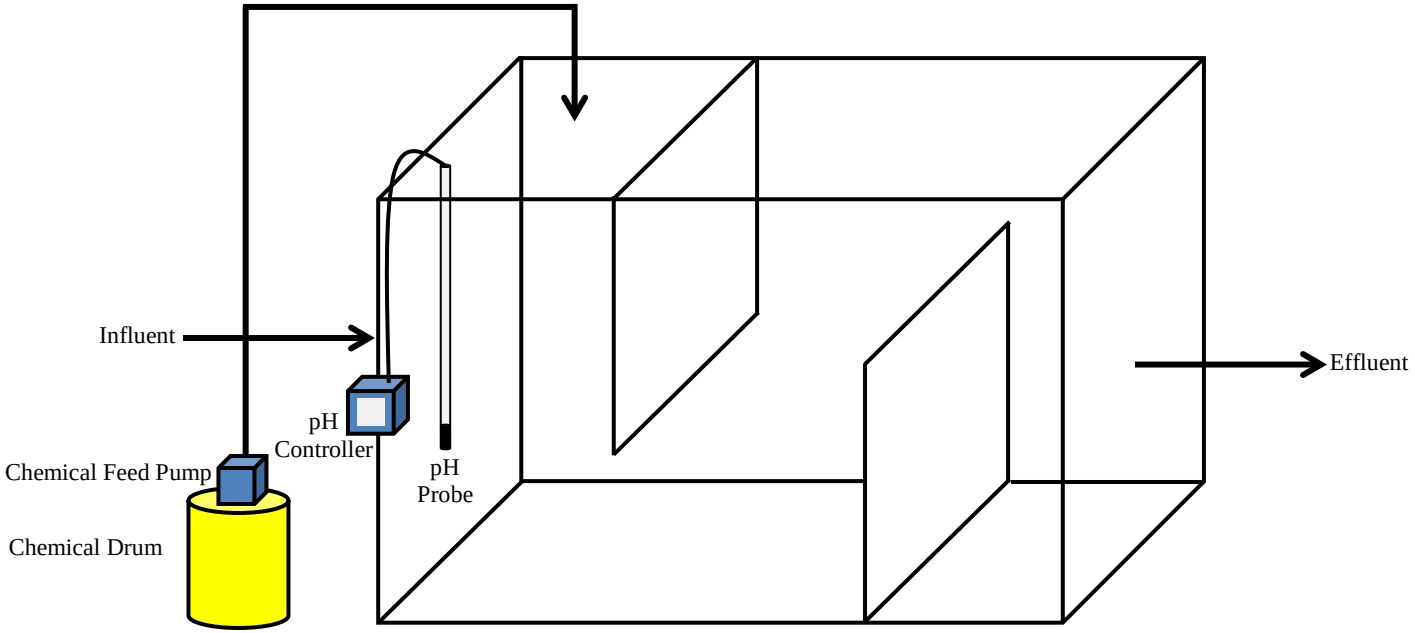
SECTION VIEW "A-A"



18,000 Gal. Weir Tank

Lockwood Remediation Technologies, LLC

89 Crawford Street
Leominster, Massachusetts 01453
O: 774-450-7177
F: 888-835-0617



Notes:

1.) Figure is not to scale.
2.) System layout can vary with site conditions.

89 Crawford Street
Leominster, Massachusetts 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

Configuration of pH Adjustment System

Lockwood Remediation Technologies, LLC

One Controller for the Broadest Range of Sensors.

Choose from 30 digital and analog sensor families for up to 17 di:erent parameters.

Maximum Versatility

The sc200 controller allows the use of digital and analog sensors, either alone or in combination, to provide compatibility with Hach's broad range of sensors, eliminating the need for dedicated, parameter-specific controllers.

Ease of Use and Confidence in Results

Large, high-resolution, transreflective display provides optimal viewing resolution in any lighting condition. Guided calibration procedures in 19 languages minimize complexity and reduce operator error. Password-protected SD card reader o:ers a simple solution for data download and transfer. Visual warning system provides critical alerts.

Wide Variety of Communication Options

Utilize two to five analog outputs to transmit primary and secondary values for each sensor, or integrate Hach sensors and analyzers into MODBUS RS232/RS485, Profibus® DP, and HART networks.

Password protected SD card reader offers a simple solution for data download and transfer, and sc200 and digital sensor configuration file duplication and backup.

Controller Comparison

Features	Previous Models sc100™ Controller	Previous Models GLI53 Controller	sc200™ Controller	Benefits
Display	64 x 128 pixels 33 x 66 mm (1.3 x 2.6 in.)	64 x 128 pixels 33 x 66 mm (1.3 x 2.6 in.)	160 x 240 pixels 48 x 68 mm (1.89 x 2.67 in.) Transreflective	• Improved user interface—50% bigger • Easier to read in daylight and sunlight
Data Management	irDA Port/PDA Service Cable	N/A	SD Card Service Cable	• Simplifies data transfer • Standardized accessories/max compatibility
Sensor Inputs	2 Max Direct Digital Analog via External Gateway	2 Max Analog Depending on Parameter	2 Max Digital and/or Analog with Sensor Card	• Simplifies analog sensor connections • Works with analog and digital sensors
Analog Inputs	N/A	N/A	1 Analog Input Signal Analog 4-20mA Card	• Enables non-sc analyzer monitoring • Accepts mA signals from other analyzers for local display • Consolidates analog mA signals to a digital output
4-20 mA Outputs	2 Standard	2 Standard	2 Standard Optional 3 Additional	• Total of five (5) 4-20 mA outputs allows multiple mA outputs per sensor input
Digital Communication	MODBUS RS232/RS485 Profibus DP V1.0	HART	MODBUS RS232/RS485 Profibus DP V1.0 HART 7.2	• Unprecedented combination of sensor breadth and digital communication options

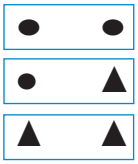
Choose from Hach's Broad Range of Digital and Analog Sensors

Parameter	Sensor	Digital or Analog
Ammonia	AMTAX™ sc, NH4D sc, AISE sc, AN-ISE sc	●
Chlorine	CLF10 sc, CLT10 sc, 9184 sc	●
Chlorine Dioxide	9185 sc	●
Conductivity	GLI 3400 Contacting, GLI 3700 Inductive	▲
Dissolved Oxygen	LDO® Model 2, 5740 sc	●
Dissolved Oxygen	5500	▲
Flow	U53, F53 Sensors	▲
Nitrate	NITRATAX™ sc, NO3D sc, NISE sc, AN-ISE sc	●
Oil in Water	FP360 sc	●
Organics	UVAS sc	●
Ozone	9187 sc	●
pH/ORP	pHD	●
pH/ORP	pHD, pH Combination, LCP	▲
Phosphate	PHOSPHAX™ sc	●
Sludge Level	SONATAX™ sc	●
Suspended Solids	SOLITAX™ sc, TSS sc	●
Turbidity	1720E, FT660 sc, SS7 sc, ULTRATURB sc, SOLITAX sc, TSS sc	●
Ultra Pure Conductivity	8310, 8311, 8312, 8315, 8316, 8317 Contacting	▲
Ultra Pure pH/ORP	8362	▲

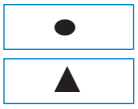
● = Digital ▲ = Analog

Connect up to two of any of the sensors listed above, in any combination, to meet your application needs. The diagrams below demonstrate the potential configurations. Operation of analog sensors requires the controller to be equipped with the appropriate sensor module. Contact Hach Technical Support for help with selecting the appropriate module.

2 Channel Configurations



1 Channel Configurations



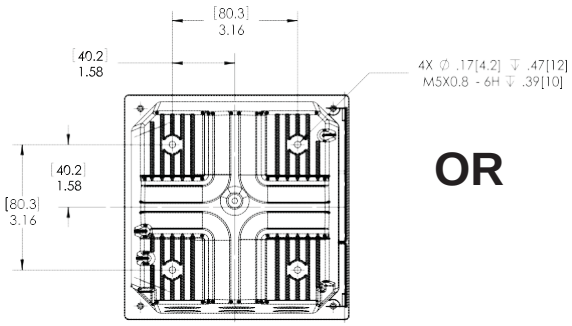
Specifications*

Dimensions (H x W x D)	5.7 in x 5.7 in x 7.1 in (144 mm x 144 mm x 181 mm)
Display	Graphic dot matrix LCD with LED backlighting, transreflective
Display Size	1.9 x 2.7 in. (48 mm x 68 mm)
Display Resolution	240 x 160 pixels
Weight	3.75 lbs. (1.70 kg)
Power Requirements (Voltage)	100 - 240 V AC, 24 V DC
Power Requirements (Hz)	50/60 Hz
Operating Temperature Range	-20 to 60 °C , 0 to 95% RH non-condensing
Analog Outputs	Two (Five with optional expansion module) to isolated current outputs, max 550 Ω , Accuracy: ± 0.1% of FS (20mA) at 25 °C, ± 0.5% of FS over -20 °C to 60 °C range Operational Mode: measurement or calculated value
Analog Output Functional Mode	Linear, Logarithmic, Bi-linear, PID
Security Levels	2 password-protected levels
Mounting Configurations	Wall, pole, and panel mounting
Enclosure Rating	NEMA 4X/IP66
Conduit Openings	1/2 in NPT Conduit
Relay: Operational Mode	Primary or secondary measurement, calculated value (dual channel only) or timer
Relay Functions	Scheduler (Timer), Alarm, Feeder Control, Event Control, Pulse Width Modulation, Frequency Control, and Warning
Relays	Four electromechanical SPDT (Form C) contacts, 1200 W, 5 A
Communication	MODBUS RS232/RS485, PROFIBUS DPV1, or HART 7.2 optional
Memory Backup	Flash memory
Electrical Certifications	EMC CE compliant for conducted and radiated emissions: - CISPR 11 (Class A limits) - EMC Immunity EN 61326-1 (Industrial limits) Safety cETLus safety mark for: - General Locations per ANSI/UL 61010-1 & CAN/CSA C22.2. No. 61010-1 - Hazardous Location Class I, Division 2, Groups A,B,C & D (Zone 2, Group IIC) per FM 3600 / FM 3611 & CSA C22.2 No. 213 M1987 with approved options and appropriately rated Class I, Division 2 or Zone 2 sensors cULus safety mark - General Locations per UL 61010-1 & CAN/CSA C22.2. No. 61010-1

**Subject to change without notice.*

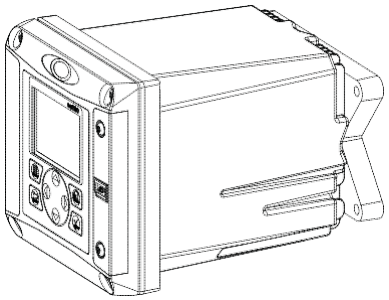
Dimensions

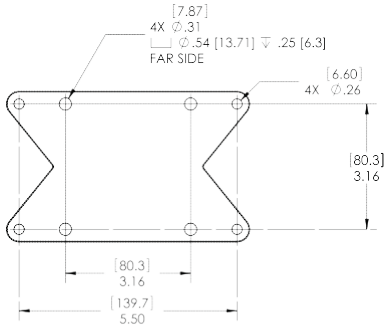
Surface Mounting Dimensions



Mounting Dimensions
(Rear View)

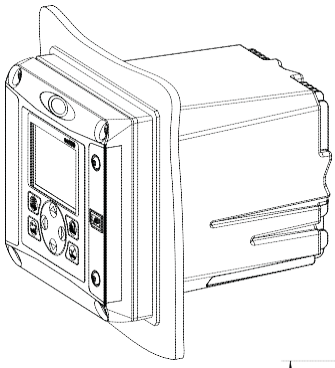
OR

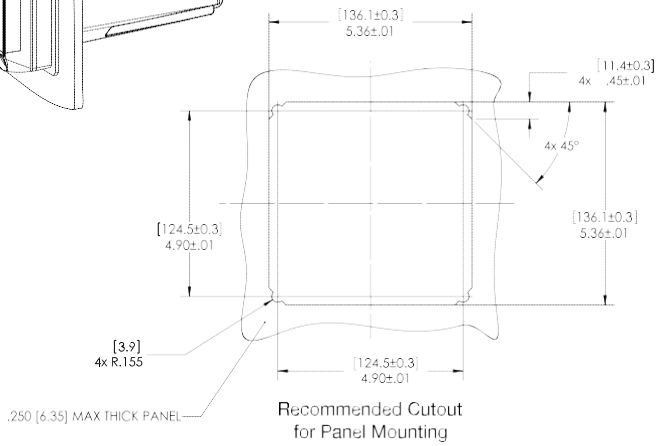




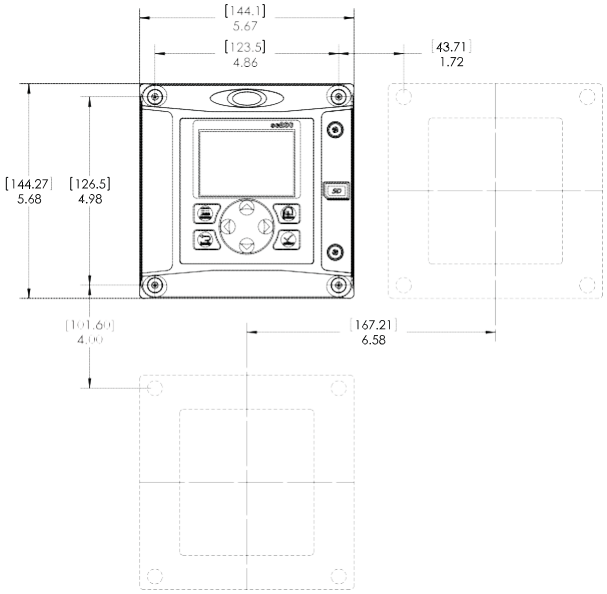
Bracket (supplied) for Surface Mounting
(Not compatible with Weather and Sun Shield p/n 9220600 when surface mounting.)

Panel Mounting Dimensions



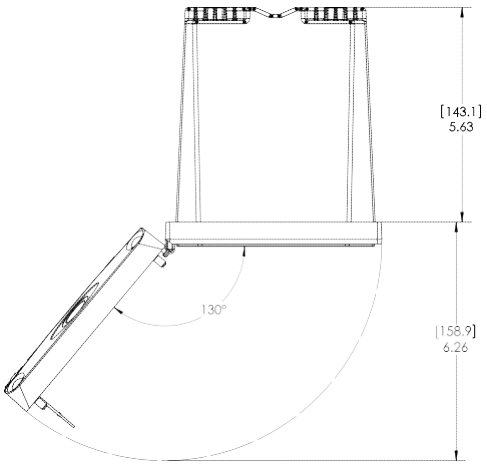


Recommended Cutout
for Panel Mounting

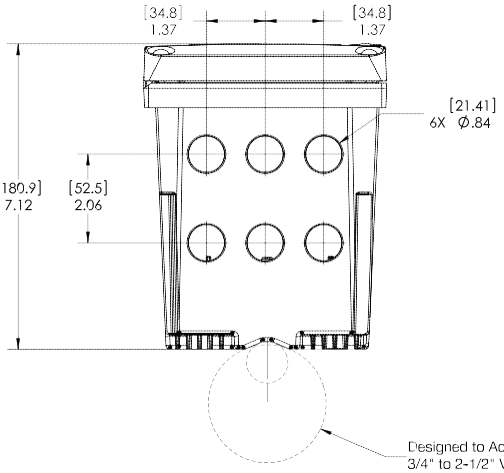


Minimum Spacing Dimensions
for Group Mounting

Top and Bottom Views

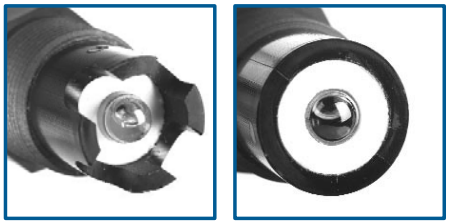


Door Opening Details



3/4-inch Combination pH and ORP Sensor Kits

Use the Digital Gateway to make any Hach analog combination pH or ORP sensor compatible with the Hach sc1000 Controller.



Digital combination pH and ORP sensors are available in convertible, insertion, and sanitary mounting styles. Choose from rugged dome electrodes or "easy-to-clean" flat glass electrodes.

Features and Benefits

Low Price—High Performance

These combination sensors are designed for specialty applications for immersion or in-line mounting. The reference cell features a double-junction design for extended service life, and a built-in solution ground. The body is molded from chemically-resistant Ryton® or PVDF, and the reference junction is coaxial porous Teflon®. All sensors are rated 0 to 105ºC up to 100 psig, and have integral 4.5 m (15 ft.) cables with tinned leads. The PC-series (for pH) and RC-series (for ORP) combination sensors are ideal for measuring mild and aggressive media.

Special Electrode Configurations

Sensors with rugged dome electrodes, "easy-to-clean" flat glass electrodes, and even HF (hydrofluoric acid) resistant glass electrodes are available for a wide variety of process solutions.

Temperature Compensation Element Option

The PC-series combination pH sensors are available with or without a Pt 1000 ohm RTD temperature element. The RC-series combination ORP sensors are supplied without a temperature element.

Versatile Mounting Styles

Sensors are available in three mounting styles—convertible, insertion, and sanitary. Please turn to page 3 for more information.

Full-Featured "Plug and Play" Hach sc Digital Controllers

There are no complicated wiring or set up procedures with any Hach sc controller. Just plug in any combination of Hach digital sensors and it's ready to use—it's "plug and play."

One or multiple sensors—The sc controller family allows you to receive data from up to eight Hach digital sensors in any combination using a single controller.

Communications—Multiple alarm/control schemes are available using the relays and PID control outputs. Available communications include analog 4-20 mA, digital MODBUS® (RS485 and RS232) or Profibus DP protocols. (Other digital protocols are available. Contact your Hach representative for details.)

