

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

- During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (Advanced Treatment Discharge after Disinfection).

Such discharges shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Quantity - lbs./day</u>		<u>Discharge Limitations</u>		<u>Concentration - specify units</u>		<u>Monitoring Requirement</u>	
	<u>Monthly Average</u>	<u>Maximum Daily</u>	<u>Monthly Average</u> *(Minimum)	<u>Weekly Average</u> *(Average)	<u>Maximum Daily</u> *(Maximum)	<u>Measurement Frequency</u>	<u>Sample Type</u>	
Flow (To Plant Headworks)	--- MGD	--- MGD ¹				Continuous	Recorder	
Flow (To Advanced Treatment)	31 MGD	--- MGD ¹				Continuous	Recorder	
CBOD ₅ (Nov. 1 – Apr. 30)	6,464	11,634	25 mg/l	40 mg/l	45 mg/l	1/Day	24-Hr. Comp.	
CBOD ₅ (May 1 – Oct. 31)	2,585	3,878	10 mg/l	10 mg/l	15 mg/l	1/Day	24-Hr. Comp.	
CBOD ₅ - % Removal 85%					1/Month	Calculated		
TSS (Nov. 1 – Apr. 30)	7,756	12,927	30 mg/l	45 mg/l	50 mg/l	1/Day	24-Hr. Comp.	
TSS (May 1 – Oct. 31)	5,171	7,756	20 mg/l	20 mg/l	30 mg/l	1/Day	24-Hr. Comp.	
TSS-% Removal	85%					1/Month	Calculated	
Settleable Solids				--- m/l	--- m/l	1/Day	Grab	

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

Sampling for TSS, CBOD₅, Flow, and Settleable Solids shall be performed Sunday-Saturday. All CBOD₅ and TSS samples shall be taken on the influent and effluent with appropriate allowances for hydraulic detention (flow-through) time.

¹Flow to the WWTF's headworks shall be reported. All flows up to 116 MGD shall receive at least primary treatment and disinfection. Up to 46 MGD must receive advanced treatment.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A (Advanced Treatment Discharge after Disinfection).

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Effluent Characteristic	Quantity - lbs./day		Discharge Limitations		Concentration - specify units		Monitoring Requirement	
	Monthly Average	Maximum Daily	Monthly Average	Weekly Average	Maximum Daily	Weekly Average	Measurement Frequency	Sample Type
Enterococci		35 cfu ¹ 100 ml			276 cfu ¹ 100 ml		2/Day	Grab ²
Fecal Coliform		--- MPN ¹ 100 ml	--- MPN ¹ 100 ml	--- MPN ¹ 100 ml	--- MPN ¹ 100 ml		1/Day	Grab ²
UV Intensity ³		(--- mw/cm ²)	(--- mw/cm ²)	(--- mw/cm ²)	(--- mw/cm ²)		Continuous	Recorder
UV Transmittance ³		(--- %)	(--- %)	(--- %)	(--- %)		Continuous	Recorder
UV Dosage ³		(---mw-s/cm ²) ⁴	(---mw-s/cm ²) ⁴	(---mw-s/cm ²) ⁴	(---mw-s/cm ²) ⁴		Continuous	Recorder
pH		(6.0 SU)	(6.0 SU)	(6.0 SU)	(9.0 SU)		1/Day	Grab

¹The Geometric Mean shall be used to obtain the "maximum daily" (when there are multiple sampled in a day), "weekly average", and "monthly average" values.

² The Fecal Coliform sample shall be taken at the same time as one of the Enterococci samples. Compliance with the Enterococci limitations shall be determined by taking a minimum of two (2) grab samples per day, separated by a minimum of three (3) hours, unless good cause exists for not having the minimum separation. In the event that the permittee believes that good cause exists, written documentation, in the form of a cover letter to the permittee's Discharge Monitoring Reports, must be submitted to the DEM demonstrating that good cause existed. The facility shall report any fecal coliform sample result that exceeds 400 MPN/100 ml to the RIDEM in accordance with the 24-hour reporting requirements under Part II(I)(5) of the permit.

³UV Intensity, Transmittance, and Dosage readings shall be recorded continuously to provide a record that proper disinfection was achieved at all times.

⁴UV Dosage is defined as the UV Intensity (mW/ cm²) multiplied by the Exposure Time (s).

*Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily. Sampling for Fecal Coliform, Enterococci, pH, UV Intensity, UV Transmittance, and UV Dosage shall be performed Sunday – Saturday.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A (Advanced Treatment Discharge after Disinfection).

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3. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (Advanced Treatment Discharge After Disinfection).

Such discharges shall be monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>		<u>Concentration - specify units</u>		<u>Monitoring Requirement</u>	
	<u>Quantity - lbs./day</u> <u>Monthly Average</u>	<u>Maximum Daily</u>	<u>Weekly Average</u>	<u>Maximum Daily</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Oil and Grease		--- mg/l		--- mg/l	1/Month	3 Grabs ¹
Phosphorus, Total		--- mg/l		--- mg/l	1/Week	24-Hr. comp.
TKN		--- mg/l		--- mg/l	3/week	24-Hr. Comp.
Nitrite, Total (as N)		--- mg/l		--- mg/l	3/week	24-Hr. Comp.
Nitrate, Total (as N)		--- mg/l		--- mg/l	3/week	Calculated
Nitrogen, Total (TKN + Nitrite + Nitrate, as N) (May-Oct)	1293 lbs/day			--- mg/l	3/week	Calculated
(Nov-Apr)	--- lbs/day ²			--- mg/l	3/week	Calculated

¹ Three (3) grab samples shall be collected over the course of a twenty-four (24) hour period with a minimum of six (6) hours between samples. Each grab sample must be analyzed individually and the maximum values reported.

² The permittee shall operate the treatment facility to reduce the discharge of total nitrogen, during the months of November through April, to the maximum extent possible using all available treatment equipment in place at the facility, except carbon source.

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

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday at the following locations: Outfall 001A (Advanced Treatment Discharge after Disinfection).

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4. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (Advanced Treatment Discharge After Disinfection).
Such discharges shall be monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>		<u>Concentration - specify units</u>		<u>Monitoring Requirement</u>		
	<u>Quantity - lbs./day</u> <u>Monthly</u> <u>Average</u>	<u>Maximum</u> <u>Daily</u>	<u>Monthly</u> <u>Average</u>	<u>Weekly</u> <u>Average</u>	<u>Maximum</u> <u>Daily</u>	<u>Measurement</u> <u>Frequency</u>	<u>Sample</u> <u>Type</u>
Copper, Total ¹			6.5 ug/l		6.5 ug/l	2/Week	24-Hr. Comp.
Nickel, Total ¹			14.3 ug/l		70.3 ug/l	2/Week	24-Hr. Comp.
Zinc, Total ¹			85.6 ug/l		85.6 ug/l	2/Week	24-Hr. Comp.
Cyanide, Available ¹			0.8 ug/l ²		0.8 ug/l ²	2/Week	24-Hr. Comp. ³
Ammonia, Total (as N)			--- mg/l		---	1/Month	24-Hr. Comp.
Cadmium, Total ¹			--- ug/l		---	1/Month	24-Hr. Comp.
Aluminum, Total ¹			--- ug/l		---	1/Month	24-Hr. Comp.
Chromium, Hexavalent ¹			--- ug/l		---	1/Month	24-Hr. Comp.
Lead, Total ¹			--- ug/l		---	1/Month	24-Hr. Comp.

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

¹ Samples shall be taken on the influent and effluent with appropriate allowances for hydraulic detention (flow-through) time.

² The limit at which compliance/noncompliance determinations will be based is the Quantitation Limit, which is defined as 10 ug/l for Cyanide. This value may be reduced by permit modification as more sensitive methods are approved by EPA and the State.

³ Compliance with these limitations shall be determined by taking three grab samples per eight-hour shift with a minimum of two (2) hours between grabs, and preserved immediately upon collection. All samples shall be composited, then analyzed for available Cyanide.

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday at the following locations: Outfall 001A (Advanced Treatment Discharge after Disinfection).

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5. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (Advanced Treatment Discharge after Disinfection).

Such discharges shall be monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>		<u>Concentration - specify units</u>		<u>Monitoring Requirement</u>	
	<u>Quantity - lbs./day</u>	<u>Monthly Average</u>	<u>Monthly Average</u>	<u>Weekly Average</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
<u>Mysidopsis bahia</u> LC50 ¹					1/Quarter	24-Hr. Comp.
<u>Arbacia punctulata</u> C-NOEC ³					1/Quarter	24-Hr. Comp.

100%
or Greater²

50%
or Greater⁴

¹LC₅₀ is defined as the concentration of wastewater that causes mortality to 50% of the test organisms.

²The 100% or greater limit is defined as a sample that is composed of 100% effluent.

³C-NOEC is defined as the highest concentration of toxicant or effluent at which no adverse effects are observed.

⁴The 50% or greater limit is defined as a sample that is composed of 50% or more effluent.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 001A in accordance with I.B of the permit.

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6. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 002A (North Diversion Structure).

Such discharges shall be monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Quantity - lbs./day</u>		<u>Concentration - specify units</u>		<u>Monitoring Requirement</u>	
	<u>Monthly Average</u>	<u>Daily Maximum</u>	<u>Monthly Average</u>	<u>Weekly Average</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow	--- MGD	---	---	---	Continuous	Recorder

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

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 002A.

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

7. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 003A (Treated Wet Weather Outfall After Dechlorination and Prior to Combination with the Advanced Treatment Discharge). Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Quantity - lbs./day		Discharge Limitations		Concentration - specify units		Monitoring Requirement	
	Monthly Average	Maximum Daily	Monthly Average	Weekly Average	Maximum Daily	Measurement Frequency	Sample Type	
Flow	--- MGD	70 MGD	--- mg/l			Continuous	Recorder	
CBOD ₅					--- mg/l	When in Use ¹	24-Hr. Comp. (Hourly Grabs)	
CBOD ₅ - % Removal ¹							Calculated	
TSS			--- mg/l		--- mg/l	When in Use ¹	24-Hr. Comp. (Hourly Grabs)	
TSS - % Removal ¹						When in Use ¹	Calculated	

¹For monitoring purposes, an overflow is defined as any occurrence of a discharge from the wet weather facility with a minimum duration of 15 minutes. Overflows shall be considered to be separate if they are separated by six (6) hours or more. During months of no overflow, DMR's shall be marked as "no discharge". All overflows created by storm events that are greater than the one year six hour storm are not subject to these limitations and should not be included in DMR reporting calculations. However, any overflow, regardless of the size of the storm event, must be reported to the DEM's Operations and Maintenance Program.

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

*Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 003A.

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

8. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 003A (Treated Wet Weather Outfall After Dechlorination and Prior to Combination with the Advanced Treatment Discharge). Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Quantity - lbs./day		Discharge Limitations		Concentration - specify units		Monitoring Requirement	
	Monthly Average	Maximum Daily	Monthly Average	Maximum Daily	Weekly Average	Maximum Daily	Measurement Frequency	Sample Type
Fecal Coliform ¹			--- MPN 100 ml			--- MPN 100 ml	When in Use ²	Grab ^{3,4}
Enterococci ¹			--- cfu 100 mL			276 cfu 100 mL	When in Use ²	Grab ^{3,4}
Total Residual Chlorine (TRC) ^{1,5}			--- ug/l ⁶		--- ug/l ⁶	20 ug/l ⁶	When in Use ²	Grab ⁴

¹ The TRC, Fecal Coliform, and Enterococci samples shall be taken at the same time.

²For monitoring purposes, an overflow is defined as any occurrence of a discharge from the wet weather facility with a minimum duration of 15 minutes. Overflows shall be considered to be separate if they are separated by six (6) hours or more. During months of no overflow, DMR's shall be marked as "no discharge". All overflows created by storm events that are greater than the one year six hour storm are not subject to these limitations and should not be included in DMR reporting calculations. However, any overflow, regardless of the size of the storm event, must be reported to the DEM's Operations and Maintenance Program.

³The Geometric Mean shall be used to obtain the "monthly average", "weekly average", and "daily maximum" (when there are multiple samples taken in a given day) fecal coliform and enterococci results. Sampling for treated wet weather overflows taken between the hours of 2:30AM - 3:00PM on weekdays and during the hours of 2:30AM -11:00AM on weekends/holidays shall be reported on Discharge Monitoring Reports. Sampling at all times shall be reported on Monthly Operating Reports.

⁴One grab sample shall be taken per day of each overflow event. If an overflow event lasts longer than 24 hours, a grab sample shall be taken for each 24-hour period of the event. ⁵At each sampling event, one TRC sample shall be taken after chlorination but prior to dechlorination to verify that the wet weather flow has been properly chlorinated and one TRC sample shall be taken after dechlorination to verify that the wet weather flow has been properly dechlorinated. The sample after dechlorination shall be reported on DMR's.

⁶The following methods may be used to analyze the grab samples: (1) Low Level Amperometric Titration, Standard Methods (18th Edition) No. 4500-CI E; (2) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-CI G.

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

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 003A (Treated Wet Weather Outfall after Dechlorination and Prior to Combination with the Advanced Treatment Discharge).

9. a. The pH of the effluent shall not be less than 6.0 nor greater than 9.0 standard units at any time, unless these values are exceeded due to natural causes or as a result of the approved treatment processes.
- b. The discharge shall not cause visible discoloration of the receiving waters.
- c. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.
- d. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and 5-day carbonaceous biochemical oxygen demand during dry weather conditions. Dry weather is defined as any calendar day on which there is less than 0.1 inches of rain and no snow melt. The percent removal shall be based on monthly average values.
- e. When the effluent discharged for a period of 90 consecutive days exceeds 80 percent of the designed flow, the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans.
- f. The permittee shall analyze its effluent semi-annually for the EPA Priority Pollutants as listed in 40 CFR 122, Appendix D, Table II and III. One sample must be conducted with the 3rd Quarter bioassay sample and must be submitted to the DEM with the bioassay by October 15th. The results of the second analysis shall be submitted to the Department of Environmental Management by January 15th for the previous calendar year. The State user fee samples may be utilized provided that the sampling is coordinated in advance. All sampling and analysis shall be done in accordance with EPA Regulations, including 40 CFR, Part 136; grab and composite samples shall be taken as appropriate.
- g. This permit serves as the State's Water Quality Certificate for the discharges described herein.
- h. This permit authorizes the use of chlorine disinfection only for emergency purposes at outfall 001A in accordance with the Bypass and Upset provisions from part II of the permit. Any emergency uses of chlorination at outfall 001A shall be in accordance with the facility's Operation and Maintenance Manual and shall be reported on the cover letter to the DMRs. The chlorination usage reporting for outfall 001A must include the reason why chlorine was used, the duration of its use, and any sampling/analytical data.

B. BIOMONITORING REQUIREMENTS AND INTERPRETATION OF RESULTS

1. General

Beginning on the effective date of the permit, the permittee shall perform four (4) acute and four (4) chronic toxicity tests per year on samples collected from discharge outfall 001. The permittee shall conduct the tests during dry weather periods (no rain within forty-eight (48) hours prior to or during sampling unless approved by DEM) according to the following test frequency and protocols. Data shall be reported as outlined in Section B.10. The State may require additional screening, range finding, and/or definitive acute or chronic bioassays as deemed necessary based on the results of the initial bioassays required herein. Indications of toxicity could result in requiring a Toxicity Reduction Evaluation (TRE) to investigate the causes and to identify corrective actions necessary to eliminate or reduce toxicity to an acceptable level.

2. Test Frequency

On four sampling events, (one each calendar quarter) the permittee will conduct toxicity tests on the two species listed below, for a total of eight toxicity tests per year. This requirement entails performing two-species testing as follows:

<u>Species</u>	<u>Test Type</u>	<u>Frequency</u>
Mysids (<i>Mysidopsis bahia</i>)	Definitive 48-Hour Acute Static (LC ₅₀)	Quarterly
<i>Arbacia punctulata</i>	Sea Urchin 1 hour fertilization test (chronic)	Quarterly

3. Testing Methods

Toxicity tests shall be conducted in accordance with protocols listed in 40 CFR Part 136.

4. Sample Collection

For each sampling event a twenty-four (24) hour flow proportioned composite final effluent sample shall be collected during a dry weather (no rain forty-eight (48) hours prior to or during sampling unless approved by RIDEM). This sample shall be kept cool (at 4°C) and testing shall begin within twenty-four (24) hours after the last sample of the composite is collected. In the laboratory, the sample will be split into two (2) subsamples, after thorough mixing, for the following:

- A: Chemical Analysis
- B: Toxicity Testing

All samples held overnight shall be refrigerated at 4°C. Grab samples must be used for pH and temperature.

5. Salinity Adjustment

Prior to the initiation of testing, the effluent must be adjusted to make the salinity of the effluent equal to that of the marine dilution water. The test solution must be prepared by adding non-toxic dried ocean salts to a sufficient quantity of 100% effluent to raise the salinity to the desired level. After the addition of the dried salts, stir gently for thirty (30) to sixty (60) minutes, preferably with a magnetic stirrer, to ensure that the salts are in solution. It is important to check the final salinity with a refractometer or salinometer. Salinity adjustments following this procedure and in accordance with EPA protocol will ensure that the concentrations (% effluent) of each dilution are real and allow for an accurate evaluation with the acute permit limit and chronic monitoring requirements.

6. Dilution Water

Dilution water used for marine acute toxicity analyses should be of sufficient quality to meet minimum acceptability of test results (See Sections B.7 and B.8). For both species, natural seawater shall be used as the dilution water. This water shall be collected from Narragansett Bay off the dock at the URI's Graduate School of Oceanography on South Ferry Road, Narragansett. It is noted that the University claims no responsibility for the personal safety on this dock. The permittee shall observe the rules posted at the dock. If this natural seawater diluent is found to be, or suspected to be toxic or unreliable, an alternate source of natural seawater or, deionized water mixed with hypersaline brine or artificial sea salts of known quality with a salinity and pH similar to that of the receiving water may be substituted AFTER RECEIVING WRITTEN APPROVAL FROM DEM.

7. Effluent Toxicity Test Conditions for Mysids (Mysidopsis bahia)

a.	Test Type	48-Hour Static Acute Definitive
b.	Salinity	25 ppt \pm 10% for all dilutions
c.	Temperature (C)	25° \pm 1°C
d.	Light Quality	Ambient laboratory illumination
e.	Photoperiod	8 - 16 Hour Light/24-Hour
f.	Test Chamber Size	250 ml
g.	Test Solution Volume	200 ml
h.	Age of Test Organisms	1 - 5 Days
i.	No. Mysids per Test Chamber	10
j.	No. of Replicate Test Chamber Per Concentration	2
k.	Total No. Mysids per Test Concentration	20
l.	Feeding Regime	Light feeding (two (2) drops concentrated brine shrimp nauplii, approx. 100 nauplii per mysid twice daily).
m.	Aeration	None, unless dissolved oxygen concentration falls below 40% of saturation at which time gentle single-bubble aeration should be started.
n.	Dilution Water	Narragansett Bay water as discussed above.
o.	Dilutions	Five (5) dilutions plus a control: 100%, 50%, 25%, 12.5%, 6.25% and 0% effluent.
p.	Effect Measured and Test	Mortality - no movement of body test duration or appendages on gentle prodding, 48-hour LC ₅₀ and NOAEL.
q.	Test Acceptability	90% or greater survival of test organisms in control solution.
r.	Sampling Requirements	Samples are collected and used within 24 hours after the last sample of the composite is collected.
s.	Sample Volume Required	Minimum four (4) liters

8. Test Conditions for Arbacia Punctulata Fertilization Test

a.	Test type	Static
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b.	Salinity	30 0/00 \pm 2 0/00
c.	Temperature (C)	20 \pm 1°C
d.	Light quality	Ambient laboratory light during test preparation
e.	Light intensity	10-20 uE/m ² /s, or 50-100 ft-c (Ambient Laboratory Levels)
f.	Test vessel size	Disposable (glass) liquid scintillation vials (20 ml capacity), not pre-cleaned
g.	Test solution volume	5 ml
h.	Number of sea urchins	Pooled sperm from four (4) males and pooled eggs from four (4) females are used per test
i.	Number of egg and sperm cells per chamber	About 2000 eggs and 5,000,000 sperm cells per vial
j.	Number of replicate chambers per concentration	4 (minimum of 3)
k.	Dilution water	Narragansett Bay water as discussed above
l.	Dilution factor	Approximately 0.5
m.	Test duration	1 hour and 20 minutes
n.	Effects measured	Fertilization of sea urchin eggs
o.	Number of treatments per test	Minimum of five (5) effluent concentrations and a control. An additional dilution at the permitted effluent concentration (% effluent) is required.
p.	Acceptability of test results	Recommended sperm: egg ratio should result in fertilization of minimum of 70% of the eggs in the control chambers.

9. Chemical Analysis

The following chemical analysis shall be performed for every two-species sampling event.

<u>Parameter</u>	<u>Saline Effluent</u>	<u>Detection Diluent</u>	<u>Limit (mg/l)</u>
pH	X	X	---
Specific Conductance	X	X	---
Total Solids and Suspended Solids	X	X	---
Ammonia	X		0.1
Total Organic Carbon	X		0.5
Cyanide	X		0.01
Total Phenols	X		0.05
Salinity	X	X	PPT(0/00)

During the first, second, and fourth calendar quarter bioassay sampling events the following chemical analyses shall be performed:

<u>Total Metals</u>	<u>Effluent</u>	<u>Saline Diluent</u>	<u>Detection Limit (ug/l)</u>
Total Cadmium	X		0.1
Total Copper	X	X	1.0
Total Chromium (VI)	X		20.0
Total Zinc	X		5.0
Total Nickel	X		1.0
Total Lead	X	X	1.0
Total Aluminum	X		5.0

The above metal analyses may be used to fulfill, in part or in whole, monthly monitoring requirements in the permit for these specific metals.

During the third calendar quarter bioassay sampling event, the final effluent sample collected during the same twenty-four (24) hour period as the bioassay sample, shall be analyzed for priority pollutants (as listed in Tables II and III of Appendix D of 40 CFR 122). The bioassay priority pollutant scan shall be a full scan and may be coordinated with other permit conditions to fulfill any priority pollutant scan requirements.

10. Toxicity Test Report Elements

A report of results will include the following:

- Description of sample collection procedures and site description.
- Names of individuals collecting and transporting samples, times, and dates of sample collection and analysis.
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests (quality assurance); light and temperature regime; dilution water description; other information on test conditions if different than procedures recommended.
- The method used to adjust the salinity of the effluent must be reported.

