



RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

OFFICE OF WATER RESOURCES

235 Promenade Street, Providence, Rhode Island 02908

14 *BL*
December 12, 2017

CERTIFIED MAIL

Mr. Steven D'Agostino
Director of Public Works/Administration
City of Woonsocket
169 Main Street
Woonsocket, RI 02895

**RE: Final RIPDES Permit for the Woonsocket Drinking Water Treatment Plant
RIPDES Permit No. RI0001627**

Dear Mr. D'Agostino:

Enclosed is your final Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit issued pursuant to the referenced application. State regulations, promulgated under Chapter 46-12 of the Rhode Island General Laws of 1956, as amended, require this permit to become effective on the date specified in the attached permit. As outlined in the public notice and statement of basis for this permit, DEM issued a Compliance Order (Consent Agreement RIA-382) in September of 2017 containing interim effluent limitations for Total Suspended Solids in conjunction with the issuance of this permit.

Also enclosed is information relative to hearing requests and stays of RIPDES Permits.

Please note that pg. 2 of the permit's statement of basis (Part II. Permit Limitations and Conditions) has been updated to reflect the final compliance date of Consent Agreement RIA-382, which is December 31, 2020.

We appreciate your cooperation throughout the development of this permit. Should you have any questions concerning this permit, feel free to contact Samuel Kaplan of the State Permits Staff at (401) 222-4700, extension 7046.

Sincerely,

Joseph B. Haberek, PE
Supervising Sanitary Engineer

JBH:sk

Enclosures

Cc: Mayor Lisa Baldelli-Hunt
Marc Viggiani, Acting Water Division Superintendent, City of Woonsocket
ecc: Crystal Charbonneau, OWR-RIPDES

RESPONSE TO COMMENTS

NO SIGNIFICANT COMMENTS WERE RECEIVED ON THE DRAFT PERMIT FOR THIS FACILITY; THEREFORE, NO RESPONSE WAS PREPARED.

HEARING REQUESTS

If you wish to contest any of the provisions of this permit, you may request a formal hearing within thirty (30) days of receipt of this letter. The request should be submitted to the Administrative Adjudication Division at the following address:

Bonnie Stewart, Clerk
Department of Environmental Management
Office of Administrative Adjudication
One Capitol Hill
Second Floor
Providence, RI 02903

Any request for a formal hearing must conform to the requirements of Rule 49 of the State Regulations.

STAYS OF RIPDES PERMITS

Should the Department receive and grant a request for a formal hearing, the contested conditions of the permit will not automatically be stayed. However, the permittee, in accordance with Rule 50, may request a temporary stay for the duration of adjudicatory hearing proceedings. Requests for stays of permit conditions should be submitted to the Office of Water Resources at the following address:

Angelo S. Liberti, P.E.
Chief of Surface Water Protection
Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908

All uncontested conditions of the permit will be effective and enforceable in accordance with the provisions of Rule 49.

AUTHORIZATION TO DISCHARGE UNDER THE
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 46-12 of the Rhode Island General Laws, as amended,

The City of Woonsocket
169 Main Street
Woonsocket, RI 02895

is authorized to discharge from a facility located at

Woonsocket Water Treatment Plant
1500 Manville Road
Woonsocket, RI 02895

to receiving waters named

Blackstone River

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

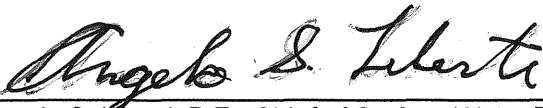
This permit shall become effective on January 1, 2018.

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on September 13, 2006.

This permit consists of ten (10) pages in Part I including effluent limitations, monitoring requirements, etc. and 10 pages in Part II including General Conditions.

Signed this 14th day of December, 2017.



Angelo S. Liberti, P.E., Chief of Surface Water Protection
Office of Water Resources
Rhode Island Department of Environmental Management
Providence, Rhode Island

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. (Consisting of Treated Filter Backwash from Treatment Unit # 1). Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Concentration - specify units		Monitoring Requirement		
	Quantity - lbs./day				Maximum Daily	Measurement Frequency	Sample Type
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly			
			*(Minimum)	*(Average)	*(Maximum)		
Flow	0.37 MGD	--- MGD				Continuous	Recorder
TSS	93 lb/day	155 lb/day	30 mg/l		50 mg/l	2/Month	Composite ¹
Turbidity			--- NTU		--- NTU	2/Month	Composite ¹
pH			(6.5 S.U.)		(9.0 S.U.)	2/Month	Grab ²
Total Residual Chlorine ³			2.0 mg/l		2.0 mg/l	2/Month	Grab
Total Aluminum			13 mg/l		110 mg/l	2/Month	Composite ¹
Total Cadmium			--- mg/l		--- mg/l	1/Quarter	Composite ¹
Total Lead			--- mg/l		--- mg/l	1/Quarter	Composite ¹

¹All composite sampling must consist of a minimum of four (4) grabs spaced equally apart during a typical filter backwash discharge.

² Compliance with these limitations shall be determined by taking a minimum of one (1) grab sample. The grab sample must be analyzed for pH immediately (<15 minutes after sample collection). The maximum value to be reported is the highest individual measurement obtained during the monitoring period. The minimum value to be reported is the lowest individual measurement obtained during the monitoring period.

³The following methods may be used to analyze the grab samples: (1) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G; (2) DPD Titrimetric (ferrous titrimetric), EPA No. 330.4 or Standard Methods (18th edition) No. 4500-Cl F; (3) Amperometric titration, EPA No. 330.1 or Standard Methods (18th edition) No. 4500-Cl D; (4) Iodometric Direct Titration, EPA No. 330.3 or Standard Methods (18th edition) No. 4500-Cl B; (5) Iodometric Back Titration, EPA No. 330.2 or Standard Methods (18th edition) No. 4500-Cl C.

--- signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

* Average Monthly Flow is calculated by dividing the total filter backwash flow per month by the total number of discharge days for the outfall during the corresponding month.

** Values in parentheses () are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

*** All filter backwash discharges must be treated prior to discharging from Outfall 001A.

**** Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 001A (Treated Filter Backwash from Treatment Unit #1)

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 002A. (Consisting of Treated Filter Backwash from Treatment Unit # 2). Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Concentration - specify units		Monitoring Requirement		
	Quantity - lbs./day				Maximum Daily <u> </u>	Measurement Frequency <u> </u>	Sample Type <u> </u>
	Average Monthly <u> </u>	Maximum Daily <u> </u>	Average Monthly <u> </u>	Average Weekly <u> </u>			
			*(Minimum)	*(Average)	*(Maximum)		
Flow	0.37 MGD	--- MGD				Continuous	Recorder
TSS	93 lb/day	155 lb/day	30 mg/l		50 mg/l	2/Month	Composite ¹
Turbidity			--- NTU		--- NTU	2/Month	Composite ¹
pH			(6.5 S.U.)		(9.0 S.U.)	2/Month	Grab ²
Total Residual Chlorine ³			2.0 mg/l		2.0 mg/l	2/Month	Grab
Total Aluminum			13 mg/l		110 mg/l	2/Month	Composite ¹
Total Cadmium			--- mg/l		--- mg/l	1/Quarter	Composite ¹
Total Lead			--- mg/l		--- mg/l	1/Quarter	Composite ¹

¹All composite sampling must consist of a minimum of four (4) grabs spaced equally apart during a typical filter backwash discharge.

²Compliance with these limitations shall be determined by taking a minimum of one (1) grab sample. The grab sample must be analyzed for pH immediately (<15 minutes after sample collection). The maximum value to be reported is the highest individual measurement obtained during the monitoring period. The minimum value to be reported is the lowest individual measurement obtained during the monitoring period.