Data logger—A built-in data logger collects measurement data, calibration, verification points, and alarm history.

Specifications*

Most pH applications fall in the 2.5-12.5 pH range. General purpose pH glass electrodes perform well in this range. Some industrial applications require accurate measurements and control at pH values below 2 or above 12. Consult Hach Technical Support for details on these applications.

Combination pH Sensors

Measuring Range
0 to 14 pH

Accuracy
Less than 0.1 pH under reference conditions

Temperature Range
0 to 105ºC (32 to 221ºF)

Flow Rate
0 to 2 m/s (0 to 6.6 ft./s); non-abrasive

Pressure Range
0 to 6.9 bar at 100ºC (0 to 100 psig at 212ºF)

Signal Transmission Distance
100 m (328 ft.) when used with the Hach Digital Gateway and a Hach sc Digital Controller.

1000 m (3280 ft.) when used with the Hach Digital Gateway, Termination Box, and a Hach sc Digital Controller.

Sensor Cable
Integral coaxial cable (plus two conductors for temperature compensator option); 4.5 m (15 ft.) long

Wetted Materials

Convertible style: Ryton® body (glass filled)

Insertion style: PVDF body (Kynar®)

Sanitary style: 316 stainless steel sleeved PVDF body

Common materials for all sensor styles include PTFE Teflon double junction, glass process electrode, and Viton® O-rings

Warranty
90 days

Combination ORP Sensors

Measuring Range
-2000 to +2000 millivolts

Accuracy
Limited to calibration solution accuracy (± 20 mV)

Temperature Range
0 to 105ºC (32 to 221ºF)

Flow Rate
0 to 2 m/s (0 to 6.6 ft./s); non-abrasive

Pressure Range
0 to 6.9 bar at 100ºC (0 to 100 psig at 212ºF)

Signal Transmission Distance
100 m (328 ft.) when used with the Hach Digital Gateway and a Hach sc Digital Controller.

1000 m (3280 ft.) when used with the Hach Digital Gateway, Termination Box, and a Hach sc Digital Controller.

Sensor Cable
Integral coaxial cable; 4.5 m (15 ft.) long; terminated with stripped and tinned wires

Wetted Materials

Convertible style: Ryton® body (glass filled)

Insertion style: PVDF body (Kynar®)

Common materials for all sensor styles include PTFE Teflon double junction, glass with platinum process electrode, and Viton® O-rings

Warranty
90 days

**Specifications subject to change without notice.*

Engineering Specifications

1. The pH sensor shall be available in convertible, insertion or sanitary styles. The ORP sensor shall be available in only convertible or insertion styles.
2. The convertible style sensor shall have a Ryton® body. The insertion style sensor shall have a PVDF body. The sanitary style sensor shall have a 316 stainless steel sleeved PVDF body. Common materials for all sensor styles shall include a PTFE Teflon® double junction, and Viton® O-rings. The pH sensor shall have a glass pH electrode. The ORP sensor shall have a platinum ORP electrode.
3. The convertible style pH sensor shall be available with or without a built-in Pt 1000 ohm RTD temperature element. Insertion and sanitary style pH sensors shall have a built-in Pt 1000 ohm RTD temperature element. Convertible and insertion style ORP sensors shall not have a built-in temperature element.
4. The sensor shall communicate via MODBUS® RS-485 to a Hach sc Digital Controller.
5. The sensor shall be Hach Company Model PC sc or PC-series for pH measurement or Model PC sc or RC-series for ORP measurement.

Dimensions

Convertible Style Sensor

The convertible style sensor has a Ryton® body that features 3/4-inch NPT threads on both ends. The sensor can be directly mounted into a standard 3/4-inch pipe tee for flow-through mounting or fastened onto the end of a pipe for immersion mounting. The convertible style sensor enables inventory consolidation, thereby reducing associated costs. Mounting tees and immersion mounting hardware are offered in a variety of materials to suit application requirements.

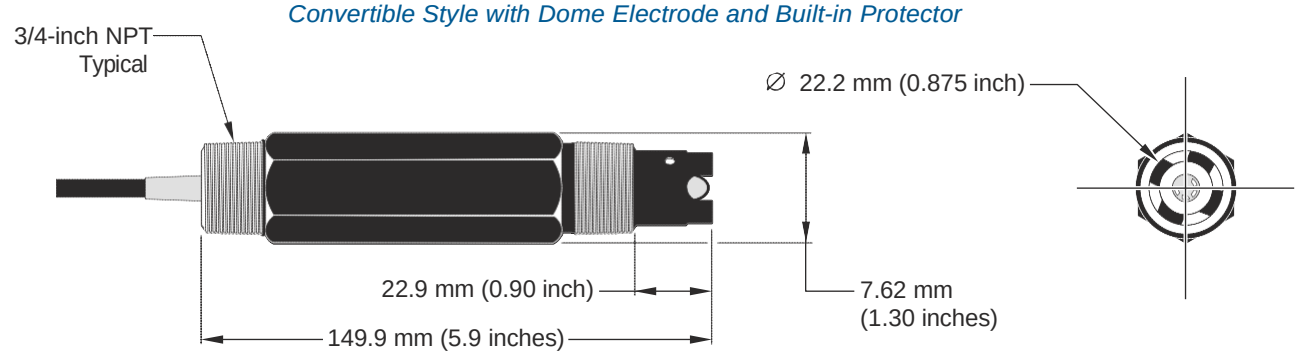
Insertion Style Sensor

Insertion style sensors feature a longer, non-threaded PVDF body with two Viton® O-rings, providing a seal when used with the optional Hach insertion mount hardware assembly. This ball valve hardware enables sensor insertion and retraction from a pipe or vessel without having to stop the process flow.

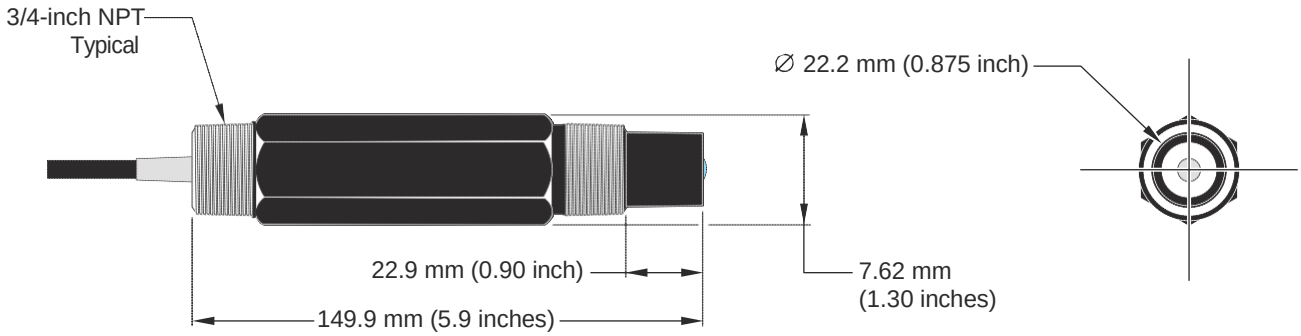
Sanitary Style Sensor

The sanitary style sensor, offered for pH measurement, has a 316 stainless steel-sleeved PVDF body with a 2-inch flange. The sensor mates to a standard 2-inch Tri-Clover fitting. The optional Hach sanitary mounting hardware includes a standard 2-inch sanitary tee, sanitary clamp, and Viton® sanitary gasket.

Convertible Style with Dome Electrode and Built-in Protector



Convertible Style with Flat Electrode



Lockwood Remediation Technologies, LLC

The Pulsatron Series A Plus offers manual function controls over stroke length and stroke rate as standard with the option to select external pace for automatic control.

Ten distinct models are available, having pressure capabilities to 250 PSIG (17 BAR) @ 12 GPO (1.9 lph), and flow capacities to 58 GPO (9.1 lph) @ 100 PSIG (7.0 BAR), with a standard turndown ratio of 100:1, and optional ratio of 1000:1. Metering performance is reproducible to within ± 3% of maximum capacity.

Features

- Manual Control by on-line adjustable stroke rate and stroke length.
- Highly Reliable timing circuit.
- Circuit Protection against voltage and current upsets.
- Solenoid Protection by thermal overload with auto-reset.
- Water Resistant, for outdoor and indoor applications.
- Internally Dampened To Reduce Noise.
- Guided Ball Check Valve Systems, to reduce back flow and enhance outstanding priming characteristics.
- Few Moving Parts and Wall Mountable.
- Safe & Easy Priming with durable leak-free bleed valve assembly (standard).
- Optional Control: External pace with auto/manual selection.

Controls

Manual Stroke Rate

Manual Stroke Length

External Pacing - Optional

External Pace With Stop - Optional (125 SPM only)

Controls Options		
Feature	Standard Configuration	Optional Configuration [1]
External Pacing	--	Auto / Manual Selection
External Pace w/ Stop (125 SPM only)	--	Auto / Manual Selection [2]
Manual Stroke Rate	10:1 Ratio	100:1 Raio
Manual Stroke Length	10:1 Ratio	10:1 Ratio
Total Turndown Ratio	100:1 Ratio	1000:1 Ratio

Note 1: On S2, S3 & S4 sizes only.

Note 2: Not available on 1000:1 turndown pumps.

Operating Benefits

- Reliable metering performance.
- Rated "hot" for continuous duty.
- High viscosity capability.
- Leak-free, sealless, liquid end.

Aftermarket

- KOPkits
- Gauges
- Dampeners
- Pressure Relief Valves
- Tanks
- Pre-Engineered Systems
- Process Controllers (PULSAblue, MicroVision)

Series A Plus
Electronic Metering Pumps

Lockwood Remediation Technologies, LLC

Series A Plus

Specifications and Model Selection

MODEL			LBC2	LB02	LBC3	LB03	LB04	LB64	LBC4	LBS2	LBS3	LBS4
Capacity nominal (max.)		GPH	0.25	0.25	0.42	0.50	1.00	1.25	2.00	0.50	1.38	2.42
		GPO	6	6	10	12	24	30	48	12	33	58
		LPH	0.9	0.9	1.6	1.9	3.8	4.7	7.6	1.9	5.2	9.14
Pressure[3] (max.)	GFPP, PVDF, 316SS or PVC <;N code) wITFE Seats)	PSIG (Bar)	250 (17)	150 (10)	250 (17)	150 (10)	100 (7)	100 (7)	50 (3.3)	250 (17)	150 (10)	100 (7)
	PVC (V code) Viton or CSPE Seats IDegas Liquid End		150 (10)							150 (10)		
Connections:		Tubina	1.14" ID X 3.18" OD						3.18" D X 1.12" OD	1.14" D X 3.18" OD		
		Pioina	1.14" FNPT									
Strokes/Minute		SPM	125							250		

Note 3: Pumps with rated pressure above 150 PSI will be de-rated to 150 PSI Max. when selecting certain valve options, see Price Book for details.

Engineering Data

Pump Head Materials Available:	GFPPL
	PVC
	PVDF
	316 SS
Diaphragm:	PTFE-faced CSPE-backed
Check Valves Materials Available:	
Seats/0-Rings:	PTFE
	CSPE
	Viton
Balls:	Ceramic
	PTFE
	316 SS
	Alloy C
Fittings Materials Available:	GFPPL
	PVC
	PVDF
Bleed Valve:	Same as fitting and check valve selected, except 316SS
Injection Valve & Foot Valve Assy:	Same as fitting and check valve selected
Tubing:	Clear PVC
	White PE

Important: Material Code - GFPPL=Glass-filled Polypropylene, PVC=Polyvinyl Chloride, PE=Polyethylene, PVDF=Polyvinylidene Fluoride, CSPE=Generic formulation of Hypalon, a registered trademark of E.I. DuPont Company. Viton is a registered trademark of E.I. DuPont Company. PVC wetted end recommended for sodium hypochlorite.

Engineering Data

Reproducibility:	+/- 3% at maximum capacty
Viscosity Max CPS:	1000 CPS
Stroke Frequency Max SPM:	125 / 250 by Model
Stroke Frequency Turn-Down Ratio:	10:1 / 100:1 by Model
Stroke Length Turn-Down Ratio:	10:1
Power Input:	115 VAC/50-60 HZ/1 ph
	230 VAC/50-60 HZ/1 ph
Average Current Draw:	
@ 115 VAC; Amps:	0.6 Amps
@ 230 VAC; Amps:	0.3 Amps
Peak hput Power:	130 Watts
Average Input Power @ Max SPM:	50 Watts

Custom Engineered Designs - Pre-Engineered Systems

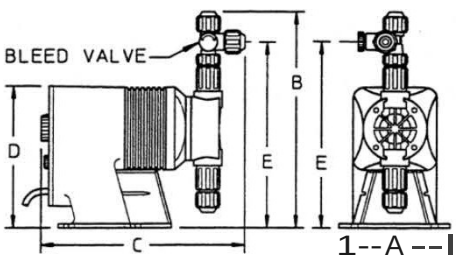
Pre-Engineered Systems

Pulsafeeder's Pre-Engineered Systems are designed to provide complete chemical feed solutions for all electronic metering applications. From stand alone simplex pH control applications to full-featured, redundant sodium hypochlorite disinfection metering, these rugged fabricated assemblies offer turn-key simplicity and industrial-grade durability. The UV-stabilized, high-grade HOPE frame offers maximum chemical compatibility and structural rigidity. Each system is factory assembled and hydrostatically tested prior to shipment.

Dimensions

Series A PLUS Dimensions (inches)						
Model No.	A	B	C	D	E	Shipping Weight
LB02 IS2	5.0	9.6	9.5	6.5	8.2	10
LBC2	5.0	9.9	9.5	6.5	8.5	10
LBC3	5.0	9.9	9.5	6.5	8.5	10
LB03 IS3	5.0	9.9	9.5	6.5	8.5	10
LB0B4	5.0	9.9	9.5	6.5	8.5	10
LB64	5.0	9.9	9.5	6.5	8.5	10
LBC4	5.0	9.9	9.5	6.5	8.5	10

NOTE: Inches X 2.54 cm



95-Gallon OverPack - 32" dia x 41.5", 1 each/package

Stock a SpillTech® OverPack with sorbents for emergency spill response, or use it as a salvage drum to ship damaged containers or hazardous waste.

- DOT-Approved for Salvage: All SpillTech® OverPacks are DOT-approved and X-rated for use as salvage drums. Helps companies conform to federal regulations when shipping damaged or leaking containers of hazardous materials, or absorbents contaminated with hazardous substances.
- Perfect for Spill Kits: Stores sorbent products (not included) for easy access as needed for spill control. Saves time when quick response is necessary.
- Sturdy Construction: 100% polyethylene OverPack resists chemicals, rust and corrosion for years of use. Integrated handles make them easy to lift, move or carry with standard material handling equipment. Twist-on, double-wall lid with closed-cell gasket provides sealed, secure closure to prevent leaks and protect contents from moisture, dirt and damage. Durable to withstand rough handling.
- Customized for You: We can customize a Spill Kit to your exact specifications, including the container, its contents and accessories, with no upcharge! Contact your local Distributor for details.

A95OVER Specifications

Dimensions:	ext. dia. 32" x 41.5" H
Shipping Dimensions:	31.75" W x 41.5" L x 31.75" H
Sold as:	1 per package
Color:	Yellow
Composition:	Polyethylene
# per Pallet:	3
Incinerable:	No
Ship Class:	250

Metric Equivalent Specifications

Dimensions:	ext. dia. 81.3cm x 105.4cm H
Shipping Dimensions:	80.6cm W x 105.4cm L x 80.6cm H

A95OVER Technical Information

Warnings & Restrictions:
There are no known warnings and restrictions for this product.

Regulations and Compliance:
49 CFR 173.3(c)(1) - If a container of hazardous waste is damaged or leaking, it can be placed in a compatible salvage drum that meets UN criteria for shipping

49 CFR 173.12(b)(2)(iv) - When labpacking, "Inner packagings…must be surrounded by a chemically compatible absorbent material in sufficient quantity to absorb the total liquid contents."

49 CFR 173.12(b) - A container used for labpacking must be "a UN 1A2 or UN 1B2 metal drum, a UN 1D plywood drum, a UN 1G fiber drum or a UN 1H2 plastic drum tested and marked at least for the Packing Group III performance level for liquids or solids."

SAFETY DATA SHEET

M32415 - ANSI - EN

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415 **SDS Revision Date:** 13-Jan-2016

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 5005 LBJ Freeway P.O. Box 809050 Dallas, TX 75380-9050 1-800-752-5151
24 Hour Emergency Telephone Number:	1-800-733-3665 or 1-972-404-3228 (USA); CANUTEC (Canada): 1-613-996-6666; CHEMTREC (within USA and Canada): 1-800-424-9300; CHEMTREC (outside USA and Canada): +1 703-527-3887; CHEMTREC Contract No: CCN16186
To Request an SDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700 (55) 55959542 (Mexico)
Product Identifier:	**CAUSTIC SODA LIQUID (ALL GRADES)**
Trade Name:	Caustic Soda Diaphragm Grade 10%, 15%, 18%, 20%, 25%, 30%, 35%, 40%, 50%, Caustic Soda Membrane 6%, 18%, 20%, 25%, 30%, 48%, 50%, 50% Caustic Soda Membrane OS, 50% Caustic Soda Diaphragm OS, Caustic Soda Low Salt 50%, Membrane Blended, 50% Caustic Soda Diaphragm (West Coast), Membrane Cell Liquor
Synonyms:	Sodium hydroxide solution, Liquid Caustic, Lye Solution, Caustic, Lye, Soda Lye, Secondary Caustic Soda Liquids
Product Use:	Metal finishing, Cleaner, Process chemical, Petroleum Industry
Uses Advised Against:	None identified

SECTION 2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

****

EMERGENCY OVERVIEW:

Color: Colorless to slightly colored
Physical State: Liquid
Appearance: Clear to opaque
Odor: Odorless

Signal Word: **DANGER**

MAJOR HEALTH HAZARDS: CORROSIVE. CAUSES SERIOUS EYE DAMAGE. CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. MAY CAUSE RESPIRATORY IRRITATION. EFFECTS OF CONTACT OR INHALATION MAY BE DELAYED.