- All chemical and physical data generated (include detection limits).
- Raw data and bench sheets.
- Any other observations or test conditions affecting test outcome.

Toxicity test data shall include the following:

Acute

- Survival for each concentration and replication at time twenty-four (24) and forty-eight (48) hours.
- LC₅₀ and 95% confidence limits shall be calculated using one of the following methods in order of preference: Probit, Trimmed Spearman Karber, Moving Average Angle, or the graphical method. All printouts (along with the name of the program, the date, and the author(s)) and graphical displays must be submitted. When data is analyzed by hand, worksheets should be submitted. The report shall also include the No Observed Acute Effect Level (NOAEL) which is defined as the highest concentration of the effluent (in % effluent) in which 90% or more of the test animals survive.
- The Probit, Trimmed Spearman Karber, and Moving Average Angle methods of analyses can only be used when mortality of some of the test organisms are observed in at least two (2) of the (percent effluent) concentrations tested (i.e., partial mortality). If a test results in a 100% survival and 100% mortality in adjacent treatments ("all or nothing" effect), an LC₅₀ may be estimated using the graphical method.

Chronic

- The endpoints of toxicity tests using the sea urchin are based on the reduction in percent of eggs fertilized. Chronic test data shall undergo hypothesis testing to determine if the distribution of results is normal using the Shapiro-Wilks test. The variance must also be tested for homogeneity using Bartlett's Test. Then the endpoint estimates, NOEC and LOEC must be determined using Dunnett's Procedure, Bonferroni's T-Test, Steel's Many-One Rank Test, or Wilcoxon Rank Sum Test. The choice of test depends on the number of replicates and whether the variance is homogeneous or not. See EPA/600/4-87/028 for details. (All printouts and graphics displays must be submitted along with the name of the program, the date, and the author(s). When data is analyzed by hand, the worksheets should be submitted).
- C-NOEC Chronic No Observed Effect Concentration
- LOEC Lowest Observed Effect Concentration
- MATC Maximum Allowable Toxicant Concentration

11. Special Condition

Due to the fact that the suggested dilution water for this facility to use in conducting the bioassays is from the end of the dock at the URI's Narragansett Bay Campus, a Letter of Agreement must be signed and submitted to the Graduate School of Oceanography. Requests to use another source of dilution water will have to be approved by the Department of Environmental Management.

12. Reporting of Bioassay Testing

Bioassay Testing shall be reported as follows:

<u>Quarter Testing to be Performed</u>	<u>Results Submitted on DMR for</u>
January 1 - March 31	March
April 1 - June 30	June
July 1 - September 30	September
October 1 - December 31	December

Reports shall be maintained by the permittee and shall be made available upon request by RIDEM.

C. INDUSTRIAL PRETREATMENT PROGRAM

1. Definitions

For the purpose of this permit, the following definitions apply.

- a. 40 CFR 403 and sections thereof refer to the General Pretreatment regulations, 40 CFR Part 403 as revised.
- b. Categorical Pretreatment Standards mean any regulation containing pollutant discharge limits promulgated by the USEPA in accordance with section 307(b) and (c) of the Clean Water Act (33 USC 1251), as amended, which apply to a specific category of industrial users and which appears in 40 CFR Chapter 1, subchapter N.
- c. Pretreatment Standards include all specific prohibitions and prohibitive discharge limits established pursuant to 40 CFR 403.5, including but not limited to, local limits, and the Categorical Pretreatment Standards.
- d. Regulated Pollutants shall include those pollutants contained in applicable categorical standards and any other pollutants listed in the Pretreatment Standards which have reasonable potential to be present in an industrial user's effluent.

2. Implementation

The authority and procedures of the Industrial Pretreatment Program shall at all times be fully and effectively exercised and implemented, in compliance with the requirements of this permit and in accordance with the legal authorities, policies, procedures and financial provisions described in the permittee's approved Pretreatment Program and Sewer Use Rules and Regulations, the Rhode Island Pretreatment Regulations and the General Pretreatment Regulations 40 CFR 403. The permittee shall maintain adequate resource levels to accomplish the objectives of the Pretreatment Program.

3. Local Limits

Pollutants introduced into POTWs by a non-domestic source (user) shall not: pass through the POTW, interfere with the operation or performance of the works, contaminate sludge as to adversely affect disposal options, or adversely affect worker safety and health.

- a. Within thirty (30) days of the effective date of this permit, the permittee shall submit to the DEM, in the form of a non-substantial program modification request, a local limits monitoring plan and procedures to ensure that an adequate database is available for periodic evaluation and, if necessary, re-development of local limits. At a minimum, the monitoring plan and procedures must ensure that adequate, site-specific data is available to calculate, for all pollutants of concern, POTW removal efficiencies, concentrations of pollutants entering advanced

treatment, the volume of sludge produced and the pollutant concentrations contained therein, and the pollutant loadings contributed to the POTW from domestic sources. In addition, the monitoring plan must provide for at least annual analysis of the POTW's influent for all priority pollutants in order to identify additional or new pollutants of concern. The monitoring plan should incorporate and utilize to the extent possible the monitoring required by Part I.A of this permit. The permittee is referred to Section 4.3.2 of EPA's July, 2004 Local Limits Guidance Manual for assistance in development the monitoring plan and procedures. Upon review, the DEM will provide written notification either granting approval of the monitoring plan and procedures or stating the deficiencies revealed therein. Should the DEM determine that a deficiency exists in the submittal, the permittee shall submit to the DEM, within thirty (30) days of the receipt of said notice, a revised monitoring plan and procedures consistent with the DEM's notice of deficiency. No longer than thirty (30) days following DEM's final approval, the permittee shall commence implementation of the monitoring plan and procedures.

- b. Within ninety (90) days of the effective date of the permit, the permittee shall submit to the DEM a workplan for the evaluation of the local discharge limitations for non-domestic users. The workplan must provide a description of the analysis to be performed, a brief summary of existing data which will be used in the evaluation, and a description of additional sampling and analysis to be performed during the evaluation. The DEM will review the workplan and provide written comment. Should the DEM determine that a deficiency exists in the proposed workplan, the permittee shall submit a revised workplan within thirty (30) days of the receipt of said notice.
- c. Within six (6) months of DEM acceptance of the workplan described in Part I.C.3.a above, the permittee shall submit to the DEM a technical local limits evaluation in accordance with procedures set forth in the July, 2004 EPA Local Limits Guidance Manual and the approved workplan specified above in Part I.C.3.b of this permit. All supporting data must be submitted with the evaluation. Within sixty (60) days of the receipt of preliminary approval of the proposed local limits (unless a longer timeframe is specified therein), the permittee shall submit to the DEM a request for a pretreatment program modification in accordance with 40 CFR 403.18 and Part I.C.5.e of this permit. Upon final approval by the DEM and adoption by the permittee, these standards shall be deemed Pretreatment Standards for the purposes of Section 307(d) of the Clean Water Act.
- d. Within thirty (30) days of final approval, the permittee shall adopt the revised local limits and reissue or modify all applicable industrial user permits to contain the modified local limits.
- e. At the time of renewal of this permit and in accordance with 40 CFR 122.21(j)(4) as revised July 24, 1990, the permittee shall submit to the DEM with its permit renewal application a written technical evaluation of the need to revise local limits. The evaluation shall be based, at a minimum, on information obtained during the implementation of the permittee's local limits monitoring plan and current RIPDES permit discharge limits, sludge disposal criteria, secondary treatment inhibition, and worker health and safety criteria.

4. Enforcement Response Plan (ERP)

On September 29, 2003 DEM issued a determination that the permittee's May 9, 2003 ERP meets the requirements of 40 CFR 403.8(f)(5). The permittee shall continue to implement its approved ERP and any subsequent amendments approved by DEM, at all times.

5. General

- a. The permittee shall carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with Pretreatment Standards. At a minimum, all significant industrial users shall be inspected and monitored for all regulated pollutants (as determined by the permittee's approved Industrial Pretreatment Program on a case-by-case basis) at the frequency established in the approved Industrial Pretreatment Program but in no case less than once per year (one (1) year being determined as the reporting year established in Part I.C.7 of this permit). In addition, these inspections, monitoring and surveillance activities must be conducted in accordance with EPA's Industrial User Inspection and Sampling Manual for POTW's, April 1994. All inspections, monitoring, and surveillance activities shall be performed, and have records maintained, with sufficient care to produce evidence admissible in enforcement proceedings or judicial actions. The permittee shall evaluate, at least every two years unless specific 40 CFR 403 Streamlining provisions have been adopted to the contrary, whether each SIU requires a slug control plan. If a slug control plan is required, it must include, at a minimum, those elements contained in 40 CFR 403.8(f)(2)(vi).
- b. The permittee shall reissue all necessary Industrial User (IU) control mechanisms within thirty (30) days of their expiration date. The permittee shall issue, within sixty (60) days after the determination that an IU is a Significant Industrial User (SIU), all SIU control mechanisms. All SIU control mechanisms must contain, at a minimum, those conditions stated in 40 CFR 403.8(f)(1)(iii)(B). All control mechanisms must be mailed via Certified Mail, Return Receipt Requested. A complete bound copy of the control mechanism with the appropriate receipt must be kept as part of the Industrial User's permanent file. In addition, the permittee must develop a Permit Fact Sheet describing the basis for the SIU's permit and retain this fact sheet as part of the SIU's permanent file.
- c. The permittee must identify each instance of noncompliance with any pretreatment standard and/or requirement and take a formal documented action for each instance of noncompliance. Copies of all such documentation must be maintained in the Industrial User's permanent file.
- d. The permittee shall prohibit Industrial Users from the dilution of a discharge as a substitute for adequate treatment in accordance with 40 CFR 403.6(d).
- e. The permittee shall comply with the procedures of 40 CFR 403.18 for instituting any modifications of the permittee's approved Pretreatment Program. Significant changes in the operation of a POTW's Approved Pretreatment Program must be submitted and approved following the procedures outlined in 40 CFR 403.18(b) and 403.9(b). However, the endorsement of local officials responsible for supervising and/or funding the pretreatment program required by 403.9(b)(2) will not be required until DEM completes a preliminary review of the submission. The DEM will evaluate and review the permittee's initial proposal for a modification and provide written notification either granting preliminary approval of the proposed modifications or stating the deficiencies contained therein. DEM's written notification will also include a determination whether the submission constitutes a substantial or non-substantial program modification as defined by 40 CFR 403.18. Should DEM determine that a deficiency exists in the proposed modification, the permittee shall submit to DEM, within thirty (30) days of the receipt of said notice, a revised submission consistent with DEM's notice of deficiency.

Pretreatment program modifications which the permittee considers non-substantial, shall be deemed to be approved within forty-five (45) days after submission of the request for modification, unless DEM determines that the

modification is in fact a substantial modification or notifies the permittee of deficiencies. Upon receipt of notification that DEM has determined the modification is substantial, the permittee shall initiate the procedures and comply with the deadlines for substantial modifications, which are outlined below.

For substantial modifications, the permittee shall, within sixty (60) days (unless a longer time frame is granted) of the receipt of DEM's preliminary approval of the proposed modification, submit documentation (as required by 40 CFR 403.9(b)(2)) that any local public notification/participation procedures required by law have been completed, including any responses to public comments, and a statement that the local officials will endorse and/or approve the modification upon final approval by DEM.

Within thirty (30) days of DEM's final approval of the proposed modification, the permittee shall implement the modification and submit proof that the local officials have endorsed and/or approved the modification to the DEM. Upon final approval by the DEM and adoption by the permittee, this modification shall become part of the approved pretreatment program and shall be incorporated into this permit in accordance with 40CFR 122.63(g).

- f. All sampling and analysis required of the permittee, or by the permittee of any Industrial User, must be performed in accordance with the techniques described in 40 CFR 136.
- g. For those Industrial Users with discharges that are not subject to Categorical Pretreatment Standards, the permittee shall require appropriate reporting in accordance with 40 CFR 403.12(h).
- h. The permittee shall, in accordance with 40 CFR 403.12(f), require all Industrial Users to immediately notify the permittee of all discharges by the Industrial User that could cause problems to the POTW, including slug loadings, as defined by 40 CFR 403.5(b).
- i. The permittee shall require all Industrial Users to notify the permittee of substantial changes in discharge as specified in 40 CFR 403.12(j) and the permittee shall also notify DEM of each such substantial change in discharge prior to acceptance.
- j. The permittee shall require New Sources to install and have in operation all pollution control equipment required to meet applicable Pretreatment Standards before beginning to discharge. In addition, the permittee shall require New Sources to meet all applicable Pretreatment Standards within the shortest feasible time which shall not exceed ninety (90) days in accordance with 40 CFR 403.6(b).
- k. The permittee shall require all Industrial Users who are required to sample their effluent and report the results of analysis to the POTW to comply with signatory requirements contained in 40 CFR 403.12(l) when submitting such reports.
- l. The permittee shall determine, based on the criteria set forth in 40 CFR 403.8(f)(2)(vii), using the EPA method of "rolling quarters", the compliance status of each Industrial User. Any Industrial User determined to meet Significant Non-Compliance (SNC) criteria shall be included in an annual public notification as specified in 40 CFR 403.8(f)(2)(viii).
- m. The permittee shall require Industrial Users to comply with the notification and certification requirements of 40 CFR 403.12(p)(1), (3) and (4) pertaining to the discharge of substances to the POTW, which if disposed of otherwise, would be a hazardous waste under 40 CFR Part 261.

- n. The permittee shall continue to designate, as SIUs, those Industrial Users (IUs) which meet the definition contained in the permittee's Sewer Use Rules & Regulations. The permittee shall notify each newly designated SIU of its classification as an SIU within thirty (30) days of identification and shall inform the SIU of the requirements of an SIU contained in 40 CFR 403.12.

6. Categorical Industrial Users (CIUs)

- a. The permittee shall require Industrial Users to comply with applicable Categorical Pretreatment Standards in addition to all applicable Pretreatment Standards and Requirements. The permittee shall require of all Categorical Industrial Users (CIUs), all reports on compliance with applicable Categorical Pretreatment Standards and Categorical Pretreatment Standard deadlines as specified in and in accordance with Sections (b), (d), (e) and (g) of 40 CFR 403.12. In addition, the permittee shall require Categorical Industrial Users to comply with the report signatory requirements contained in 40 CFR 403.12(l) when submitting such reports.
- b. If the permittee applies the Combined Wastestream Formula (CWF) to develop fixed alternative discharge limits of Categorical Pretreatment Standards, the application of the CWF and the enforcement of the resulting limits must comply with 40 CFR 403.6(e). The permittee must document all calculations within the control mechanism fact sheet and the resulting limits within the CIU's control mechanism. The permittee must ensure that the most stringent limit is applied to the CIU's effluent at end-of-pipe based upon a comparison of the resulting CWF limits and the permittee's local limits.
- c. If the permittee has or obtains the authority to apply and enforce equivalent mass-per-day and/or concentration limitations of production-based Categorical Pretreatment Standards, then the permittee shall calculate and enforce the limits in accordance with 40 CFR 403.6(c). The permittee must document all calculations within the control mechanism fact sheet and the resulting limits within the CIU's control mechanism.

7. Annual Report

The annual report for the permittee's program shall contain information pertaining to the reporting year which shall extend from January 1st through December 31st and shall be submitted to the DEM by March 15th. Each item below must be addressed separately and any items which are not applicable must be so indicated. If any item is deemed not applicable a brief explanation must be provided. The annual report shall include the following information pertaining to the reporting year:

- a. A listing of Industrial Users which complies with requirements stated in 40 CFR 403.12(i)(1). The list shall identify all Categorical Industrial Users, Significant Industrial Users and any other categories of users established by the permittee;
- b. A summary list of any notifications received by the permittee of any substantial change in the volume or character of pollutants being introduced into the POTW by new or existing IUs. If applicable, an evaluation of the quality and quantity of influent introduced into the POTW and any anticipated impact due to the changed discharge on the quantity or quality of effluent to be discharged from the POTW shall be included;
- c. A summary list of Industrial User compliance status. The summary shall identify the IUs determined to be in non-compliance, and if applicable, the type of enforcement actions taken and penalty amounts levied;

- d. A list of industries which were determined, in accordance with Part I.C.5.I of this permit, to be in significant non-compliance required to be published in a local newspaper and proof of publication, from the newspaper, averring that the names of these violators has been published;
- e. A summary list of inspection and monitoring activity performed by the permittee, including;
 - significant industrial users inspected by the POTW (include inspection dates for each industrial user);
 - significant industrial user sampled by the POTW (include sampling dates for each industrial user); NBC shall maintain records onsite that detail the date of each sampling analysis.
- f. A summary list of permit issuance/reissuance activities including the name of the industrial user, expiration date of previous permit, and issuance date of new permit;
- g. A summary list for each report/notification type required by 40 CFR 403.12 that was not received as required during the reporting year. All other records of notifications received in accordance with 40 CFR 403.12 shall be maintained in each Industrial User's file.
- h. A summary of public participation efforts including meetings and workshops held with the public and/or industry and notices/newsletters/bulletins published and/or distributed;
- i. A program evaluation in terms of program effectiveness, local limits application and resources which addresses but is not limited to:
 - A description of actions being taken to reduce the incidence of SNC by Industrial Users;
 - effectiveness of enforcement response program;
 - sufficiency of funding and staffing;
 - sufficiency of the Sewer Use Rules and Regulations and/or statutory authority;
- j. An evaluation of recent/proposed program modifications, both substantial and non-substantial, in terms of the modification type, implementation and actual/expected effect (note proposed modifications must be submitted under separate cover along with the information required by 40 CFR 403.18);
- k. A detailed description of all interference and pass-through that occurred during the past year and, if applicable;
 - A thorough description of all investigations into interference and pass-through during the past year;
 - A description of the monitoring, sewer inspections and evaluations which were done during the past year to detect interference and pass-through, specifying pollutants analyzed and frequencies;
- l. A summary of the average, maximum concentration, minimum concentration, and number of data points used for pollutant analytical results for influent, effluent, sludge and any toxicity or bioassay data from the wastewater treatment facility. The summary shall include a comparison of influent sampling results

versus the maximum allowable headworks loadings contained in the approved local limits evaluation and effluent sampling results versus water quality standards. Such a comparison shall be based on the analytical results required in Parts I.A and I.C. of this permit and any additional sampling data available to the permittee; and

m. A completed Annual Pretreatment Program Report Summary Sheet.

8. Sewer Use Rules and Regulations

The permittee has approved Sewer Use Rules and Regulations which shall continue to be implemented at all times.

D. COMBINED SEWER OVERFLOWS (CSOs)

1. EFFLUENT LIMITATIONS

a. During wet weather, the permittee is authorized to discharge from combined sewer outfalls (CSOs) listed in Part I.D.5, subject to the following:

i. The discharges shall comply with the EPA CSO Policy, including those requirements not specifically listed in this permit.

ii. The discharges shall receive treatment at a level providing Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT) to control and abate conventional pollutants and Best Available Technology Economically Achievable (BAT) to control and abate non-conventional and toxic pollutants. The DEM and EPA have made a Best Professional Judgment (BPJ) determination that BPT, BCT, and BAT for combined sewer overflow (CSO) control include the implementation of Nine Minimum Controls (NMC) specified below and detailed further in Part I.D.2. "Nine Minimum Controls, Minimum Implementation Levels" of this permit:

1. The permittee shall implement Standard Operating Procedures and proper operation and maintenance programs for the sewer system and all CSO outfalls to reduce the magnitude, frequency, and duration of CSOs. The program shall consider regular sewer inspections; sewer, catch basin, and regulator cleaning; equipment and sewer collection system repair or replacement, where necessary; disconnection of illegal connections, and the items in Parts I.E and I.D.2.f. of this permit.

2. The permittee shall implement Standard Operating Procedures that will maximize use of the collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency, and duration of CSOs.

3. The permittee shall evaluate the CSO impacts from non-domestic users and take appropriate steps to minimize such impacts.

4. The permittee shall implement Standard Operating Procedures to operate the POTW treatment plant at maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency, and duration of CSOs. The permittee shall deliver all flows to the treatment plant within the constraints of the treatment capacity of the POTW.

5. Dry weather overflows from CSO outfalls are prohibited. The permittee shall implement Standard Operating Procedures and proper operation and maintenance programs to detect and eliminate dry weather overflows, including but not limited to routine bacteria monitoring at key in-stream locations, flow monitoring at all CSOs, and implementation of an effective Capacity, Management, Operation, and Maintenance (CMOM) Program. Each dry weather overflow must be reported to DEM as soon as the permittee becomes aware of the overflow. When the permittee detects a dry weather overflow, the permittee shall begin corrective action immediately. All dry weather sanitary and/or industrial discharges from CSOs must be reported to DEM within twenty-four (24) hours in accordance with the reporting requirements for plant bypass (Paragraph M of Part II of this permit). The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated.
 6. The permittee shall implement measures to control solid and floatable materials in CSOs. These measures shall include, but not be limited to, a requirement for facilities permitted by the NBC's Industrial Pretreatment Program to establish Best Management Practices (BMPs) to control the discharge of litter from their site to the combined sewer system and having the NBC verify the effectiveness of the BMPs during annual pretreatment inspections required under Part I.C of this permit. Any deficiencies with the BMPs shall be brought to the attention of the pretreatment permit holder.
 7. The permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.
 8. The permittee shall implement a public notification process to inform citizens of when and where CSOs occur. The process must include: (a) a mechanism to alert persons of the occurrence of CSOs and; (b) a system to determine the nature and duration of conditions that are potentially harmful for users of receiving waters due to CSOs. NBC's existing notification systems employed to notify the public of CSO events (signage at CSO outfalls, flags, and notification to DEM of dry weather overflows) with the additional notification requirements from Part I.D.4 may be used to satisfy DEM's public notice reporting requirements.
 9. The permittee shall monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls.
- b. Within ninety (90) days of the effective date of this permit, the permittee shall submit an updated Nine Minimum Controls Plan to DEM for review and approval. The update shall include the status of the implementation of each of the minimum controls shown in Parts I.D.1.a.ii.1. – 9. of the permit and evaluate alternatives to enhance their effectiveness and reflect consideration of the schedule for implementation of Phase III of NBC's CSO controls.
- i. Once approved by DEM, the Permittee shall implement the approved Nine Minimum Controls Plan.
 - ii. If the Nine Minimum Controls Plan is reviewed by the DEM the permittee may be notified at any time that the Plan does not meet one or more of

the minimum requirements of Parts I.D.1.a.ii.1-9 of this permit. After such notification from the DEM, the permittee shall make changes to the Plan and shall submit 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.