³The following methods may be used to analyze the grab samples: (1) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-CI G; (2) DPD Titrimetric (ferrous titrimetric), EPA No. 330.4 or Standard Methods (18th edition) No. 4500-CI F; (3) Amperometric titration, EPA No. 330.1 or Standard Methods (18th edition) No. 4500-CI D; (4) Iodometric Direct Titration, EPA No. 330.3 or Standard Methods (18th edition) No. 4500-CI B; (5) Iodometric Back Titration, EPA No. 330.2 or Standard Methods (18th edition) No. 4500-CI C.

--- signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

* Average Monthly Flow is calculated by dividing the total filter backwash flow per month by the total number of discharge days for the outfall during the corresponding month.

** Values in parentheses () are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

*** All filter backwash discharges must be treated prior to discharging from Outfall 002A.

****Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 002A (Treated Filter Backwash from Treatment Unit #2).

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 003A. (Consisting of Treated Filter Backwash from Treatment Unit #3). Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Concentration - specify units		Monitoring Requirement		
	Quantity - lbs./day				Maximum Daily	Measurement Frequency	Sample Type
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly			
			*(Minimum)	*(Average)	*(Maximum)		
Flow	0.37 MGD	--- MGD				Continuous	Recorder
TSS	93 lb/day	155 lb/day	30 mg/l		50 mg/l	2/Month	Composite ¹
Turbidity			--- NTU		--- NTU	2/Month	Composite ¹
pH			(6.5 S.U.)		(9.0 S.U.)	2/Month	Grabs ²
Total Residual Chlorine ³			2.0 mg/l		2.0 mg/l	2/Month	Grab
Total Aluminum			13 mg/l		110 mg/l	2/Month	Composite ¹
Total Cadmium			--- mg/l		--- mg/l	1/Quarter	Composite ¹
Total Lead			--- mg/l		--- mg/l	1/Quarter	Composite ¹

¹All composite sampling must consist of a minimum of four (4) grabs spaced equally apart during a typical filter backwash discharge.

²Compliance with these limitations shall be determined by taking a minimum of one (1) grab sample. The grab sample must be analyzed for pH immediately (<15 minutes after sample collection). The maximum value to be reported is the highest individual measurement obtained during the monitoring period. The minimum value to be reported is the lowest individual measurement obtained during the monitoring period.

³The following methods may be used to analyze the grab samples: (1) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G; (2) DPD Titrimetric (ferrous titrimetric), EPA No. 330.4 or Standard Methods (18th edition) No. 4500-Cl F; (3) Amperometric titration, EPA No. 330.1 or Standard Methods (18th edition) No. 4500-Cl D; (4) Iodometric Direct Titration, EPA No. 330.3 or Standard Methods (18th edition) No. 4500-Cl B; (5) Iodometric Back Titration, EPA No. 330.2 or Standard Methods (18th edition) No. 4500-Cl C.

--- signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

* Average Monthly Flow is calculated by dividing the total filter backwash flow per month by the total number of discharge days for the outfall during the corresponding month.

** Values in parentheses () are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

*** All filter backwash discharges must be treated prior to discharging from Outfall 003A.

****Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 003A (Treated Filter Backwash from Treatment Unit #3).

4. The pH of the effluent must be in the range of 6.5 - 9.0 standard units.
5. The discharge shall not cause visible discoloration of the receiving waters.
6. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.
7. The turbidity of the receiving water shall not exceed 10 NTU over natural background.
8. Solids, sludges, or biosolids removed in the course of treatment or control of wastewaters, shall be properly disposed of in compliance with applicable state laws, regulations, and permit requirements, and in a manner such as to prevent any pollutant from such materials from entering the waters of the state.
9. The permittee is required to maintain and implement a comprehensive Residuals Management Plan. The components of the Residuals Management Plan must include the following:
 - a. Characterization of the form, quantity, and quality of the residuals;
 - b. Determination of the appropriate regulatory requirements;
 - c. Identification of feasible disposal options;
 - d. Selection of appropriate residuals processing/treatment technologies and development of a residuals management strategy that meets the regulatory goals established for the water treatment facility;
 - e. Development of best management practices which at a minimum include the following: a) an evaluation of the water treatment residuals storage capacity within each residuals treatment unit and identification of criteria which will serve as a trigger to determine when treatment units (i.e. lagoons, equalization basins, etc.) need to be pulled offline in order to avoid short circuiting and potential permit violations; b) development of procedures and periodic evaluation techniques necessary to gauge the remaining storage capacity of residuals treatment units; c) an evaluation of the need for coordination between WTP operators and personnel responsible for the operation of the WTP residuals treatment units; d) development of maintenance procedures to deactivate and prepare treatment units for sludge removal. These maintenance procedures must identify the appropriate steps necessary to temporarily lower the water level in the treatment unit, remove settled sludges, and restore the flow through the treatment unit in such a way that degradation of the receiving waters and permit violations will be prevented;
 - f. A requirement that all critical activities associated with the operations and maintenance of the water treatment plant residuals treatment units be documented and copies of such documentation be kept on site at all times throughout the effective life of the permit;
 - g. A requirement to review the Residuals Management Plan (at a minimum) on a yearly basis, which also requires the Plan to be updated as necessary. A copy of the Residuals Management Plan and records of the annual reviews must be available on site at all times throughout the effective life of the permit.

The DEM may notify the permittee at any time that the Residuals Management Plan is deficient or does not meet one or more of the minimum requirements of the permit. After such notification from the DEM, the permittee shall make changes to the Residuals Management Plan and shall submit to the DEM a written certification that the requested changes have been made. Unless

otherwise provided by the DEM, the permittee shall have thirty (30) days after such notification to make the necessary changes. The permittee shall immediately amend the Residuals Management Plan if it proves to be ineffective in achieving the general objectives of controlling pollutants in discharges associated with the water treatment facility. Changes must be noted and then submitted to the DEM within thirty (30) days of amending the Residuals Management Plan. Amendments to the Residuals Management Plan may be reviewed by the DEM in the same manner as specified above.

10. This permit authorizes the use of aluminum based water treatment chemicals, hydrated lime, Magnafloc E30 (polyacrylamide), and chlorine as indicated in the permit application. The permittee must notify the DEM and obtain written approval prior to using any other chemicals.
11. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
 - a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 ug/l);
 - (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitro-phenol; and one milligram per liter (1 mg/l) for antimony;
 - (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. s122.21(g)(7); or
 - (4) Any other notification level established by the Director in accordance with 40 C.F.R. s122.44(f) and Rhode Island Regulations.
 - b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) Five hundred micrograms per liter (500 ug/l);
 - (2) One milligram per liter (1 mg/l) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. s122.21(g)(7); or
 - (4) Any other notification level established by the Director in accordance with 40 C.F.R. s122.44(f) and Rhode Island Regulations.
 - c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or by-product any toxic pollutant which was not reported in the permit application.

12. This permit serves as the State's Water Quality Certificate for the discharges described herein.

B. DETECTION LIMITS

The permittee shall assure that all wastewater testing required by this permit, is performed in conformance with the method detection limits listed below. In accordance with 40 CFR Part 136, EPA approved analysis techniques, quality assurance procedures and quality control procedures shall be followed for all reports required to be submitted under the RIPDES program. These procedures are described in "Methods for the Determination of Metals in Environmental Samples" (EPA/600/4-91/010) and "Methods for Chemical Analysis of Water and Wastes" (EPA/600/4-79/020).

The report entitled "Methods for the Determination of Metals in Environmental Samples" includes a test which must be performed in order to determine if matrix interferences are present, and a series of tests to enable reporting of sample results when interferences are identified. Each step of the series of tests becomes increasingly complex, concluding with the complete Method of Standard Additions analysis. The analysis need not continue once a result which meets the applicable quality control requirements has been obtained. Documentation of all steps conducted to identify and account for matrix interferences shall be documented and maintained onsite.

If, after conducting the complete Method of Standard Additions analysis, the laboratory is unable to determine a valid result, the laboratory shall report "could not be analyzed". Documentation supporting this claim shall be maintained onsite. If valid analytical results are repeatedly unobtainable, DEM may require that the permittee determine a method detection limit (MDL) for their effluent or sludge as outlined in 40 CFR Part 136, Appendix B.