PHYSICAL HAZARDS: MAY BE CORROSIVE TO METALS. Mixing with water, acid or incompatible materials may cause splattering and release of heat. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated.

ECOLOGICAL HAZARDS: This material has exhibited moderate toxicity to aquatic organisms. Keep out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters.

PRECAUTIONARY STATEMENTS: Do not get in eyes, on skin, or on clothing. Wear eye protection, face protection, protective gloves. Do not breathe mist, vapors, or spray. Do not ingest. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling- exposure can cause burns which are not immediately painful or visible.

ADDITIONAL HAZARD INFORMATION: This material is corrosive. It may cause severe burns and permanent damage to any tissue with which it comes into contact. Toxicity may be delayed, and may not be readily visible. To treat contacted tissue, flush with water to dilute. There is no specific antidote. Significant exposures must be referred for medical attention immediately.

****

GHS CLASSIFICATION:

GHS: PHYSICAL HAZARDS:	Corrosive to Metals Mixing with water may cause splattering and release of heat
GHS: CONTACT HAZARD - SKIN:	Category 1B - Causes severe skin burns and eye damage.
GHS: CONTACT HAZARD - EYE:	Category 1 - Causes serious eye damage

GHS: TARGET ORGAN TOXICITY (SINGLE EXPOSURE):	Category 3 - May cause respiratory irritation
GHS: CARCINOGENICITY:	Not classified as a carcinogen per GHS criteria. This product is not classified as a carcinogen by NTP, IARC or OSHA.
GHS: HAZARDOUS TO AQUATIC ENVIRONMENT - ACUTE HAZARD:	Category 3 - Harmful to aquatic life

UNKNOWN ACUTE TOXICITY: 100% of the mixture consists of ingredient(s) of unknown toxicity. There is no acute toxicity data available for this product.

GHS SYMBOL: Corrosive

GHS SIGNAL WORD: **DANGER**

GHS HAZARD STATEMENTS:

GHS - Physical Hazard Statement(s)
• May be corrosive to metals

GHS - Health Hazard Statement(s)
• Causes serious eye damage
• Causes severe skin burns and eye damage
• May cause respiratory irritation

GHS - Precautionary Statement(s) - Prevention
• Do not breathe mist, vapors, or spray
• Wear protective gloves, protective clothing, eye, and face protection
• Wash thoroughly after handling
• Keep only in original container
• Use only outdoors or in a well-ventilated area

GHS - Precautionary Statement(s) - Response
• IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower
• Wash contaminated clothing before reuse
• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
• Immediately call a POISON CENTER or doctor/physician
• IF INHALED: Remove person to fresh air and keep comfortable for breathing
• Immediately call a POISON CENTER or doctor/physician
• IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
• IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
• Specific treatment (see First Aid information on product label and/or Section 4 of the SDS)
• Absorb spillage to prevent material damage

GHS - Precautionary Statement(s) - Storage
• Store locked up
• Store in a well-ventilated place. Keep container tightly closed
• Store in corrosive resistant and NON-ALUMINUM container with a resistant inner liner (NOTE: flammable hydrogen gas may be generated if aluminum container and/or aluminum fittings are used)

GHS - Precautionary Statement(s) - Disposal
• Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Hazards Not Otherwise Classified (HNOC)
Mixing with water may cause splattering and release of heat

Additional Hazard Information
Mixing with water may cause splattering and release of heat.

See Section 11: TOXICOLOGICAL INFORMATION

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Sodium hydroxide solution, Liquid Caustic, Lye Solution, Caustic, Lye, Soda Lye, Secondary Caustic Soda Liquids

Component	Percent [%]	CAS Number
Water	48.5 - 94.5	7732-18-5
Sodium Hydroxide	5.5 - 51.5	1310-73-2
Sodium Chloride	0 - 35	7647-14-5

Notes: *All hazardous and non-hazardous components of product composition are listed.*

SECTION 4. FIRST AID MEASURES

INHALATION: If inhalation of mists, vapors, or spray occurs and adverse effects result, remove to uncontaminated area. Evaluate ABC's (is Airway constricted, is Breathing occurring, and is blood Circulating) and treat symptomatically. GET MEDICAL ATTENTION IMMEDIATELY. There is no specific antidote, treat symptomatically.

SKIN CONTACT: Immediately flush contaminated areas with water. Remove contaminated clothing, jewelry, and shoes immediately. Wash contaminated areas with large amounts of water. GET MEDICAL ATTENTION IMMEDIATELY. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods.

EYE CONTACT: Immediately flush contaminated eyes with a directed stream of water for as long as possible. Remove contact lenses, if present and easy to do. Continue rinsing. GET MEDICAL ATTENTION IMMEDIATELY. Washing eyes within several seconds is essential to achieve maximum effectiveness.

INGESTION: If swallowed, do not induce vomiting. For definite or probable ingestion, do not administer oral fluids. If vomiting occurs spontaneously, keep airway clear. Monitor airway. Volume resuscitation (IV fluids) and circulatory support (CPR) may be required. Never give anything by mouth to an unconscious or convulsive person. GET MEDICAL ATTENTION IMMEDIATELY.

Most Important Symptoms/Effects (Acute and Delayed) Corrosive. This material may be corrosive to any tissue it comes in contact with. It can cause serious burns and extensive tissue destruction resulting in: liquefaction, necrosis, and/or perforation.

Acute Symptoms/Effects: Listed below.
Inhalation (Breathing): Respiratory System Effects: Exposure to airborne material may cause irritation, redness of upper and lower airways, coughing, laryngeospasm, shortness of breath, bronchoconstriction, and possible pulmonary edema. Severe and permanent scarring may occur. Pulmonary edema may develop several hours after a severe acute exposure. Aspiration of this material may cause the same conditions.
Skin: Skin Corrosion. Exposure to skin may cause redness, itching, irritation, swelling, burns (first, second, or third degree), liquefaction of skin, and damage to underlying tissues (deep and painful wounds).
Eye: Serious Eye Damage. Eye exposures may cause eye lid burns, conjunctivitis, corneal edema, corneal burn, corneal perforation, damage to internal contents of the eye, permanent visual defects, and blindness and/or loss of the eye.
Ingestion (Swallowing): Gastrointestinal System Effects: Exposure by ingestion may cause irritation, swelling, and perforation of upper and lower gastrointestinal tissues. Permanent scarring may occur.

Delayed Symptoms/Effects:
- Skin: Repeated and prolonged skin contact may cause a chronic dermatitis

Interaction with Other Chemicals Which Enhance Toxicity: None known.

Medical Conditions Aggravated by Exposure: May aggravate preexisting conditions such as: eye disorders that decrease tear production or have reduced integrity of the eye; skin disorders that compromise the integrity of the skin; and respiratory conditions including asthma and other breathing disorders.

Protection of First-Aiders: Protect yourself by avoiding contact with this material. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Do not ingest. Use personal protective equipment. Refer to Section 8 for specific personal protective equipment recommendations. At minimum, treating personnel should utilize PPE sufficient for prevention of bloodborne pathogen transmission.

Notes to Physician: Medical observation and assessment is recommended for all ingestions, all eye exposures, and symptomatic inhalation and dermal exposures. For symptomatic ingestion, do not administer oral fluids and consider investigation by endoscopy, X-ray, or CT scan. Esophageal perforation, airway compromise, hypotension, and shock are possible. For prolonged exposures and significant exposures, consider delayed injury to exposed tissues. There is no antidote. Treatment is supportive care. Follow normal parameters for airway, breathing, and circulation. Surgical intervention may be required.

SECTION 5. FIRE-FIGHTING MEASURES

Fire Hazard: Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. May react with chemically reactive metals such as aluminum, zinc, magnesium, copper, etc. to release hydrogen gas which can form explosive mixtures in air.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire.

Fire Fighting: Move container from fire area if it can be done without risk. Cool containers with water. Do not apply water directly on this product. Heat is generated when mixed with water. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Avoid contact with skin.

Component	Immediately Dangerous to Life/ Health (IDLH)
Sodium Hydroxide 1310-73-2	10 mg/m^3 IDLH

Hazardous Combustion Products: Sodium hydroxide fumes can be generated by thermal decomposition at elevated temperatures

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): Not flammable

Upper Flammability Level (air): Not flammable

Flash point: Not flammable

Auto-ignition Temperature: Not applicable

GHS: PHYSICAL HAZARDS:
- Corrosive to Metals
- Mixing with water may cause splattering and release of heat

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Do not get in eyes, on skin or on clothing. Avoid breathing mist, vapor, or spray. Do not ingest. Wear appropriate personal protective equipment recommended in Section 8 of the SDS.

Methods and Materials for Containment and Cleaning Up:
In case of spill or leak, stop the leak as soon as possible, if safe to do so. Completely contain spilled materials with dikes, sandbags, etc. Shovel dry material into suitable container. Liquid material may be removed with a vacuum truck. Remaining material may be diluted with water and neutralized with dilute acid, then absorbed and collected. Flush spill area with water, if appropriate.

Environmental Precautions:
Keep out of water supplies and sewers. Do not flush into surface water or sanitary sewer system. This material is alkaline and may raise the pH of surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling:
Avoid breathing vapor or mist. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Do not ingest. Do not eat, drink or smoke in areas where this material is used. Wear personal protective equipment as described in Exposure Controls/Personal Protection (Section 8) of the SDS. NEVER add water to product. When mixing, slowly add to water to minimize heat generation and spattering.

Safe Storage Conditions:
Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

Incompatibilities/ Materials to Avoid:
Acids and halogenated compounds, Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys, Releases heat when diluted in water

GHS: PHYSICAL HAZARDS:
- Corrosive to Metals
- Mixing with water may cause splattering and release of heat

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Regulatory Exposure Limit(s): Listed below for the product components that have regulatory occupational exposure limits (OEL's).

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PELCeiling
Sodium Hydroxide 1310-73-2	2 mg/m^3	-----	-----

OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit

NON-REGULATORY EXPOSURE LIMIT(S): Listed below for the product components that have non-regulatory occupational exposure limits (OEL's).

Component	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Sodium Hydroxide	-----	-----	2 mg/m^3	-----	-----	2 mg/m^3

- The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

- The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

Component	OXY REL 8 hr TWA	OXY REL STEL	OXY REL Ceiling
Sodium Chloride 7647-14-5 (0 - 35)	-----	-----	-----

ENGINEERING CONTROLS: Provide local exhaust ventilation where dust or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a face-shield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear protective clothing to minimize skin contact. Wear chemical resistant clothing and rubber boots when potential for contact with the material exists. Always place pants legs over boots. Contaminated clothing should be removed, then discarded or laundered. Discard contaminated leather goods.

Hand Protection: Wear appropriate chemical resistant gloves. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove.

Protective Material Types:
- Natural rubber
- Neoprene
- Nitrile
- Polyvinyl chloride (PVC)
- Tyvek®
- Tychem®

Respiratory Protection: A NIOSH approved respirator with N95 (dust, fume, mist) cartridges may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure. If eye irritation occurs, a full face style mask should be used. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

Component	Immediately Dangerous to Life/ Health (IDLH)
Sodium Hydroxide 1310-73-2	10 mg/m^3 IDLH

HYGIENE MEASURES: Handle in accordance with good industrial hygiene and safety practices. Wash hands and affected skin immediately after handling, before breaks, and at the end of the workday. When using do not eat or drink. When using do not smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Appearance:	Clear to opaque
Color:	Colorless to slightly colored
Odor:	Odorless
Odor Threshold [ppm]:	No data available.
Molecular Weight:	40.01
Molecular Formula:	NaOH
Decomposition Temperature:	No data available
Boiling Point/Range:	215 - 291°F (102 - 144°C)
Freezing Point/Range:	-26 to 59°F (-32 to 15 °C).
Vapor Pressure:	13 - 135 mmHg @ 60 °C
Vapor Density (air=1):	No data available
Relative Density/Specific Gravity (water=1):	1.05 – 1.56 @ 15.6 °C
Density:	8.8 - 13.0 lbs/gal @ 15.6 °C
Water Solubility:	100%
pH:	14.0 (theoretical value of 7.5% solution)
Volatility:	No data available
Evaporation Rate (ether=1):	No data available
Partition Coefficient (n-octanol/water):	No data available
Flash point:	Not flammable
Flammability (solid, gas):	Not flammable
Lower Flammability Level (air):	Not flammable
Upper Flammability Level (air):	Not flammable
Auto-ignition Temperature:	Not applicable
Viscosity:	About 24cp for 50% solution at 40 °C (104 °F)

SECTION 10. STABILITY AND REACTIVITY

Reactivity: Soluble in water, releasing heat sufficient to ignite combustibles. Reacts with metals, and may form hydrogen gas.

Chemical Stability: Stable at normal temperatures and pressures.

Possibility of Hazardous Reactions:
Mixing with water, acid, or incompatible materials may cause splattering and release of large amounts of heat. Will react with some metals forming flammable hydrogen gas. Carbon monoxide gas may form upon contact with reducing sugars, food and beverage products in enclosed spaces.

Conditions to Avoid: (e.g., static discharge, shock, or vibration) -. None known.

Incompatibilities/ Materials to Avoid: Acids and halogenated compounds. Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys. Releases heat when diluted in water.

Hazardous Decomposition Products: Toxic fumes of sodium oxide

Hazardous Polymerization: Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

IRRITATION DATA: PRIMARY SKIN IRRITATION: Severe Irritation, Corrosive (rabbit, 24 hr)
PRIMARY EYE IRRITATION: Severe Irritation, Corrosive (rabbit, 24 hr)

TOXICITY DATA:

PRODUCT TOXICITY DATA: CAUSTIC SODA LIQUID (ALL GRADES)

LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
No reliable data available	No reliable data available	No data available

COMPONENT TOXICITY DATA:
Note: The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given.

Component	LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
Water 7732-18-5	90 mL/kg (Rat)	-----	-----
Sodium Hydroxide 1310-73-2	140-3400 mg/kg	1350 mg/kg (Rabbit)	-----
Sodium Chloride 7647-14-5	3 g/kg (Rat)	-----	42 g/m^3 (1 hr-Rat)

****

POTENTIAL HEALTH EFFECTS:

Eye contact: Corrosive. Causes serious eye damage which can result in: severe irritation, pain and burns, and permanent damage including blindness.

Skin contact: Corrosive. Causes severe skin burns. Prolonged or repeat skin exposures can result in dermatitis.

Inhalation: Corrosive. Inhalation injury may result from ingestion and/or aspiration of this material. May cause severe irritation of the respiratory tract with potential airway compromise, coughing, choking, pain, and burns of the mucous membrane and respiratory system. This material can be extremely destructive to the tissue of the mucus membranes and respiratory system. Aspiration may cause chemical pneumonitis, pulmonary edema, damage to lung tissue, death.

Ingestion: Corrosive. If swallowed, may cause severe oral and esophageal, mucus membrane, and gastrointestinal burns and possible perforation. If swallowed, may pose a lung aspiration hazard during vomiting.

Chronic Effects: Repeated or prolonged skin contact may result in dermatitis.

SIGNS AND SYMPTOMS OF EXPOSURE:
This material may cause severe burns and permanent damage to any tissue with which it comes into contact. It can cause serious burns and extensive tissue destruction resulting in liquefaction, necrosis and/or perforation. Signs and symptoms of exposure vary, and are dependent on the route of exposure, degree of exposure, and duration of exposure.

Inhalation (Breathing): Respiratory System Effects: Exposure to airborne material may cause irritation, redness of upper and lower airways, coughing, laryngeospasm, shortness of breath, bronchoconstriction, and possible pulmonary edema. Severe and permanent scarring may occur. Pulmonary edema may develop several hours after a severe acute exposure. Aspiration of this material may cause the same conditions.
Skin: Skin Corrosion. Exposure to skin may cause redness, itching, irritation, swelling, burns (first, second, or third degree), liquefaction of skin, and damage to underlying tissues (deep and painful wounds).
Eye: Serious Eye Damage. Eye exposures may cause eye lid burns, conjunctivitis, corneal edema, corneal burn, corneal perforation, damage to internal contents of the eye, permanent visual defects, and blindness and/or loss of the eye.
Ingestion (Swallowing): Gastrointestinal System Effects: Exposure by ingestion may cause irritation, swelling, and perforation of upper and lower gastrointestinal tissues. Permanent scarring may occur.

TOXICITY:
When in solution, this material will affect all tissues with which it comes in contact. The severity of the tissue damage is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucus membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact.

Interaction with Other Chemicals Which Enhance Toxicity: None known.

****

GHS HEALTH HAZARDS:

GHS: CONTACT HAZARD - EYE: Category 1 - Causes serious eye damage

GHS: CONTACT HAZARD - SKIN: Category 1B - Causes severe skin burns and eye damage

Skin Absorbent / Dermal Route? No.

GHS: CARCINOGENICITY:
Not classified as a carcinogen per GHS criteria. This product is not classified as a carcinogen by NTP, IARC or OSHA.

SPECIFIC TARGET ORGAN TOXICITY (Single Exposure):
Category 3 - Respiratory Irritation

SECTION 12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

Aquatic Toxicity:
This material has exhibited moderate toxicity to aquatic organisms. Data provided are for sodium hydroxide

Component	Freshwater Fish	Invertebrate Toxicity:	Algae Toxicity:	Other Toxicity:
Sodium Chloride 7647-14-5 (0 - 35)		340.7 - 469.2 mg/L EC50 = 1000 mg/L EC50	-----	

FATE AND TRANSPORT:

BIODEGRADATION: This material is inorganic and not subject to biodegradation

PERSISTENCE: This material is alkaline and may raise the pH of surface waters with low buffering capacity This material is believed to exist in the disassociated state in the environment

BIOCONCENTRATION: This material is not expected to bioconcentrate in organisms.