2. Nine Minimum Controls, Minimum Implementation Levels

- a. The Permittee must implement the nine minimum controls in accordance with the documentation approved by DEM or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the following controls plus other controls the Permittee can reasonably implement as set forth in the documentation.
- b. The direct discharge of holding tank wastes and septage to a CSO is prohibited. Discharges of holding tank wastes and septage into the sewer system must be at locations which minimize the likelihood of concentrated wastes being discharged from CSOs.
- c. Dry weather overflows (DWOs) are prohibited. All dry weather sanitary and/or industrial discharges from CSOs must be reported to DEM within twenty-four (24) hours in accordance with the reporting requirements for plant bypass (Paragraph M of Part II of this permit).
- d. The Permittee shall provide public awareness of all occurrences of a bypass of the treatment facility. The public awareness shall be provided by raising a red flag, with a minimum size of three feet by five feet (3' X 5'), at the outfall. The flag shall be raised at the onset of a facility bypass of any volume or after a failure in chlorination during which time at least 500,000 gallons are discharged. The flag shall be kept raised for five (5) continuous days after each bypass or failure in chlorination. Within thirty (30) days of the effective date of this permit, the permittee shall provide public notice in the Legal Section of the Providence Journal explaining the flag raising procedure. The wording for the Providence Journal notice shall be in accordance with the wording approved in the DEM's April 21, 1992 letter.
- e. NBC shall maintain CSO identification signs at each CSO in the Bucklin Point Service Area. The signs must comply with the minimum requirement as approved by DEM.
- f. Operation and maintenance of the sewer system:
 - i. All catch basins owned by the permittee shall be cleaned a minimum of twice per year.
 - ii. All collection system pump stations in the permittee's service area shall be inspected at least weekly and all pump station generators shall be inspected a minimum of twice per year.
 - iii. All regulators shall be inspected at least twice a month.
 - iv. All tidegates shall be inspected and maintained on a monthly basis.
 - v. All sumps in the Bucklin Point Service Area associated with CSO regulators shall be cleaned quarterly.

- vi. A report on combined sewer overflow/regulator maintenance and repair during the previous six (6) months shall be submitted to the DEM, Office of Water Resources, by the 15th of January and July of each year. The report shall include which structures were checked and when, the condition of each one, which were reported and when, which ones must yet be repaired, the reasons any repair was delayed, and the anticipated repair schedule.
3. Within 180 days of the effective date of this permit, the permittee shall submit a proposed program to expand their existing program to encourage or require the implementation of practices to reduce the volume of stormwater discharged to the combined sewer systems to the DEM for review and approval. The submittal shall include but not be limited to consideration of sewer rate credits/modifications, grants, the use of supplemental environmental projects by users found in violation of NBC requirements, distribution of rain barrels, and providing technical assistance to customers and contributing municipalities for the implementation of green infrastructure practices at existing properties. The submittal shall also include a proposed schedule for the implementation of the program. Upon review, the DEM will provide written notification either granting approval of the program or stating the deficiencies revealed therein. Should the DEM determine that a deficiency exists, the permittee shall submit a revised program that addresses the DEM's deficiencies to the DEM within thirty (30) days of the receipt of said notice, unless a longer timeframe is specified by DEM. Upon DEM approval, the permittee shall commence implementation of the program in accordance with the approved schedule.
4. The permittee shall implement a web-based public notification process to inform the public of when and where CSOs occur. The notification system must include a map-based system that alerts persons of the occurrence of CSOs and the duration of CSOs.

5. Combined Sewer Overflows or Emergency Bypasses

<u>Discharge Serial No.</u>	<u>Location</u>	<u>Maximum Daily Flow That Could Be Discharged</u>	<u>Discharge Type</u>	<u>Receiving Water</u>
002A	North Diversion Structure (Bucklin Point)	Flows exceeding 116 MGD	Combined Sewer Overflow/Emergency Bypass	Seekonk River
003A	Bucklin Point WWTF (Treated Wet Weather Outfall)	70 MGD	Combined Sewer Overflow	Seekonk River
101A	River Street at Samoset Street Central Falls, RI	23.30 MGD	Combined Sewer Overflow	Blackstone River
103A	Aigan Street at High Street Central Falls, RI	90.33 MGD	Combined Sewer Overflow	Blackstone River
104A	Charles Street at Sacred Heart Avenue Central Falls, RI	133.2 MGD	Combined Sewer Overflow	Blackstone River
105A	Cross Street at Roosevelt Avenue Central Falls, RI	62.86 MGD	Combined Sewer Overflow	Blackstone River
106A	Higginson Ave (2 pipes) Central Falls, RI	73.76 MGD (total)	Combined Sewer Overflow	Blackstone River
107A	Dexter Street (107A) Hunt Street (107B) (combine into CSO in Richmond Street - 107 Central Falls, RI)	50.90 MGD(total)	Combined Sewer Overflow	Blackstone River
201A	East Street west of Branch Street Pawtucket, RI	161.5 MGD	Combined Sewer Overflow	Blackstone River
202A	Beneath Roosevelt Ave. Bridge west of Japonica Street Pawtucket, RI	161.5 MGD	Combined Sewer Overflow	Blackstone River
203A	Carnation Street west of Front Street, Pawtucket, RI	unknown	Combined Sewer Overflow	Blackstone River
204A	North Side of Central Avenue northwest of its intersection with Front Street, Pawtucket, RI	17.1 MGD	Combined Sewer Overflow ('36" pipe)	Blackstone River
205A	Central Avenue west of its intersection with Front Street Pawtucket, RI	239.0 MGD	Combined Sewer Overflow (54" pipe)	Blackstone River
206A	Blackstone Avenue east of Roosevelt Avenue, Pawtucket, RI	unknown	Combined Sewer Overflow	Blackstone River
207A	Blackstone Avenue west of Front Street, Pawtucket, RI	unknown	Combined Sewer Overflow	Blackstone River

5. Combined Sewer Overflows or Emergency Bypasses (continued)

208A	Exchange Street east of Roosevelt Avenue, Pawtucket, RI	unknown	Combined Sewer Overflow	Blackstone River
209A	Exchange Street west of Fountain Street, Pawtucket, RI	12.3 MGD	Combined Sewer Overflow	Blackstone River
210A	Main Street between East Avenue and the west abutment of the Main Street Bridge, Pawtucket, RI	80.8 MGD	Combined Sewer Overflow (48" pipe serves as a relief pipe for Outfall 211A)	Blackstone River
211A	Main Street between East Avenue and west abutment of the Main Street Bridge, Pawtucket, RI	62.0 MGD	Combined Sewer Overflow	Blackstone River
212A	Main Street between diversion structure on Broadway and east abutment on the Main Street Bridge, Pawtucket, RI	unknown	Combined Sewer Overflow	Blackstone River
213A	Easement area extending east of the intersection of East Avenue and Pleasant Street, Pawtucket, RI	203.5 MGD	Combined Sewer Overflow (48" pipe)	Seekonk River
214A	Roosevelt Avenue Extension east of Pleasant Street, Pawtucket, RI	unknown	Combined Sewer Overflow	Seekonk River
215A	Division Street between east bridge abutment & diversion structure (#18) Pawtucket, RI	71.1 MGD	Combined Sewer Overflow	Seekonk River
216A	Between intersection of School Street and Woodlawn Avenue, Pawtucket, RI	45.9 MGD	Combined Sewer Overflow	Seekonk River
217A	Overflow from diversion structures at Taft (#10) & Merry (#11) Streets through an easement to the west bank of the river, Pawtucket, RI	38.8 MGD	Combined Sewer Overflow	Seekonk River
218A	Bucklin Brook overflow Pawtucket, RI	258.4 MGD	Combined Sewer Overflow	Seekonk River
220A	Moshassuck Street Pawtucket, RI	145.4 MGD	Combined Sewer Overflow	Moshassuck River

E. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions:

1. Maintenance Staff

The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit.

2. Infiltration/Inflow

The permittee shall minimize infiltration/inflow to the sewer system. A summary report of all actions taken to minimize infiltration/inflow during the previous year shall be submitted to DEM, Office of Water Resources, by the 15th day of January of each year.

3. Combined Sewer Overflows and Bypasses

The permittee shall operate and improve the sewer system to minimize the discharge of pollutants from combined sewer overflows and bypasses.

F. SLUDGE

The permittee shall conform and adhere to all conditions, practices and regulations as contained in the State of Rhode Island Rules and Regulations for the Treatment, Disposal, Utilization and Transportation of Sewage Sludge. The permittee shall comply with its DEM Order of Approval for the disposal of sludge.

G. 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 (the EPA method is noted for reference, other EPA approved methods found in 40 CFR Part 136 may be utilized). All sludge testing required by this permit shall be in conformance with the method detection limits found in 40 CFR 503.8. 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 submitted along with the monitoring reports.

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 submitted along with the monitoring report. 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.

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	0.001
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
Aluminum, Total	5.0
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0

*Polynuclear Aromatic Hydrocarbons

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

*** Not a priority pollutant as designated in the 1997 Water Quality Regulations (Table 5)

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).

H. MONITORING AND REPORTING

1. Monitoring

All monitoring required by this permit shall be done in accordance with sampling and analytical testing procedures specified in Federal Regulations (40 CFR Part 136).

2. Reporting

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

a. 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.

b. 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
- Wet Weather Event Summary Reports
- Monthly Operating Reports

All other reports (i.e. I/I reports, Bioassays, P/T reports, etc.) should be submitted to DEM hard copy via regular US mail (see Part I.F.4 below).

c. Submittal of Requests and Reports to DEM

The following requests, reports, and information described in this permit shall be submitted to the DEM.

- i. Transfer of Permit notice
- ii. Request for changes in sampling location
- iii. Request for reduction in testing frequency
- iv. Request for reduction in WET testing requirement
- v. Report on unacceptable dilution water / request for alternative dilution water for WET testing

These reports, information, and requests shall be submitted to DEM by hard copy mail to the following address:

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

d. 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.

- i. Written notifications required under Part II
- ii. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
- iii. Priority Pollutant Scan results
- iv. Toxicity Monitoring Reports
- v. Infiltration/Inflow Reports

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

e. 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(l)(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.

3. Fixed Site Monitoring and Reporting

The permittee shall continue as a partner in the Narragansett Bay Fixed Site Monitoring Network (NBFSMN) by continuing to seasonally operate and maintain instruments capable of collecting near surface and near bottom measurements of temperature, salinity, chlorophyll and dissolved oxygen on a continuous basis (usually every fifteen minutes, except when down for maintenance/repair) at Bullocks Point Reach and Seekonk River/Phillipsdale and by collecting and reporting data in accordance with the NBFSMN Seasonal Monitoring Quality Assurance Project Plan 2014, as amended.

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

FACT SHEET

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

RIPDES PERMIT NO. **RI0100072**

NAME AND ADDRESS OF APPLICANT:

The Narragansett Bay Commission
One Service Road
Providence, Rhode Island 02905

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Bucklin Point Wastewater Treatment Facility
102 Campbell Avenue
East Providence, Rhode Island
And
associated Combined Sewer Overflows (CSOs)

RECEIVING WATERS: **Seekonk River (Water Body ID# RI0007019E-01) (Bucklin Point WWTF), Moshassuck River (Water Body ID# RI0003008R-01C) (CSO Outfalls), and Blackstone River (Water body ID# RI0001003R-01B) (CSO Outfalls)**

CLASSIFICATION: **SB1{a} (Seekonk River);B{a} (Moshassuck River);B1{a} (Blackstone River)**

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 waters. The facility is engaged in the treatment of domestic and industrial sewage. The discharge is from the Bucklin Point Wastewater Treatment Facility and the Combined Sewer Overflows associated with the wastewater treatment facility's collection system. A site layout of the facility and a process flow diagram are in shown in Figures 1a and 1b.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters based on DMR data from July 2009 through June 2014 is shown on Attachment A-2.

III. Permit Limitations and Conditions

The final effluent limitations and monitoring requirements may be found in the draft permit. The NBC is currently subject to Consent Agreement RIA-330, which establishes a compliance schedule for the facility to complete construction of its CSO Long Term Control Plan (LTCP) and to comply with its final permit limits for Flow, BOD₅, TSS, Ammonia (May-October), Total Copper, Total Mercury, Total Nickel, Total Silver, Total Zinc, and Cyanide.

The DEM anticipates continuing this consent agreement in order to maintain the compliance schedule for the NBC to comply with its CSO requirements. In addition, the DEM anticipates including a schedule for the NBC to implement the web-based CSO public notification process from Part I.D.4 of the permit. In terms of toxic pollutants, DEM anticipates continuing interim limits for Total Copper, but not for Cyanide, Total Mercury, Total Nickel, Total Silver, or Total Zinc. The NBC was also previously subject to Consent Agreement RIA-372 which established a Total Nitrogen compliance schedule. However, the NBC has completed construction of the upgrades necessary to meet and has been complying with its final Total Nitrogen limits. Therefore, a Consent Agreement for the Total Nitrogen limits will not be required.

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

Facility Description

The Narragansett Bay Commission owns and operates the Bucklin Point Wastewater Treatment Facility (WWTF) located on Campbell Avenue in East Providence, Rhode Island and several associated Combined Sewer Overflows (CSOs). Although the Narragansett Bay Commission is responsible for the flows that discharge from the CSOs, the actual CSOs in the Bucklin Point service area are owned by the municipalities in which the CSOs are located. The Bucklin Point facility services the communities of Central Falls, Cumberland, Pawtucket, and portions of Lincoln, East Providence, and Smithfield. As of March 2016, the date of the facility's most recent annual pretreatment report, there were thirty-four (34) Significant Industrial Users contributing wastewater to the Bucklin Point WWTF. The discharge from the WWTF to the Seekonk River consists of treated sanitary sewage and treated commercial and industrial wastewater. Treatment consists of Screening, Grit Removal, Primary Settling, Advanced Activated Sludge Treatment, Secondary Settling, and UV Disinfection.

From the effective date of this permit, the permittee is authorized to discharge from the CSOs associated with the Bucklin Point WWTF, as listed in this permit, provided that the discharge complies with the EPA CSO Policy and that discharges receive treatment at a level providing Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT) to control and abate conventional pollutants, and Best Available Technology Economically Achievable (BAT) to control and abate non-conventional and toxic pollutants.

NBC Bucklin Point's most recent RIPDES permit, authorizing discharges from the above-mentioned facilities, was issued on December 31, 2001. This permit became effective on February 1, 2002 and expired on February 1, 2007. The facility submitted an application for permit reissuance to the DEM on August 2, 2006. On August 7, 2006, the DEM issued an application complete letter to the facility. In accordance with Rule 13(a) of the Regulations for the Rhode Island Pollutant Discharge Elimination System, the facility's December 31, 2001 RIPDES permit remains in effect since the DEM has determined that a timely and complete permit application was submitted. Once this permit is reissued, it will supersede the December 31, 2001 permit.

Receiving Water Description

The water bodies that receive the discharge from the Bucklin Point WWTF and its associated CSOs are the Seekonk, Moshassuck, and Blackstone Rivers.

The water body segment for the Seekonk River is RI0007019E-01 and is located in Pawtucket, Providence, and East Providence. This water body segment is delineated by Slater Mill Dam at Main Street in Pawtucket and India Point in Providence. This segment of the Seekonk River is listed on DEM's 2012 303(d) List of Impaired Water Bodies as being impaired for Fish and Wildlife habitat due to Nitrogen and Dissolved Oxygen, and it is impaired for Primary and Secondary Contact Recreation for Fecal Coliform. The water body segment for the Seekonk

River is classified as an SB1{a} water body according to the Rhode Island Water Quality Regulations. Class SB1{a} waters are designated for primary and secondary contact recreational activities and fish and wildlife habitat. They shall be suitable for aquacultural uses, navigation, and industrial cooling. Class SB1{a} waters shall have good aesthetic value. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. However, all Class SB criteria must be met. These waters will likely be impacted by combined sewer overflows in accordance with approved CSO Facilities Plans and in compliance with rule 19.E.1 of the Rhode Island Water Quality Regulations and the Rhode Island CSO Policy. Therefore, primary contact recreational activities, shellfishing uses, and fish and wildlife habitat will likely be restricted.

The water body segment for the Moshassuck River is RI0003008R-01C, and is located in Central Falls, Pawtucket, and Providence. This water body segment is delineated by the first CSO discharge point at Weeden Street Bridge and the confluence of the Moshassuck River with the Woonasquatucket River. This segment of the Moshassuck River is listed on DEM's 2012 303(d) List of Impaired Water Bodies as being impaired for Fish and Wildlife habitat for Benthic-Macroinvertebrate Bioassessments, and it is also impaired for primary and secondary contact recreation for Enterococcus. The water body segment for the Moshassuck River is classified as a class B{a} water body according to the Rhode Island Water Quality Regulations. Class B waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities. Class B{a} waters shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. Class B waters shall have good aesthetic value. These waters will likely be impacted by combined sewer overflows in accordance with approved CSO Facilities Plans and in compliance with rule 19.E.1 of the Rhode Island Water Quality Regulations and the Rhode Island CSO Policy. Therefore, primary contact recreational activities, shellfishing uses, and fish and wildlife habitat will likely be restricted.

The water body segment for the Blackstone River is RI0001003R-01B, and is located in Central Falls and Pawtucket. This water body segment is delineated by River and Samoset streets in Central Falls and the Slater Mill Dam. This segment of the Blackstone River is listed on DEM's 2012 303(d) List of Impaired Water Bodies as being impaired for Fish and Wildlife Habitat due to Benthic-Macroinvertebrate Bioassessments, Cadmium, Lead, Dissolved Oxygen, and Total Phosphorus. The 2012 303(d) List also lists the water body as being impaired for fish consumption due to Mercury and PCB in fish tissue, and it is also impaired for primary and secondary contact recreation due to enterococcus and fecal coliform. The water body segment for the Blackstone River is classified as a B1{a} water body according to the Rhode Island Water Quality Regulations. Class B1{a} waters 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 SB criteria must be met. These waters will likely be impacted by combined sewer overflows in accordance with approved CSO Facilities Plans and in compliance with rule 19.E.1 of the Rhode Island Water Quality Regulations and the Rhode Island CSO Policy. Therefore, primary contact recreational activities, shellfishing uses, and fish and wildlife habitat will likely be restricted.

Permit Limit Development

The requirements set forth in this permit are from the State's Water Quality Regulations and the State's Regulations for the Rhode Island Pollutant Discharge Elimination System, both filed pursuant to RIGL Chapter 46-12, as amended. DEM's primary authority over the permit comes from EPA's delegation of the program in September 1984 under the Clean Water Act (CWA).

Development of RIPDES permit limitations is a multi-step process consisting of: determining if Federal effluent guidelines apply; calculation of allowable discharge levels based on background data and available dilution; assigning appropriate Best Professional Judgment (BPJ) limits; comparing existing and proposed limits; comparing discharge data to proposed limits; performing an antidegradation/antibacksliding analysis to determine the final permit limits; and developing interim limits as appropriate.

Water quality criteria are comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or State 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.

WWTF Conventional Pollutant Permit Limitations

CBOD₅, TSS, and pH

The November-April "Average Monthly" and "Average Weekly" Carbonaceous Biochemical Oxygen Demand (CBOD₅) and Total Suspended Solids (TSS) concentration-based limitations plus the year-round pH limitations are based upon the secondary treatment requirements of Section 301 (b)(1)(B) of the CWA as defined in 40 CFR 133.102 (a) - (c). The November-April "Maximum Daily" CBOD₅ and TSS concentration-based limits are based on Rhode Island requirements for Publicly Owned Treatment Works (POTW's) under Section 401 (a)(1) of the CWA and in 40 CFR 124.53 and 124.56.

The May-October "Average Monthly", "Average Weekly", and "Daily Maximum" CBOD₅ and TSS limits are set at levels more stringent than those called out in 40 CFR 133.102 (a)-(c) due to increased pollutant removals that will be achieved from the operation of nutrient removal equipment. These limits are more stringent than those from the previous permit. However, based upon a review of the NBC's historic data since the nutrient removal upgrades were placed on-line it has been determined that the NBC can meet these new limits.

The mass-based (i.e. lb/day) CBOD₅ and TSS limits were calculated using the above-mentioned concentration-based limits in mg/L, the WWTF's monthly average design flow in MGD, and the appropriate conversion factor of 8.34 lbs/gallon. All of the mass-based limits were at least as stringent as those from the previous permit. Based upon a review of the NBC's historic data since the nutrient removal upgrades were placed on-line it has been determined that the NBC can meet these new limits.

Oil and Grease

Oil and Grease monitoring has been included to ensure that the WWTF's collection system will not experience blockages due to excessive levels of grease and to ensure that the WWTF will not experience inhibition. Monitoring data will serve as an indicator of excessive levels of Oil and Grease in the collection system that is typically attributed to restaurants and other sources of Oil and Grease loading which discharge to the sewer collection system. NBC and DEM will be able to use this data to track and potentially initiate corrective action if necessary to prevent backups and blockages within the sewer collection system.

Settleable Solids

Settleable Solids monitoring has been included as a process-control parameter that can aid in the assessment of the operation of the plant but need not have an effluent limit.

CBOD₅ and TSS % Removal

The "Percent Removal" requirements for CBOD₅ and TSS are in accordance with 40 CFR 133.102(a) and (b) respectively.

Bacteria

Table 2.8.D(3) of the Rhode Island Water Quality Regulations includes Enterococci criteria for primary contact/swimming of a geometric mean of 35 colonies/100 ml and a single sample maximum of 104 colonies/100 ml. However, the "single sample maximum" value is only used by the Rhode Island Department of Health to evaluate swimming advisories at public beaches and is not applied to the receiving water in the area of the Bucklin Point WWTF outfall. EPA's November 12, 2008 memorandum regarding "Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation" specifies that it is not appropriate to use dilution for bacteria criteria in receiving waters that are designated for primary contact recreation. Therefore, because the receiving water is designated for primary contact recreation, the DEM has assigned a monthly average Enterococci limit of 35 colonies/100 ml for outfall 001A. This limit is consistent with the water quality criteria from Table 2.8.D(3) of the Rhode Island Water Quality Regulations. The daily maximum Enterococci limit has been set at the 90% upper confidence level value for "lightly used full body contact recreation" of 276 colonies/100 ml. The DEM has also assigned Fecal Coliform monitoring to ensure that the discharge from the WWTF will not have an impact on any areas designated for shellfish harvesting outside of the immediate vicinity of the outfall.