When calculating sample averages for reporting on discharge monitoring reports (DMRs):

1. "could not be analyzed" data shall be excluded, and shall not be considered as failure to comply with the permit sampling requirements;
2. results reported as less than the MDL shall be reported as zero in accordance with the DEM's DMR Instructions, provided that all appropriate EPA approved methods were followed.

Therefore, all sample results shall be reported as: an actual value, "could not be analyzed", or zero. The effluent or sludge specific MDL must be calculated using the methods outlined in 40 CFR Part 136, Appendix B. Samples which have been diluted to ensure that the sample concentration will be within the linear dynamic range shall not be diluted to the extent that the analyte is not detected. If this should occur the analysis shall be repeated using a lower degree of dilution.

LIST OF TOXIC POLLUTANTS

The following list of toxic pollutants has been designated pursuant to Section 307(a)(1) of the Clean Water Act. The Method Detection Limits (MDLs) represent the required Rhode Island MDLs.

Volatiles - EPA Method 624		MDL ug/l (ppb)			
1V	acrolein	10.0	16P	heptachlor	0.029
2V	acrylonitrile	5.0	17P	heptachlor epoxide	0.040
3V	benzene	1.0	Pesticides - EPA Method 608		
5V	bromoform	1.0	18P	PCB-1242	0.289
6V	carbon tetrachloride	1.0	19P	PCB-1254	0.298
7V	chlorobenzene	1.0	20P	PCB-1221	0.723
8V	chlorodibromomethane	1.0	21P	PCB-1232	0.387
9V	chloroethane	1.0	22P	PCB-1248	0.283
10V	2-chloroethylvinyl ether	5.0	23P	PCB-1260	0.222
11V	chloroform	1.0	24P	PCB-1016	0.494
12V	dichlorobromomethane	1.0	25P	toxaphene	1.670
14V	1,1-dichloroethane	1.0	Base/Neutral - EPA Method 625		
15V	1,2-dichloroethane	1.0	1B	acenaphthene *	1.0
16V	1,1-dichloroethylene	1.0	2B	acenaphthylene *	1.0
17V	1,2-dichloropropane	1.0	3B	anthracene *	1.0
18V	1,3-dichloropropylene	1.0	4B	benzidine	4.0
19V	ethylbenzene	1.0	5B	benzo(a)anthracene *	2.0
20V	methyl bromide	1.0	6B	benzo(a)pyrene *	2.0
21V	methyl chloride	1.0	7B	3,4-benzofluoranthene *	1.0
22V	methylene chloride	1.0	8B	benzo(ghi)perylene *	2.0
23V	1,1,1,2-tetrachloroethane	1.0	9B	benzo(k)fluoranthene *	2.0
24V	tetrachloroethylene	1.0	10B	bis(2-chloroethoxy)methane	2.0
25V	toluene	1.0	11B	bis(2-chloroethyl)ether	1.0
26V	1,2-trans-dichloroethylene	1.0	12B	bis(2-chloroisopropyl)ether	1.0
27V	1,1,1-trichloroethane	1.0	13B	bis(2-ethylhexyl)phthalate	1.0
28V	1,1,2-trichloroethane	1.0	14B	4-bromophenyl phenyl ether	1.0
29V	trichloroethylene	1.0	15B	butylbenzyl phthalate	1.0
31V	vinyl chloride	1.0	16B	2-chloronaphthalene	1.0
Acid Compounds - EPA Method 625			17B	4-chlorophenyl phenyl ether	1.0
1A	2-chlorophenol	1.0	18B	chrysene *	1.0
2A	2,4-dichlorophenol	1.0	19B	dibenzo (a,h)anthracene *	2.0
3A	2,4-dimethylphenol	1.0	20B	1,2-dichlorobenzene	1.0
4A	4,6-dinitro-o-cresol	1.0	21B	1,3-dichlorobenzene	1.0
5A	2,4-dinitrophenol	2.0	22B	1,4-dichlorobenzene	1.0
6A	2-nitrophenol	1.0	23B	3,3' -dichlorobenzidine	2.0
7A	4-nitrophenol	1.0	24B	diethyl phthalate	1.0
8A	p-chloro-m-cresol	2.0	25B	dimethyl phthalate	1.0
9A	pentachlorophenol	1.0	26B	di-n-butyl phthalate	1.0
10A	phenol	1.0	27B	2,4-dinitrotoluene	2.0
11A	2,4,6-trichlorophenol	1.0	28B	2,6-dinitrotoluene	2.0
Pesticides - EPA Method 608			29B	di-n-octyl phthalate	1.0
1P	aldrin	0.059	30B	1,2-diphenylhydrazine (as azobenzene)	1.0
2P	alpha-BHC	0.058	31B	fluoranthene *	1.0
3P	beta-BHC	0.043	32B	fluorene *	1.0
4P	gamma-BHC	0.048	33B	hexachlorobenzene	1.0
5P	delta-BHC	0.034	34B	hexachlorobutadiene	1.0
6P	chlordane	0.211	35B	hexachlorocyclopentadiene	2.0
7P	4,4' -DDT	0.251	36B	hexachloroethane	1.0
8P	4,4' -DDE	0.049	37B	indeno(1,2,3-cd)pyrene *	2.0
9P	4,4' -DDD	0.139	38B	isophorone	1.0
10P	dieldrin	0.082	39B	naphthalene *	1.0
11P	alpha-endosulfan	0.031	40B	nitrobenzene	1.0
12P	beta-endosulfan	0.036	41B	N-nitrosodimethylamine	1.0
13P	endosulfan sulfate	0.109	42B	N-nitrosodi-n-propylamine	1.0
14P	endrin	0.050	43B	N-nitrosodiphenylamine	1.0
15P	endrin aldehyde	0.062	44B	phenanthrene *	1.0
			45B	pyrene *	1.0
			46B	1,2,4-trichlorobenzene	1.0

OTHER TOXIC POLLUTANTS

	MDL ug/l (ppb)
Antimony, Total	3.0
Arsenic, Total	1.0
Beryllium, Total	0.2
Cadmium, Total	0.1
Chromium, Total	1.0
Chromium, Hexavalent	20.0
Copper, Total	1.0
Lead, Total	1.0
Mercury, Total	0.2
Nickel, Total	1.0
Selenium, Total	2.0
Silver, Total	0.5
Thallium, Total	1.0
Zinc, Total	5.0
Asbestos	**
Cyanide, Total	10.0
Phenols, Total	50.0
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0
Turbidity	0.2 NTU
Fecal Coliform	2.0 MPN/100 ml

** No Rhode Island Department of Environmental Management (RIDEM) MDL

NOTE:

The MDL for a given analyte may vary with the type of sample. MDLs which are determined in reagent water may be lower than those determined in wastewater due to fewer matrix interferences. Wastewater is variable in composition and may therefore contain substances (interferents) that could affect MDLs for some analytes of interest. Variability in instrument performance can also lead to inconsistencies in determinations of MDLs.

To help verify the absence of matrix or chemical interference the analyst is required to complete specific quality control procedures. For the metals analyses listed above the analyst must withdraw from the sample two equal aliquots; to one aliquot add a known amount of analyte, and then dilute both to the same volume and analyze. The unspiked aliquot multiplied by the dilution factor should be compared to the original. Agreement of the results within 10% indicates the absence of interference. Comparison of the actual signal from the spiked aliquot to the expected response from the analyte in an aqueous standard should help confirm the finding from the dilution analysis. (Methods for Chemical Analysis of Water and Wastes EPA-600/4-79/020).

For Methods 624 and 625 the laboratory must on an ongoing basis, spike at least 5% of the samples from each sample site being monitored. For laboratories analyzing 1 to 20 samples per month, at least one spiked sample per month is required. The spike should be at the discharge permit limit or 1 to 5 times higher than the background concentration determined in Section 8.3.2, whichever concentration would be larger. (40 CFR Part 136 Appendix B Method 624 and 625 subparts 8.3.1 and 8.3.11).