BIOACCUMULATIVE POTENTIAL: Does not bioaccumulate.

MOBILITY IN SOIL: No data available.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited slight toxicity to terrestrial organisms. This material has exhibited moderate toxicity to aquatic organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from material:
Reuse or reprocess, if possible. May be subject to disposal regulations. Dispose in accordance with all applicable regulations.

Container Management:
Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container rinsate must be disposed of in compliance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION

LAND TRANSPORT

U.S. DOT 49 CFR 172.101:

UN NUMBER: UN1824
PROPER SHIPPING NAME: Sodium Hydroxide Solution
HAZARD CLASS/ DIVISION: 8

PACKING GROUP: II
LABELING REQUIREMENTS: 8
RQ (lbs): RQ 1000 lbs. (Sodium Hydroxide)

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

UN NUMBER: UN1824
SHIPPING NAME: Sodium hydroxide solution
CLASS OR DIVISION: 8
PACKING/RISK GROUP: II
LABELING REQUIREMENTS: 8

MARITIME TRANSPORT (IMO / IMDG) :

UN NUMBER: UN1824
PROPER SHIPPING NAME: Sodium hydroxide solution
HAZARD CLASS / DIVISION: 8
Packing Group: II
LABELING REQUIREMENTS: 8

SECTION 15. REGULATORY INFORMATION

U.S. REGULATIONS

OSHA REGULATORY STATUS:
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	CERCLA Reportable Quantities:
Sodium Hydroxide	1000 lb (final RQ)

SARA EHS Chemical (40 CFR 355.30)
No components are listed

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.10):
Acute Health Hazard

EPCRA SECTION 313 (40 CFR 372.65):
No components are listed

DEPARTMENT OF HOMELAND SECURITY (DHS)- Chemical Facility Anti-Terrorism Standards (6 CFR 27):
No components in this material are regulated under DHS

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):
Not regulated

FDA: This material has Generally Recognized as Safe (GRAS) status under specific FDA regulations. Additional information is available from the Code of Federal Regulations which is accessible on the FDA's website. This product is not produced under all current Good Manufacturing Practices (cGMP) requirements as defined by the Food and Drug Administration (FDA).

NATIONAL INVENTORY STATUS

U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA): All components are listed or exempt

Component	U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA):
Water 7732-18-5 (48.5 - 94.5)	Listed
Sodium Hydroxide 1310-73-2 (5.5 - 51.5)	Listed
Sodium Chloride 7647-14-5 (0 - 35)	Listed

TSCA 12(b): This product is not subject to export notification.

Canadian Chemical Inventory: All components of this product are listed on either the DSL or the NDSL.

STATE REGULATIONS

California Proposition 65:
This product and its ingredients are not listed, but it may contain impurities/trace elements known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act. For additional information, contact OxyChem Technical Services at 1-800-733-1165.

Component	California Proposition 65 Cancer WARNING:	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List
Sodium Hydroxide 1310-73-2	Not Listed	Not Listed	Not Listed	Listed	1706	corrosive

Component	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List	Rhode Island Right to Know Hazardous Substance List
Water 7732-18-5	Not Listed	Listed	Not Listed	Not Listed	Not Listed
Sodium Hydroxide 1310-73-2	Not Listed	Listed	Not Listed	Present	Listed

CANADIAN REGULATIONS

• This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations

Component	Water
WHMIS - Classifications of Substances: Uncontrolled product according to WHMIS classification criteria	
Component	Sodium Hydroxide
WHMIS - Classifications of Substances: E	
Component	Sodium Chloride
WHMIS - Classifications of Substances: Uncontrolled product according to WHMIS classification criteria	

SECTION 16. OTHER INFORMATION

Prepared by: OxyChem Corporate HESS - Product Stewardship

Rev. Date: 13-Jan-2016

Other information:
The Safety Data Sheet for Caustic Soda Liquid (ALL Grades) can be used for hazard communication purposes for off-specification, secondary caustic soda liquids generated when cleaning caustic soda storage tanks, including the general disclaimer found in section 16 of the Safety Data Sheet

HMIS: (SCALE 0-4) (Rated using National Paint & Coatings Association HMIS: Rating Instructions, 2nd Edition)

Health Rating: 3 **Flammability Rating:** 0 **Reactivity Rating:** 1

NFPA 704 - Hazard Identification Ratings (SCALE 0-4) : Listed below.

Health Rating: 3 **Flammability:** 0 **Reactivity Rating:** 1

Reason for Revision:
• Changed GHS Classification: SEE SECTION 2
• Toxicological Information has been revised: SEE SECTION 11

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415 **SDS Revision Date:** 13-Jan-2016

IMPORTANT:
The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESSED OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal and other factors that may involve other or additional legal, environmental, safety or performance considerations, and OxyChem assumes no liability whatsoever for the use of or reliance upon this information. While our technical personnel will be happy to respond to questions, safe handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, local or foreign laws

OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Safety Data Sheet available to your employees

End of Safety Data Sheet

The Pulsatron Series HV designed for high viscosity applications for precise and accurate metering control. The Series HV offers manual control over stroke length and stroke rate as standard with the option to choose between 4-20mA and external pace inputs for automatic control.

Five distinct models are available, having pressure capabilities to 150 PSIG (10 BAR) @ 12 GPD (1.9 lph), and flow capacities to 240 GPD (37.9 lph) @ 80 PSIG (5.6 BAR), with a turndown ratio of 100:1. Metering performance is reproducible to within ± 2% of maximum capacity.

Features

- Automatic Control, available with 4-20mADC direct or external pacing, with stop function.
- Manual Control by on-line adjustable stroke rate and stroke length.
- Auto-Off-Manual switch.
- Highly Reliable timing circuit.
- Circuit Protection against voltage and current upsets.
- Panel Mounted Fuse.
- Solenoid Protection by thermal overload with auto-reset.
- Water Resistant, for outdoor and indoor applications.
- Indicator Lights, panel mounted.
- Guided Ball Check Valve Systems, to reduce back flow and enhance outstanding priming characteristics.
- Viscosities to 20,000 CPS.

Controls

Manual Stroke Rate

- Turn-Down Ratio 10:1

Manual Stroke Length

- Turn-Down Ratio 10:1

4-20mA or 20-4mA Input

- Automatic Control

Operating Benefits

- Reliable metering performance.
- Rated "hot" for continuous duty.
- High viscosity capability.
- Leak-free, sealless, liquid end.

Aftermarket

- KOPkits
- Gauges
- Dampeners
- Pressure Relief Valves
- Tanks
- Pre-Engineered Systems
- Process Controllers (PULSAblue, MicroVision)

Series HV

Specifications and Model Selection

MODEL		LVB3	LVF4	LVG4	LVG5	LVH7
Capacity	GPH	0.50	1.00	2.00	4.00	10.00
nominal	GPD	12	24	48	96	240
(max.)	LPH	1.9	3.8	7.6	15.1	37.9
Pressure	PSIG	150	150	110	110	80
(max.)	BAR	10	10	7	7	5.6
Connections:	Tubing	(S) .50" I.D. X .75" O.D. .38" I.D. X .50" OD (LVB3 & F4 only) (S & D) .50" I.D. X .75" O.D. (LVG4,G5 & H7 only)				

Engineering Data

Pump Head Materials Available: GFPPL, PVC, PVDF, 316 SS

Diaphragm: PTFE-faced CSPE-backed

Check Valves Materials Available:

Seats/O-Rings: PTFE, CSPE, Viton

Balls: Ceramic, PTFE, 316 SS, Alloy C

Fittings Materials Available: GFPPL, PVC, PVDF

Bleed Valve: Same as fitting and check valve selected, except 316SS

Injection Valve & Foot Valve Assy: Same as fitting and check valve selected

Tubing: Clear PVC, White PE

Important: Material Code - GFPPL=Glass-filled Polypropylene, PVC=Polyvinyl Chloride, PE=Polyethylene, PVDF=Polyvinylidene Fluoride, CSPE=Generic formulation of Hypalon, a registered trademark of E.I. DuPont Company. Viton is a registered trademark of E.I. DuPont Company. PVC wetted end recommended for sodium hypochlorite.

Engineering Data

Reproducibility: +/- 2% at maximum capacity

Viscosity Max CPS: 20,000 CPS

Stroke Frequency Max SPM: 125

Stroke Frequency Turn-Down Ratio: 10:1

Stroke Length Turn-Down Ratio: 10:1

Power Input: 115 VAC/50-60 HZ/1 ph, 230 VAC/50-60 HZ/1 ph

Average Current Draw:

@ 115 VAC; Amps: 1.0 Amps

@ 230 VAC; Amps: 0.5 Amps @ 230 VAC

Peak Input Power: 300 Watts

Average Input Power @ Max SPM: 130 Watts

Custom Engineered Designs – Pre-Engineered Systems

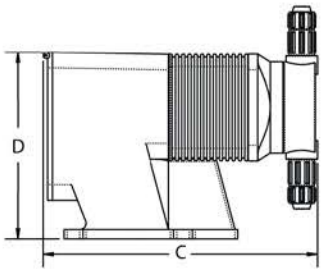
Pre-Engineered Systems

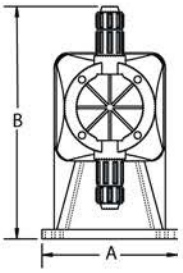
Pulsafeeder's Pre-Engineered Systems are designed to provide complete chemical feed solutions for all electronic metering applications. From stand alone simplex pH control applications to full-featured, redundant sodium hypochlorite disinfection metering, these rugged fabricated assemblies offer turn-key simplicity and industrial-grade durability. The UV-stabilized, high-grade HDPE frame offers maximum chemical compatibility and structural rigidity. Each system is factory assembled and hydrostatically tested prior to shipment.

Dimensions

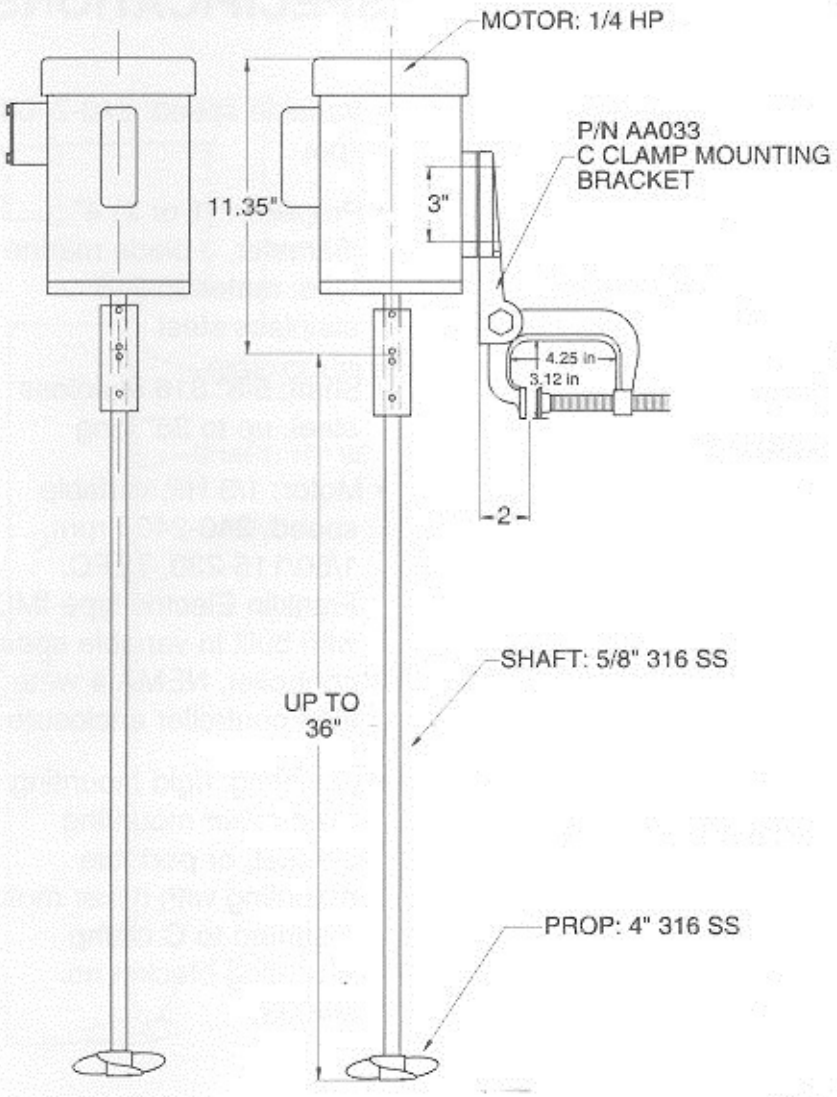
Series HV Dimensions (inches)					
Model No.	A	B	C	D	Shipping Weight
LVB3	5.4	9.3	9.5	7.5	13
LVF4	5.4	10.8	10.8	7.5	18
LVG4	5.4	9.5	10.6	7.5	18
LVG5	5.4	10.8	10.8	7.5	18
LVH7	6.1	11.5	11	8.2	25

NOTE: Inches X 2.54 = cm





MIXER MODEL NO. AA102A



AA102A

SPECIFICATIONS

- Speed: 1,725 rpm
- Propeller: (1 or 2) 4" diameter, 3 blade marine type, material: 316 stainless steel
- Shaft: 5/8" 316 stainless steel, up to 36" long
- Motor: 1/4 HP, 1,725 rpm, 1/60/115-230, capacitor start, or 3/60/230-460, TEFC
- Mounting: rigid mounting to fixed mixer mounting bracket, or portable mounting with mixer motor mounted to C clamp mounting bracket no. AA033.

Revision date 2019-15-4

SAFETY DATA SHEET

Revision number 1

SECTION 1) CHEMICAL PRODUCT AND SUPPLIER'S IDENTIFICATION

Product Name:	Redux E50
Product Use:	Water and Wastewater Treatment Coagulant/Flocculant
Revision Date:	Apr 15, 2019
Supersedes Date:	Mar 5, 2015
Manufacturer's Name:	Azure Water Services
Address:	280 Callegari Dr. West Haven CT, 06516
Emergency Phone:	Chemtrec, (1) 800-424-9300, in US and Canada only

SECTION 2) HAZARDS IDENTIFICATION

Classification

Corrosive to metals - Category 1

Eye Irritation - Category 2

Skin Irritation - Category 2

Pictograms

Signal Word

Warning

Hazardous Statements - Health

Causes serious eye irritation

Causes skin irritation

Hazardous Statements - Physical

May be corrosive to metals

Precautionary Statements - General

If medical advice is needed, have product container or label at hand.

Keep out of reach of children.

Read label before use.

Precautionary Statements - Prevention

Keep only in original packaging.

Wash thoroughly after handling.

Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary Statements - Response

Absorb spillage to prevent material damage.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF ON SKIN: Wash with plenty of water.

Specific treatment (see first-aid on this SDS).

If skin irritation occurs: Get medical advice/attention.

Take off contaminated clothing. And wash it before reuse.

Precautionary Statements - Storage

Store in a corrosive resistant container with a resistant inner liner.

Precautionary Statements - Disposal

No precautionary statement available.

Hazards Not Otherwise Classified (HNOC)

None.

SECTION 3) COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Chemical Name	% By Weight
PROPRIETARY	Trade Secret Ingredient	45 - 55%

Specific chemical identity and/or exact percentage (concentration) of the composition has been withheld to protect confidentiality.

SECTION 4) FIRST-AID MEASURES

Inhalation

Remove source of exposure or move person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor/. If breathing has stopped, trained personnel should begin rescue breathing or, if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED).

Eye Contact

Remove source of exposure or move person to fresh air. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for a flushing duration of 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a POISON CENTER/doctor.

Skin Contact

Take off immediately all contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Rinse skin with lukewarm, gently flowing water/shower for a duration of 30 minutes or until medical aid is available. Immediately call a POISON CENTER/doctor. Wash contaminated clothing before re-use or discard.

Ingestion

Rinse mouth with water. Do NOT induce vomiting. Give 1 to 2 cups of milk or water to drink. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, lie on your side, in the recovery position. Immediately call a POISON CENTER/doctor.

Most Important Symptoms and Effects, Both acute and Delayed

No data available.

Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5) FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Dry chemical, foam, carbon dioxide. Sand or earth may be used for small fires only.

Use extinguishing agent suitable for type of surrounding fire.

Unsuitable Extinguishing Media

Do not use direct water stream since this may cause fire to spread.

Specific Hazards in Case of Fire

In case of fire, hazardous decomposition products may include sulphur oxides.

Fire-Fighting Procedures

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Water may be ineffective but can be used to cool containers exposed to heat or flame. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Special Protective Actions

Wear protective pressure self-contained breathing apparatus (SCBA) and full turnout gear.

SECTION 6) ACCIDENTAL RELEASE MEASURES

Emergency Procedure

Isolate hazard area and keep unnecessary people away. Remove all possible sources of ignition in the surrounding area. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.

Absorb spill with absorbent material or vacuum spill into polyethylene lined steel or plastic drums.

Do not touch or walk through spilled material.

If spilled material is cleaned up using a regulated solvent, the resulting waste mixture may be regulated.

Recommended Equipment

Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA (NIOSH approved).

Personal Precautions

Avoid breathing vapor or mist. Avoid contact with skin, eye or clothing. Ensure adequate ventilation. Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing.

Environmental Precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems and natural waterways by using sand, earth, or other appropriate barriers.

Methods and Materials for Containment and Cleaning Up

Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spilled product.