WWTF Toxic Pollutant Limits

Water Quality-Based Limit Calculations

The allowable effluent limitations were established on the basis of acute and chronic aquatic life criteria and human health criteria using the following: available in stream dilution; an allocation factor; and background concentrations when available and/or appropriate. The aquatic life and human health criteria are specified in 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. Details concerning the calculation of potential permit limitations, selection of factors, which influence their calculation, and the selection of final permit limitations are included below or in the attached documents. The NBC Bucklin Point's 2001 permit also contained water quality-based limits.

Mixing Zones and Dilution Factors

The dilution factors that define the acute and chronic mixing zones for the Bucklin Point WWTF were submitted to the DEM in a report entitled *Dilution Study of the Blackstone Valley District Commission's Treated Effluent Discharge to the Seekonk River* (Aquatec, Incorporated; September 1991). The effluent dye study is similar to studies that have been conducted by other major RIPDES permittees, which discharge to marine waters.

The WWTF's effluent is discharged through an 8' x 10' pipe. After reviewing the effluent dye study report, it was determined that mixing zones and corresponding dilution factors are appropriate for the Bucklin Point WWTF. The size of the acute and chronic mixing zones was determined using the EPA's criteria from the "Technical Support Document for Water Quality-based Toxics Control" (TSD). Specifically, based on analysis of the Dye Study (September 1991) a chronic dilution factor of 2 with a mixing zone of 300 feet in radius and an acute dilution factor of 1 (no dilution) were deemed appropriate. Details regarding the sizing of the mixing zone and the determination of the appropriate dilution factors can be found in the previous development document dated

September 2001. Provided in Figure #2 is a map detailing the location of the outfall and the acute and chronic mixing zones.

Using the above dilution factors, the allowable discharge limits were calculated as follows:

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

$$Limit_1 = (DF) * (Criteria) * (80\%)$$

Where: DF = acute or chronic dilution factor, as appropriate

Note: The right side of the above-referenced formula is divided by the appropriate metals translator when this formula is used to calculate limits for metals.

- b) Using available background concentration data¹.

$$Limit_1 = (DF) * (Criteria) * 90\% - (Background) * (DF - 1)$$

Where: DF = acute or chronic dilution factor, as appropriate

Note: The right side of the above-referenced formula is divided by the appropriate metals translator when this formula is used to calculate limits for metals.

Since background concentrations were available for Arsenic, Cadmium, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc, 90% of criteria was allocated for these pollutants. All other limits were calculated using 80% allocation, due to a lack of background data.

The formulas and data noted above were applied with the following exceptions

- A) Pollutants that, based on the acute and chronic dilution factors, have a higher allowable chronic limit than allowable acute limit. For this situation, both the "Monthly Average" and "Daily Maximum" limits were set at the allowable acute limit.
- B) Total residual chlorine. The limits for total residual chlorine (TRC) were established in accordance with the DEM Effluent Disinfection Policy. The "Monthly Average" and "Daily Maximum" were based on a 100% allocation, a zero background concentration, and the appropriate dilution factor(s). The 100% allocation factor for TRC was used due to the non-conservative nature of chlorine and the improbability of the receiving water having a detectable background TRC concentration.
- C) Pollutants with water quality based monthly average limits in the previous RIPDES permit. The relaxation of monthly average limits from the previous permit was restricted in accordance with the antibacksliding provisions of the Clean Water Act and the Policy on the Implementation of the Antidegradation Provisions of the Rhode Island Water Quality Regulations.

The potential ammonia limitations were derived from acute and chronic water quality criteria for saltwater from the Rhode Island Water Quality Regulations, which are based upon salinity, pH, and temperature. A salinity equal to 20 ppt., pH equal to 7.4 standard units, and average

¹Source of background data for Arsenic, Cadmium, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc is Table 3-10 from the Army Corps of Engineers' and EPA's "Draft Environmental Impact Statement for the Rhode Island Region Long-Term Dredged Material Disposal Site" 2004 OCLC # 71790716 with corrections made to the average concentrations to account for arithmetic errors as noted in file correspondence between the NBC and RIDEM.

temperatures equal to 20°C and 5°C during Summer and Winter seasons, respectively, were used to calculate the allowable water quality-based discharge levels for ammonia.

Metals Translators

On September 30, 2004, the NBC submitted a Final Metals Compliance Evaluation Report to the DEM as required under consent agreement RIA-330. This Final Metals Compliance Evaluation Report included the results of the NBC's metals translator study. Water quality criteria for metals are applicable to the dissolved form. A translator study is performed to evaluate the degree to which particulate metals will become dissolved (i.e. translate into dissolved) once discharged into the environment. Several factors, can affect this process and DEM reviewed the metals translator study to determine if the data had any seasonal, tidal, and/or spatial (transects) variability.

Based on this analysis, the DEM determined that the most appropriate metals translator data set to use is the data from the October 2001 surveys. This data set was selected since more of the particulate metals became dissolved than it did during the other surveys (i.e. the translators calculated from this survey were consistently higher). Therefore, it was determined that translators from this survey will ensure that the dissolved metals criteria are met during all seasons. Further after evaluation of the translators at various transects and tides, it was determined that there is not significant variability caused by tides and transects. As a result, the DEM determined that the appropriate translators to use are the ones calculated from the October 2001 survey. The following table is a summary of the final metals translator values for the Providence and Seekonk Rivers after including a 5% margin of safety. Note: After incorporating a 5% margin of safety into the Providence River's nickel translator the value was greater than 1.0, therefore, this translator was set equal to 1.0.

Table 1: Final Metals Translators for Each River (ug/L)

River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
Providence	0.935	0.818	0.217	1.000	0.420
Seekonk	0.952	0.670	0.138	0.947	0.489

Although the Bucklin Point facility discharges into the Seekonk River, which subsequently flows into the Providence River, a review of the September 1991 dye study for the Bucklin Point WWTF indicates that the dilution by the time that Bucklin Point's effluent reaches the Providence River is at least 30:1. Therefore, since there will be significantly more dilution at the point where Bucklin Point's effluent eventually enters the Providence River vs. the near-field dilution of (1:1 acute and 2:1 chronic), the DEM has determined that using the translators for the Seekonk and the near-field dilution factors to assign metals limits for the Bucklin Point facility will be protective of both rivers. Table 2 lists the final metals translator values assigned to the Bucklin Point WWTF.

Table 2: Final Metals Translators for the Wastewater Treatment Facility (WWTF)

WWTF	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
Bucklin Point	0.952	0.670	0.138	0.947	0.489

A report on the DEM's review of the NBC's metals translator study can be found in Attachment A-3.

Reference Attachment A-4 for calculations of allowable limits based on the Aquatic Life and Human Health Criteria from the Rhode Island Water Quality Regulations.

Antibacksliding

Antibacksliding restricts the level of relaxation of water quality based limits from the previous permit. Section 303(d)(4) of the Clean Water Act addresses antibacksliding as the following:

Section 303(d)(4)

- A) Standards not attained - For receiving waters that have not attained the applicable water quality standards, limits based on a TMDL or WLA can only be revised if the water quality standards will be met. This may be done by (i) determining that the cumulative effect of all such revised limits would assure the attainment of such water quality standards; or (ii) removing the designated use which is not being attained in accordance with regulations under Section 303.
- B) Standards attained - For receiving waters achieving or exceeding applicable water quality standards, limits can be relaxed if the revision is consistent with the State's Antidegradation Policy.

Therefore, in order to determine whether backsliding is permissible, the first question that must be answered is whether or not the receiving water is attaining the water quality standard. The Office has determined the most appropriate evaluation of existing water quality is by calculating the pollutant levels, which would result after consideration of all currently valid RIPDES permit limits or historic discharge data (whichever is greater), background data (when available), and any new information (i.e.: dilution factors).

Antidegradation

The DEM document entitled "Policy on the Implementation of the Antidegradation Provisions of the Rhode Island Water Quality Regulations" (the Policy) from Appendix C of the Rhode Island Water Quality Regulations establishes four tiers of water quality protection:

In terms of a RIPDES permit, an increased discharge is defined as an increase in any limitation, which would result in an increased mass loading to a receiving water. The baseline for this comparison would be the monthly average mass loading established by the previous permit. It would be inappropriate to use the daily maximum mass loading since the Policy is not applicable to short-term changes in water quality.

For the purposes of ensuring that the revised limit is consistent with the requirements of antidegradation, existing water quality must be defined. As explained earlier, DEM evaluates existing water quality by determining the pollutant levels which would result under the design conditions appropriate for the particular criteria (i.e., background water quality, when available and/or appropriate; non-point source inputs; and existing RIPDES permit limitations or recent historical discharge data, whichever is higher). In general, available data would be used to make this determination.

Using the above-mentioned criteria, the present in stream water quality C_p is defined as:

$$C_p = \frac{(DF - 1) * C_b + (1 * C_d)}{DF}$$

where: C_b = background concentration²

²Source of background data for Arsenic, Cadmium, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc is Table 3-10 from the Army Corps of Engineers' and EPA's "Draft Environmental Impact Statement for the Rhode Island Region Long-Term Dredged Material Disposal Site" 2004 OCLC # 71790716

C_d = discharge data³
DF = dilution factor

If the waterbody is a high quality water for the pollutant in question ($C_p < C_{criteria}$), then the discharge requires an evaluation under Tier 2 protection. If the waterbody is not determined to be high quality for that parameter, then antibacksliding will allow an increased permit limit only if it can be assured that water quality standards would be attained. Therefore, the permit limit would be calculated to comply with Tier 1 protection, using the procedures noted previously (i.e., Limit₁).

Assuming the receiving water has been designated as a high quality waterbody for the parameter under investigation, the next step is to determine whether the new or increased discharge is permissible and if so whether an important benefits demonstration is required. For existing discharges DEM shall follow the general rule of allocating no more than 20% of the remaining assimilative capacity without the need to complete an important benefits demonstration (assuming the receiving water is not an SRPW or ONRW). On a case-by-case basis, the DEM may limit the allocation or determine that any incremental loss or impact to the receiving water is significant enough to require a detailed important benefits demonstration.

Water Quality Based Limits - Considering Antibacksliding and Antidegradation

The receiving stream was determined to be a high quality water for Chromium (VI), Lead, Mercury, Nickel, and Zinc. As a result, DEM used the following four (4) steps to establish permit limitations for these parameters to be consistent with Tier 2 protection of antidegradation.

- 1) Determine the remaining assimilative capacity of the receiving water C_{rac} . The remaining assimilative capacity (or buffer) is equivalent to the difference between the criteria and the calculated present in stream water quality concentrations:

$$C_{rac} = C_{criteria} - C_p$$

where: $C_{criteria}$ = applicable standard for the most sensitive use; and
 C_p = the calculated present water quality concentration.

- 2) Establish the percentage of the remaining assimilative capacity that will be allocated to the permittee.

DEM allocated 20% of the remaining assimilative capacity for Lead, Mercury, Nickel, and Zinc. The decision to allocate 20% of the remaining assimilative capacity included but was not limited to the following factors: was the Operation and Maintenance (O&M) of the facility being consistently rated highly, evolution of the facilities industrial pretreatment program and a review of historic discharge data. DEM allocated 0% of the remaining assimilative capacity for Chromium (VI). The decision to allocate 0% of the remaining assimilative capacity was based on the fact that the historical discharge concentration was well below the previous permit limit. Therefore, there was no apparent reason to allocate any additional assimilative capacity of the receiving water.

- 3) Calculate an increased permit limit that would meet the Antidegradation Implementation Policy.

³Discharge data refers to the maximum of the permit limit or the historic discharge level. The historic discharge level is determined by calculating the upper 95th percent confidence interval for the monthly average reported data for the past five (5) years. For specific cases, changes in treatment efficiency or pretreatment limitations may support the use of an alternative period of time. Calculations of the upper 95th percentile may be found in Attachment A-5.

The next step is to calculate a permit limit based on the available concentration. The available concentration is a percentage of the remaining assimilative capacity of the receiving water, which can be allocated to the permittee, plus the present water quality. This concentration is then used to calculate a permit limit. The limit is calculated by subtracting background data (if available or appropriate) from the criteria and using the appropriate dilution factors and allocation factors in a mass balanced relationship.

The limit is determined by:

$$Limit_2 = (C_p + \% * C_{rac}) * DF - (DF - 1) * C_b$$

- 4) Finally, compare Limit₁ to Limit₂.

The final limit is the minimum of Limit₁ and Limit₂.

Provided in Attachments A-5 and A-6 are calculations determining the historic discharge level and illustrating the antibacksliding/antidegradation process, respectively.

Reasonable Potential

In accordance with 40 CFR 122.4(d)(1)(i), it is only necessary to establish permit limits for those pollutants in the discharge which have the reasonable potential to cause or contribute to the exceedance of in stream criteria. In order to evaluate the need for permit limits, the most stringent calculated acute and chronic limits are compared to the Discharge Monitoring Report (DMR) and the State User Fee Program data. A complete listing of any pollutants detected from State User Fee Program data for the period July 2007 through November 2011 and a summary of the DMR data for the period July 2009 through June 2014 are provided in Attachments A-7 and A-8 respectively. Note: The User Fee Program sampling was discontinued after the 2011 sampling event. Attachment A-9 is a summary comparison of the allowable water quality-based limits vs. the DMR and State User Fee Program data. An assessment was made to determine if limits were necessary for any pollutants that had water quality criteria using the data collected during the previous five years. Based on these comparisons, water quality limitations for outfall 001 have been deemed necessary for Total Copper, Total Nickel, Cyanide, and Total Zinc. In addition, although Total Ammonia effluent concentrations were low, Total Ammonia limits are necessary to ensure that the WWTF continues to nitrify its wastewater effectively to reduce the ammonia concentrations to acceptable levels. Although these pollutants did not have "reasonable potential", monthly monitoring for Total Cadmium, Total Aluminum, Chromium (VI), and Total Lead have been included in the permit since these pollutants are part of the standard list of pollutants monitored as part of the bioassay testing.

UV Limits

As part of an upgrade to the WWTF, the facility replaced chlorination/dechlorination as its selected disinfection system for its dry weather discharge with ultraviolet (UV) disinfection. To ensure that the WWTF is providing proper disinfection, the permit includes continuous monitoring of the UV intensity, UV transmittance, and UV dosage. This data will be used to ensure that the UV disinfection system is operating as designed and approved. This permit also authorizes the use of chlorine disinfection only for emergency purposes and in accordance with the facility's Operation and Maintenance Manual.

As part of the upgrade, the facility also converted the WWTF over to use its old primary clarifiers and chlorination/dechlorination disinfection system to treat wet weather flows. This treated wet weather flow will combine with the advanced treatment flow prior to being discharged through the

existing outfall. In order to monitor the quality of the treated wet weather flow, the DEM has designated outfall 003A as the treated wet weather outfall after dechlorination and prior to combination with the advanced treatment discharge. The effluent limitations specified for Outfall 003A were established in accordance with the EPA's Combined Sewer Overflow Policy.

WWTF Nonconventional Pollutant Limits

BPJ-Based Permit Limits for Nutrients

The Providence and Seekonk Rivers are impacted by low Dissolved Oxygen (DO) levels and high phytoplankton concentrations that are related to excessive nitrogen loadings. Significant areas of the Providence and Seekonk Rivers suffer from hypoxic (low DO) and anoxic (lack of DO) conditions and violate water quality standards. Available data shows that nitrogen loads are dominated by wastewater treatment facility inputs.

DEM hired a consultant and has been working with a technical advisory committee (TAC), consisting primarily of scientists and engineers representing, academic, municipal, state and federal organizations, to calibrate a model and develop a water quality restoration plan, or TMDL. It was concluded that the hydrodynamic model formulation could not adequately simulate conditions due to the relatively severe changes in the bathymetry in the Providence River. Therefore, the DEM has concluded that the best method available for evaluating impacts and setting nitrogen load reduction targets for the Providence River is to use the set of empirical relations developed from the Marine Ecosystems Research Laboratory (MERL) enrichment gradient studies at the University of Rhode Island.

In February 2004, DEM developed an analysis titled "Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers". This analysis indicated that wastewater treatment facility (WWTF) discharges are required to be reduced to the limit of technology (total nitrogen of 3 mg/l), but that the Seekonk River and portions of the Providence River may not fully comply with existing water quality standards for dissolved oxygen. DEM has evaluated the implementation costs, the performance of available technology, and estimates of water quality improvement to develop a phased plan for implementation of WWTF improvements at MA and RI WWTFs which maximizes the DO levels relative to implementation cost. Estimates of capital costs to modify existing facilities to achieve the target levels on a seasonal basis were developed. These costs included allowances for planning, design, construction and administration and must be considered Order-of-Magnitude estimates, since specific facility characteristics were not evaluated.

DEM issued permit modification to the appropriate WWTFs in June of 2005 that established seasonal (May – October) limits for total nitrogen. These limits, in combination with the reductions being assigned to the other WWTFs, will achieve a 50% reduction from the 1995-1996 Rhode Island WWTF loading, consistent with the recommendations from The Governor's Narragansett Bay and Watershed Planning Commission. In particular, on June 27, 2005, DEM issued the NBC a permit modification which added a seasonal Total Nitrogen limit of 5.0 mg/l, and required that the permittee operate the treatment facility to reduce the discharge of total nitrogen, during the months of November through April, to the maximum extent possible using all available treatment equipment in place at the facility. Assigning seasonal total nitrogen limits and requiring that the WWTF be operated year round in a manner to reduce the discharge of nitrogen to the maximum extent possible will result in substantial progress towards the mitigation of hypoxic/anoxic events and meeting water quality standards. The analysis contained in "Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers", indicates that the contribution of Massachusetts WWTFs is significant and, therefore, the DEM is also working with the Massachusetts Department of Environmental Protection and the EPA to pursue appropriate nitrogen reductions for these WWTFs. An integral component of the phased plan is a water quality reassessment that will evaluate the water quality improvements achieved after the WWTF upgrades

have been completed and will determine the need for further reductions. In addition, several researchers are currently developing water quality models that DEM will evaluate to determine their utility towards evaluating the need for further reductions.

The permit maintains the Total Nitrogen permit limits and the nutrient monitoring frequencies first implemented in the 2005 permit modification. The DEM will continue to evaluate water quality improvements that result from the implementation of these nutrient limits.

Bioassay Testing

DEM's toxicity permitting policy is based on past toxicity data and the level of available dilution. Based upon past toxicity results and available dilution, the draft permit requires an $LC_{50} \geq 100\%$ effluent limit for quarterly acute tests conducted on Mysids. At this point in time a chronic toxicity effluent limit has not been established. However, dilutions of less than 10 require that chronic toxicity be evaluated. Therefore, the permit requires that one acute and one chronic toxicity test be conducted on the final effluent once per quarter. Based upon the available dilution, the draft permit requires an $LC_{50} \geq 100\%$ effluent limit for quarterly acute tests conducted on Mysids and a chronic C-NOEC limit of 50% for quarterly chronic tests conducted on Arbacia. These tests shall assure control of toxicity in the effluent. If toxicity is consistently demonstrated, then toxicity identification and reduction will be required.

Wet Weather Limits

As indicated above, NBC's sewer collection system consists of combined sewers that convey both sanitary sewage and stormwater runoff during rain events. During wet weather, the combined flow may exceed the capacity of the WWTF and the interceptor sewers, and a portion of the combined flow is discharged to the receiving waters through the CSO facilities.

CSOs are point sources subject to RIPDES permit requirements for both water-quality based and technology-based requirements but are not subject to the secondary treatment regulations applicable to publicly owned treatment works in accordance with 40 CFR §133.103(a). Section 301(b)(1)(C) of the Clean Water Act mandated compliance with water quality standards by July 1, 1977. Technology-based permit limits must be established for best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) based on best professional judgment (BPJ) in accordance with Section 301(b) and Section 402(a) of the Clean Water Act.

The framework for compliance with Clean Water Act requirements for CSOs is set forth in EPA's National CSO Control Policy, 59 Fed. Reg. 18688 (1994). It sets the following objectives:

- 1) To ensure that if the CSO discharges occur, they are only as a result of wet weather;
- 2) To bring all wet weather CSO discharge points into compliance with the technology based requirements of the CWA and applicable federal and state water quality standards; and
- 3) To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

The CSO Control Policy also established as a matter of national policy the minimum BCT/BAT controls that represent the BPJ of the agency on a consistent, national basis. These are the "nine minimum controls" defined in the CSO Control Policy and set forth in the Part I.D of the Permit. The nine minimum controls include: (1) proper operation and maintenance of the sewer system and the CSOs, (2) maximum use of the collection system for storage, (3) review pretreatment programs to assure that CSO impacts are minimized, (4) maximization of flow to the POTW for treatment, (5) prohibition of dry weather overflows, (6) control of solid and floatable materials in CSOs, (7) pollution prevention programs, (8) public notification to ensure that the public receives

adequate notification of CSO occurrences and CSO impacts, and (9) monitoring to effectively characterize CSO impacts and the efficacy of CSO controls. In accordance with the National CSO Control Policy and consistent with the conditions in the previous permit, the draft permit contains conditions that ensure that NBC complies with the nine minimum controls.

In addition, on July 12, 1999 DEM approved the NBC's three phase CSO long-term control plan, also known as the NBC's Concept Design Report Amendment (CDRA). The CDRA evaluated a range of CSO control alternatives and the approved alternative reduces CSO discharges primarily by the construction of a deep rock tunnel to store CSO flow for treatment at the Bucklin Point WWTF. After the tunnel is built, flows will receive advanced secondary treatment until the capacity of the tunnel is exceeded. Since the WWTF has excess primary treatment capacity, the approved CDRA also includes primary treatment and disinfection of wet weather flows when the storage capacity of the tunnel is exceeded or when necessary to create capacity in the tunnel to store an imminent storm in an effort to reduce or eliminate untreated CSOs. Prior to construction of the tunnel untreated CSO discharges will also be minimized by providing primary treatment and disinfection of wet weather flows that exceed the "dry weather" capacity of the WWTF (i.e., the design capacity of the advanced treatment equipment).