C. MONITORING AND REPORTING

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to the DEM within the time specified within the permit.

Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

The permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to DEM no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to DEM.

2. Submittal of Reports as NetDMR Attachments

Unless otherwise specified in this permit, the permittee must submit electronic copies of documents in NetDMR that are directly related to the DMR. These include the following:

- DMR Cover Letters
- Below Detection Limit summary tables
- Monthly Operating Reports

3. Submittal of Reports in Hard Copy Form

The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to DEM.

- A. Written notifications required under Part II
- B. Notice of unauthorized discharges

This information shall be submitted to DEM at the following address:

Rhode Island Department of Environmental Management
RIPDES Program
235 Promenade Street
Providence, Rhode Island 02908

4. Verbal Reports and Verbal Notifications

Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to the DEM. This includes verbal reports and notifications which require reporting within 24 hours. (See Part II.(I)(5) General Requirements for 24-hour reporting) Verbal reports and verbal notifications shall be made to DEM at (401) 222-4700 or (401) 222-3070 at night.

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 PROMENADE STREET
PROVIDENCE, RHODE ISLAND 02908-5767

STATEMENT OF BASIS

RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES) PERMIT TO DISCHARGE TO WATERS OF THE STATE

RIPDES PERMIT NO.

RI0001627

NAME AND ADDRESS OF APPLICANT:

City of Woonsocket
169 Main Street
Woonsocket, RI 02895

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Woonsocket Water Treatment Plant
1500 Manville Road
Woonsocket, Rhode Island 02895

RECEIVING WATER:

Blackstone River

CLASSIFICATION:

B1

I. Proposed Action, Type of Facility, and Discharge Location

The above named applicant has applied to the Rhode Island Department of Environmental Management (DEM) for reissuance of a RIPDES Permit to discharge into the designated receiving water. The facility is involved in the production of potable water for "domestic" and "industrial" uses. The discharge is from three outfalls associated with the backwashing of three water treatment units used for the production of potable water. The bulk of the total settled residuals produced in each of the three treatment units is discharged directly to the Woonsocket Waste Water Treatment Facility under the authorization of the Woonsocket Waste Water Treatment Plant Industrial Pretreatment Program. This permit only authorizes the discharge of treated filter backwash to the Blackstone River.

II. Permit Limitations and Conditions

The effluent limitations, monitoring requirements, and any implementation schedule (if required) may be found in the draft permit. A quantitative description of the discharge in terms of significant effluent parameters based on historic discharge monitoring report (DMR) data is shown in Attachment 1. When the 2006 permit was issued it was determined that the discharges from outfalls 001A, 002A, and 003A would not comply with certain permit limitations and requirements applicable to these outfalls. By a letter dated October 10, 2006 the City requested an administrative hearing and moved to stay certain conditions of the RIPDES permit for pH, Total Suspended Solids, and the mandatory filter backwash treatment requirements applicable to outfalls 001A, 002A, and 003A.

The DEM granted the stay request for outfalls 001A, 002A, and 003A. Consent Agreement No. RIA-382 was subsequently signed on June 27, 2008 which provided interim limitations for outfalls 001A, 002A, and 003A and a schedule for the City to bring the discharges into compliance with the 2006 permit limitations. On January 14, 2010 the City completed the installation of the pH adjustment system in order to comply with pH limitations. The consent agreement included a compliance schedule to bring the City into compliance with the TSS and mandatory filter backwash treatment requirements applicable to outfalls 001A, 002A, and 003A. The compliance option selected by the City was the construction of a new water treatment plant which would eliminate the need for a surface water discharge. The City of Woonsocket indicated to the DEM that upgrading or replacing the existing water treatment plant was also required as a result of the aging infrastructure present at the facility in addition to anticipated changes to the drinking water quality criteria. The original deadline established in RIA-382 to eliminate all discharges from the existing water treatment plant was March 1, 2013. In a letter dated May 26, 2010 the City requested modifications to the consent agreement. On June 19, 2012 a modified Consent Agreement No. RIA-382 was established and executed by both parties establishing interim milestones with a deadline to complete startup and initiation of operations of a new water treatment plant and elimination of all discharges by May 1, 2016. In December 2015 the City requested further modifications to RIA-382. The City projects that a Design-Build-Operate (DBO) contract will be awarded to the selected vendor by July 31, 2016. The City has also requested at this same time an extension to the requirements of the recent consent agreement entered into on September 17, 2017 which established December 31, 2020 as a compliance deadline for the new facility to initiate operation and maintain compliance with final limits. The DEM has revised RIA-382 to contain these new deadlines. Once this permit is finalized the City will be subject to interim limits for TSS and the mandatory filter backwash treatment requirements for Outfalls 001A, 002A, and 003A under Consent Agreement No. RIA-382 until the discharge is eliminated on December 31, 2020.

III. **Permit Basis and Explanation of Effluent Limitation Derivation**

The Facility

The City of Woonsocket operates a Water Treatment Plant at 1500 Manville Road in Woonsocket, RI. The Woonsocket Water Treatment Plant (WTP) is engaged in the treatment of water to produce potable water for "domestic" and "industrial" uses. The plant receives raw water from a combination of sources which include a series of ponds and reservoirs. The WTP utilizes surface water from the Crookfall Brook and Harris Pond Watersheds. The Crookfall Brook watershed, located within the town of Smithfield, North Smithfield, and Lincoln consists of Reservoir #3, Reservoir #1, and Crookfall Brook. The Crookfall Brook is the primary source for the WTP and extends over approximately 7.93 mi². The Harris Pond watershed area is used as a supplemental source on an as needed basis and consists of approximately 33.3 mi² extending through Massachusetts including the communities of Blackstone, Mendon, Hopedale, Upton, Bellingham, and Milford.

Treatment Process

The plant treats raw surface water by a series of processes. The first step in the process includes pretreatment by chemical addition. Incoming raw water is treated with the following pretreatment chemicals: aluminum sulfate, hydrated lime (as needed), chlorine (as needed), and non-ionic polymer. Once the pretreatment chemical addition process is complete, the pretreated water enters a static mixing chamber and then is directed to one of three units designed for flocculation, clarification, and filtration. Following the flocculation and clarification process settled sludge is discharged directly to the Woonsocket Waste Water Treatment Plant Sanitary Sewer system on a daily basis. The Woonsocket WTP currently holds an industrial user permit for these discharges as authorized by the Woonsocket Waste Water Treatment Plant Industrial Pretreatment Program. Once filtration has occurred chlorine, fluoride, and a corrosion inhibitor is added to the treated water prior to entering one of the two clear wells. Once the treated water exits the clear wells, it is then

treated with lime and enters the distribution system. The surface water discharge consists of filter backwash originating from each of the three filtration units. During normal operation of the plant backwashing from any one of the three filtration units takes place approximately three days per week in the winter and four days per week in the summer due to higher seasonal demands on the treatment system. Based on historical operating data provided by the City of Woonsocket, the monthly average discharge flow limit has been set at 0.37 MGD. The treatment plant may backwash one of the filters any day of the week, although under certain circumstances two of the filters may be discharged in one day for a total backwash flow of 0.8 MGD. Each filtration unit discharges to a separate outfall. The outfalls discharge directly into the Blackstone River and are designated as 001A, 002A, and 003A. The Woonsocket WTP process diagram is included in Attachment 2.

Discharge Location

The discharges from this facility exit through outfalls 001A, 002A, and 003A and enter the Blackstone River which is designated in the RI Water Quality Regulations as Water Body ID No. RI0001003R – 01A. This segment of the Blackstone River begins at the Massachusetts-Rhode Island border and extends to the Combined Sewer Outfall located at River and Samoset Streets in Central Falls. This segment is located in the following municipalities: Woonsocket, North Smithfield, Cumberland, Lincoln, and Central Falls. This water body is classified as Class B1 which according to the RI Water Quality Regulations are waters which are designated for primary and secondary contact recreational activities and fish and wildlife habitat. They shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. However all Class B criteria must be met.