SECTION 7) HANDLING AND STORAGE

General

Wash hands after use.
Do not get in eyes, on skin or on clothing.
Do not breathe vapors or mists.
Use good personal hygiene practices.
Eating, drinking and smoking in work areas is prohibited.
Remove contaminated clothing and protective equipment before entering eating areas.
Eyewash stations and showers should be available in areas where this material is used and stored.

Ventilation Requirements

Use only with adequate ventilation to control air contaminants to their exposure limits. The use of local ventilation is recommended to control emissions near the source.

Storage Room Requirements

Keep container(s) tightly closed and properly labeled. Store in cool, dry, well-ventilated areas away from heat, direct sunlight and strong oxidizers. Store in approved containers and protect against physical damage. Keep containers securely sealed when not in use. Indoor storage should meet OSHA standards and appropriate fire codes. Containers that have been opened must be carefully resealed to prevent leakage. Empty containers retain residue and may be dangerous.

Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored.

SECTION 8) EXPOSURE CONTROLS, PERSONAL PROTECTION

Eye Protection

Wear eye protection with side shields or goggles. Wear indirect-vent, impact and splash resistant goggles when working with liquids. If additional protection is needed for entire face, use in combination with a face shield.

Skin Protection

Use of gloves approved to relevant standards made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Use of an apron and over-boots of chemically impervious materials such as neoprene or nitrile rubber is recommended to avoid skin sensitization. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Launder soiled clothes or properly disposed of contaminated material, which cannot be decontaminated.

Respiratory Protection

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker, a respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed. Check with respiratory protective equipment suppliers.

Appropriate Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

SECTION 9) PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Density	11.10 lb/gal
Specific Gravity	1.33 - 1.35
Appearance	Colorless to yellow liquid
pH	3 - 4
Odor Threshold	N/A
Odor Description	N/A
Water Solubility	complete
Viscosity	< 100cps @20C
Vapor Pressure	Similar to water
Vapor Density	N/A
Freezing Point	<19 °F
Boiling Point	>212 °F
Evaporation Rate	N/A
Flammability	Will not burn

SECTION 10) STABILITY AND REACTIVITY

Stability

Stable under normal storage and handling conditions.

Conditions To Avoid

Avoid heat, sparks, flame, high temperature and contact with incompatible materials.

Hazardous Reactions/Polymerization

Hazardous polymerization will not occur.

Incompatible Materials

Strong bases, acids, oxidizing and reducing agents.

Hazardous Decomposition Products

May produce carbon monoxide, carbon dioxide.

SECTION 11) TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Inhalation LC50 : Not Available
Oral LD50 : Not Available
Dermal LD50 : Not Available

Acute Toxicity

Component	weight-%	Oral LD50	Dermal LD50	Inhalation LC50
Trade Secret Ingredient	45 - 55%	= 9187 mg/kg (Rat)	> 2000 mg/k (Rat)	--

Aspiration Hazard

No Data Available

Respiratory/Skin Sensitization

No Data Available

Serious Eye Damage/Irritation

Causes serious eye irritation

Skin Corrosion/Irritation

Causes skin irritation

Specific Target Organ Toxicity - Repeated Exposure

No Data Available

Specific Target Organ Toxicity - Single Exposure

No Data Available

SECTION 12) ECOLOGICAL INFORMATION

Ecotoxicity

Acute aquatic toxicity - Product Information

Fish
LC 50 (96 hour, static) 776.4 mg/L *Pimephales promelas* (Fathead Minnow) [1]
EC 50 (96 hour, static) 265.5 mg/L *Pimephales promelas* (Fathead Minnow) [1]

Crustacea
LC 50 (48 hour, static) 803.8 mg/L *Ceriodaphnia dubia* (Water Flea) [1]
EC 50 (48 hour, static) 33.2 mg/L *Ceriodaphnia dubia* (Water Flea) [1]

Algae/aquatic plants
No information available

Acute aquatic toxicity - Component Information

Component	weight-%	Algae/aquatic plants	Fish	Toxicity to daphnia and other aquatic invertebrates
Trade Secret Ingredient	45 - 55%	--	LC50 (96 h static) 100 - 500 mg/L (Brachydanio rerio)	--

Mobility in Soil

No data available.

Bio-accumulative Potential

No data available.

Persistence and Degradability

No data available.

Other Adverse Effect

No data available.

SECTION 13) DISPOSAL CONSIDERATIONS

Waste Disposal

Under RCRA it is the responsibility of the user of the product to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste. Waste management should be in full compliance with federal, state and local laws.
Empty Containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld or use for any other purposes. Return drums to reclamation centers for proper cleaning and reuse.

SECTION 14) TRANSPORT INFORMATION

U.S. DOT Information

NOT REGULATED FOR TRANSPORTATION

This product is excepted from DOT regulations under 49 CFR 173.154(d) when shipped by road or railway. The product exception is referenced in 49 CFR 172.101 Table. Packaging material must not be aluminum, steel or be degraded by this product

SECTION 15) REGULATORY INFORMATION

CAS	Chemical Name	% By Weight	Regulation List
No applicable CAS	No applicable chemical	-	-

SECTION 16) OTHER INFORMATION

Glossary

ACGIH- American Conference of Governmental Industrial Hygienists; ANSI- American National Standards Institute; Canadian TDGCanadian Transportation of Dangerous Goods; CAS- Chemical Abstract Service; Chemtrec- Chemical Transportation Emergency Center(US); CHIP- Chemical Hazard Information and Packaging; DSL- Domestic Substances List; EC- Equivalent Concentration; EH40 (UK)- HSE Guidance Note EH40 Occupational Exposure Limits; EPCRA- Emergency Planning and Community Right-To-Know Act; ESL Effects screening levels; HMIS- Hazardous Material Information Service; LC- Lethal Concentration; LD- Lethal Dose; NFPA- National Fire Protection Association; OEL- Occupational Exposure Limits; OSHA- Occupational Safety and Health Administration, US Department of Labor; PEL- Permissible Exposure Limit; SARA (Title III)- Superfund Amendments and Reauthorization Act; SARA 313- Superfund Amendments and Reauthorization Act, Section 313; SCBA- Self Contained Breathing Apparatus; STEL-Short Term Exposure Limit; TCEQ Texas Commission on Environmental Quality; TLV- Threshold Limit Value; TSCA- Toxic Substances Control Act Public Law 94-469; TWA Time Weighted Value; US DOT- US Department of Transportation; WHMIS- Workplace Hazardous Materials Information System.

Additional Information

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Version 1.0:

Revision Date: Apr 15,2019

First Edition.

DISCLAIMER

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

SAFETY DATA SHEET

Revision date 2019-27-9

Revision number 2

SECTION 1) CHEMICAL PRODUCT AND SUPPLIER'S IDENTIFICATION

Product ID:	FOC ND-9911
Product Name:	Waste/Water Treatment. For industrial use only
Revision Date:	Sep 27,2019
Supersedes Date:	April 28, 2019
Manufacturer's Name:	Azure Water Services
Address:	280 Callegari Drive West Haven, CT, US, 06516
Emergency Phone:	Chemtrec 800-424-9300, in US and Canada only

SECTION 2) HAZARDS IDENTIFICATION

Classification

Eye Irritation - Category 2

Skin Irritation - Category 3

Pictograms

Signal Word

Warning

Hazardous Statements - Health

Causes serious eye irritation

Causes mild skin irritation

Precautionary Statements - General

If medical advice is needed, have product container or label at hand.

Keep out of reach of children.

Read label before use.

Precautionary Statements - Prevention

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

Precautionary Statements - Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

If skin irritation occurs: Get medical advice/attention.

Precautionary Statements - Storage

No precautionary statement available.

Precautionary Statements - Disposal

No precautionary statement available.

Hazards Not Otherwise Classified (HNOC)

None.

SECTION 3) COMPOSITION / INFORMATION ON INGREDIENTS

Substances/Mixtures

Chemical nature: Anionic Polyacrylamide

This product is not classified as Hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

All of the product's ingredients are either listed or exempt from the TSCA Inventory.

Some specific chemical identity is being withheld as a trade secrets
None of the chemicals in this product are hazardous according to the GHS.

SECTION 4) FIRST-AID MEASURES

Inhalation

Remove source of exposure or move person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor/. If breathing has stopped, trained personnel should begin rescue breathing or, if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED).

Eye Contact

Remove source of exposure or move person to fresh air. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for a flushing duration of 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a POISON CENTER/doctor.

Skin Contact

Take off immediately all contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Rinse skin with lukewarm, gently flowing water/shower for a duration of 30 minutes or until medical aid is available. Immediately call a POISON CENTER/doctor. Wash contaminated clothing before re-use or discard.

Ingestion

Rinse mouth with water. Do NOT induce vomiting. Give 1 to 2 cups of milk or water to drink. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, lie on your side, in the recovery position. Immediately call a POISON CENTER/doctor.

Most Important Symptoms and Effects, Both acute and Delayed

No data available.

Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5) FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Dry chemical, foam, carbon dioxide. Sand or earth may be used for small fires only.

Use extinguishing agent suitable for type of surrounding fire.

Unsuitable Extinguishing Media

Do not use direct water stream since this may cause fire to spread.

Specific Hazards in Case of Fire

In case of fire, hazardous decomposition products may include sulphur oxides.

Fire-Fighting Procedures

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Water may be ineffective but can be used to cool containers exposed to heat or flame. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Special Protective Actions

Wear protective pressure self-contained breathing apparatus (SCBA) and full turnout gear.

SECTION 6) ACCIDENTAL RELEASE MEASURES

Emergency Procedure

Isolate hazard area and keep unnecessary people away. Remove all possible sources of ignition in the surrounding area. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.

Absorb spill with absorbent material or vacuum spill into polyethylene lined steel or plastic drums.

Do not touch or walk through spilled material.

If spilled material is cleaned up using a regulated solvent, the resulting waste mixture may be regulated.

Recommended Equipment

Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA (NIOSH approved).

Personal Precautions

Avoid breathing vapor or mist. Avoid contact with skin, eye or clothing. Ensure adequate ventilation. Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing.

Environmental Precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems and natural waterways by using sand, earth, or other appropriate barriers.

Methods and Materials for Containment and Cleaning Up

Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spilled product.

SECTION 7) HANDLING AND STORAGE

General

Wash hands after use.
Do not get in eyes, on skin or on clothing.
Do not breathe vapors or mists.
Use good personal hygiene practices.
Eating, drinking and smoking in work areas is prohibited.
Remove contaminated clothing and protective equipment before entering eating areas.
Eyewash stations and showers should be available in areas where this material is used and stored.

Ventilation Requirements

Use only with adequate ventilation to control air contaminants to their exposure limits. The use of local ventilation is recommended to control emissions near the source.

Storage Room Requirements

Keep container(s) tightly closed and properly labeled. Store in cool, dry, well-ventilated areas away from heat, direct sunlight and strong oxidizers. Store in approved containers and protect against physical damage. Keep containers securely sealed when not in use. Indoor storage should meet OSHA standards and appropriate fire codes. Containers that have been opened must be carefully resealed to prevent leakage. Empty containers retain residue and may be dangerous.
Use ventilation systems where this product is used and stored.

SECTION 8) EXPOSURE CONTROLS, PERSONAL PROTECTION

Eye Protection

Wear eye protection with side shields or goggles. Wear indirect-vent, impact and splash resistant goggles when working with liquids. If additional protection is needed for entire face, use in combination with a face shield.

Skin Protection

Use of gloves approved to relevant standards made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Use of an apron and over-boots of chemically impervious materials such as neoprene or nitrile rubber is recommended to avoid skin sensitization. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Launder soiled clothes or properly disposed of contaminated material, which cannot be decontaminated.

Respiratory Protection

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker, a respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed. Check with respiratory protective equipment suppliers.

Appropriate Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

SECTION 9) PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Density	5.85 lb/gal
Specific Gravity	0.65 - 0.85
Appearance	Off white granular solid
pH	6.0 - 8.0
Odor Threshold	N/A
Odor Description	characteristic odor
Water Solubility	< 2%
Viscosity	N/A
Vapor Pressure	Similar to water
Vapor Density	N/A
Freezing Point	<32 °F
Boiling Point	>212 °F
Evaporation Rate	N/A
Flammability	Flash point at or above 200°F/93°C

SECTION 10) STABILITY AND REACTIVITY

Stability

Stable under normal storage and handling conditions.

Conditions To Avoid

Avoid heat, sparks, flame, high temperature and contact with incompatible materials.

Hazardous Reactions/Polymerization

Hazardous polymerization will not occur.

Incompatible Materials

Strong bases, acids, oxidizing and reducing agents.

Hazardous Decomposition Products

May produce carbon monoxide, carbon dioxide.

SECTION 11) TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Inhalation, ingestion, skin absorption.

Acute Toxicity

Acute Oral Toxicity: Results displayed may not be the result of actual testing of this material but based on a similar tested material
LD50, Rat, 4 hr > 2,500 mg/kg (estimated)
Acute Inhalation Toxicity: LC50, Rat, 4 hr, > 20mg/l (estimated)
Acute Dermal Toxicity: LD50, Rabbit, > 10,000 mg/kg (estimated)

Carcinogenicity

Based on available data, the classification criteria are not meet.

Respiratory/Skin Sensitization

No Data Available

Serious Eye Damage/Irritation

Causes serious eye irritation

Skin Corrosion/Irritation

Causes mild skin irritation

Specific Target Organ Toxicity - Repeated Exposure

No Data Available

Specific Target Organ Toxicity - Single Exposure

No Data Available

SECTION 12) ECOLOGICAL INFORMATION

Ecotoxicity effects

Aquatic Toxicity: Ecotoxicological information provided is based on a structurally or compositionally similar product.

LC50, Bluegill sunfish (Lepomis macrochirus), 96 hr, > 100 mg/kg	OECD Test Guideline 203
LC50, Rainbow Trout (Oncorhynchus mykiss), 96 hr, > 100 mg/l	OECD Test Guideline 203
EC50, Water Flea (Daphina Magna), 48 hr, > 100 mg/l	OECD Test Guideline 202
EC50, Amphipoda (Corophium Volutator), 10 d, 1415 mg/l	OECD Test Guideline 202
EC50, Copepod (Acartia Tonsa), 48 hr, 342 mg/l	OECD Test Guideline 202
IC50, Green Algae (Selenastrum capricornutum), 72 hr, > 100mg/l	OECD Test Guideline 201
IC50, Diatom (Skeletonema Costatum), 72 hr, 2,276 mg/l	OECD Test Guideline 201

Mobility in Soil

Water Solubility: Limited by viscosity.
Surface Tension: Not applicable

Persistence and degradability

Ecotoxicological information provided is based on a structurally or compositionally similar product.

Not Readily Biodegradable.

Ready Biodegradability: d:< 10%	OECD Test Guideline 301 D/28
Biodegradability in Seawater: d: 1.7%	OECD Test Guideline 306/28

Bioaccumulative potential

Bioaccumulation is unlikely. Because of the high molecular weight of the polymer diffusion through biological membranes is very small.

Partion coefficient

N-octanol/water: Not applicable

Other adverse effects

This material is not classified as dangerous for the environment .

SECTION 13) DISPOSAL CONSIDERATIONS

Waste Disposal

Under RCRA it is the responsibility of the user of the product to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste. Waste management should be in full compliance with federal, state and local laws.
Empty Containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld or use for any other purposes. Return drums to reclamation centers for proper cleaning and reuse.

SECTION 14) TRANSPORT INFORMATION

U.S. DOT Information

For all transportation accidents, call CHEMTREC at 800/424-9300. All spills and leaks of this material must be handled in accordance with local, state, and federal regulations.

DOT Shipping Designation:

Non-hazardous under 29-CFR 1910.1200. Water treatment compound

SECTION 15) REGULATORY INFORMATION

CAS	Chemical Name	% By Weight	Regulation List
No applicable CAS	No applicable chemical	-	-

SECTION 16) OTHER INFORMATION

Glossary

ACGIH- American Conference of Governmental Industrial Hygienists; ANSI- American National Standards Institute; Canadian TDGCanadian Transportation of Dangerous Goods; CAS- Chemical Abstract Service; Chemtrec- Chemical Transportation Emergency Center(US); CHIP- Chemical Hazard Information and Packaging; DSL- Domestic Substances List; EC- Equivalent Concentration; EH40 (UK)- HSE Guidance Note EH40 Occupational Exposure Limits; EPCRA- Emergency Planning and Community Right-To-Know Act; ESL Effects screening levels; HMIS- Hazardous Material Information Service; LC- Lethal Concentration; LD- Lethal Dose; NFPA- National Fire Protection Association; OEL- Occupational Exposure Limits; OSHA- Occupational Safety and Health Administration, US Department of Labor; PEL- Permissible Exposure Limit; SARA (Title III)- Superfund Amendments and Reauthorization Act; SARA 313- Superfund Amendments and Reauthorization Act, Section 313; SCBA- Self Contained Breathing Apparatus; STEL-Short Term Exposure Limit; TCEQ Texas Commission on Environmental Quality; TLV- Threshold Limit Value; TSCA- Toxic Substances Control Act Public Law 94-469; TWA Time Weighted Value; US DOT- US Department of Transportation; WHMIS- Workplace Hazardous Materials Information System.

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

DISCLAIMER

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

Electric Motor Driven

Submersible Pump

Models S3B1-E6 *and* S3B1

Size 3”

CERTIFIED PERFORMANCE

The manufacturer of this pump certifies that it was manufactured in accordance with the standards of the Contractors Pump Bureau.