Similar to the December 31, 2001 permit, this permit establishes limits regarding CSOs through the use of: a limit on the maximum flow that will receive full advanced treatment; implementation of an approved plan that limits the use of the wet weather treatment facility at interim technology based limits (both narrative and numeric) for the CSOs; limits on the wet weather treatment discharge (i.e. Outfall 003); and a narrative requirement that NBC implement a long-term control plan that complies with the requirements of the EPA's CSO Policy (which includes compliance with water quality standards).

The NBC's CSOs and wet weather treatment discharges authorized by the permit are not currently in compliance with the EPA CSO policy. Therefore, on January 12, 2004 RIDEM and NBC entered Consent Agreement RIA-330 (most current amendment dated February 27, 2007) that established a three phased schedule for implementation of the approved CDRA. The Consent Agreement requires that NBC amend the plan as necessary to ensure compliance with the Federal Clean Water Act, the EPA CSO control policy, and the Rhode Island Water Quality Regulations. As indicated above, upon issuance of this permit, the DEM anticipates continuing this consent agreement with possible modifications in order to maintain the compliance schedule for the NBC to comply with its CSO requirements.

The permit limits (narrative and numeric) included in this permit are consistent with EPA guidance document entitled: "Combined Sewer Overflow: Guidance for Permit Writers" September 1995, which states that: "The CSO Control Policy outlines a process for CSO-related bypass whereby, under certain circumstances the permit writer may allow wet weather flows to receive primary clarification at the POTW treatment plant and then be discharged, without these flows being subject to secondary treatment requirements." The key considerations when allowing primary treatment include: excess primary capacity at the WWTF; secondary treatment is properly operated and maintained; secondary treatment capacity is available for peak dry weather plus an appropriate amount of wet weather flow; and that the cost and performance of alternatives to the bypass have been evaluated in the long-term control plan. As noted above, NBC is not currently in compliance with the narrative permit limit that requires compliance with the CSO policy and is working on a three-phased approach under consent agreement RIA-330 to come into compliance with this condition. A determination of the NBC's compliance with the Federal Clean Water Act, the EPA CSO control policy, and the Rhode Island Water Quality Regulations will be made upon full implementation of the CDRA.

In accordance with the EPA's guidance document, DEM has assigned "interim" authorization to have a CSO-related bypass around advanced treatment (e.g., outfall 003A). This outfall has been assigned limits that are equivalent to primary treatment. Equivalent to primary treatment was defined as the use of technologies such that the treated effluent results in removal rates of

50% of TSS and 35% of BOD₅ loadings, or 100% removal of settleable solids, whichever is demonstrated to have the greatest water quality benefit. Note: Since the rest of the monitoring at the facility was for CBOD₅, the percent removal limits for BOD₅ have been changed to CBOD₅. The DEM and EPA agree that TSS is an appropriate measure of the solids content being discharged to the receiving waters. Therefore, the DEM has determined that the removal of 50% of TSS and 35% of CBOD₅ loadings will have the greatest water quality benefit and, as a result, these limits have been assigned to outfall 003A. The permit limitations for BOD₅ %-removal and TSS %-removal are consistent with the limits from NBC's previous RIPDES permit.

In addition, Outfall 003A is subject to additional technology-based effluent limitations. These effluent limitations are:

Enterococci: 276 cfu/100 ml maximum daily
Total Residual Chlorine: 20 ug/L maximum daily

In making the determination to assign these additional limits, DEM considered the factors identified in 40 C.F.R § 125.3(d), including the cost and benefits of the facility, the age of the facility, and the demonstrated ability of treatment technologies to meet the limitations. The permit also requires that the permittee conduct concurrent monitoring for Fecal Coliform to evaluate potential impacts to shellfishing.

For the purposes of monitoring requirements at outfall 003, an overflow shall be defined as any event which causes effluent to enter the receiving water for a time greater than or equal to fifteen (15) minutes. All discharges from outfall 003 created by storm events that are greater than the one year six hour storm are not subject to the limitations and should not be included in DMR reporting calculations. However, any discharge from outfall 003, regardless of the size of the storm event, must be reported to the DEM's Operations and Maintenance Program. Overflow occurrences shall be considered to be separate overflows if six (6) or more hours separate two (2) overflow events.

Dry weather overflows from the CSO facilities are not permitted. A regular maintenance/inspection program, a plan to maximize flow to the Treatment Plant and storage within the collection system are also required.

Other Limits and Conditions

The effluent monitoring requirements have been specified in accordance with RIPDES regulations as well as 40 CFR 122.41(j)(1), 122.44(i), and 122.48 to yield data representative of the discharge.

Permits must contain sludge conditions requiring compliance with limits, State laws, and applicable regulations as per Section 405(d) of the CWA and 40 CFR 503. The DEM Sludge Order of Approval sets forth the conditions to ensure this compliance. The permit contains requirements for the permittee to comply with the State's Sludge Regulations and the permittee's DEM Order of Approval for sludge disposal in accordance with the requirements of Section 405(d) of the CWA.

The permit contains a reporting requirement for a local program to regulate industrial discharges to the sewer system (referred to as pretreatment program). This program is being required under authority of Section 402(b)(8) of the CWA and 40 CFR 122.44(j)(2) and 403.8 because NBC Bucklin Point receives significant discharges of industrial wastewater. Attachment A-1 is the EPA Region 1 Annual Pretreatment Report Summary Sheet.

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 consist primarily of management requirements common to all permits.

Final Permit Limits

Presented in the following Tables is a summary of the permit limitations set forth in the Final Permit for all Outfalls.

Table #3: Outfall 001A – WWTF Effluent

Parameter	Monthly Average	Weekly Average	Daily Maximum
Flow ¹	--- MGD		--- MGD ¹
Flow	31 MGD		--- MGD ¹
CBOD ₅ ⁴ November 1 – April 30	25 mg/L	40 mg/L	45 mg/L
CBOD ₅ Mass Limits November 1 – April 30	6,464 lbs/day		11,634 lbs/day
CBOD ₅ ⁴ May 1 – October 31	10 mg/L	10 mg/L	15 mg/L
CBOD ₅ Mass Limits May 1 – October 31	2,585 lbs/day		3,878 lbs/day
CBOD ₅ % Removal	85 %		
TSS ⁴ November 1 – April 30	30 mg/L	45 mg/L	50 mg/L
TSS Mass Limits November 1 – April 30	7,756 lbs/day		12,927 lbs/day
TSS ⁴ May 1 – October 31	20 mg/L	20 mg/L	30 mg/L
TSS Mass Limits May 1 – October 31	5,171 lbs/day		7,756 lbs/day
TSS % Removal	85 %		
Settleable Solids		--- ml/L	--- ml/L
Enterococci	<u>35 cfu</u> 100 mL		<u>276 cfu</u> 100 mL
Fecal Coliform	<u>--- MPN</u> 100 mL	<u>--- MPN</u> 100 mL	<u>--- MPN</u> 100 mL
UV Intensity	--- mw/cm ² (min.)	--- mw/cm ² (ave)	--- mw/cm ² (max.)
UV Transmittance	--- %(min.)	--- %(ave.)	--- %(max.)
UV Dosage	--- mw-s/cm ² (min.)	--- mw-s/cm ² (ave)	--- mw-s/cm ² (max.)
pH	6.0 SU (min.)		9.0 SU (max.)

Oil & Grease	--- mg/L		--- mg/L
Total Phosphorus	--- mg/L		--- mg/L
TKN (as N)	--- mg/L		--- mg/L
Total Nitrate (as N)	--- mg/L		--- mg/L
Total Nitrite (as N)	--- mg/L		--- mg/L
Total Nitrogen (as N) May 1 – October 31	5.0 mg/L		--- mg/L
Total Nitrogen (as N) Mass Limits May 1 – October 31	1,293 lb/d		
Total Nitrogen (as N) November 1 – April 30	--- mg/L ²		--- mg/L
Total Nitrogen (as N) Mass Limits November 1 – April 30	--- lb/d ²		
Ammonia, Total	--- mg/L		--- mg/L
Copper, Total ⁴	6.5 ug/L		6.5 ug/L
Nickel, Total ⁴	14.3 ug/L		70.3 ug/L
Zinc, Total ⁴	85.6 ug/L		85.6 ug/L
Available Cyanide ⁴	0.8 ug/L ³		0.8 ug/L ³
Cadmium, Total ⁴	--- ug/L		--- ug/L
Aluminum, Total ⁴	--- ug/L		--- ug/L
Hexavalent Chromium ⁴	--- ug/L		--- ug/L
Lead, Total ⁴	--- ug/L		--- ug/L
LC ₅₀ - <i>Mysidopsis bahia</i>			≥ 100%
C-NOEC - <i>Arbacia punctulata</i>			≥ 50 %

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

¹All flows up to 116 MGD shall receive at least primary treatment and disinfection. Up to 46 MGD must receive advanced treatment

²The permittee shall operate the treatment facility to reduce the discharge of Total Nitrogen, during the months of November through April, to the maximum extent possible using all available treatment equipment in place at the facility, except methanol addition.

³The limit at which compliance/noncompliance determinations will be based is the Quantitation Limit, which is defined as 10 ug/l for Cyanide.

⁴Samples shall be taken on the influent and effluent.

Table #4: Outfall 002A – North Diversion Structure

Parameter	Monthly Average	Weekly Average	Daily Maximum
Flow (Volume)	--- MGD		--- MGD

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

Table #5: Outfall 003A – Treated Wet Weather Outfall After Dechlorination and Prior to Combination with the Advanced Treatment Discharge

Parameter	Monthly Average	Weekly Average	Daily Maximum
Flow (Volume)	--- MGD		70 MGD
CBOD ₅	--- mg/L		--- mg/L
CBOD ₅ % Removal	35%		
TSS	--- mg/L		--- mg/L
TSS % Removal	50%		
Fecal Coliform	<u>--- MPN</u> 100 mL		<u>--- MPN</u> 100 mL
Enterococci	<u>--- cfu</u> 100 mL		<u>276 cfu</u> 100 mL
Total Residual Chlorine	--- ug/L (min)	--- ug/L (ave)	20 ug/L (max)

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

* For monitoring purposes, an overflow is defined as any occurrence of a discharge from a CSO to the receiving water with a minimum duration of 15 minutes. Overflows shall be considered to be separate if they are separated by six (6) or more hours. During months of no overflow DMRs shall be marked as "no discharge." Dry weather overflows of any duration are prohibited. Any discharge from a CSO to the receiving water, regardless of the duration, must be reported as a CSO to the DEM's Operations and Maintenance Program.

V. **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. In accordance with Chapter 46-17.4 of Rhode Island General Laws, a public hearing will be held prior to the close of the public comment period. 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.

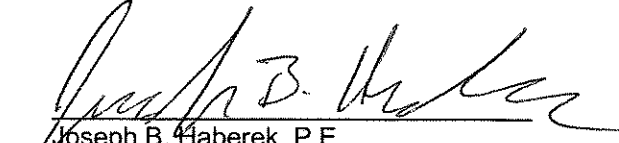
Following the close of the comment period, and after a public hearing, the Director will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments, provided oral testimony, or requested notice. Within thirty (30) days following 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.

VI. **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, P.E.
Department of Environmental Management
Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-4700, Ext.: 7715
e-mail: joseph.haberek@dem.ri.gov

11/23/16
Date


Joseph B. Haberek, P.E.
Principal Sanitary Engineer
Office of Water Resources
Department of Environmental Management

Attachment A-1: Annual Pretreatment Report Summary Sheet

POTW Name:

NPDES Permit #:

Pretreatment Report Period Start Date:

Pretreatment Report Period End Date:

of Significant Industrial Users (SIUs):

of SIUs Without Control Mechanisms:

of SIUs not Inspected:

of SIUs not Sampled:

of SIUs in Significant Noncompliance (SNC) with Pretreatment Standards:

of SIUs in SNC with Reporting Requirements:

of SIUs in SNC with Pretreatment Compliance Schedule:

of SIUs in SNC Published in Newspaper:

of SIUs with Compliance Schedules:

of Violation Notices Issued to SIUs:

of Administrative Orders Issued to SIUs:

of Civil Suits Filed Against SIUs:

of Criminal Suits Filed Against SIUs:

of Categorical Industrial Users (CIUs):

of CIUs in SNC:

Penalties

Total Dollar Amount of Penalties Collected \$

of IUs from which Penalties have been collected:

ATTACHMENT A-2

DESCRIPTION OF DISCHARGE: Secondary treated domestic and industrial wastewater.
DISCHARGE: 001A - Advanced Treatment Discharge

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS:

PARAMETER	DAILY MAXIMUM¹	WKLY AVERAGE²	MONTHLY AVERAGE³
FLOW (MGD)	34.02		20.30
BOD ₅ (PPM)	16.83	6.31	4.31
BOD ₅ (LBS/DAY)	4234.70		823.75
BOD ₅ (% REMOVAL)			94.72
TSS (PPM)	33.08	12.25	7.98
TSS (LBS/DAY)	8387.38		1528.29
TSS (% REMOVAL)			91.15
Fecal Coliform	366.792MPN/100 ml	11.363 MPN/100 ml	6.175 MPN/100 m
pH	6.32 S.U. (Minimum) ⁴		6.90 S.U. (Maximum) ⁵
Cyanide (PPB)	3.61		2.25
Total Cadmium (PPB)	0.0859		0.0491
Hexavalent Chromium (PPB)	7.98		3.97
Total Lead (PPB)	1.17		0.58
Total Copper (PPB)	14.83		9.27
Total Mercury (PPB)	0.0128		0.0047
Total Nickel (PPB)	16.60		25.54
Total Silver (PPB)	0.54		0.31
Total Zinc (PPM)	44.98		36.13
Ammonia (PPM)			
May-Oct	2.02		0.497
Nov-Apr	3.11		1.23
Total Kjeldahl Nitrogen (PPM)	4.81		2.20
Nitrogen, Nitrate (PPM)	6.70		4.91
Nitrogen, Nitrite (PPM)	0.148		0.0738
Nitrogen, Total (PPM)			
May-Oct	8.49		6.49
Nov-Apr	11.36		7.86
Nitrogen Total (LBS/DAY)			
May-Oct			1021
Nov-Apr			1448

¹Data represents the mean of the daily maximum data from July 2009 – June 2014

²Data represents the mean of the weekly average data from July 2009 – June 2014

³Data represents the mean of the monthly average data from July 2009 – June 2014

⁴Data represents the mean of the minimum data from July 2009 – June 2014

⁵Data represents the mean of the maximum data from July 2009 – June 2014

ATTACHMENT A-2 Cont.

DESCRIPTION OF DISCHARGE: Secondary treated domestic and industrial wastewater.
DISCHARGE: 001A - Advanced Treatment Discharge

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS:

PARAMETER	DAILY MAXIMUM¹	WKLY AVERAGE²	MONTHLY AVERAGE³
Oil and Grease (PPM)	1.145		1.132
Solids, Settleable (ML/L)	5.165	0.7658	
Phosphorus (PPM)	3.29	2.24	
Ultraviolet light dosage	78.03 mW-sec/cm ²	58.41 mW-sec/cm ²	44.49 mW-sec/cm ²
Ultraviolet light intensity	349.53 (mo. max.)	227.11 (mo. avg.)	168.66 (mo. min.)
Ultraviolet light transmittance	77.12 (mo. max. %)	73.00 (mo. avg. %)	67.39 (mo. min. %)

Biotoxicity Data LC₅₀ Values (in percent effluent)

Mysid	2 nd qtr. >100	3 rd qtr >100	4 th qtr. >100	2013 1 st qtr. >100	2 nd qtr. >100	3 rd qtr >100	4 th qtr. >100	2014 1 st qtr. >100	2 nd qtr. >100
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Biotoxicity Data NOEL Static 1 Hr. Fert. Chronic Arbaicia

Arbaicia	2 nd qtr. 100	3 rd qtr 100	4 th qtr. 100	2013 1 st qtr. 100	2 nd qtr. 100	3 rd qtr 100	4 th qtr. 100	2014 1 st qtr. 100	2 nd qtr. 100
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ATTACHMENT A-2 CONTINUED

DESCRIPTION OF DISCHARGE: Secondary treated domestic and industrial wastewater.
DISCHARGE: 002A - North Diversion Structure

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS¹:

PARAMETER	DAILY MAXIMUM	WKLY AVERAGE	MONTHLY AVERAGE
FLOW (MGD)	1.48		0.99

¹Data is from July 2009 – June 2014

DESCRIPTION OF DISCHARGE: Secondary treated domestic and industrial wastewater.
DISCHARGE: 003A - Wet Weather Discharge

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS¹:

PARAMETER	DAILY MAXIMUM	WKLY AVERAGE	MONTHLY AVERAGE
FLOW (MGD)	13.87		7.34
BOD ₅ (PPM)	69.13		55.88
BOD ₅ (% REMOVAL)			75.86
TSS (PPM)	78.77		59.42
TSS (% REMOVAL)			88.82
Chlorine Residual (PPB)			208.86 ²
Fecal Coliform	70.96 MPN/100 ml ³		28.82 MPN/100 ml ³
pH	6.708 S.U. (Minimum) ⁴		7.06 S.U. (Maximum) ⁵

¹Data is from the months of July 2009 – June 2014

²Data represents the mean of the average data from July 2009 – June 2014

³Data represents the geometric mean of the data from April 2006 – December 2008

⁴Data represents the mean of the minimum data from August 2005 – September 2007

⁵Data represents the mean of the maximum data from August 2005 – September 2007

Figures #1a and 1b

Site Layout of the Bucklin Point Wastewater Treatment Facility and Flow Schematic

Fig. 1a - Facility Site Plan

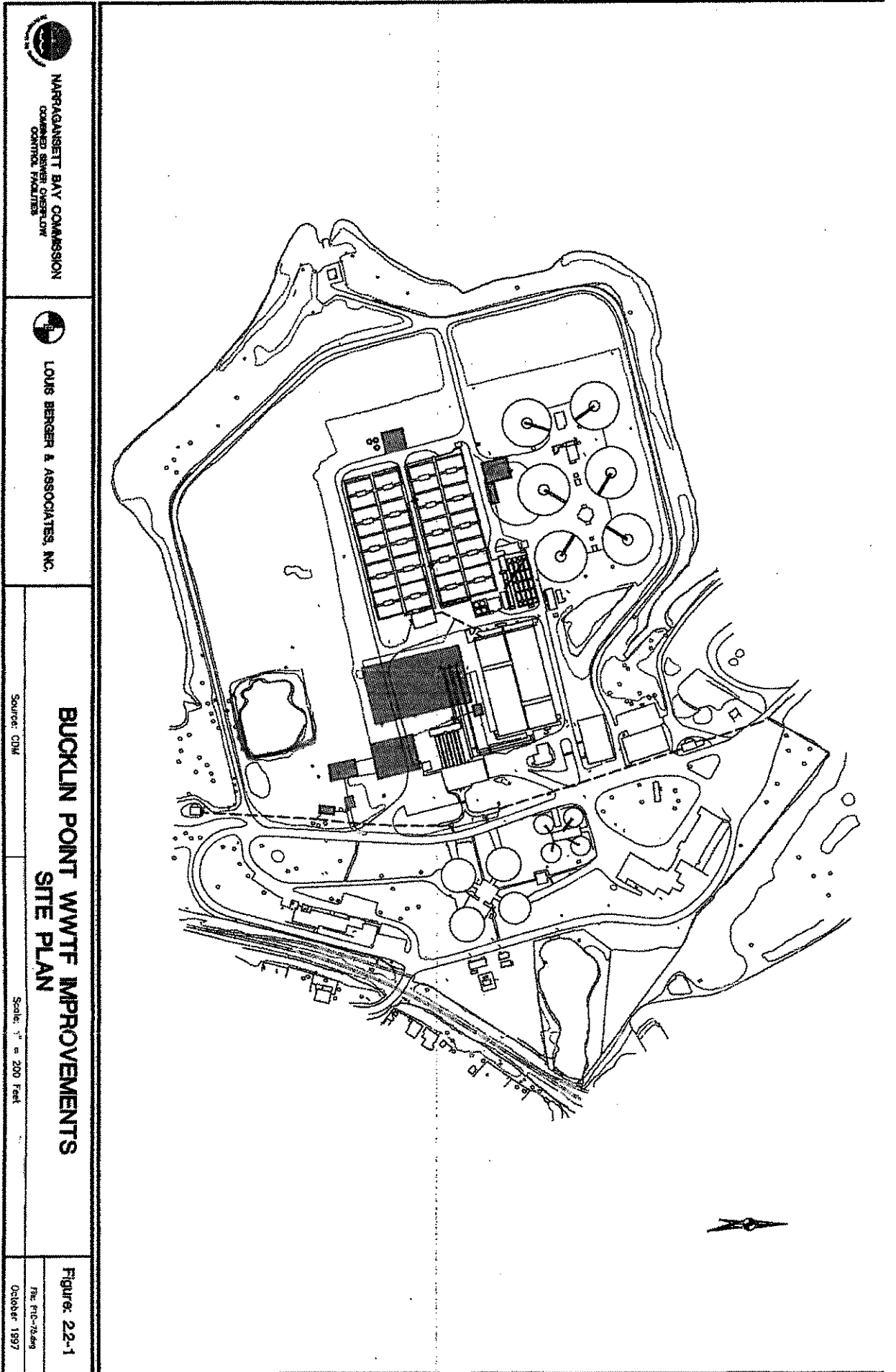
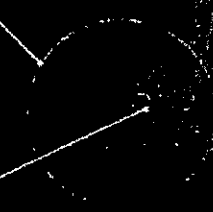


Figure #2

**Location of the Bucklin Point Wastewater Treatment Facility
Outfall and the Associated Chronic and Acute Mixing Zones**

chronic mixing zone
DF=2, radius=300ft

acute mixing zone
DF=1, radius=25ft



ATTACHMENT A-3

September 20, 2016 DEM Translator Study Review Memo

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

INTER-OFFICE MEMO

TO: Eric A. Beck, P.E. DATE: September 20, 2016
Supervising Sanitary Engineer
DEPT: Environmental Management

FROM: Joseph B. Haberek, P.E.
Principal Sanitary Engineer
DEPT: Environmental Management

CC: Samuel Kaplan, P.E. and Angelo Liberti, P.E.