The attainment of the Clean Water Act goals is measured by determining how well waters support their designated uses. According to the 2014 303(d) List of Impaired Waters this segment of the Blackstone River is listed as not supporting the fish and wildlife habitat use due to impairments associated with Benthic-Macroinvertebrate Bioassessments, Cadmium, Eurasian Water Milfoil, Myriophyllum Spicatum, Lead, Non-Native Aquatic Plants, Dissolved Oxygen, and Total Phosphorus. In addition, this waterbody segment is not supporting the fish consumption use due to impairments associated with Mercury and PCBs in Fish Tissue. This waterbody segment is not supporting primary and secondary contact recreational uses due to impairments associated with Enterococcus and Fecal Coliform.

General Requirements

Development of RIPDES permit limitations is a multi-step process consisting of the following steps: identifying applicable technology-based limits; calculating allowable water-quality based discharge levels based on instream criteria, background data and available dilution; establishing Best Professional Judgement (BPJ) limits in accordance with Section 402 of the CWA; and assigning the most stringent as the final discharge limitations.

Water quality criteria are comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or States for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal. A technology-based limit is a numeric limit, which is determined by examining the capability of a treatment process to reduce or eliminate pollutants.

Appendix B of the Water Quality Regulations describes the flows used to determine compliance with the aquatic life criteria, specifying that the design flow to be utilized for aquatic life criteria shall not be exceeded at or above the lowest average 7 consecutive day low flow with an average recurrence

frequency of once in 10 years (7Q10). The DEM has calculated the 7Q10 at the location of the WTP outfalls (001A, 002A, and 003A) based on a comparison of the drainage areas for the Blackstone River at the USGS Woonsocket Gauging Station # 01112500, the drainage area for the location of the WTP outfalls, and the 7Q10 flow at Station # 01112500. Using the following steps a site specific 7Q10 flow value was determined:

Step 1: Determine the Drainage Area of the watershed that is upstream of the gauge station:

$$DA_{\text{Upstream of Gauge}} = 416 \text{ mi}^2$$

Step 2: Find the 7Q10 flow for the gauge station:

$$7Q10_{\text{Gauge}} = 102.25 \text{ ft}^3/\text{sec}$$

Step 3: Determine drainage area of the watershed that is upstream from the point of discharge:

$$DA_{\text{Upstream of discharge}} = 423 \text{ mi}^2$$

Step 4: Calculate the equivalent 7Q10 flow using the following formula:

$$7Q10_{\text{Woonsocket WTP}} = (7Q10_{\text{Gauge}}/DA_{\text{Upstream of gauge}}) \times (DA_{\text{Upstream of discharge}})$$

$$7Q10_{\text{Woonsocket WTP}} = 104 \text{ ft}^3/\text{sec (cfs)}$$

Based on the site specific 7Q10 flow in the Blackstone River at the location of the WTP outfalls 001A, 002A, and 003A, a dilution factor was then determined for each of the outfalls:

$$DF = \frac{Q_D + Q_{dis.}}{Q_{dis.}}$$

Where: DF = Dilution Factor
Q_D = Design Flow (Receiving Water 7Q10 Flow)
Q_{dis.} = Discharge Flow

Outfall 001A, 002A, and 003A

The dilution factor was determined to be 183, based on a 7Q10 flow of 104 cfs and a monthly average discharge flow of 0.572 cfs (0.37 MGD).

Water Quality Based Permit Limitations

The allowable effluent limitations were established based on the non-class A freshwater acute and chronic aquatic life criteria and human health criteria specified in Appendix B of the Rhode Island Water Quality Regulations, as amended, using 80% allocation when no background data was available or background data is impacted by upstream sources and 90% allocation when background data is available. Since either there is no background data available, or the background data is impacted by upstream sources, the allowable water quality-based discharge levels are set equal to 80% of the water quality criteria for Class B waters as listed in Appendix B of the Rhode Island Water Quality Regulations. Aquatic life criteria have been established to ensure the protection and propagation of aquatic life while human health criteria represent the pollutant levels that would not result in a significant risk to public health from ingestion of aquatic organisms. The more stringent of the two criteria was then used in establishing allowable effluent limitations.

For water quality-based limitations the allowable discharge limits were calculated as follows:

Background concentration unknown or available data is impacted by sources that have not yet achieved water quality based limits.

$$\text{Limit}_1 = (\text{DF}) * (\text{Criteria}) * (80\%)$$

In accordance with 40 CFR 122.44(d)(1)(iii), water quality based effluent limitations are only required for those pollutants in the discharge that have the reasonable potential to cause or contribute to the exceedence of instream criteria. In order to evaluate the need for permit limits, the allowable monthly average (chronic) and allowable maximum daily (acute) discharge concentrations are compared to the monthly average and maximum daily Discharge Monitoring Report (DMR) data or other monitoring data.

Total Suspended Solids

The previous permit issued on September 13, 2006 included monthly average and daily maximum TSS limitations of 30 mg/l monthly average and 50 mg/l daily maximum. These permit limits were assigned based on Best Professional Judgment (BPJ). The DEM has determined that the use of the best available treatment technologies are not cost prohibitive and that by using the best available treatment technologies such as a settling lagoon or other device(s) whereby comparable control of suspended solids is possible, the 30 mg/l and 50 mg/l TSS limitations can be achieved. According to the U.S. Environmental Protection Agency Filter Backwash Recycling Rule Technical Guidance Manual, there are several options available for solids separation from spent filter backwash water and other residual waste streams. Typical treatment technologies that are available to meet these limitations are settling lagoons, sand drying beds, mechanical dewatering systems such as tube and plate settlers and centrifuge equipment. Mass based limits for outfall 001A, 002A, and 003A were previously determined using the concentration based limits and the monthly average flow limit of 0.37 MGD resulting in TSS loading limits of 93 lb/day monthly average and 155 lb/day daily maximum. These previous TSS concentration and loading based permit limitations have been carried forward in this permit.

Turbidity

Turbidity monitoring requirements have been included in this permit in order to establish a database of NTU data that can be used to determine compliance with water quality criteria. The permit also includes a narrative condition that the receiving water's turbidity not be increased more than 10 NTU over background.

Total Iron

The previous permit issued on September 13, 2006 required monitoring for Total Iron only during months in which iron based coagulation agents were used in the water treatment process. During all other periods sampling was not required. Since the permit was previously issued the City of Woonsocket has not used iron based water treatment chemicals at the drinking water plant. As a result, monitoring for this parameter was not conducted and effluent data was not reported. The DEM has not included monitoring requirements for Total Iron in this permit. However, this permit does authorize the use of aluminum based chemicals in the water treatment process. The permittee must notify the DEM and request a permit modification prior to using any other coagulation agents other than those specifically addressed in Part I.A.10 of the permit.

Total Aluminum

The previous permit issued on September 13, 2006 specified permit limitations for Total Aluminum due to the fact that the discharges from outfalls 001A, 002A, and 003A contain aluminum. This is due to the fact that the Woonsocket WTP utilizes Aluminum Sulfate as the primary coagulation

agent in the water treatment process. Using discharge monitoring report data from the previous five years the RIPDES program evaluated the impact that these discharges are having on the receiving water during filter backwash discharges. The following results were obtained by averaging the values submitted on the DMRs between May 2007 and September 2015: Outfall 001A (6.4 mg/l monthly average and 7.2 mg/l daily maximum), Outfall 002A (5.4 mg/l monthly average and 6.1 mg/l daily maximum), Outfall 003A (5.0 mg/l monthly average and 5.6 mg/l daily maximum). Applicable permit limitations were calculated by using the following equation:

Background concentration unknown or available data is impacted by sources that have not yet achieved water quality based limits.

$$\text{Limit}_1 = (DF) * (\text{Criteria}) * (80\%)$$

This calculation bears the following Total Aluminum values: Monthly Average = 13 mg/l, and Daily Maximum = 110 mg/l. Although the DMR data collected and submitted in accordance with the 2006 permit are below these values, the DEM has determined that there is reasonable potential for the discharge to violate water quality criteria for Total Aluminum and therefore permit limitations have been assigned to outfalls 001A, 002A, and 003A.