PUMP SPECIFICATIONS

Suction Head: Aluminum Alloy 356-T6 With Bonded Nitrile Lining; Maximum Operating Pressure 50 psi (345 kPa).*
Impeller: Ductile Iron 65-45-12.
Seal Plate: Aluminum Alloy 356-T6 With Bonded Nitrile Lining.
Intermediate: Aluminum Alloy 356-T6.
Motor Housing: Aluminum Alloy 356-T6.
Motor Shaft: Stainless Steel 416.
Bearings: Upper, Open Single Row Ball Bearing.
Lower, Two Shield, Double Row Ball Bearing.
Shaft Sleeve: Stainless Steel 304.
Discharge Flange: Aluminum Alloy 356-T6.
Gaskets: Cork with Nitrile Binder (NC710).
O-Rings: Buna-N.
Wetted Hardware: Standard Plated Steel and Stainless Steel.
Strainer: Urethane Coated Steel. 51% Open Area, 0.375” (9,5 mm) Diameter Openings.
Hoisting Bail: Urethane Coated Steel.

Standard Equipment

NEMA Type 3R Rainproof Control Box. *(See Section130, Pages 80 and 85.)*
Provides On-Off, Circuit Breaker and Motor Overload Protection.

Optional Equipment

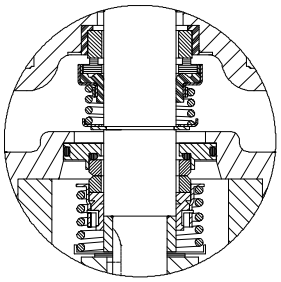
Liquid Level Control: *(See Sec. 130, Page 150.)*
a. Turtle Type Pressure Activated Level Switch.
b. .Float Activated Level Switch.
Staging Adapter Kit.

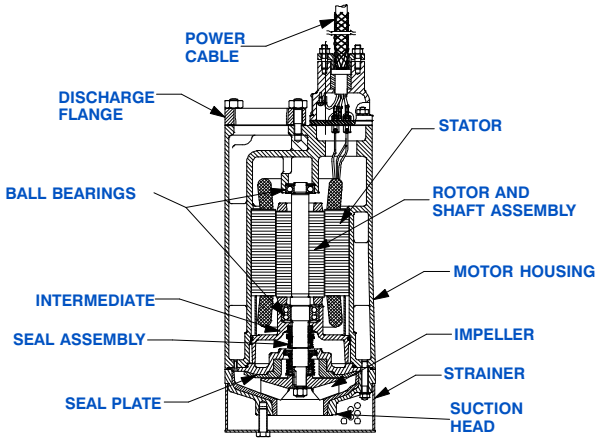
MOTOR/CABLE SPECIFICATIONS

Motor: Oil Filled Enclosure; 6.0 H.P.; 3450 R.P.M.
Single Phase: 230 Volt, 60 Hz, 34 Full Load AMPS, 7.2 kW (Max.)
Three Phase: 200/230/460/575 Volt, 60 Hz, 26.5/23/11.5/9.2 Full Load AMPS, 6.8 kW (Max.)
Power Cable: 4 Wire; Type SO/SOW/SOOW; 10 AWG; 3 Power Conductors, Plus 1 Ground. Nominal Length 50 Feet (15 m). Standard. (*Specify Alternate Length at Time of Order.*)
Recommended Generator Size: 15 kW Across the Line Start.

**Consult Factory for Applications Exceeding Maximum Pressure and/or Temperature Indicated.*

WARNING!
Do not use in explosive atmosphere or for pumping volatile flammable liquids.





SEAL SPECIFICATIONS

Tandem, Oil Lubricated.

Upper Seal: Type 21, Mechanical. Carbon Rotating Face. Ni-Resist Stationary Face. Buna-N Elastomers. Stainless Steel 18-8 Cage and Spring.

Lower Seal: Type 2, Mechanical. Tungsten Titanium Carbide Rotating and Stationary Faces. Stainless Steel 316 Stationary Seat. Fluorocarbon Elastomers (DuPont Viton® or Equivalent). Stainless Steel 303/304 Cage and Spring.

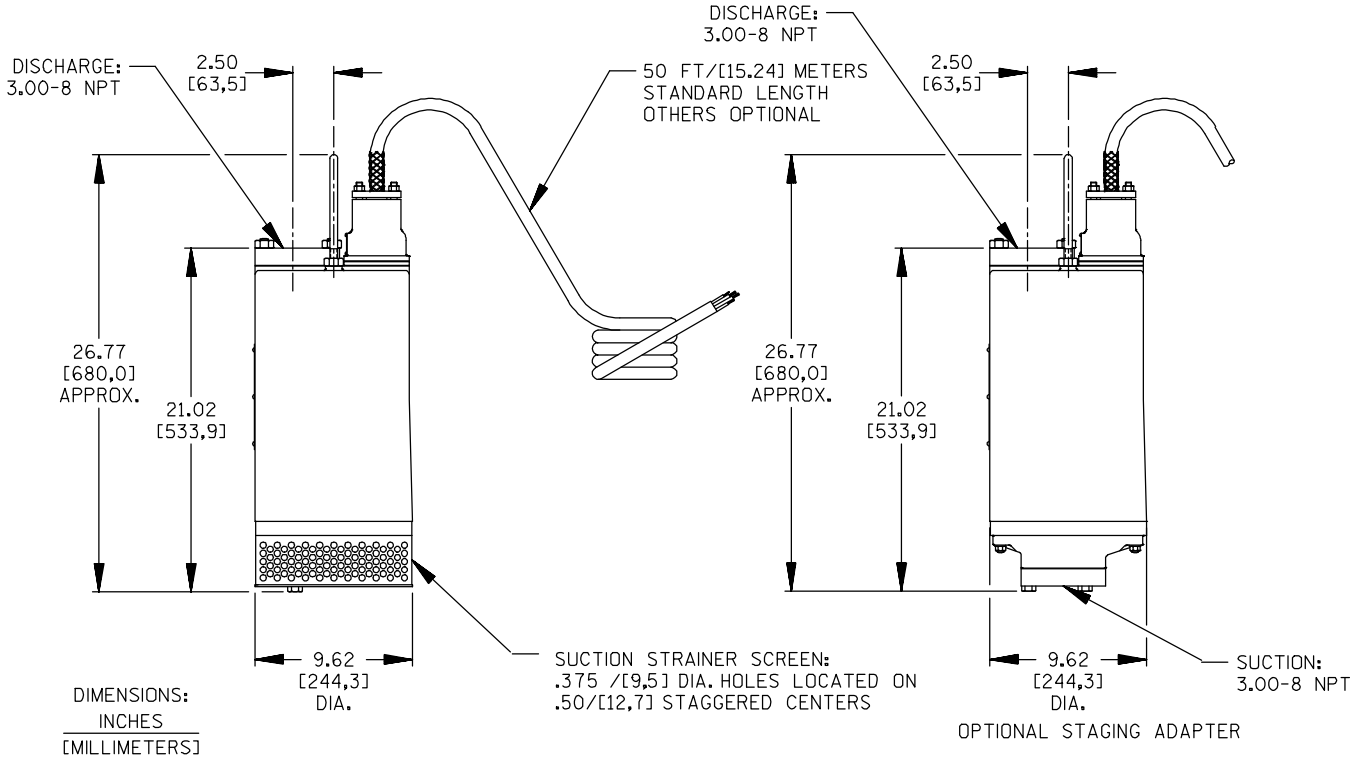
Maximum Temperature of Liquid Pumped, 122°F (50°C).*

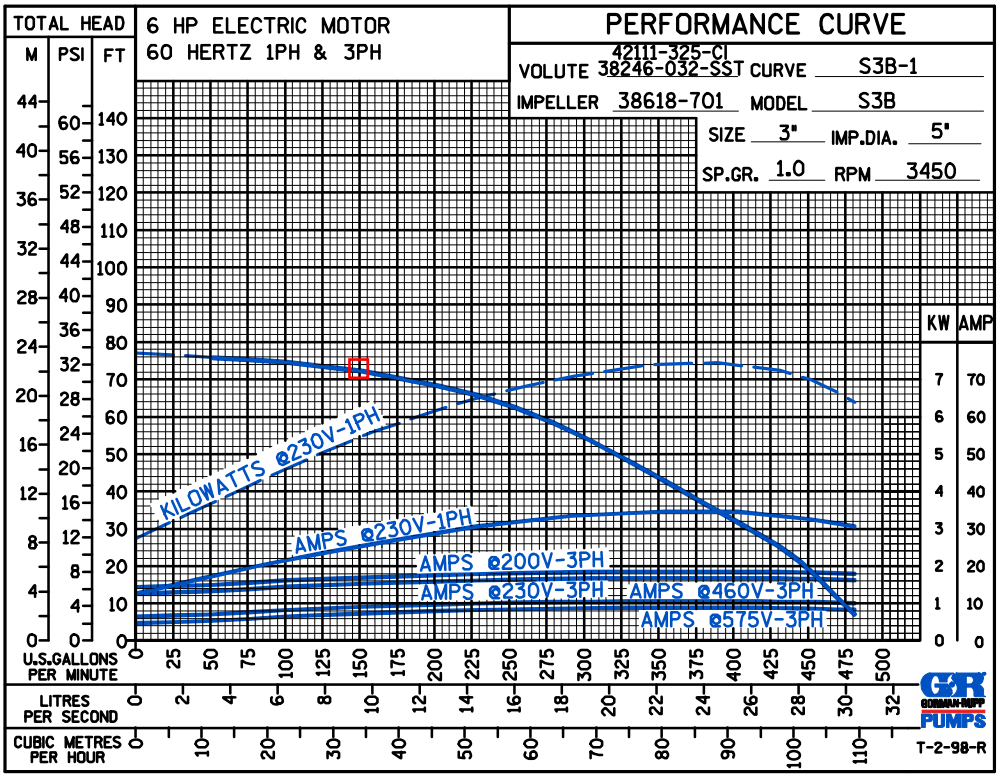
Specification Data

SECTION 130, PAGE 660

APPROXIMATE
DIMENSIONS and WEIGHTS

NET WEIGHT:	**145 LBS. (65,8 KG.)**
SHIPPING WEIGHT:	**155 LBS. (70,3 KG.)**
EXPORT CRATE SIZE:	**7.8 CU. FT. (0,22 CU. M.)**



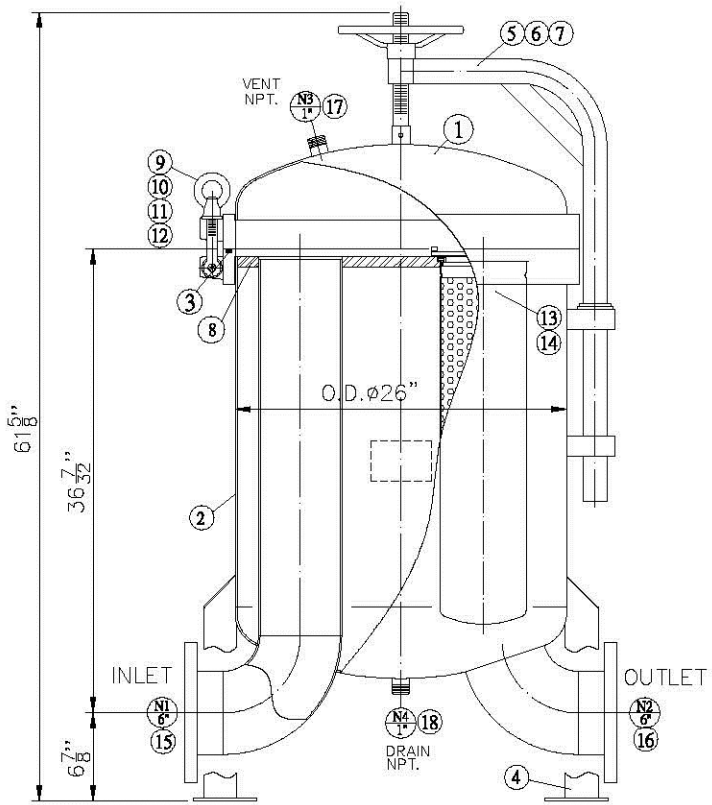


GORMAN-RUPP PUMPS

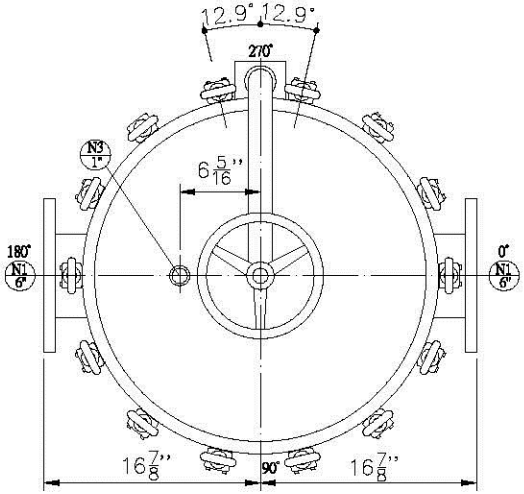
www.grpumps.com

Specifications Subject to Change Without Notice

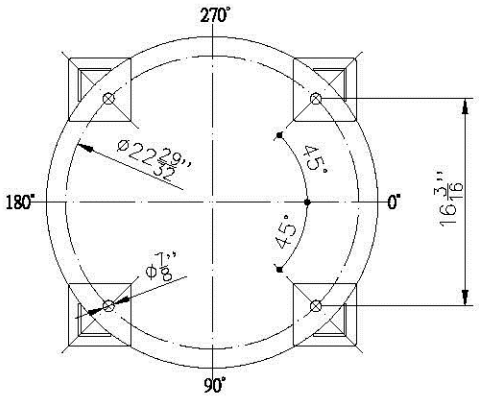
Printed in U.S.A.



SIDE VIEW



TOP VIEW



ANCHOR

BILL OF MATERIALS
(QUANTITY PER UNIT)

PROD ORDER_____S.O_____ MFG. SERIAL NO._____

CUSTOMER_____ DESIGN __150__ PSIG __90__ °C

DESTINATION_____ MAX. A.W.P._150__ PSIG __90__ °C

CUST. P.O._____ HYDROSTATIC TESTED _225_ PSIG

CUST.EQUIP_____ CODE _____

CODE STAMP_____ N.B._____

NO OF UNITS _____ SCH SHIP DATE _____

WEIGHT EMPTY _____ KG. FULL _____ KG

NO.	DESCRIPTION	MATERIAL	UNIT	QUAN.	PART NO.
1	FILTER COVER	304		1	
2	FILTER SHELL	304		1	
3	GASKET	EPDM		1	
4	LEG WELDMENT	304		4	
5	DAVIT HANDWHEEL	304		1	
6	DAVIT SCREW	304		1	
7	DAVIT ARM	304		1	
8	SEPARATE PLATE	304		1	
9	EYENUT	304		14	
10	WASHER	304		14	
11	EYEBOLT	304		14	
12	BOLT SUPPORT	304		14	
13	BASKET	304		6	
14	BAG–LOCK DEVICE	304		6	
15	INLET 6" ANSI 150B RF	304		1	
16	OUTLET 6" ANSI 150B RF	304		1	
17	VENT NPT 1"	304		1	
18	DRAIN NPT 1"	304		1	

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA

NAME	REV: A
Multi-Bag Filter Vessel	SCALE: NONE

PROJECT NO.	ORDER NO.	ITEM NO.

DATE: UNIT: INCH

Polyester Liquid Filter Bag

Features

* Polyester liquid bag filter are available with a carbon steel ring, stainless steel ring or plastic flanges.
* Heavy-duty handle eases installation and removal
* Metal ring sewn into bag top for increased durability and positive sealing
* Wide array of media fibers to meet needed temperature and micron specifications

Applications

Polyester liquid filter bags can be used in the filtering of a wide array of industrial and commercial process fluids

Sizes

Our liquid filter bags are available for all common liquid bag housings. Dimensions range from 4.12" diameter X 8" length thru 9" diameter X 32" length.