SUBJECT: Review of NBC's Final Metals Compliance Report

This memo is being written in response to the Department of Environmental Management's (DEM's) review of the Narragansett Bay Commission's (NBC's) Final Metals Compliance Evaluation Report that was dated September 30, 2004 (the Report). This report was submitted to the DEM as required under paragraph 14(a) of consent agreement RIA-330. Specifically, paragraph 14(a) required that the NBC submit a Final Metals Compliance Evaluation Report that included the following elements: 1) a summary of the results of the NBC's metals translator sampling including all data from field metals translator studies and the seasonal surveys of the Providence and Seekonk Rivers and a recommendation on the appropriate metals translator to be used in calculating Rhode Island Pollutant Discharge Elimination System (RIPDES) limits, 2) any additional data collected since the submission of the Interim Metals Compliance Report, including potable water supply sampling, river monitoring, and domestic wastewater characterization sampling, 3) revised RIPDES permit limits calculated using the recommended metals translator and the new background receiving water concentrations, 4) a new local limits evaluation using the updated domestic wastewater characterization and the revised RIPDES limits, and 5) an evaluation of the NBC's ability to comply with the revised RIPDES limits.

Based upon a review of the September 30, 2004 Report, it has been determined that it includes all of the elements required under paragraph 14(a) of the NBC's consent agreement. However, since the recently revised Rhode Island Water Quality Regulations includes several changes to water quality criteria, a detailed review of items 3 (revised RIPDES limit calculations), 4 (updated local limits), or 5 (NBC's compliance evaluation) were not conducted. As we previously agreed, since the changes to the Rhode Island Water Quality Regulations will impact the RIPDES limits that the NBC would have calculated, we decided not to perform a detailed review of items 3,4, and 5. Instead, we agreed that we would review the metals translators and, once we came to an agreement on these translators, use them to calculate revised RIPDES limits that would be included in a draft RIPDES permit. We would then have the NBC update their local limits evaluation using these new RIPDES limits and perform a new compliance evaluation as part of the permit reissuance process. Therefore, this memo focuses on my review of the results of the NBC's metals translator study.

The following table summarizes the Environmental Protection Agency's (EPA's) requirements for a metals translator study, from the EPA's June 1996 document "The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion". The table also includes columns that identify how the NBC proposed to address the EPA requirements in their metals translator scope of work that was submitted with the May 16, 2001 Interim Metals Compliance Report and what activities they actually undertook as part of their metals translator study.

Final Metals Compliance Evaluation Report Review Memo

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<i>EPA Metals Translator Guidance Requirement</i>	<i>Scope of Work Specification</i>	<i>Actually Achieved</i>
3.1.1 – sample during critical (i.e., low flow) conditions	Surveys will be planned to coincide with critical conditions for pH and flow	Surveys were conducted during 4 seasons at a variety of sites and depths over a full tidal cycle and under different environmental and wastewater effluent conditions
3.1.2 – field study should extend over several months	4 seasonal receiving water surveys over the course of a year	4 seasonal surveys were conducted over the course of a 10 month period
3.2.1 – collect samples at or beyond the edge of the mixing zone from a point where complete mixing has occurred	4 seasonal surveys of the Providence and Seekonk Rivers will be conducted	4 seasonal surveys conducted for both the Providence and Seekonk Rivers on 7/23/01, 10/28/01, 12/16/01, and 5/8/02
3.2.2 – collect samples from the far field to ensure that the translator will be protective of the characteristics of the receiving water not just the effluent	The study area will include the entire length of the Providence and Seekonk Rivers	The study area for the Providence River included 1 transect upstream of the Fields Point WWTF and 3 transects downstream. The study area for the Seekonk River included 1 transect above the Bucklin Point WWTF, 1 transect at the outfall, and 4 transects downstream.
3.2.3 – collect samples from effluent and the upstream ambient water and combine in the laboratory at the design dilution factor to ensure that the translator is protective at design conditions (i.e., 7Q10 and design flow)	Ambient samples will be collected from GSO dock and Fields Point effluent samples will be mixed at a 10:1 ratio and analyzed	Ambient and WWTF effluent samples were collected, but were not analyzed at the 10:1 dilution ratio.
3.3 – at least 10 sets of total and dissolved metals samples should be collected during low flow conditions or 20 pairs over all flow conditions	4 surveys will be conducted and a total of 60 sample sets will be collected during each survey (40 in the Providence River and 20 in the Seekonk River)	A total of 106 sample sets were taken from the Providence River and a total of 103 sample sets were taken from the Seekonk River
3.4 – sample for total, dissolved, and particulate metals fractions as well as TSS, Particulate Organic Carbon (POC), pH, hardness and flow	Samples will be analyzed for total and dissolved metals	Samples were analyzed for total and dissolved metals, TSS, POC, pH, salinity, chlorophyll, silicate, phosphate, ammonia, nitrate, nitrite, total nitrogen, total phosphorus, Dissolved Organic Carbon (DOC), and particulate nitrogen
3.5 – use trace metals sampling (i.e., clean sampling) techniques	EPA Method 1669 trace metals sampling methods will be used	Trace metals methods were used

Final Metals Compliance Evaluation Report Review Memo

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As can be seen from the table above, the NBC's metals translator study that was submitted as part of the September 30, 2004 Report generally concurs with the EPA's guidance and with the scope of work from the Interim Metal Compliance Report. The only exception is that the NBC did not mix ambient samples and Fields Point effluent samples at a 10:1 ratio and analyze the combined sample. However, due to the number of in-stream samples (209 total sets of samples) and the seasonal and flow variability that they obtained from the four (4) surveys, it does not appear that this is a major issue due to the fact that they were able to get such a large data set at various dilutions. Therefore, it has been determined that, although the NBC did not analyze a mixture of the receiving water and effluent at the 10:1 dilution factor specified in the permit, the metals translator data collected by the NBC is adequate to determine a site-specific metals translator provided that a conservative evaluation is used.

When analyzing the metals translator data, the EPA's guidance document recommends using the geometric mean of the calculated translators if the data is log-normally distributed plus an appropriate margin of safety. The NBC indicated that the data is lognormal. Therefore, the use of the geometric mean metals translator values is appropriate.

Based upon a review of the seasonal metals translator data for each river, the DEM has determined that there is a significant difference in the translators measured between the seasons. Specifically, the DEM has determined that the geometric means of the translators for each river for the October 2001 survey were significantly higher than the other three surveys. Therefore, since the higher metals translators results in lower total metals permit limits, the DEM has determined that it is appropriate to focus on the October 2001 survey as the most conservative survey. The following table demonstrates that the translators calculated from the October 2001 survey were either the maximum or very close to the maximum of the translators calculated during all four surveys for both rivers.

Table 1: Seasonal Variability Analysis (Maximum Values are in Bold)

Date	River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
		Cadmium	Copper	Lead	Nickel	Silver
July 2001	Providence	0.830	0.631	0.077	0.907	0.281
	Seekonk	0.361	0.272	0.022	0.790	0.161
October 2001	Providence	0.890	0.779	0.207	0.975	0.400
	Seekonk	0.907	0.638	0.131	0.902	0.466
December 2001	Providence	0.918	0.651	0.054	0.974	0.404
	Seekonk	0.749	0.475	0.070	0.853	0.480
May 2002	Providence	0.791	0.754	0.097	0.918	0.414
	Seekonk	0.721	0.455	0.084	0.908	0.239

In addition to analyzing the translator data for seasonal variability, the DEM also evaluated the data for tidal variability. After comparing the geometric means of the translators for the Providence and Seekonk Rivers during the incoming and outgoing tides against each other, it was determined that there is not a significant correlation between the translators and the tides. Therefore, it is appropriate to use both tides when determining the translators for the October 2001 survey. The following table illustrates this point for the October 2001 data. Note: Other surveys had similar correlations.

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Table 2: Tidal Variability Analysis

River	Tide	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
		Cadmium	Copper	Lead	Nickel	Silver
Providence	In	0.894	0.765	0.236	0.954	0.460
	Out	0.887	0.793	0.182	0.996	0.348
Seekonk	In	0.935	0.613	0.131	0.929	0.479
	Out	0.880	0.665	0.132	0.876	0.454

The DEM also evaluated the data for spatial variability (i.e., variability from transect to transect). After comparing the geometric means of the translators for each of the Providence and Seekonk Rivers' transects against each other, it was determined that there is not a significant correlation between the translators for each transect (e.g., no transect consistently had the highest translators). Therefore, it is appropriate to use data from all transects when calculating the translators for the October 2001 survey. The following table illustrates this point for the October 2001 data. Note: Data from the Providence River's transect 5 was not used since it only consisted of one data point.

Table 3: Transect Variability Analysis

River	Transect	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
		Cadmium	Copper	Lead	Nickel	Silver
Providence	1	0.916	0.732	0.169	0.991	0.341
	2	0.871	0.770	0.180	0.962	0.380
	3	0.886	0.806	0.229	0.984	0.457
	4	0.861	0.751	0.267	0.959	0.364
	All Data	0.890	0.779	0.207	0.975	0.400
Seekonk	1	0.859	0.672	0.107	0.861	0.621
	2	0.930	0.650	0.139	0.950	0.452
	3	0.910	0.583	0.091	0.922	0.487
	4	0.849	0.668	0.139	0.894	0.461
	All Data	0.907	0.638	0.131	0.902	0.466

Based on the analysis above, the DEM has determined that the most appropriate metals translator data set to use is the data from the October 2001 surveys. This data set was selected since the translators calculated from this survey were consistently higher than the translators calculated from the other surveys. Therefore, it was determined that this survey is representative of the most conservative season. Further after evaluation of the translators at various transects and tides, it was determined that there is not significant variability caused by tides and transects. As a result, the DEM determined that the appropriate translators to use are the ones calculated from the October 2001 survey. The following table is a summary of the final metals translator values for the Providence and Seekonk Rivers after including a 5% margin of safety. Note: After incorporating a 5% margin of safety into the Providence River's nickel translator the value was greater than 1.0, therefore, this translator was set equal to 1.0.

Table 4: Final Metals Translators for Each River

River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
Providence	0.935	0.818	0.217	1.000	0.420
Seekonk	0.952	0.670	0.138	0.947	0.489

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Although the Bucklin Point facility discharges into the Seekonk River, which subsequently flows into the Providence River, a review of the September 1991 dye study for the Bucklin Point WWTF indicates that the dilution by the time that Bucklin Point's effluent reaches the Providence River is at least 30:1. Therefore, since there will be significantly more dilution at the point where Bucklin Point's effluent eventually enters the Providence River vs. the near-field dilution of (1:1 acute and 2:1 chronic), using the translators for the Seekonk and the near-field dilution factors to assign metals limits for the Bucklin Point facility will be protective of both rivers. As a result, the following table includes the final translators that will be assigned:

Table 5: Final Metals Translators for Each Wastewater Treatment Facility (WWTF)

WWTF	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
Fields Point	0.935	0.818	0.217	1.000	0.420
Bucklin Point	0.952	0.670	0.138	0.947	0.489

Prior to making a final decision regarding the metals translators to be applied to the NBC's facilities, it was decided that we should look at the dissolved/total metals ratios in the upstream water and the NBC's outfalls.

To evaluate the dissolved and total metals concentrations in the upstream water, I contacted Connie Carey and Elizabeth Scott and requested that they provide me with any data that they have which includes both total and dissolved metals for the Blackstone River. The only data that we found, which included both dissolved and total metals for the same sample sets, was from the Blackstone River Initiative (BRI). The BRI included dissolved and total metals data for Cadmium, Copper, Lead, and Nickel from three surveys conducted in July 1991, August 1991, and October 1991. The following data is a summary of this data for the last two stations in the Blackstone River (Lonsdale Avenue – Station #: BLK20 and Slater Mill Dam – Station #: BLK 21). All other stations in the BRI were significantly upstream of the Slater Mill Dam.

Table 6: Metals Translators Calculated from the BRI Report

River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)			
	Cadmium	Copper	Lead	Nickel
BLK20	0.545	0.610	0.337	0.831
BLK21	0.363	0.613	0.276	0.743

To evaluate the dissolved and total metals concentrations in the outfalls, I used the data presented in attachment 2J of the NBC's 2004 Final Metals Compliance Report. The following table is a summary of this data from attachment 2J.

Table 7: Metals Translators Calculated at the Outfalls

River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
FP Outfall	0.916	0.763	0.093	0.963	0.334
BP Outfall	0.844	0.667	0.175	0.871	0.408

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As can be seen from the data in tables 6 and 7, there is a significant increase in the percent of dissolved metals in the Rivers in the immediate vicinity of the treatment facilities. This is a result of the discharges from the WWTF's having high levels of treatment and, therefore, predominantly dissolved metals. The only metal that does not follow this trend is Lead. This may be a result of lead in the WWTF's primarily consisting of particulate lead.

Table 5 is a summary of the metals translator values recommended for each facility. Based upon a review of Table 5 against Table 6, it would appear that the final recommended metals translators are conservative when compared to the translators obtained from the BRI (i.e., the recommended translators are significantly higher than the BRI translators). This is true for all metals except Lead. In addition, the translators in Table 5 are also conservative relative to the translators calculated at the outfalls (i.e., the translators in Table 5 are greater than the translators in Table 7). This holds true for all metals, including Lead. Therefore, it appears that the translators included in Table 5 will be protective of water quality and they will be used as the final metals translators for the NBC's WWTFs.

The metals translators in table 5 will be used to calculate permit limits in the NBC's RIPDES permits. When calculating RIPDES permit limits, the DEM will also use the following background metals concentrations from the Army Corps of Engineers and EPA's "Draft Environmental Impact Statement for the Rhode Island Region Long-Term Dredged Material Disposal Site" (see Table 3-10 of the Draft Environmental Impact Statement Report) with corrections made to account for arithmetic errors as noted in file correspondence between the NBC and DEM..

Table 8: Background Concentrations

Pollutant	Background Conc. (ug/l)
As	1.04
Cd	0.035
Cr (VI)	0.272
Cu	0.385
Pb	0.079
Hg	0.000636
Ni	0.475
Se	0.07
Ag	0.023
Zn	1.33

ATTACHMENT A-4

**Calculation of Allowable Acute and Chronic Discharge Limitations
Based on Saltwater Aquatic Life Criteria and Human Health Criteria**

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS FACILITY SPECIFIC DATA INPUT SHEET

NOTE: LIMITS BASED ON RI WATER QUALITY CRITERIA DATED JULY 2006

FACILITY NAME: NBC - Buckliin Point

RIPDES PERMIT #: RI0100072

	DISSOLVED BACKGROUND DATA (ug/L)	ACUTE METAL TRANSLATOR	CHRONIC METAL TRANSLATOR
ALUMINUM	NA	NA	NA
ARSENIC	1.04	1	1
CADMIUM	0.035	0.952	0.952
CHROMIUM III	NA	NA	NA
CHROMIUM VI	0.272	0.993	0.993
COPPER	0.385	0.67	0.67
LEAD	0.079	0.138	0.138
MERCURY	0.000636	0.85	NA
NICKEL	0.475	0.947	0.947
SELENIUM	0.07	0.998	0.998
SILVER	0.023	0.489	0.489
ZINC	1.33	0.946	0.946

USE NA WHEN NO DATA IS AVAILABLE

NOTE 1: BACKGROUND DATA BASED ON CONCENTRATIONS OBTAINED FROM THE ARMY CORPS OF ENGINEERS AND EPA'S 2004 "DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE RHODE ISLAND REGION LONG-TERM DREDGED MATERIAL DISPOSAL SITE"

NOTE 2: METALS TRANSLATORS FOR CADMIUM, COPPER, LEAD, NICKEL, AND SILVER ARE CALCULATED FROM NBC SAMPLING OF PROVIDENCE AND SEEKONK RIVERS, OCTOBER 2001 SURVEY. ALL OTHER METALS TRANSLATORS ARE FROM THE RHODE ISLAND WATER QUALITY REGULATIONS

DILUTION FACTORS	
ACUTE =	1 x
CHRONIC =	2 x
HUMAN HEALTH =	2 x

NOTE: TEST WWTF'S DILUTION FACTORS OBTAINED FROM A DYE STUDY.

TOTAL AMMONIA CRITERIA (ug/L)	
WINTER ACUTE =	79000
CHRONIC =	12000
SUMMER ACUTE =	27000
CHRONIC =	4100

NOTE 1: LIMITS ARE FROM TABLE 3 IN THE RI WATER QUALITY REGS. USING:

SALINITY = 20 g/Kg; pH = 7.4 s.u.
WINTER (NOV-APRIL) TEMP=5.0 C;
SUMMER (MAY-OCT) TEMP=20.0 C.
(SEE JULY 11, 1996 LETTER)

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: NBC - Bucklin Point RIPDES PERMIT #: RI0100072

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
PRIORITY POLLUTANTS:							
TOXIC METALS AND CYANIDE							
ANTIMONY	7440360			No Criteria			1024
ARSENIC (limits are total recoverable)	7440382	1.04	69	62.1	36	640	1.48
ASBESTOS	1332214			No Criteria			No Criteria
BERYLLIUM	7440417			No Criteria			No Criteria
CADMIUM (limits are total recoverable)	7440439	0.035	40	37.81512605	8.8		16.60189076
CHROMIUM III (limits are total recoverable)	16065831	NA		No Criteria			No Criteria
CHROMIUM VI (limits are total recoverable)	18540299	0.272	1100	996.978852	50		90.36052367
COPPER (limits are total recoverable)	7440508	0.385	4.8	6.447761194	3.1		7.753731343
CYANIDE	57125		1	0.80	1	140	1.6
LEAD (limits are total recoverable)	7439921	0.079	210	1369.565217	8.1		105.0797101
MERCURY (limits are total recoverable)	7439976	0.000636	1.8	1.905882353	0.94	0.15	0.269364
NICKEL (limits are total recoverable)	7440020	0.475	74	70.32734952	8.2	4600	15.0844773
SELENIUM (limits are total recoverable)	7782492	0.07	290	261.5230461	71	4200	127.9859719
SILVER (limits are total recoverable)	7440224	0.023	1.9	3.496932515			No Criteria
THALLIUM	7440280			No Criteria		0.47	0.752
ZINC (limits are total recoverable)	7440666	1.33	90	85.62367865	81	26000	152.7167019
VOLATILE ORGANIC COMPOUNDS							
ACROLEIN	107028			No Criteria			464
ACRYLONITRILE	107131			No Criteria		290	4
BENZENE	71432			No Criteria		510	816
BROMOFORM	75252			No Criteria		1400	2240
CARBON TETRACHLORIDE	56235			No Criteria		16	25.6
CHLOROBENZENE	108907			No Criteria		1600	2560
CHLORODIBROMOMETHANE	124481			No Criteria		130	208
CHLOROFORM	67663			No Criteria		4700	7520
DICHLOROBROMOMETHANE	75274			No Criteria		170	272
1,2DICHLOROETHANE	107062			No Criteria		370	592
1,1DICHLOROETHYLENE	75354			No Criteria		7100	11360
1,2DICHLOROPROPANE	78875			No Criteria		150	240
1,3DICHLOROPROPYLENE	542756			No Criteria		21	33.6
ETHYLBENZENE	100414			No Criteria		2100	3360
BROMOMETHANE (methyl bromide)	74839			No Criteria		1500	2400
CHLOROMETHANE (methyl chloride)	74873			No Criteria			No Criteria
METHYLENE CHLORIDE	75092			No Criteria		5900	9440

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: NBC - Bucklin Point RIPDES PERMIT #: RI0100072

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,1,2,2-TETRACHLOROETHANE	79345			No Criteria		40	64
TETRACHLOROETHYLENE	127184			No Criteria		33	52.8
TOLUENE	108883			No Criteria		15000	24000
1,2-TRANS-DICHLOROETHYLENE	156605			No Criteria		10000	16000
1,1,1-TRICHLOROETHANE	71556			No Criteria		160	No Criteria
1,1,2-TRICHLOROETHANE	79005			No Criteria		300	256
TRICHLOROETHYLENE	79016			No Criteria		2.4	480
VINYL CHLORIDE	75014			No Criteria			3.84
ACID ORGANIC COMPOUNDS							
2-CHLOROPHENOL	95578			No Criteria		150	240
2,4-DICHLOROPHENOL	120832			No Criteria		290	464
2,4-DIMETHYLPHENOL	105679			No Criteria		850	1360
4,6-DINITRO-2-METHYL PHENOL	534521			No Criteria		280	448
2,4-DINITROPHENOL	51285			No Criteria		5300	8480
4-NITROPHENOL	88755			No Criteria			No Criteria
PENTACHLOROPHENOL	87865		13	10.4	7.9	30	12.64
PHENOL	108952			No Criteria		1700000	2720000
2,4,6-TRICHLOROPHENOL	88062			No Criteria		24	38.4
BASE NEUTRAL COMPOUNDS							
ACENAPHTHENE	83329			No Criteria		990	1584
ANTHRACENE	120127			No Criteria		40000	64000
BENZIDINE	92875			No Criteria		0.002	0.0032
POLYCYCLIC AROMATIC HYDROCARBONS				No Criteria		0.18	0.288
BIS(2-CHLOROETHYL)ETHER	111444			No Criteria		5.3	8.48
BIS(2-CHLOROISOPROPYL)ETHER	108601			No Criteria		65000	104000
BIS(2-ETHYLHEXYL)PHTHALATE	117817			No Criteria		22	35.2
BUTYL BENZYL PHTHALATE	85687			No Criteria		1900	3040
2-CHLORONAPHTHALENE	91587			No Criteria		1600	2560
1,2-DICHLOROBENZENE	95501			No Criteria		1300	2080
1,3-DICHLOROBENZENE	541731			No Criteria		960	1536
1,4-DICHLOROBENZENE	106467			No Criteria		190	304
3,3-DICHLOROBENZIDENE	91941			No Criteria		0.28	0.448
DIETHYL PHTHALATE	84662			No Criteria		44000	70400
DIMETHYL PHTHALATE	131113			No Criteria		1100000	1760000
Di-n-BUTYL PHTHALATE	84742			No Criteria		4500	7200
2,4-DINITROTOLUENE	121142			No Criteria		34	54.4

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: NBC - Bucklin Point RIPDES PERMIT #: RI0100072