Receiving Water Body Impairments

The previous permit issued on September 13, 2006 required quarterly monitoring for Total Copper and Total Lead based on the fact that the Blackstone River from the MA-RI border to the CSO outfall located at River and Samoset Streets in Central Falls was impaired for Copper and Lead according to the State of Rhode Island 2004 303(d) List, List of Impaired Waters dated May 2005. As indicated above, the receiving water is currently listed as impaired for Total Cadmium and Total Lead and is no longer listed as impaired for Total Copper. Based on the monitoring data collected over approximately the last five years it has been determined that there is no reasonable potential for the proposed discharge from outfalls 001A, 002A, and 003A to violate the applicable permit limitations established for Copper (monthly average limit = 417 ug/l and daily maximum limit = 554 ug/l). As a result these monitoring requirements for Copper have been eliminated from the draft permit. However, since the receiving water is listed as impaired for Cadmium and Lead, monitoring for these pollutants has been included in the permit. The discharge from this facility is not expected to contribute to any of the other impairments.

Total Residual Chlorine

Total Residual Chlorine (TRC) limits have been assigned in this permit due to the fact that there is reasonable potential for the discharge to exceed water quality criteria limits for TRC. When calculating TRC limits 100% allocation of TRC was used due to the fact that chlorine is not expected to be found in ambient water and it is a non-conservative pollutant. Therefore, the permit limit is calculated using the following equation:

$$\text{Limit}_1 = (DF) * (\text{Criteria}) * (100\%)$$

Based on the above mentioned equation, limits for chlorine were calculated as: Monthly Average Limit = 2009 ug/l, and Maximum Daily Limit = 3470 ug/l. In order to prevent acute toxic impacts in the receiving water at the point of discharge the DEM typically applies a BPJ limit of 2.0 mg/l as a technology based limit in cases where water quality based limitations are less stringent. Therefore, a technology based limit of 2.0 mg/l has been applied.

pH

The effluent limitations for pH have been established in accordance with the Rhode Island Water

Quality Regulations Table 1.8.D.(2) Class Specific Criteria – Class B Fresh Waters. Table 1.8.D.(2) Class Specific Criteria – Class B Fresh Waters specifies that the pH must be in the range of 6.5-9.0 s.u. or as naturally occurs.

Residuals Management Requirements

Water treatment plant residuals form when suspended solids in the raw water react with chemicals such as coagulants added in the treatment processes and from the addition of other process control chemicals such as lime and polymer. Some potable water treatment processes generate residuals that are relatively easy to process and dispose of. For example, leaves, limbs, logs, plastic bottles, and other large floating debris separated from water during the initial screening process can be disposed of at conventional solid waste landfills. However, most other treatment processes produce more complex residual waste streams that may require advanced processing and disposal methods to protect human health and the environment.

The primary residuals produced at the Woonsocket WTP are sludges (i.e., water that contains suspended solids from the source water and the reaction products of chemicals added in the treatment process). The Woonsocket WTP utilizes *aluminum sulfate* (for solids removal), *hydrated lime* (for pH adjustment as needed), *chlorine* (for disinfection as needed), and a *non-ionic polymer* (for additional solids removal) for the pretreatment process prior to beginning the flocculation, clarification, and filtration phase. For a typical coagulation filtration system the typical disposal options for these residuals consist of the following: landfilling, directly discharging to the sanitary sewer under authorization of the local industrial pretreatment program, or by shipping the residuals to a facility which possesses an effective Solid Waste Beneficial Use Determination (BUD) issued by the DEM Office of Waste Management. The Woonsocket WTP directs the majority of its residuals to the Woonsocket WWTF. These residuals are piped directly from the bottom of each of the flocculation, coagulation, filtration units to the Woonsocket WWTF under the authorization of the Woonsocket WWTF Industrial Pretreatment Program. Any remaining residuals produced by the treatment process are filtered in one of the three flocculation, coagulation, filtration units operated at the WTP and are discharged periodically as part of the routine filter backwashing process described previously. This permit requires that a Residuals Management Plan be maintained and implemented at the water treatment facility in order to ensure that this waste stream is properly managed. The specific Residuals Management Plan requirements can be found in the permit.

Water Treatment Chemicals

TRC, Total Aluminum, and pH limits have been assigned in the permit to regulate the concentrations of aluminum sulfate, calcium hydroxide hydrated lime (slaked lime), and liquid chlorine discharged to the Blackstone River in the filter backwash waste streams. The environmental impact of the non-ionic polymer has been evaluated based on the concentration in use in the process water prior to filter backwash operations and the toxicity information presented in the Material Safety Data Sheets (MSDS). The concentration of non-ionic polymer, identified as *Magnafloc E30* (polyacrylamide), intended for use as a coagulation and flocculation additive, listed in the permit reapplication dated February 9, 2012 is in the range of 0.1 mg/l to 0.35 mg/l. The MSDS identified the following LC50 concentrations for 96 hour toxicity tests: Bluegill LC50 > 100 mg/l, and Trout LC50 > 100 mg/l. Not considering dilution at the receiving water and the potential for a reduction in concentration of the non-ionic polymer from the pretreatment step to the final filter backwashing step, the DEM is confident that the concentrations of non-ionic polymer discharged from the WTP will have minimal adverse impact on the Blackstone River.

Stormwater

This permit does not authorize the discharge of stormwater from the facility. The Woonsocket WTP falls under Standard Industrial Classification (SIC) 4941 – Water Supply, which applies to

establishments primarily engaged in distributing water for sale for domestic, commercial, and industrial use. Based on the RIPDES Program's review it has been determined that facilities that fall under SIC code 4941 are not required to obtain coverage under the NPDES Storm Water Multi-Sector General Permit and therefore the facility is not required to apply.

Antibacksliding/Antidegradation

The Antibacksliding Provision of the Clean Water Act (found at Section 402(o) and repeated at 40 CFR 122.44(l)) prohibits reissuing a permit containing less stringent effluent limits than the comparable limits from the previous permit. Since none of the permit limits, both concentration and mass loadings, are less stringent than in the previous permit, antibacksliding regulations are being met. The draft permit is being reissued with limitations as stringent or more stringent than those in the existing permit with no change to the outfall location.

Selection of Final Permit Limits

The effluent monitoring requirements have been specified in accordance with RIPDES regulations as well as 40 CFR 122.41(j), 122.44(l), and 122.48 to yield data representative of the discharge. The Office has determined that all permit limitations are consistent with the Rhode Island Antidegradation Policy.

The remaining general and specific conditions of the permit are based on the RIPDES regulations as well as 40 CFR Parts 122 through 125 and consisting primarily of management requirements common to all permits.

IV. Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the Rhode Island Department of Environmental Management, Office of Water Resources, 235 Promenade Street, Providence, Rhode Island, 02908-5767. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to the Rhode Island Department of Environmental Management. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Director finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Director will respond to all significant comments and make these responses available to the public at DEM's Providence Office.


Following the close of the comment period, and after a public hearing, if such hearing is held, the Director will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within thirty (30) days following the notice of the final permit decision any interested person may submit a request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of Rule 49 of the Regulations for the Rhode Island Pollutant Discharge Elimination System.