Micron Ratings

Available fibers range from 1 to 1500 microns

Options

* Bag finish or covers for strict migration requirements.
* Plastic top O.E.M. replacements
* Multi-layered filtering capabilities for higher dirt holding capacities

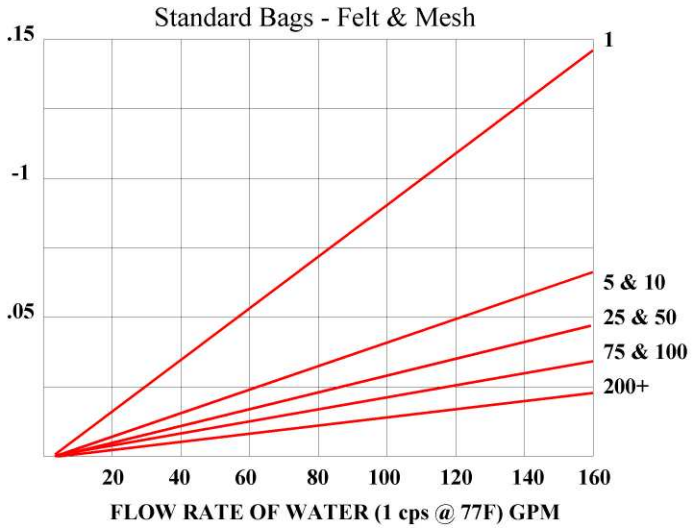
Optional Filter Media

Felt: Nomex, Polyester, Polypropylene

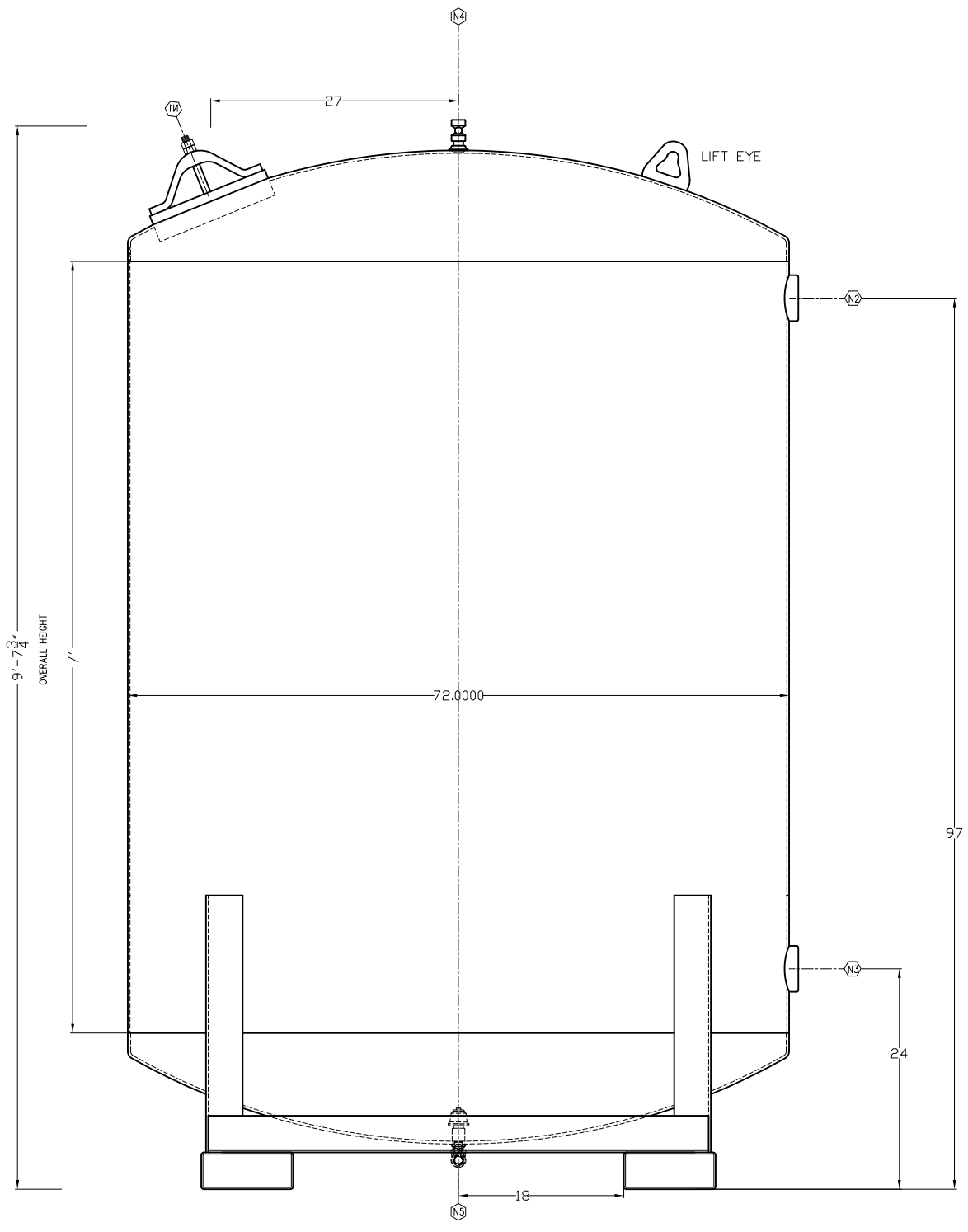
Monofilament: Nylon, Polyester, Polypropylene

Multifilament: Nylon, Polyester

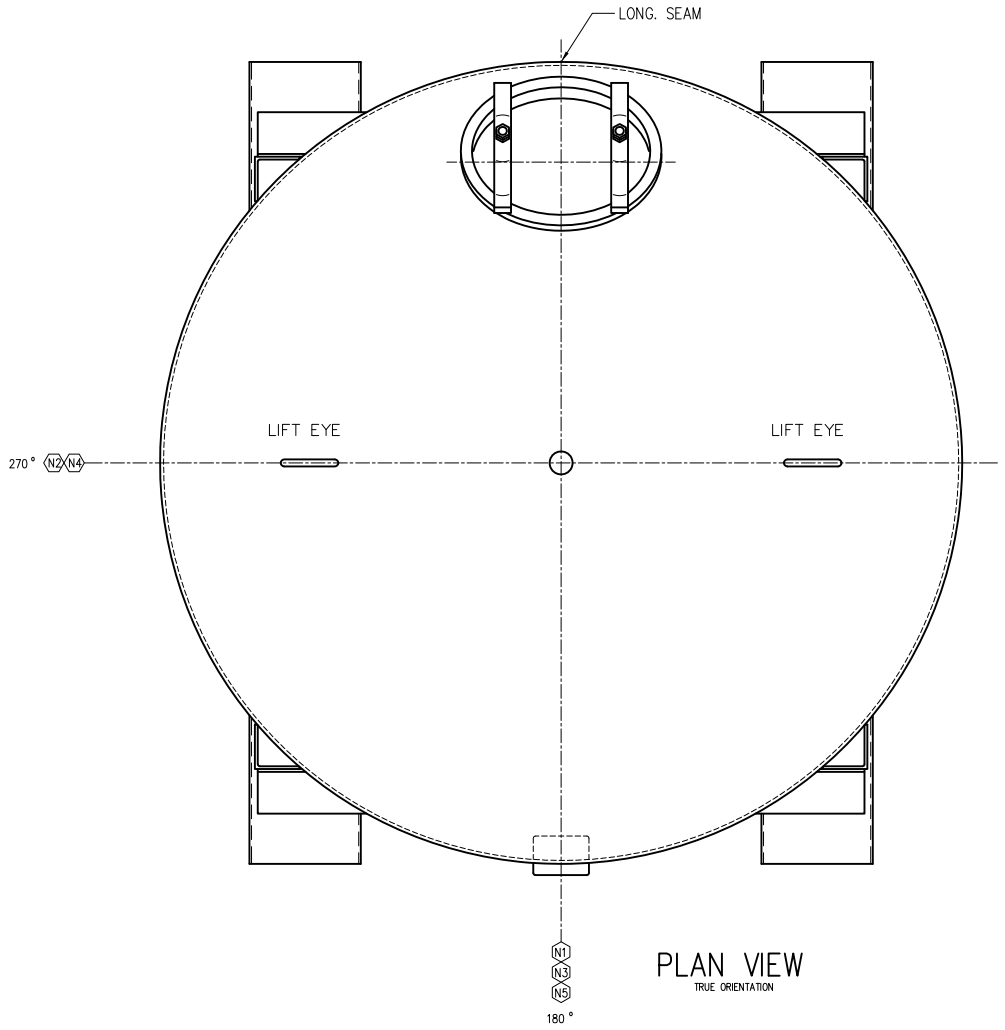
Polypropylene: Oil Removal



RevNo	Revision note	Date	Signature	Checked



ELEVATION VIEW



PLAN VIEW
TRUE ORIENTATION

NOZZLE SCHEDULE

ID	*Description*	*Service*
N1	14" x 18" Ellip. Manway w/3/4" x 3" Ring	Upper bed access with Cover (SA-36), Bolts, Neoprene Gasket
N2	4" FNPT 3000# Coupling	Process Inlet
N3	4" FNPT 3000# Coupling	Process Outlet
N4	1/2" 150# Tank Flange	Vent w/Valve
N5	1" FNPT 3000# Coupling	Drain w/Valve
N6		
N7		

COATINGS SCHEDULE

Surface	*Surface Preparation*	*Product Specification*
Internal - 1	SSPC-SP10 , Near White Blast	Carboline Carboguard 635 6-10 mils DFT per Coat
Internal - 2	Inspect	Carboline Carboguard 635 6-10 mils DFT per Coat
External - 1	SSPC-SP6	Carboline Carboguard 635 6-10 mils DFT
External - 2	n/a	Carboline Carbothane 8845 3-5 mils DFT (Blue)
External - 3	n/a	n/a

NOTES

Item	*Details*
Construction	Non-Code Design Pressure: 75 PSIG @ 140 DEG F.
Mtrls Vessel	Shell: SA-36 Heads: SA-36 Pipe: SA-53 (see nozzle detail for others)
Mtrls Interls	Hub, Laterals (.012" Slot), Diffuser: 304 SS Gaskets: Buna-N
n/a	n/a
n/a	n/a
Media	TBD

5,000 lb. High Pressure Liquid Media Vessel

Lockwood Remediation Technologies, LLC

89 Crawford Street
Leominster, Massachusetts 01453
O: 774-450-7177
F: 888-835-0617

89 Crawford Street
Leominster, Massachusetts 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

FILTRATION MEDIA :
8x30 RE-ACTIVATED CARBON
4x10 RE-ACTIVATED CARBON

GENERAL DESCRIPTION

Select Re-Activated carbon from domestic sources is quality screened during our purchasing process for activity, density and fines. The use of re-activated carbon is recommended as a lower cost alternative for most sites where drinking water quality is not necessary. In many cases our re-activated carbon meets and exceeds imported virgin carbon. In addition all carbon either sold by itself or installed in our filtration units traced by lot number to the installation or sale.

8x30 (Liquid Phase) Standard Specifications:	Standard	Value
Iodine Number	ASTM D-4607	800 Minimum
Moisture Content	ASTM D-2867	5% Maximum (as packed)
Particle Size	ASTM D-2862	8x30 US Mesh
Ash		10% Maximum
Total Surface Area (N2BET)		1050 Minimum
Pore Volume (cc/g)		0.75

4*10 (Vapor Phase) Standard Specifications:	Standard	Value
Carbon Tetrachloride Activity Level	ASTM D-3467	40 Minimum
Moisture Content	ASTM D-2867	5% Maximum (as packed)
Particle Size	ASTM D-2862	4x10 US Mesh
Ash		10% Maximum
Total Surface Area (N2BET)		1050 Minimum
Pore Volume (cc/g)		0.75

89 Crawford Street
Leominster, MA 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

SAFETY DATA SHEET

Revision Date: 11/11

1.1 IDENTIFICATION OF PRODUCT.

Designation: - Activated carbon

1.2 COMPANY.

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453

Phone: 774-450-7177
Fax: 888-835-0617

2 HAZARDOUS AND OTHER INGREDIENTS.

Exposure limits may vary. It is recommended that information about locally applicable exposure limits be obtained.

%w/w	Compound	CAS No	MAK mg/m^3	TLV mg/m^3	PEL mg/m^3
			(Germany)	(ACGIH)	(OSHA)
100	Bituminous Carbon	7440-44-0		2 mg/m3	15 mg/m3
			T Dust	T dust	

3 PHYSICAL DATA.

State:	Solid
Appearance:	Black granule, extradite, or powder
pH:	Not applicable
Boiling point or range:	Sublimes
Melting point or range:	3550 C (6422 F)
Vapor pressure:	1 @3586 C (6487 F)
Vapor density:	0.4
Density relative to water:	1.5 – 1.8 Specific gravity
Solubility in water:	Insoluble in water
Partition coefficient: (n-octanol/water):	
Other data:	odorless

4 FIRE AND EXPLOSION HAZARD DATA.

Fire, explosion and reactivity hazards:	Flammable.
Flammability and flammability limits:	Flammable.
Autoflammability:	Not applicable.
Explosive properties:	Non explosive.
Oxidizing properties:	Non oxidizing.

Fire fighting measures:
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.

Explosion:
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Minimum explosible concentration 0.140 g/l.

Fire Extinguishing Media:
Water or water spray.

Unusual Fire and Explosion Hazards:
Contact with strong oxidize such as ozone, liquid oxygen, chlorine, permanganate, etc., may result in fire.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

5 STABILITY AND REACTIVITY DATA.

The product is stable under normal handling and storage conditions.

Conditions to avoid:	Incompatibilities.
Materials to avoid:	Liquid air and oxidizing materials. Strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc
Hazardous decomposition products:	Involvement in a fire causes formation of carbon dioxide and carbon monoxide.

Emergency Overview

WARNING! FLAMMABLE SOLID. ACTIVATED CARBON AFFECTS THE RESPIRATORY AND CARDIOVASCULAR SYSTEMS.

CAUTION!!! Wet activated carbon removes oxygen from air causing a severe hazard to workers inside carbon vessels and enclosed or confined spaces. Before entering such an area, sampling and work procedures for low oxygen levels should be taken to ensure ample oxygen availability, observing all local, state, and federal regulations.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 3 - Severe (Flammable)
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; CLASS B EXTINGUISHER
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
May cause mild irritation to the respiratory tract. The acute inhalation LC50 (Rat) is >64.4 mg/l (nominal concentration) for activated carbon.

Ingestion:
No adverse effects expected. May cause mild irritation to the gastrointestinal tract. The acute oral LD50 (Rat) is >10g/kg.

Skin Contact:
Not expected to be a health hazard from skin exposure. May cause mild irritation and redness. The primary skin irritation index (Rabbit) is 0.

Eye Contact:
No adverse effects expected. May cause mild irritation, possible reddening.

Chronic Exposure:
Prolonged inhalation of excessive dust may produce pulmonary disorders. The effects of long-term, low-level exposures to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the avoidance of all effects from repetitive acute exposures.

Aggravation of Pre-existing Conditions:
No information found.

6. First Aid Measures

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion:
Give several glasses of water to drink to dilute. If large amounts were swallowed, seek medical attention.

Skin Contact:
Not expected to require first aid measures. Wash exposed area with soap and water. Seek medical attention if irritation develops.

Eye Contact:
Wash thoroughly with running water for at least 15 minutes. Seek medical attention if irritation develops.

7. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. Warning! Spent product may have absorbed hazardous materials.

8. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

CAUTION!! Wet activated carbon removes oxygen from air causing a severe hazard to workers inside carbon vessels and enclosed or confined spaces. Before entering such an area, sampling and work procedures for low oxygen levels should be taken to ensure ample oxygen availability, observing all local, state, and federal or national regulations.

9. Exposure Controls/Personal Protection

Exposure Guidelines:
OSHA PEL*:
5mg/M3 (Respirable)
ACGIH TLV*:
10 mg/M3 (Total)
*PELs and TLVs are 8-hour TWAs unless otherwise noted.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear protective gloves and clean body-covering clothing.

Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

10. Toxicological Information

Investigated as a reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Activated Carbon (7440-44-0)	No	No	None

11. Ecological Information

Environmental Fate:
No information found.

Environmental Toxicity:
No information found.

12. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

13. Transport Information

Proper Shipping Name:
NOT REGULATED
Hazard Class:
N/A
Identification Number:
N/A
Packing Group:
N/A
This product has been tested according to the United Nations *Transport of Dangerous Goods* test protocol for spontaneously combustible materials. It has been specifically determined that this product does not meet the definition of a self heating substance or any hazard class, and therefore is not a hazardous material and not regulated.

14. Regulatory Information

SARA TITLE III:
N/A
TSCA:
The ingredients of this product are on the TSCA Inventory List.
OSHA:
Nonhazardous according to definitions of health hazard and physical hazard provided in the Hazard Communication Standard (29 CFR 1910.1200)
CANADA

WHMIS CLASSIFICATION:
Not Classified
DSL#:
6798
EEC
Council Directives relating to the classification, packaging, and labeling of dangerous substances and preparations.
Risk (R) and Safety (S) phrases:
May be irritating to eyes (R36).

15. Other Information

NFPA Ratings: Health: 0 **Flammability:** 1 **Reactivity:** 0

Label Hazard Warning:
WARNING! FLAMMABLE SOLID. ACTIVATED CARBON AFFECTS THE RESPIRATORY AND CARDIOVASCULAR SYSTEMS.

Label Precautions:
Keep away from heat, sparks and flame. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

Label First Aid:
If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.

RESINTECH INC
INNOVATIONS IN ION EXCHANGE

CGS

CATION EXCHANGE RESIN
SOFTENING GRADE
Na FORM

RESINTECH CGS is a sodium form standard crosslinked gel strong acid cation resin. *CGS* is optimized for residential applications that require good regeneration efficiency and high capacity. *RESINTECH CGS* is intended for use in all residential and commercial softening applications that do not have significant amounts of chlorine in the feedwater. *CGS* is supplied in the sodium form.

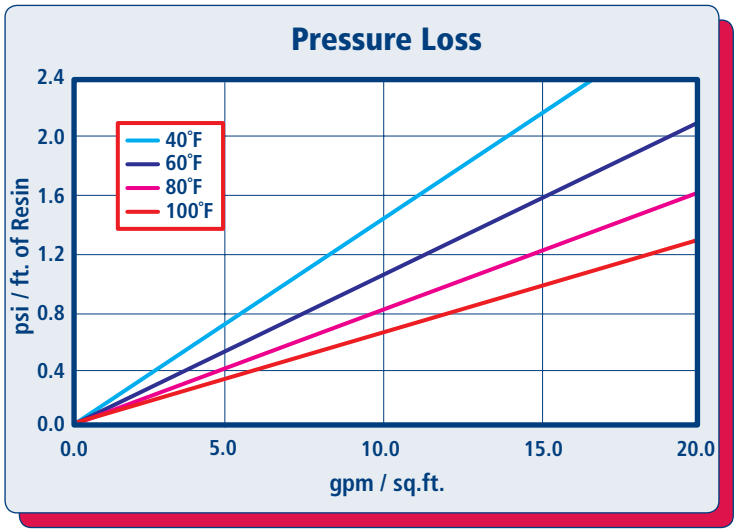
NSF/ANSI 44-61 CERTIFIED FOR MATERIAL SAFETY

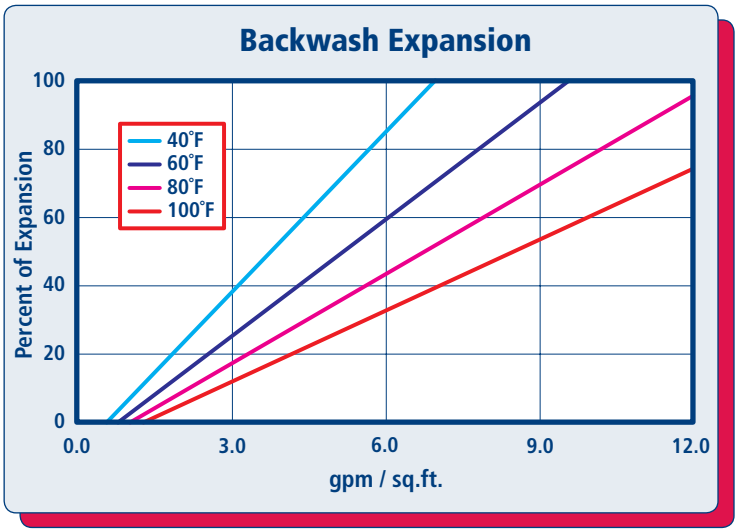
FEATURES & BENEFITS

- **RESIDENTIAL SOFTENING APPLICATIONS**
  Resin parameters are optimized for residential softeners
- **LOW COLOR THROW**
- **SUPERIOR PHYSICAL STABILITY**
  93% plus sphericity and high crush strengths together with carefully controlled particle distribution provides long life and low pressure drop
- **COMPLIES WITH US FDA REGULATIONS**
  Conforms to paragraph 21CFR173.25 of the Food Additives Regulations of the US FDA

Prior to first use for potable water, resin should be backwashed for a minimum of 20 minutes, followed by 10 bed volumes of downflow rinse.