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,2-DIPHENYLHYDRAZINE	122667			No Criteria		2	3.2
FLUORANTHENE	206440			No Criteria		140	224
FLUORENE	86737			No Criteria		5300	8480
HEXACHLOROBENZENE	118741			No Criteria		0.0029	0.00464
HEXACHLOROBUTADIENE	87683			No Criteria		180	288
HEXACHLOROCYCLOPENTADIENE	77474			No Criteria		1100	1760
HEXACHLOROETHANE	67721			No Criteria		33	52.8
ISOPHORONE	78591			No Criteria		9600	15360
NAPHTHALENE	91203			No Criteria			No Criteria
NITROBENZENE	98953			No Criteria		690	1104
NNITROSODIMETHYLAMINE	62759			No Criteria		30	48
NNITROSODINPROPYLAMINE	621647			No Criteria		5.1	8.16
NNITROSODIPHENYLAMINE	86306			No Criteria		60	96
PYRENE	129000			No Criteria		4000	6400
1,2,4-trichlorobenzene	120821			No Criteria		70	112
PESTICIDES/PCBs							
ALDRIN	309002		1.3	1.04		0.0005	0.0008
Alpha BHC	319846			No Criteria		0.049	0.0784
Beta BHC	319857			No Criteria		0.17	0.272
Gamma BHC (Lindane)	58899		0.16	0.128		1.8	2.88
CHLORDANE	57749		0.09	0.072	0.004	0.0081	0.0064
4,4DDT	50293		0.13	0.104	0.001	0.0022	0.0016
4,4DDE	72559			No Criteria		0.0022	0.00352
4,4DDD	72548			No Criteria		0.0031	0.00496
DIELDRIN	60571		0.71	0.568	0.0019	0.00054	0.000864
ENDOSULFAN (alpha)	959988		0.034	0.0272	0.0087	89	0.01392
ENDOSULFAN (beta)	33213659		0.034	0.0272	0.0087	89	0.01392
ENDOSULFAN (sulfate)	1031078			No Criteria		89	142.4
ENDRIN	72208		0.037	0.0296	0.0023	0.06	0.00368
ENDRIN ALDEHYDE	7421934			No Criteria		0.3	0.48
HEPTACHLOR	76448		0.053	0.0424	0.0036	0.00079	0.001264
HEPTACHLOR EPOXIDE	1024573		0.053	0.0424	0.0036	0.00039	0.000624
POLYCHLORINATED BIPHENYLS3	1336363			No Criteria	0.03	0.00064	0.001024
2,3,7,8TCDD (Dioxin)	1746016		0.21	No Criteria		0.000000051	8.16E-08
TOXAPHENE	8001352		0.42	0.168	0.0002	0.0028	0.00032
TRIBUTYL TIN				0.336	0.0074		0.01184

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: NBC - Bucklin Point RIPDES PERMIT #: RI0100072

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
NON PRIORITY POLLUTANTS:							
OTHER SUBSTANCES							
ALUMINIUM (limits are total recoverable)	7429905	NA		No Criteria			No Criteria
AMMONIA as N (winter/summer)	7664417		64938	51950.4	9864		15782.4 5392.32
4BROMOPHENYL PHENYL ETHER				No Criteria			No Criteria
CHLORIDE	16887006			No Criteria			No Criteria
CHLORINE	7782505		13	13	7.5		15
4CHLORO2METHYLPHENOL				No Criteria			No Criteria
1CHLORONAPHTHALENE				No Criteria			No Criteria
4CHLOROPHENOL	106489			No Criteria			No Criteria
2,4DICHLORO6METHYLPHENOL				No Criteria			No Criteria
1,1DICHLOROPROPANE	142289			No Criteria			No Criteria
1,3DICHLOROPROPANE				No Criteria			No Criteria
2,3DINITROTOLUENE				No Criteria			No Criteria
2,4DINITRO6METHYL PHENOL				No Criteria			No Criteria
IRON	7439896			No Criteria			No Criteria
pentachlorobenzene	608935			No Criteria			No Criteria
PENTACHLOROETHANE				No Criteria			No Criteria
1,2,3,5tetrachlorobenzene				No Criteria			No Criteria
1,1,1,2TETRACHLOROETHANE	630206			No Criteria			No Criteria
2,3,4,6TETRACHLOROPHENOL	58902			No Criteria			No Criteria
2,3,5,6TETRACHLOROPHENOL				No Criteria			No Criteria
2,4,5TRICHLOROPHENOL	95954			No Criteria			No Criteria
2,4,6TRINITROPHENOL	88062			No Criteria			No Criteria
XYLENE	1330207			No Criteria			No Criteria

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: NBC - Bucklin Point

RIPDES PERMIT #: RI0100072

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
PRIORITY POLLUTANTS			
TOXIC METALS AND CYANIDE			
ANTIMONY	7440360	No Criteria	1024.00
ARSENIC, TOTAL	7440382	62.10	1.48
ASBESTOS	1332214	No Criteria	No Criteria
BERYLLIUM	7440417	No Criteria	No Criteria
CADMIUM, TOTAL	7440439	37.82	16.60
CHROMIUM III, TOTAL	16065831	No Criteria	No Criteria
CHROMIUM VI, TOTAL	18540299	996.98	90.36
COPPER, TOTAL	7440508	6.45	6.45
CYANIDE	57125	0.80	0.80
LEAD, TOTAL	7439921	1369.57	105.08
MERCURY, TOTAL	7439976	1.91	0.27
NICKEL, TOTAL	7440020	70.33	15.08
SELENIUM, TOTAL	7782492	261.52	127.99
SILVER, TOTAL	7440224	3.50	No Criteria
THALLIUM	7440280	No Criteria	0.75
ZINC, TOTAL	7440666	85.62	85.62
VOLATILE ORGANIC COMPOUNDS			
ACROLEIN	107028	No Criteria	464.00
ACRYLONITRILE	107131	No Criteria	4.00
BENZENE	71432	No Criteria	816.00
BROMOFORM	75252	No Criteria	2240.00
CARBON TETRACHLORIDE	56235	No Criteria	25.60
CHLOROBENZENE	108907	No Criteria	2560.00
CHLORODIBROMOMETHANE	124481	No Criteria	208.00
CHLOROFORM	67663	No Criteria	7520.00
DICHLOROBROMOMETHANE	75274	No Criteria	272.00
1,2DICHLOROETHANE	107062	No Criteria	592.00
1,1DICHLOROETHYLENE	75354	No Criteria	11360.00
1,2DICHLOROPROPANE	78875	No Criteria	240.00
1,3DICHLOROPROPYLENE	542756	No Criteria	33.60
ETHYLBENZENE	100414	No Criteria	3360.00
BROMOMETHANE (methyl bromide)	74839	No Criteria	2400.00
CHLOROMETHANE (methyl chloride)	74873	No Criteria	No Criteria
METHYLENE CHLORIDE	75092	No Criteria	9440.00
1,1,2,2TETRACHLOROETHANE	79345	No Criteria	64.00

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
TETRACHLOROETHYLENE	127184	No Criteria	52.80
TOLUENE	108883	No Criteria	24000.00
1,2TRANSDICHLOROETHYLENE	156605	No Criteria	16000.00
1,1,1TRICHLOROETHANE	71556	No Criteria	No Criteria
1,1,2TRICHLOROETHANE	79005	No Criteria	256.00
TRICHLOROETHYLENE	79016	No Criteria	480.00
VINYL CHLORIDE	75014	No Criteria	3.84
ACID ORGANIC COMPOUNDS			
2CHLOROPHENOL	95578	No Criteria	240.00
2,4DICHLOROPHENOL	120832	No Criteria	464.00
2,4DIMETHYLPHENOL	105679	No Criteria	1360.00
4,6DINITRO2METHYL PHENOL	534521	No Criteria	448.00
2,4DINITROPHENOL	51285	No Criteria	8480.00
4NITROPHENOL	88755	No Criteria	No Criteria
PENTACHLOROPHENOL	87865	10.40	10.40
PHENOL	108952	No Criteria	272000.00
2,4,6TRICHLOROPHENOL	88062	No Criteria	38.40
BASE NEUTRAL COMPOUNDS			
ACENAPHTHENE	83329	No Criteria	1584.00
ANTHRACENE	120127	No Criteria	64000.00
BENZIDINE	92875	No Criteria	0.00
PAHs		No Criteria	0.29
BIS(2CHLOROETHYL)ETHER	111444	No Criteria	8.48
BIS(2ETHYLHEXYL)PHTHALATE	108601	No Criteria	104000.00
BUTYL BENZYL PHTHALATE	117817	No Criteria	35.20
2CHLORONAPHTHALENE	85687	No Criteria	3040.00
1,2DICHLOROBENZENE	91587	No Criteria	2560.00
1,3DICHLOROBENZENE	95501	No Criteria	2080.00
1,4DICHLOROBENZENE	541731	No Criteria	1536.00
3,3DICHLOROBENZIDENE	106467	No Criteria	304.00
DIETHYL PHTHALATE	91941	No Criteria	0.45
DIMETHYL PHTHALATE	84662	No Criteria	70400.00
DI-n-BUTYL PHTHALATE	131113	No Criteria	1760000.00
2,4DINITROTOLUENE	84742	No Criteria	7200.00
1,2DIPHENYLHYDRAZINE	121142	No Criteria	54.40
FLUORANTHENE	122667	No Criteria	3.20
	206440	No Criteria	224.00

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS
FACILITY NAME: NBC - Bucklin Point **RIPDES PERMIT #: RI0100072**

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
FLUORENE	86737	No Criteria	8480.00
HEXACHLOROBENZENE	118741	No Criteria	0.00
HEXACHLOROBUTADIENE	87683	No Criteria	288.00
HEXACHLOROCYCLOPENTADIENE	77474	No Criteria	1760.00
HEXACHLOROETHANE	67721	No Criteria	52.80
ISOPHORONE	78591	No Criteria	15360.00
NAPHTHALENE	91203	No Criteria	No Criteria
NITROBENZENE	98953	No Criteria	1104.00
N-NITROSODIMETHYLAMINE	62759	No Criteria	48.00
N-NITROSODI-N-PROPYLAMINE	621647	No Criteria	8.16
N-NITROSODIPHENYLAMINE	86306	No Criteria	96.00
PYRENE	129000	No Criteria	6400.00
1,2,4trichlorobenzene	120821	No Criteria	112.00
PESTICIDES/PCBs			
ALDRIN	309002	1.04	0.00
Alpha BHC	319846	No Criteria	0.08
Beta BHC	319857	No Criteria	0.27
Gamma BHC (Lindane)	58899	0.13	0.13
CHLORDANE	57749	0.07	0.01
4,4DDT	50293	0.10	0.00
4,4DDE	72559	No Criteria	0.00
4,4DDD	72548	No Criteria	0.00
DIELDRIN	60571	0.57	0.00
ENDOSULFAN (alpha)	959988	0.03	0.01
ENDOSULFAN (beta)	33213659	0.03	0.01
ENDOSULFAN (sulfate)	1031078	No Criteria	142.40
ENDRIN	72208	0.03	0.00
ENDRIN ALDEHYDE	7421934	No Criteria	0.48
HEPTACHLOR	76448	0.04	0.00
HEPTACHLOR EPOXIDE	1024573	0.04	0.00
POLYCHLORINATED BIPHENYLS3	1336363	No Criteria	0.00
2,3,7,8TCDD (Dioxin)	1746016	No Criteria	0.00
TOXAPHENE	8001352	0.17	0.00
TRIBUTYL TIN		0.34	0.01

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
NON PRIORITY POLLUTANTS, OTHER SUBSTANCES			
ALUMINUM, TOTAL	7429905	No Criteria	No Criteria
AMMONIA (as N), WINTER (NOV-APR)	7664417	51950.40	15782.40
AMMONIA (as N), SUMMER (MAY-OC)	7664417	17755.20	5392.32
4BROMOPHENYL PHENYL ETHER		No Criteria	No Criteria
CHLORIDE	16887006	No Criteria	No Criteria
CHLORINE	7782505	13.00	13.00
4CHLORO2METHYLPHENOL		No Criteria	No Criteria
1CHLORONAPHTHALENE		No Criteria	No Criteria
4CHLOROPHENOL	106489	No Criteria	No Criteria
2,4DICHLORO6METHYLPHENOL		No Criteria	No Criteria
1,1DICHLOROPROPANE		No Criteria	No Criteria
1,3DICHLOROPROPANE	142289	No Criteria	No Criteria
2,3DINITROTOLUENE		No Criteria	No Criteria
2,4DINITRO6METHYL PHENOL		No Criteria	No Criteria
IRON	7439896	No Criteria	No Criteria
608935		No Criteria	No Criteria
pentachlorobenzene		No Criteria	No Criteria
PENTACHLOROETHANE		No Criteria	No Criteria
1,2,3,5tetrachlorobenzene		No Criteria	No Criteria
1,1,1,2TETRACHLOROETHANE	630206	No Criteria	No Criteria
2,3,4,6TETRACHLOROPHENOL	58902	No Criteria	No Criteria
2,3,5,6TETRACHLOROPHENOL		No Criteria	No Criteria
2,4,5TRICHLOROPHENOL	95954	No Criteria	No Criteria
2,4,6TRINITROPHENOL	88062	No Criteria	No Criteria
XYLENE	1330207	No Criteria	No Criteria

ATTACHMENT A-5
Calculation of Historic Discharge Levels

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS
FOR LESS THAN TEN SAMPLES TSD pgE-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

n := 1 Number of times the permittee will sample per month
 k := 60 Sample size of the data set
 D := 10 Detection Limit l := 0, 1 .. 1 Counter
 r := 50 Number of nondetects i := 1, 2 .. k - r Counter
 $\delta := \frac{r}{k}$

$Area_{95} := \frac{.95 - \delta}{1 - \delta}$ $Area_{95} = 0.7$ $Area_{99} := \frac{.99 - \delta}{1 - \delta}$ $Area_{99} = 0.94$

$z_{99} := 1.56$ $z_{95} := 0.53$ Find from Table A-4 and insert Areas from the table

$x_i :=$ Daily data is best, use monthly averages if necessary

12.5
1.4
4.6
1.3
1.4
5.3
16
48.5
2.2
4.1

$y_i := \ln(x_i)$

$\mu_y := \sum_i \frac{y_i}{k - r}$

$\sigma_y := \sqrt{\sum_i \frac{(y_i - \mu_y)^2}{k - r - 1}}$

$E(x) := \delta \cdot D + (1 - \delta) \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2)$

$V(x) := (1 - \delta) \cdot \exp(2 \cdot \mu_y + \sigma_y^2) \cdot [\exp(\sigma_y^2) - (1 - \delta)] + \delta \cdot (1 - \delta) \cdot D \cdot (D - 2 \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2))$

$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)]^2}$ $B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2}$ $C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$

$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]}$ $\mu_n := \ln\left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)}\right] - 0.5 \cdot \sigma_n^2$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

$X_{95} := \max(\text{Compare})$

$X_{95} = 8.9$ monthly average interim limit

Compare₂ :=

$\exp(\mu_y + z_{99} \cdot \sigma_y)$
D

$X_{99} := \max(\text{Compare2})$

$X_{99} = 31$ daily maximum interim limit

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS FOR LESS THAN TEN SAMPLES TSD pgE-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

n := 8 Number of times the permittee will sample per month
 k := 50 Sample size of the data set
 NA - 0 non-detects D := 0 Detection Limit l := 0, 1 .. 1 Counter
 r := 0 Number of nondetects i := 1, 2 .. k - r Counter
 $\delta := \frac{r}{k}$
 $Area_{95} := \frac{.95 - \delta}{1 - \delta}$ $Area_{95} = 0.95$ $Area_{99} := \frac{.99 - \delta}{1 - \delta}$ $Area_{99} = 0.99$
 $z_{99} := 2.33$ $z_{95} := 1.65$ Find from Table A-4 and insert Areas from the table

$x_i :=$ Daily data is best, use monthly averages if necessary

15.6
9
9
8.6
9.2
9.3
9.9
9.2
11.1
5.5
8.4
4.3
7.4
6.9
8.1
6.9
8.3
8.5
7.8
8.4
8.9
8.74
7.1
7.14
7.57
7.53
8.28
10.01
16.12
10.8
8.75
7.8
5.45
9.47
13.36
9.48

$y_i := \ln(x_i)$

$\mu_y := \sum_i \frac{y_i}{k - r}$

$\sigma_y := \sqrt{\sum_i \frac{(y_i - \mu_y)^2}{k - r - 1}}$

$E(x) := \delta \cdot D + (1 - \delta) \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2)$

$V(x) := (1 - \delta) \cdot \exp(2 \cdot \mu_y + \sigma_y^2) \cdot [\exp(\sigma_y^2) - (1 - \delta)] + \delta \cdot (1 - \delta) \cdot D \cdot (D - 2 \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2))$

$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)]^2}$ $B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2}$ $C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$

$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]}$

$\mu_n := \ln\left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)}\right] - 0.5 \cdot \sigma_n^2$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

$X_{95} := \max(\text{Compare}_1)$

$X_{95} = 10.5$ monthly average interim limit

interim limits Bucklin Point Copper 012915.mcd

Compare₂ :=

$\exp(\mu_y + z_{99} \cdot \sigma_y)$
D

$X_{99} := \max(\text{Compare}_2)$

$X_{99} = 16.4$ daily maximum interim limit

11.33
11.68
11.43
8.36
5.95
7.4
20.23
7.6
6.29
6.6
6.6
6.8
9.12
10.03

interim limits Bucklin Point Copper 012915.mcd

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS
FOR LESS THAN TEN SAMPLES TSD pgE-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

n := 1 Number of times the permittee will sample per month
 k := 60 Sample size of the data set
 D := 10 Detection Limit l := 0, 1 .. 1 Counter
 r := 12 Number of nondetects i := 1, 2 .. k - r Counter
 $\delta := \frac{r}{k}$

$Area_{95} := \frac{.95 - \delta}{1 - \delta}$ $Area_{95} = 0.938$ $Area_{99} := \frac{.99 - \delta}{1 - \delta}$ $Area_{99} = 0.988$

$z_{99} := 2.26$ $z_{95} := 1.54$ Find from Table A-4 and insert Areas from the table

$x_i :=$ Daily data is best, use monthly averages if necessary

0.62
0.51
0.51
0.9
0.75
0.07
0.12
0.24
0.15
0.35
0.63
0.48
0.38
0.42
0.46
0.43
0.6
0.57
0.46
0.43
0.41
0.42
0.43
0.36
0.41
0.5
0.48
0.34
0.56
0.58
0.45
1.35
1.56
0.66
0.67
0.89

$y_i := \ln(x_i)$

$\mu_y := \sum_i \frac{y_i}{k - r}$

$\sigma_y := \sqrt{\sum_i \frac{(y_i - \mu_y)^2}{k - r - 1}}$

$E(x) := \delta \cdot D + (1 - \delta) \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2)$

$V(x) := (1 - \delta) \cdot \exp(2 \cdot \mu_y + \sigma_y^2) \cdot [\exp(\sigma_y^2) - (1 - \delta)] + \delta \cdot (1 - \delta) \cdot D \cdot (D - 2 \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2))$

$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)]^2}$ $B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2}$ $C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$

$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]}$

$\mu_n := \ln\left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)}\right] - 0.5 \cdot \sigma_n^2$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

$X_{95} := \max(\text{Compare})$

Compare₂ :=

$\exp(\mu_y + z_{99} \cdot \sigma_y)$
D

$X_{99} := \max(\text{Compare2})$

$X_{95} = 1.1$ monthly average interim limit $X_{99} = 1.7$ daily maximum interim limit
interim limits Bucklin Point Lead 012215.mcd

0.75
0.55
0.55
0.56
1.26
0.54
0.58
0.66
0.6
0.77
0.52
0.55

interim limits Bucklin Point Lead 012215.mcd

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS
FOR LESS THAN TEN SAMPLES TSD pgE-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

$n := 1$ Number of times the permittee will sample per month

$k := 60$ Sample size of the data set

Assumed $D := 0.01$ Detection Limit $l := 0, 1 \dots 1$ Counter

$r := 47$ Number of nondetects $i := 1, 2 \dots k - r$ Counter

$$\delta := \frac{r}{k}$$

$$\text{Area}_{95} := \frac{.95 - \delta}{1 - \delta} \quad \text{Area}_{95} = 0.769 \quad \text{Area}_{99} := \frac{.99 - \delta}{1 - \delta} \quad \text{Area}_{99} = 0.954$$

$z_{99} := 1.69$ $z_{95} := 0.74$ Find from Table A-4 and insert Areas from the table

$x_i :=$ Daily data is best, use monthly averages if necessary

0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.03
0.01
0.01

$$y_i := \ln(x_i)$$

$$\mu y := \sum_i \frac{y_i}{k - r}$$

$$\sigma y := \sqrt{\sum_i \frac{(y_i - \mu y)^2}{k - r - 1}}$$

$$E(x) := \delta \cdot D + (1 - \delta) \cdot \exp(\mu y + 0.5 \cdot \sigma y^2)$$

$$V(x) := (1 - \delta) \cdot \exp(2 \cdot \mu y + \sigma y^2) \cdot \left[\exp(\sigma y^2) - (1 - \delta) \right] + \delta \cdot (1 - \delta) \cdot D \cdot (D - 2 \cdot \exp(\mu y + 0.5 \cdot \sigma y^2))$$

$$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)]^2} \quad B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2} \quad C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$$

$$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]} \quad \mu_n := \ln\left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)}\right] - 0.5 \cdot \sigma_n^2$$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

$$X_{95} := \max(\text{Compare})$$

Compare₂ :=

$\exp(\mu y + z_{99} \cdot \sigma y)$
D

$$X_{99} := \max(\text{Compare2})$$

$X_{95} = 0.01$ monthly average interim limit $X_{99} = 0.02$ daily maximum interim limit

interim limits Bucklin Point Mercury 012915.mcd

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS
 FOR LESS THAN TEN SAMPLES TSD pgE-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

n := 8 Number of times the permittee will sample per month
 k := 50 Sample size of the data set
 NA D := 0 Detection Limit l := 0, 1 .. 1 Counter
 r := 0 Number of nondetects i := 1, 2 .. k - r Counter
 $\delta := \frac{r}{k}$

$Area_{95} := \frac{.95 - \delta}{1 - \delta}$ Area₉₅ = 0.95 $Area_{99} := \frac{.99 - \delta}{1 - \delta}$ Area₉₉ = 0.99

z₉₉ := 2.33 z₉₅ := 1.65 Find from Table A-4 and insert Areas from the table

x_i := Daily data is best, use monthly averages if necessary

7.6
7.2
7.2
7.2
8.3
7.2
8.4
9.6
8.6
2.9
2.5
2.9
9.1
5.1
5.3
7.6
5.5
6
4.2
5
5
4.5
7.6
6.9
4.9
26.9
6.7
6.89
52.23
6.2
6.02
6.4
4.92
6.54
5.18
10.5

y_i := ln(x_i)