IV. **DEM Contact**

Additional information concerning the permit may be obtained between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, excluding holidays from:

Joseph B. Haberek, PE
RIPDES Program
Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-4700, ext. 7715
Email: joseph.haberek@dem.ri.gov

12/12/17
Date


Joseph B. Haberek, PE
Supervising Sanitary Engineer
RIPDES Permitting Section
Office of Water Resources
Department of Environmental Management

ATTACHMENT 1

DESCRIPTION OF DISCHARGE: Filter Backwash from Water Treatment Unit No. 1
DISCHARGE: 001A

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS:

PARAMETER	MONTHLY AVERAGE¹	DAILY MAXIMUM¹
Aluminum, Total (mg/l)	6.4	7.2
Chlorine, Total Residual (mg/l)	0.03	0.05
Copper, Total (ug/l) ²	0	0
Lead, Total (ug/l) ²	0	0
pH (s.u.)	6.04 (MIN)	7.77(MAX)
Total Suspended Solids (lb/day)	104	113
Total Suspended Solids (mg/l) ³	48.2	54.3
Turbidity (NTU)	18.21	21.42
Flow (mgd)	0.29	0.32

¹ All data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for approximately the last five years (May 2007 thru September 2015).

² Total Copper and Total Lead data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee on a quarterly basis from June 2008 thru September 2015.

³ Total Suspended Solids data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for July 2008 thru September 30, 2015.

DESCRIPTION OF DISCHARGE: Filter Backwash from Water Treatment Unit No.2
DISCHARGE: 002A

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS:

PARAMETER	MONTHLY AVERAGE¹	DAILY MAXIMUM¹
Aluminum, Total (mg/l)	5.4	6.1
Chlorine, Total Residual (mg/l)	0.04	0.05
Copper, Total (ug/l) ²	0.83	0.83
Lead, Total (ug/l) ²	0	0

pH (s.u.)	6.12 (MIN)	7.73 (MAX)
Total Suspended Solids (lb/day)	83	92
Total Suspended Solids (mg/l) ³	40	45
Turbidity (NTU)	15.5	17.8
Flow (mgd)	0.29	0.31

¹ All data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for approximately the last five years (May 2007 thru September 2015).

² Total Copper and Total Lead data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee on a quarterly basis from June 2008 thru September 2015.

³ Total Suspended Solids concentration data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for July 2008 thru September 30, 2015.

DESCRIPTION OF DISCHARGE: Filter Backwash from Water Treatment Unit No. 3
DISCHARGE: 003A

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS:

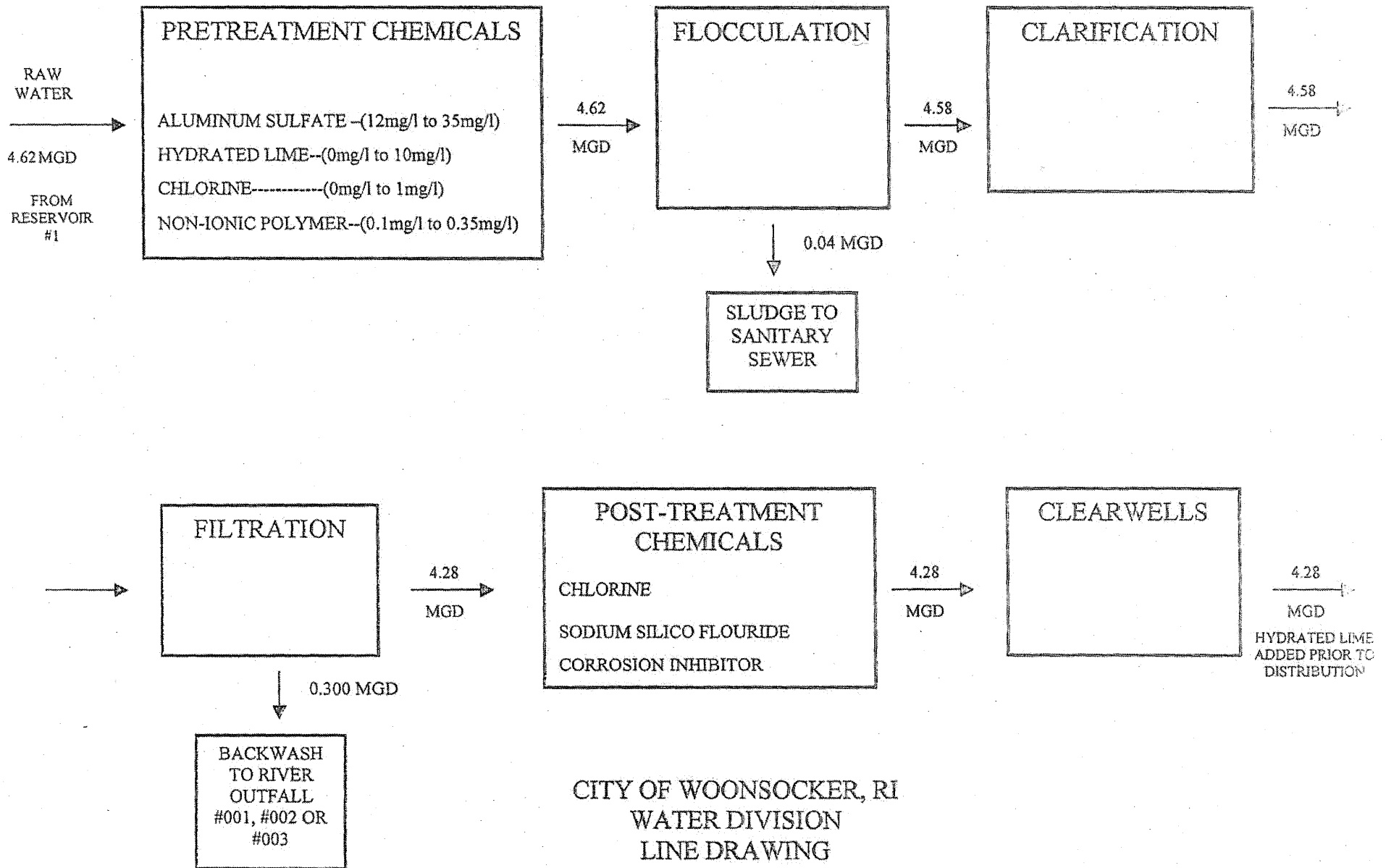
PARAMETER	MONTHLY AVERAGE¹	DAILY MAXIMUM¹
Aluminum, Total (mg/l)	5.0	5.6
Chlorine, Total Residual (mg/l)	0.03	0.04
Copper, Total (ug/l) ²	1.03	1.03
Lead, Total (ug/l) ²	0	0
pH (s.u.)	6.11	7.73
Total Suspended Solids (lb/day)	79	85
Total Suspended Solids (mg/l) ³	37	41
Turbidity (NTU)	13.9	16.0
Flow (mgd)	0.29	0.31

¹ All data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for approximately the last five years (May 2007 thru September 2015).

² Total Copper and Total Lead data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee on a quarterly basis from June 2008 thru September 2015.

³ Total Suspended Solids data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for July 2008 thru September 30, 2015.

ATTACHMENT 2



CITY OF WOONSOCKER, RI
WATER DIVISION
LINE DRAWING

PART II
TABLE OF CONTENTS

GENERAL REQUIREMENTS

- (a) Duty to Comply
- (b) Duty to Reapply
- (c) Need to Halt or Reduce Not a Defense
- (d) Duty to Mitigate
- (e) Proper Operation and Maintenance
- (f) Permit Actions
- (g) Property Rights
- (h) Duty to Provide Information
- (i) Inspection and Entry
- (j) Monitoring and Records
- (k) Signatory Requirements
- (l) Reporting Requirements
- (m) Bypass
- (n) Upset
- (o) Change in Discharge
- (p) Removed Substances
- (q) Power Failures
- (r) Availability of Reports
- (s) State Laws
- (t) Other Laws
- (u) Severability
- (v) Reopener Clause
- (w) Confidentiality of Information
- (x) Best Management Practices
- (y) Right of Appeal

DEFINITIONS

GENERAL REQUIREMENTS

(a) Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Chapter 46-12 of the Rhode Island General Laws and the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

- (1) The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.
- (2) The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307 or 308 of the Act is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment of not more than 1 year, or both.
- (3) Chapter 46-12 of the Rhode Island General Laws provides that any person who violates a permit condition is subject to a civil penalty of not more than \$5,000 per day of such violation. Any person who willfully or negligently violates a permit condition is subject to a criminal penalty of not more than \$10,000 per day of such violation and imprisonment for not more than 30 days, or both. Any person who knowingly makes any false statement in connection with the permit is subject to a criminal penalty of not more than \$5,000 for each instance of violation or by imprisonment for not more than 30 days, or both.