HYDRAULIC PROPERTIES





PRESSURE LOSS

The graph above shows the expected pressure loss of *ResinTech CGS* per foot of bed depth as a function of flow rate at various temperatures.

BACKWASH

The graph above shows the expansion characteristics of *ResinTech CGS* as a function of flow rate at various temperatures.

160 Cooper Road • West Berlin, NJ 08091 USA • p: 856.768.9600 • f: 856.768.9601 • e: ixresin@resintech.com • w: resintech.com

RESINTECH® CGS

PHYSICAL PROPERTIES

Polymer Structure	Styrene/DVB
Polymer Type	Gel
Functional Group	Sulfonic Acid
Physical Form	Spherical beads
Ionic Form as shipped	Sodium
Total Capacity	
Sodium form	>1.8 meq/mL
Water Retention	
Sodium form	40 to 52 percent
Approximate Shipping Weight	
Sodium form	50 lbs./cu.ft.
Screen Size Distribution (U.S. mesh)	16 to 50
Maximum Fines Content (<50 mesh)	1 percent
Minimum Sphericity	90 percent
Uniformity Coefficient	1.6 approx.
Resin Color	Amber

Note: Physical properties can be certified on a per lot basis, available upon request

SUGGESTED OPERATING CONDITIONS

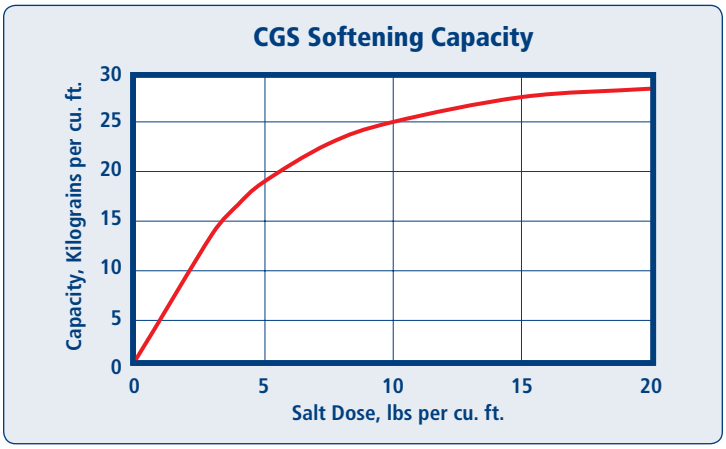
Maximum continuous temperature	
Sodium form	250˚F
Minimum bed depth	24 inches
Backwash expansion	25 to 50 percent
Maximum pressure loss	25 psi
Operating pH range	0 to 14 SU
Regenerant Concentration	
Salt cycle	10 to 15 percent NaCl
Regenerant level	4 to 15 lbs./cu.ft.
Regenerant flow rate.	0.5 to 1.5 gpm/cu.ft.
Regenerant contact time	>20 minutes
Displacement flow rate	Same as dilution water
Displacement volume	10 to 15 gallons/cu.ft.
Rinse flow rate	Same as service flow
Rinse volume	35 to 60 gallons/cu.ft.
Service flow rate	1 to 10 gpm/cu.ft.

Note: These guidelines describe average low risk operating conditions. They are not intended to be absolute minimums or maximums.
For operation outside these guidelines, contact ResinTech Technical Support

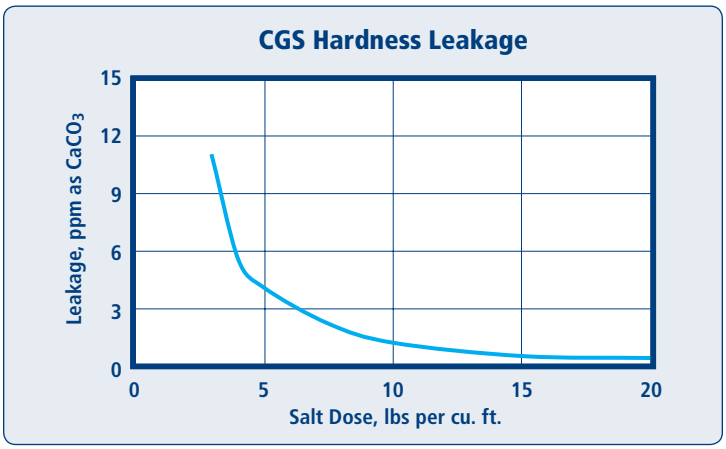
APPLICATIONS

SOFTENING

ResinTech CGS is a standard crosslinked cation resin optimized for residential and commercial applications. This type of resin is easier to regenerate than the higher crosslinked resins. CGS has marginal resistance to chlorine and other oxidants and is not ideal for high temperature and other high stress applications.



Capacity and leakage data are based on the following: 2:1 Ca:Mg ratio, 500 ppm TDS as CaCO3, 0.2% hardness in the salt and 10% brine concentration applied co-currently through the resin over 30 minutes. No engineering downgrade has been applied.



RESINTECH INC.
INNOVATIONS IN ION EXCHANGE

East Coast - West Berlin, NJ p:856.768.9600 • Midwest - Chicago, IL p:708.777.1167 • West Coast - Los Angeles, CA p:323.262.1600

Safety Data Sheet

Product Names: CGS, CGS-BL, CG8, CG8-BL, CG8-C, CG8-F, CG8-UPS, CG8-HP, CG8-NS, CG10, CG10-BL, CG10-UPS, CG10-HP, SACMP, SACMP-UPS

(Cation Exchange Resin in the Sodium Form)

Effective date 31 March 2015

Section 1: Identification

1a	Product Names	ResinTech CGS, CGS-BL, CG8, CG8-BL, CG8-C, CG8-F, CG8-UPS, CG8-HP, CG8-NS, CG10, CG10-BL, CG10-UPS, CG10-HP, SACMP, SACMP-UPS
1b	Common Name	Cation exchange resin in the sodium form.
1c	Intended use	All general purpose cation exchange for general use including water softening and demineralization.
1d	Manufacturer Address	ResinTech, Inc. 160 Cooper Road, West Berlin, NJ 08091 USA
	Phone Email	856-768-9600 ixresin@resintech.com

Section 2: Hazard Identification

2a	OSHA Hazard classification	Not hazardous or dangerous

Product Hazard Rating	Scale
Health = 0	0 = Negligible
Fire = 1	1 = Slight
Reactivity = 0	2 = Moderate
Special – N/A	3 = High
	4 = Extreme

2b	Product description	Amber, tan or black colored solid beads with little or no odor.
2c	Precautions for use	Safety glasses and gloves recommended. Slipping hazard if spilled.
2c	Potential health effects	Will cause eye irritation. Ingestion is not likely to pose a health risk.
2d	Environmental effects	Little or none.

Section 2A: Hazard classification UN OSHA globally harmonized system

Warning (contains ion exchange resin)

H320: Causes eye irritation (Category 2B)

Precautionary Statements

P264: Wash hands thoroughly after handling.

P280: Wear protective gloves/protective clothing/eye protection/face protection

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.

P333+313: If skin irritation or a rash occurs: Get medical advice/attention.

P337+313: If eye irritation persists get medical advice/attention.

P403+233: Store in a well-ventilated place. Keep container tightly closed.

P411: Store at temperatures not exceeding 50 °C/ 122 °F.

Please refer to the safety data sheet for additional information regarding this product

ResinTech, Inc.
160 Cooper Road
West Berlin, NJ 08091-9234
856 768-9600
Ixresin@resintech.com

Section 3: Composition/ Information on Ingredients

3a	Chemical name	Polystyrene sulfonate in the sodium form
3b	Ingredients Polystyrene sulfonate in the sodium form	CAS# 69011-22-9 (40 - 60%)
	Water	CAS# 7732-18-5 (40 – 60%)

Section 4: First Aid Measures

4a	Inhalation	No adverse effects expected- normal use of product does not produce odors or vapors.
4b	Skin	Wash with soap and water- seek medical attention if a rash develops.
4c	Eye contact	Wash immediately with water-seek attention if discomfort continues.
4d	Ingestion	No adverse effects expected for small amounts, larger amounts can cause stomach irritation. Seek medical attention if discomfort occurs.

Section 5: Fire Fighting Measures

5a	Flammability	NFPA Fire rating = 1
5b	Extinguishing media	Water, CO2, foam, dry powder
5c	Fire fighting Procedures	Follow general fire fighting procedures indicated in the work place.
5d	Protective Equipment	MSHA/NIOSH approved self-contained breathing gear, full protective clothing.
5e	Combustion Products	Carbon oxides and other toxic gasses and vapors.
5f	Unusual Hazards	Product is not combustible until moisture is removed. Resin begins to burn at approximately 230º C. Auto ignition can occur above 500º C.

Section 6: Accidental Release Measures

6a	Personal Precautions	Keep people away, spilled resin can be a slipping hazard, wear gloves and safety glasses to minimize skin or eye contact.
6b	Incompatible Chemicals	Strong oxidants can create risk of combustion products similar to burning.
6c	Environmental Precautions	Keep out of public sewers and waterways.
6d	Containment Materials	Use plastic, paper, or metal containers.
6e	Methods of Clean-up	Sweep up material and transfer to containers.

Section 7: Handling and Storage

7a	Handling	Avoid prolonged skin contact. Avoid contact with salts or with salty water to prevent premature exhaustion of the resin. Keep resin moist and avoid allowing resin to completely dry.
7b	Storage	Store in a cool dry place (0º to 45º C) in the original shipping container. This product is thermally sensitive and will have reduced shelf life if subjected to extended periods of time at temperatures exceeding 50º C. Although freezing does not usually damage ion exchange resins, avoid repeated freeze thaw cycles.
7c	TSCA considerations	Ion exchange resins should be listed on the TSCA Inventory in compliance with State and Federal Regulations.

Section 8: Exposure Controls/Personal Protection

8a	OSHA exposure limits	None noted.
8b	Engineering Controls	Provide adequate ventilation.
8c	Personal Protection Measures	
	Eye Protection	Safety glasses or goggles.
	Respiratory Protection	Not required for normal use.
	Protective Gloves	Recommended for extended contact.

Section 9: Physical and Chemical Properties

Appearance	Amber, tan, or black beads.
Flammability or explosive limits	Flammable above 500º C
Odor	None
Physical State	Solid
Vapor pressure	Not available
Odor threshold	Not available
Vapor density	Not available
pH	Near neutral (6 to 8 typical)
Relative density	Approx 800 grams/Liter
Melting point/freezing point	Does not melt, freezes at approx. 0 C
Solubility	Insoluble in water and most solvents
Boiling point	Does not boil
Flash point	Approx 500º C
Evaporation rate	Does not evaporate
Partition Coefficient (n-octonol/water)	Not applicable
Auto-ignition temperature	Approx 500º C
Decomposition temperature	Above 230º C
Viscosity	Not applicable

Section 10: Stability and Reactivity

10a Stability	Stable under normal conditions.
10b Conditions to Avoid	Heat, exposure to strong oxidants.
10c Hazardous by-products	Organic sulfonates, charred polystyrene, aromatic acids and hydrocarbons, organic amines, nitrogen oxides, carbon oxides, chlorinated hydrocarbons.
10d Incompatible materials	Strong oxidizing agents (such as HNO_3)
10e Hazardous Polymerization	Does not occur

Section 11: Toxicological Information

11a	Likely Routes of Exposure	Oral, skin or eye contact.
11b	Effects of exposure	
	Delayed	None known.
	Immediate (acute)	None known.
	Chronic	None known.
11c	Toxicity Measures	
	Skin Adsorption	Unlikely.
	Ingestion	Oral toxicity believed to be low but no LD50 has been established.
	Inhalation	Unknown, vapors are very unlikely due to physical properties (insoluble solid).
11d	Toxicity Symptoms	
	Skin Adsorption	Mild rash.
	Ingestion	Indigestion or general malaise.
	Inhalation	Unknown.
11e	Carcinogenicity	None known

Section 12: Ecological information

12a	Eco toxicity	Not harmful to plant or animal life.
12b	Mobility	Insoluble.
12c	Biodegradability	Not biodegradable.
12d	Bioaccumulation	Insignificant.
12e	Other adverse effects	Not Harmful to the environment.

Section 13: Disposal Considerations

13a General considerations	Material is non-hazardous.
13b Disposal Containers	Most plastic and paper containers are suitable.
13c Disposal methods	No specific method necessary
13d Sewage Disposal	Not recommended
13e Precautions for incineration	May release toxic vapors when burned
13f Precautions for landfills	Resins used to remove hazardous materials may then become hazardous mixtures.

Section 14: Transportation Information

14a Transportation Class	Not classified as a dangerous good for transport by land, sea, or air.
14b TDG	Not regulated.
14c IATA	Not regulated.
14d DOT (49 CFR 172.101)	Not Regulated.

Section 15: Regulatory Information

15a CERCLA	Not regulated
15b SARA Title III	Not regulated
15c Clean Air act	Not regulated
15d Clean Water Act	Not regulated
15e TSCA	Not regulated
15f Canadian Regulations	
WHMIS	Not a controlled product
TDG	Not regulated
15g Mexican Regulations	Not Dangerous

Section 16: Other Information

The information provided in this safety data sheet is presented in good faith and believed to be accurate as of the effective data shown above. However, no warranty or guarantee of accuracy, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's responsibility to ensure that their activities comply with federal, state, and local laws.

16a Date of Revision 31 March 2015

ZENNER PERFORMANCE
Cast Iron Turbine Meters
Sizes 2” through 12”

INTRODUCTION: ZENNER PERFORMANCE Turbine Meters are designed for applications where flows are usually moderate to high and occasionally low. They are used in measurement of potable cold water in commercial and industrial services where flows are in one direction.

OPERATION: Water flows through the turbine section which causes the rotor to turn proportionately to the quantity of water flowing through the meter. A drive magnet transmits the motion of the rotor to a driven magnet located within the hermetically sealed register. The magnet is connected to a gear train which translates the rotations into volume totalization displayed on the register dial face. The only moving parts in the meter are the rotor assembly and vertical shaft .

CONSTRUCTION: ZENNER PERFORMANCE Turbine Meters consist of three basic components: Cast Iron Epoxy Coated main case, measuring element, and sealed register. The measuring element assembly includes the rotor assembly, vertical shaft and a calibration vane which eliminates the need for calibration change gears.

MAINTENANCE: ZENNER PERFORMANCE Turbine Meters are engineered and manufactured to provide long-term service and operate virtually maintenance free. If necessary the universal measuring element (UME) can be removed from the main case for maintenance. Interchangeability of certain parts between like sized meters minimizes spare parts inventory.

CONFORMANCE: ZENNER PERFORMANCE Turbine Meters are tested and comply with AWWA C701 Class II performance standards.

STRAINERS: ZENNER PERFORMANCE recommends the use of a separate strainer upstream from the turbine meter. Strainers reduce the chance of damage to the rotor as well as the frequency in which it must be removed for inspection. The lack of a strainer may void the warranty of the turbine meter.

CONNECTIONS: Companion flanges for installation of meters on various pipe types and sizes are available in bronze or cast iron.

PMT04

PMT06

ZENNER PERFORMANCE
15280 Addison Rd #340, Addison, TX 75001, (972) 386-6611, Fax (972) 386-1814
www.zennerusa.com

MODEL		PMT02	PMT03	PMT04	PMT06	PMT08	PMT10	PMT12
SIZE		2"	3"	4"	6"	8"	10"	12"
Flow rate maximum intermittent	USGPM	400	550	1250	2500	4500	7000	8800
Maximum continuous	USGPM	200	450	1000	2000	3500	5500	6200
Optimum operating flow range	USGPM	3 - 200	5 - 550	10 - 1250	20 - 2500	30 - 4500	50 - 7000	90 - 8800
Low flow rate	USGPM	2	2-1/2	5	12	20	45	65
Start-up flow rate	USGPM	7/8	1-1/8	1-3/8	7-1/2	8	15	15
Maximum Working Pressure	P.S.I.	160	160	160	160	160	160	160
Maximum Temperature	Deg. F	140	140	140	140	140	140	140
Length	Inches	7-7/8	8-7/8	9-7/8	11-7/8	13-3/4	17-3/4	19-5/8
Height	Inches	9-1/2	10-1/4	11	12-7/8	14-1/4	19	20-1/4
Width	Inches	7	7-1/2	9	11	13-1/2	16	19
Weight	Pounds	24	32	38	84	126	225	255
Number of holes per flange		4	4	8	8	8	12	12

ZENNER PERFORMANCE
15280 Addison Rd #340, Addison, TX 75001, (972) 386-6611, Fax (972) 386-1814
www.zennerusa.com