(b) Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

(c) Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(d) Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(e) Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures, and, where applicable, compliance with DEM "Rules and Regulations Pertaining to the Operation and Maintenance of Wastewater Treatment Facilities" and "Rules and Regulations Pertaining to the Disposal and Utilization of Wastewater Treatment Facility Sludge." This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

(f) Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause, including but not limited to: (1) Violation of any terms or conditions of this permit; (2) Obtaining this permit by misrepresentation or failure to disclose all relevant facts; or (3) A change in any conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(g) Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

(h) Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

(i) Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- (1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- (2) Have access to and copy, at reasonable times any records that must be kept under the conditions of this permit;
- (3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

- (4) Sample or monitor any substances or parameters at any location, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA or Rhode Island law.

(j) Monitoring and Records

- (1) Samples and measurements taken for the purpose of monitoring shall be representative of the volume and nature of the discharge over the sampling and reporting period.
- (2) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings from continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 5 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.
- (3) Records of monitoring information shall include:
 - (i) The date, exact place, and time of sampling or measurements;
 - (ii) The individual(s) who performed the sampling or measurements;
 - (iii) The date(s) analyses were performed;
 - (iv) The individual(s) who performed the analyses;
 - (v) The analytical techniques or methods used; and
 - (vi) The results of such analyses.
- (4) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136 and applicable Rhode Island regulations, unless other test procedures have been specified in this permit.
- (5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall upon conviction, be punished by a fine of not more than \$10,000 per violation or by imprisonment for not more than 6 months per violation or by both. Chapter 46-12 of the Rhode Island General Laws also provides that such acts are subject to a fine of not more than \$5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.
- (6) Monitoring results must be reported on a Discharge Monitoring Report (DMR).
- (7) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR Part 136, applicable State regulations, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(k) Signatory Requirement

All applications, reports, or information submitted to the Director shall be signed and certified in accordance with Rule 12 of the Rhode Island Pollutant Discharge Elimination System (RIPDES) Regulations. Rhode Island General Laws, Chapter 46-12 provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.

(l) Reporting Requirements

- (1) Planned changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility.
- (2) Anticipated noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with the permit requirements.
- (3) Transfers. This permit is not transferable to any person except after written notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under State and Federal law.
- (4) Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.
- (5) Twenty-four hour reporting. The permittee shall immediately report any noncompliance which may endanger health or the environment by calling DEM at (401) 222-4700 or (401) 222-3070 at night.

A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The following information must be reported immediately:

- (i) Any unanticipated bypass which causes a violation of any effluent limitation in the permit; or
- (ii) Any upset which causes a violation of any effluent limitation in the permit; or
- (iii) Any violation of a maximum daily discharge limitation for any of the pollutants specifically listed by the Director in the permit.

The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

- (6) Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs (1), (2), and (5), of this section, at the time monitoring reports are submitted. The reports shall contain the information required in paragraph (1)(5) of the section.
- (7) Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, they shall promptly submit such facts or information.

(m) Bypass

"Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

- (1) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (2) and (3) of this section.
- (2) Notice.
 - (i) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.
 - (ii) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Rule 14.18 of the RIPDES Regulations.
- (3) Prohibition of bypass.
 - (i) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:
 - (A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, where "severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production;
 - (B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - (C) The permittee submitted notices as required under paragraph (2) of this section.

- (ii) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph (3)(i) of this section.

(n) Upset

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

- (1) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph (2) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
- (2) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - (a) An upset occurred and that the permittee can identify the cause(s) of the upset;
 - (b) The permitted facility was at the time being properly operated;
 - (c) The permittee submitted notice of the upset as required in Rule 14.18 of the RIPDES Regulations; and
 - (d) The permittee complied with any remedial measures required under Rule 14.05 of the RIPDES Regulations.
- (3) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(o) Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. Discharges which cause a violation of water quality standards are prohibited. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different or increased discharges of pollutants must be reported by submission of a new NPDES application at least 180 days prior to commencement of such discharges, or if such changes will not violate the effluent limitations specified in this permit, by notice, in writing, to the Director of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by the permit constitutes a violation.

(p) Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner consistent with applicable Federal and State laws and regulations including, but not limited to the CWA and the Federal Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq., Rhode Island General Laws, Chapters 46-12, 23-19.1 and regulations promulgated thereunder.

(q) Power Failures

In order to maintain compliance with the effluent limitation and prohibitions of this permit, the permittee shall either:

In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or if such alternative power source is not in existence, and no date for its implementation appears in Part I,

Halt reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

(r) Availability of Reports

Except for data determined to be confidential under paragraph (w) below, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the DEM, 291 Promenade Street, Providence, Rhode Island. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA and under Section 46-12-14 of the Rhode Island General Laws.

(s) State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law.

(t) Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, and local laws and regulations.

(u) Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

(v) Reopener Clause

The Director reserves the right to make appropriate revisions to this permit in order to incorporate any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA or State law. In accordance with Rules 15 and 23 of the RIPDES Regulations, if any effluent standard or prohibition, or water quality standard is promulgated under the CWA or under State law which is more stringent than any limitation on the pollutant in the permit, or controls a pollutant not limited in the permit, then the Director may promptly reopen the permit and modify or revoke and reissue the permit to conform to the applicable standard.

(w) Confidentiality of Information

(1) Any information submitted to DEM pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, DEM may make the information available to the public without further notice.

(2) Claims of confidentiality for the following information will be denied:

- (i) The name and address of any permit applicant or permittee;
- (ii) Permit applications, permits and any attachments thereto; and
- (iii) NPDES effluent data.

(x) Best Management Practices

The permittee shall adopt Best Management Practices (BMP) to control or abate the discharge of toxic pollutants and hazardous substances associated with or ancillary to the industrial manufacturing or treatment process and the Director may request the submission of a BMP plan where the Director determines that a permittee's practices may contribute significant amounts of such pollutants to waters of the State.

(y) Right of Appeal

Within thirty (30) days of receipt of notice of a final permit decision, the permittee or any interested person may submit a request to the Director for an adjudicatory hearing to reconsider or contest that decision. The request for a hearing must conform to the requirements of Rule 49 of the RIPDES Regulations.

DEFINITIONS

1. For purposes of this permit, those definitions contained in the RIPDES Regulations and the Rhode Island Pretreatment Regulations shall apply.
2. The following abbreviations, when used, are defined below.

cu. M/day or M ³ /day	cubic meters per day
mg/l	milligrams per liter
ug/l	micrograms per liter
lbs/day	pounds per day
kg/day	kilograms per day
Temp. °C	temperature in degrees Centigrade
Temp. °F	temperature in degrees Fahrenheit
Turb.	turbidity measured by the Nephelometric Method (NTU)
TNFR or TSS	total nonfilterable residue or total suspended solids
DO	dissolved oxygen
BOD	five-day biochemical oxygen demand unless otherwise specified
TKN	total Kjeldahl nitrogen as nitrogen
Total N	total nitrogen
NH ₃ -N	ammonia nitrogen as nitrogen
Total P	total phosphorus
COD	chemical oxygen demand
TOC	total organic carbon
Surfactant	surface-active agent
pH	a measure of the hydrogen ion concentration
PCB	polychlorinated biphenyl
CFS	cubic feet per second
MGD	million gallons per day
Oil & Grease	Freon extractable material
Total Coliform	total coliform bacteria
Fecal Coliform	total fecal coliform bacteria
ml/l	milliliter(s) per liter
NO ₃ -N	nitrate nitrogen as nitrogen
NO ₂ -N	nitrite nitrogen as nitrogen
NO ₃ -NO ₂	combined nitrate and nitrite nitrogen as nitrogen
Cl ₂	total residual chlorine