$\mu_y := \sum_i \frac{y_i}{k - r}$

$\sigma_y := \sqrt{\sum_i \frac{(y_i - \mu_y)^2}{k - r - 1}}$

E(x) := δ · D + (1 - δ) · exp(μ_y + 0.5 · σ_y²)

V(x) := (1 - δ) · exp(2 · μ_y + σ_y²) · [exp(σ_y²) - (1 - δ)] ...
 + δ · (1 - δ) · D · (D - 2 · exp(μ_y + 0.5 · σ_y²))

$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)]^2}$ $B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2}$ $C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$

$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]}$

$\mu_n := \ln\left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)}\right] - 0.5 \cdot \sigma_n^2$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

Compare₂₁ :=

$\exp(\mu_y + z_{99} \cdot \sigma_y)$
D

X₉₅ := max(Compare)

X₉₉ := max(Compare2)

X₉₅ = 10.8 monthly average interim limit X₉₉ = 23.2 daily maximum interim limit

interim limits Bucklin Point Nickel 012215.mcd

19.21
11.23
7.48
7.18
8.98
7.59
8.77
5.63
11.33
15
6.3
5.4
5.2
5.02

interim limits Bucklin Point Nickel 012215.mcd

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS FOR LESS THAN TEN SAMPLES TSD pgE-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

$n := 8$ Number of times the permittee will sample per month
 $k := 30$ Sample size of the data set
 NA $D := 0$ Detection Limit $l := 0, 1 \dots 1$ Counter
 $r := 0$ Number of nondetects $i := 1, 2 \dots k - r$ Counter
 $\delta := \frac{r}{k}$
 $Area_{95} := \frac{.95 - \delta}{1 - \delta}$ $Area_{95} = 0.95$ $Area_{99} := \frac{.99 - \delta}{1 - \delta}$ $Area_{99} = 0.99$
 $z_{99} := 2.33$ $z_{95} := 1.65$ Find from Table A-4 and insert Areas from the table

$x_i :=$ Daily data is best, use monthly averages if necessary

35
36.6
31.7
33.9
34.7
30.6
36.7
36.7
44
44.9
39.2
39.6
36.9
33
35.4
30.9
28.9
29.9
27.3
29.4
34.3
33.6
38.6
38.7
32.6
30
36.5
38.4
32.6
34.8
38.2
40.2
36.6
41.83
38.19
36.9

$y_i := \ln(x_i)$

$\mu_y := \sum_i \frac{y_i}{k - r}$

$\sigma_y := \sqrt{\sum_i \frac{(y_i - \mu_y)^2}{k - r - 1}}$

$E(x) := \delta \cdot D + (1 - \delta) \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2)$

$V(x) := (1 - \delta) \cdot \exp(2 \cdot \mu_y + \sigma_y^2) \cdot [\exp(\sigma_y^2) - (1 - \delta)] + \delta \cdot (1 - \delta) \cdot D \cdot (D - 2 \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2))$

$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)]^2}$ $B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2}$ $C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$

$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]}$

$\mu_n := \ln\left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)}\right] - 0.5 \cdot \sigma_n^2$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

Compare₂ :=

$\exp(\mu_y + z_{99} \cdot \sigma_y)$
D

$X_{95} := \max(\text{Compare})$

$X_{99} := \max(\text{Compare2})$

$X_{95} = 39.3$ monthly average interim limit $X_{99} = 49$ daily maximum interim limit

interim limits Bucklin Point Zinc 012215.mcd

36.3
33.5
35.3
31.4
34.8
40
53.8
45.8
38.8
43.37
39.3
34.7
39.1
40.7

interim limits Bucklin Point Zinc 012215.mcd

ATTACHMENT A-6

**Calculation of Allowable Chronic Discharge Limitations
Based on an Analysis Considering Antidegradation and Antibacksliding**

Facility : NBC Bucklin Point WWTF
 Parameter : Zinc

Input required data (use N/A when data is not available):

Chronic Metals Translator	:	0.946
Previous monthly average limit (Total)	:	76 ug/L
Historical discharge concentration (Total)	:	39.3 ug/L
Waterbody background concentration (Dissolved)	:	1.33 ug/L
Facility chronic dilution factor	:	2 x
Chronic criteria (Dissolved)	:	81 ug/L
Remaining Assimilative Capacity to be Allocated	:	20 %

Note: 20 % of the remaining assimilative capacity was allocated because NBC Bucklin Point has a well running approved pretreatment program and the facility has been given an excellent rating by the Department

Determine existing water quality:

$$C_p = \frac{(DF - 1) * C_b + 1 * (C_d * MT)}{DF} = 36.613 \text{ ug/L}$$

DF = Chronic Dilution Factor
 Cb = Background Data (Dissolved)
 Cd = Maximum of Historical Data or Previous Monthly Limit
 MT = Metals Translator (Use RI Conversion Factor if Site-Specific is Unavailable)

Since the resulting instream concentration is less than the chronic criteria, the water body is attaining and pursuant to 303(d)(4)(b) backsliding is only possible if the requirements of antidegradation can be met.

Calculation of the new chronic permit limit:

$C_{rac} = C_{criteria} - C_p$	=	44.387 ug/L	
Proposed Limit = $(C_p + \% * C_{rac}) * DF - (DF - 1) * C_b$		89.6508 ug/L	Dissolved
Proposed Limit = (Proposed Dissolved Limit/MT) =		94.76828753 ug/L	Total
Traditional Limit =		85.62 ug/L	

The antidegradation permit limit is greater than the limit which would result from using traditional procedures. Therefore, use the traditional chronic permit limit.

Chronic limit = 85.62 ug/L

Calculation of the new acute permit limit:

Acute Limit = 85.62 ug/L

Final Limits:

MONTHLY AVERAGE PERMIT LIMIT	:	85.62 ug/L
DAILY MAXIMUM PERMIT LIMIT	:	85.62 ug/L

ATTACHMENT A-7

**Summary of Detected State User Fee Data
June 2007 to October 2011**

Item#	Cycle	Date	Parameter	Conc., ug/L	min/max	n	tot	ave
1	20	10/30/2007	Antimony, Total	1	min	1	1	
2	21	12/10/2009	Antimony, Total	1		2	2	
3	22	12/9/2009	Antimony, Total	1		3	3	
4	24	10/6/2011	Antimony, Total	1		4	4	
5	19	9/20/2007	Antimony, Total	2	max	5	6	1.2
6	19	6/26/2007	Arsenic	1	min	1	1	
7	19	9/20/2007	Arsenic	1		2	2	
8	20	6/4/2008	Arsenic	1		3	3	
9	20	10/30/2007	Arsenic	1		4	4	
10	21	10/22/2009	Arsenic	1		5	5	
11	23	9/9/2010	Arsenic	1		6	6	
12	23	9/8/2010	Arsenic	1		7	7	
13	24	10/6/2011	Arsenic	1	max	8	8	1.0
14	21	10/22/2009	BOD	1000	min	1	1000	
15	19	9/20/2007	BOD	2000		2	3000	
16	22	4/20/2010	BOD	2000		3	5000	
17	23	9/9/2010	BOD	2000		4	7000	
18	23	9/8/2010	BOD	2000		5	9000	
19	24	10/6/2011	BOD	2000		6	11000	
20	19	6/26/2007	BOD	3000		7	14000	
21	20	10/30/2007	BOD	3000		8	17000	
22	22	12/9/2009	BOD	4000		9	21000	
23	21	12/10/2009	BOD	9000		10	30000	
24	20	6/4/2008	BOD	14000	max	11	44000	4000.0
25	21	12/10/2009	Chloroform	1	min	1	1	
26	21	10/22/2009	Chloroform	1.1		2	2.1	
27	24	10/6/2011	Chloroform	1.1		3	3.2	
28	20	6/4/2008	Chloroform	1.2		4	4.4	
29	22	12/9/2009	Chloroform	1.3		5	5.7	
30	19	6/26/2007	Chloroform	1.4		6	7.1	
31	22	4/20/2010	Chloroform	1.6	max	7	8.7	1.2
32	19	6/26/2007	Chromium, Total	1	min	1	1	
33	23	9/8/2010	Chromium, Total	1		2	2	
34	23	9/9/2010	Chromium, Total	1		3	3	
35	24	10/6/2011	Chromium, Total	1		4	4	
36	20	6/4/2008	Chromium, Total	2		5	6	
37	21	12/10/2009	Chromium, Total	2		6	8	
38	21	10/22/2009	Chromium, Total	2		7	10	
39	22	4/20/2010	Chromium, Total	2		8	12	
40	22	12/9/2009	Chromium, Total	2		9	14	
41	20	10/30/2007	Chromium, Total	17		10	31	
42	19	9/20/2007	Chromium, Total	21	max	11	52	4.7
43	22	4/20/2010	Copper, Total	5	min	1	5	
44	19	9/20/2007	Copper, Total	9		2	14	
45	19	6/26/2007	Copper, Total	9		3	23	
46	21	12/10/2009	Copper, Total	10		4	33	
47	21	10/22/2009	Copper, Total	10		5	43	
48	23	9/8/2010	Copper, Total	10		6	53	
Item#	Cycle	Date	Parameter	Conc., ug/L	min/max	n	tot	ave

49	23	9/9/2010	Copper, Total	10		7	63	
50	24	10/6/2011	Copper, Total	10		8	73	
51	22	12/9/2009	Copper, Total	12		9	85	
52	20	10/30/2007	Copper, Total	15		10	100	
53	20	6/4/2008	Copper, Total	17	max	11	117	10.6
54	23	9/8/2010	Diethyl Phthalate	18.34	max	1	18.34	18.3
55	20	10/30/2007	Lead, Total	2	min	1	2	
56	20	6/4/2008	Lead, Total	2		2	4	
57	19	9/20/2007	Lead, Total	4	max	3	8	2.7
58	22	4/20/2010	Nickel, Total	5	min	1	5	
59	23	9/8/2010	Nickel, Total	6		2	11	
60	23	9/9/2010	Nickel, Total	7		3	18	
61	24	10/6/2011	Nickel, Total	8		4	26	
62	21	10/22/2009	Nickel, Total	10		5	36	
63	22	12/9/2009	Nickel, Total	10		6	46	
64	21	12/10/2009	Nickel, Total	12		7	58	
65	20	6/4/2008	Nickel, Total	13		8	71	
66	19	6/26/2007	Nickel, Total	14		9	85	
67	19	9/20/2007	Nickel, Total	20		10	105	
68	20	10/30/2007	Nickel, Total	32	max	11	137	12.5
69	20	6/4/2008	Selenium, Total	4	max	1	4	4.0
70	21	12/10/2009	Settleable Solids	0.3	max	1	0.3	0.3
71	22	4/20/2010	Tetrachloroethene	2.3	min	1	2.3	
72	21	12/10/2009	Tetrachloroethene	2.7	max	2	5	2.5
73	20	6/4/2008	Toluene	1.2	max	1	1.2	1.2
74	23	9/9/2010	TSS	1200	min	1	1200	
75	19	6/26/2007	TSS	2000		2	3200	
76	19	9/20/2007	TSS	3000		3	6200	
77	23	9/8/2010	TSS	4800		4	11000	
78	24	10/6/2011	TSS	6400		5	17400	
79	20	10/30/2007	TSS	8000		6	25400	
80	22	4/20/2010	TSS	8000		7	33400	
81	22	12/9/2009	TSS	8000		8	41400	
82	20	6/4/2008	TSS	10000		9	51400	
83	21	10/22/2009	TSS	11000		10	62400	
84	21	12/10/2009	TSS	24000	max	11	86400	7854.5
85	24	10/6/2011	Zinc, Total	30	min	1	30	
86	20	6/4/2008	Zinc, Total	32		2	62	
87	19	6/26/2007	Zinc, Total	33		3	95	
88	23	9/9/2010	Zinc, Total	33		4	128	
89	23	9/8/2010	Zinc, Total	34		5	162	
90	22	4/20/2010	Zinc, Total	35		6	197	
91	20	10/30/2007	Zinc, Total	37		7	234	
92	21	12/10/2009	Zinc, Total	37		8	271	
93	22	12/9/2009	Zinc, Total	39		9	310	
94	19	9/20/2007	Zinc, Total	41		10	351	
95	21	10/22/2009	Zinc, Total	45	max	11	396	36.0

y

ATTACHMENT A-8

**Summary of Discharge Monitoring Report Data
July 2009 – June 2014**

**No Associated Facility Interest
DMR Data Summary 10/27/14**

***** NOT ICIS CERTIFIED*****

001A

BOD, 5-day, 20 deg. C Location= 1

	MO AVG lb/d	DAILY MX lb/d	
Mean	823.749	4234.703	
Minimum	176.	619.	
Maximum	3124.	30136.99	
Data Count	60	60	
	MO AVG mg/L	WKLY AVG mg/L	DAILY MX mg/L
Mean	4.3078	6.3068	16.8278
Minimum	1.	2.	3.
Maximum	13.34	23.45	106.37
Data Count	60	60	60

Cadmium, total [as Cd] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	.0491	.0859
Minimum	.007	.04
Maximum	.12	.3
Data Count	60	60

Chromium, hexavalent [as Cr] Location= 1

	MO AVG ug/L	DAILY MX ug/L	
Mean	3.9748	7.9833	
Minimum	.	.	<i>note:</i>
Maximum	48.5	128.	<i>Minimums = MDLs = 0</i>
Data Count	60	60	

Coliform, fecal general Location= 1

	MO GEO MPN/100mL	WKLY GEO MPN/100mL	DAILY MX MPN/100mL
Mean	6.175	11.3633	366.7917
Minimum	2.	2.	4.
Maximum	20.	67.	14957.8
Data Count	60	60	60

Copper, total [as Cu] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	9.2709	14.8287
Minimum	4.3	6.9
Maximum	20.23	99.3
Data Count	60	60

Cyanide, total [as CN] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	2.2528	3.6098
Minimum	.	.
Maximum	11.33	22.32
Data Count	60	60

note:
Minimums = MDLs = 0

Flow, in conduit or thru treatment plant Location

	MO AVG MGD	DAILY MX MGD
Mean	20.3022	34.0248
Minimum	15.38	21.85
Maximum	31.97	45.82
Data Count	60	60

Lead, total [as Pb] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	.5808	1.1696
Minimum	.	.
Maximum	1.889	7.
Data Count	60	60

note:
Minimums = MDLs = 0

Mercury, total [as Hg] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	.0047	.0128
Minimum	.002	.
Maximum	.0303	.112
Data Count	60	60

note:
Minimums = MDLs = 0

Nickel, total [as Ni] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	8.5833	16.6008
Minimum	2.5	5.3
Maximum	52.23	238.7
Data Count	60	60

Nitrogen, ammonia total [as N] Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	.8637	2.567
Minimum	.042	.15
Maximum	10.21	13.1
Data Count	60	60

Nitrogen, Kjeldahl, total [as N] Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	2.1982	4.8122
Minimum	.92	1.16
Maximum	12.88	26.
Data Count	60	60

Nitrogen, nitrate total [as N] Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	4.912	6.6952
Minimum	.304	.731

Maximum	8.37	11.8
Data Count	60	60

Nitrogen, nitrite total [as N] Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	.0738	.1479
Minimum	.017	.03
Maximum	.273	.533
Data Count	60	60

Nitrogen, total [as N] Location= 1

	MO AVG lb/d
Mean	1217.5228
Minimum	6.6
Maximum	2930.3
Data Count	60

	MO AVG mg/L	DAILY MX mg/L
Mean	23.1475	60.8055
Minimum	4.36	5.55
Maximum	964.87	1712.
Data Count	60	60

Oil & Grease Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	1.1322	1.145
Minimum	.	.
Maximum	4.93	5.7
Data Count	60	60

note:
Minimums = MDLs = 0

pH Location= 1

	MINIMUM SU	MAXIMUM SU
Mean	6.3167	6.8993
Minimum	5.1	6.53
Maximum	6.7	7.8
Data Count	60	60

Phosphorus, total [as P] Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	2.2425	3.2888
Minimum	1.22	2.09
Maximum	4.69	9.56
Data Count	60	60

Silver, total [as Ag] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	.3109	.5424
Minimum	.02	.051
Maximum	13.4	21.
Data Count	60	60

Solids, settleable Location= 1

	WKLY AVG mL/L	DAILY MX mL/L
Mean	.7658	5.165
Minimum	.	.
Maximum	17.14	120.
Data Count	60	60

note:
Minimums = MDLs = 0

Solids, total suspended Location= 1

	MO AVG lb/d	DAILY MX lb/d
Mean	1528.2927	8387.3843
Minimum	399.	936.
Maximum	5808.	67896.3
Data Count	60	60

	MO AVG mg/L	WKLY AVG mg/L	DAILY MX mg/L
Mean	7.9778	12.2502	33.0762
Minimum	3.	3.	6.
Maximum	23.4	74.7	303.3
Data Count	60	60	60

Ultraviolet light dosage Location= 1

	MO MIN mW-sec/cm2	MO AVG mW-sec/cm2	MO MAX mW-sec/cm2
Mean	44.485	58.4093	78.0315
Minimum	29.75	30.68	32.66
Maximum	90.86	162.23	160.06
Data Count	60	60	60

Ultraviolet light intensity Location= 1

	MO MIN mW/cm2	MO AVG mW/cm2	MO MAX mW/cm2
Mean	168.6587	227.1145	349.526
Minimum	38.3	109.67	136.71
Maximum	392.31	455.06	536.02
Data Count	60	60	60

Ultraviolet light transmittance Location= 1

	MO MIN %	MO AVG %	MO MAX %
Mean	67.3948	73.0023	77.1185
Minimum	46.4	68.15	72.96
Maximum	76.55	79.37	83.45
Data Count	60	60	60

Zinc, total [as Zn] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	36.1331	44.9788
Minimum	26.3	29.6
Maximum	53.8	142.
Data Count	60	60

BOD, 5-day, 20 deg. C Location= G

	MO AVG lb/d	DAILY MX lb/d
Mean	31596.9143	64719.1238
Minimum	24707.3	42941.7
Maximum	37970.	108140.12
Data Count	60	60

	MO AVG mg/L	WKLY AVG mg/L	DAILY MX mg/L
Mean	188.7318	208.3607	267.3703
Minimum	112.	127.	168.
Maximum	240.93	258.	479.
Data Count	60	60	60

Cadmium, total [as Cd] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	.625	.625
Minimum	.	.
Maximum	2.5	2.5
Data Count	60	60

note:
Minimums = MDLs = 0

Chromium, hexavalent [as Cr] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	35.337	52.1165
Minimum	13.75	21.
Maximum	75.22	295.
Data Count	60	60

Copper, total [as Cu] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	57.5153	85.6298
Minimum	8.37	35.32
Maximum	98.7	274.9
Data Count	60	60

Cyanide, total [as CN] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	2.161	4.2878
Minimum	.	.
Maximum	7.58	20.49
Data Count	60	60

note:
Minimums = MDLs = 0

Flow, in conduit or thru treatment plant Location

	MO AVG MGD	DAILY MX MGD
Mean	21.1323	45.728
Minimum	15.54	21.85
Maximum	40.84	112.83
Data Count	60	60

Lead, total [as Pb] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	3.6082	9.4352
Minimum	.	.
Maximum	14.77	72.6

note:
Minimums = MDLs = 0

Data Count 60 60

Mercury, total [as Hg] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	.0567	.1189
Minimum	.0189	.0342
Maximum	.1894	1.2
Data Count	60	60

Nickel, total [as Ni] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	11.4112	29.0102
Minimum	.	.
Maximum	30.9	233.1
Data Count	60	60

note:
Minimums = MDLs = 0

Silver, total [as Ag] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	1.069	1.6038
Minimum	.	.
Maximum	4.16	6.
Data Count	60	60

note:
Minimums = MDLs = 0

Solids, total suspended Location= G

	MO AVG lb/d	DAILY MX lb/d
Mean	26857.4645	65688.3802
Minimum	21007.	64.089
Maximum	34354.	171169.
Data Count	60	60

	MO AVG mg/L	WKLY AVG mg/L	DAILY MX mg/L
Mean	157.3045	175.785	244.4717
Minimum	102.	118.	138.
Maximum	205.	228.	443.
Data Count	60	60	60

Zinc, total [as Zn] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	104.5337	139.3657
Minimum	70.22	85.64
Maximum	142.	245.
Data Count	60	60

BOD, 5-day, percent removal Location= K

	MO AV MN %
Mean	97.5175
Minimum	90.4
Maximum	100.
Data Count	60

Solids, suspended percent removal Location= K

MO AV MN %
 Mean 94.5067
 Minimum 78.1
 Maximum 98.
 Data Count 60

001T

LC50 Statre 48Hr Acute Mysid. Bahia Location=

MINIMUM %
 Mean 95.
 Minimum .
 Maximum 100.
 Data Count 20

Noel Static 1Hr Fert. Chronic Arbacia Location=

MINIMUM %
 Mean 91.25
 Minimum 25.
 Maximum 100.
 Data Count 20

002A

Flow, in conduit or thru treatment plant Location

	30DA AVG MGD	DAILY MX MGD
Mean	.9898	1.4818
Minimum	.	.
Maximum	6.66	20.44
Data Count	49	49

note:
 Minimums = MDLs = 0

003A

BOD, 5-day, 20 deg. C Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	55.8798	69.1327
Minimum	28.1	28.8
Maximum	110.25	146.2
Data Count	55	55

Chlorine, total residual Location= 1

	MINIMUM ug/L	AVERAGE ug/L	MAXIMUM ug/L
Mean	122.4727	208.8564	456.3327
Minimum	20.	40.	50.
Maximum	3100.	3100.	7980.
Data Count	55	55	55

Coliform, fecal general Location= 1

	MO AVG MPN/100mL	DAILY MX MPN/100mL
Mean	119.7163	571.4694
Minimum	2.	2.
Maximum	2800.	14000.
Data Count	49	49

Flow, in conduit or thru treatment plant Location

	MO AVG MGD	DAILY MX MGD
Mean	7.3429	13.8736
Minimum	.34	.34
Maximum	27.49	71.12
Data Count	55	55

pH Location= 1

	MINIMUM SU	MAXIMUM SU
Mean	6.708	7.0636
Minimum	5.9	6.4
Maximum	8.	8.
Data Count	55	55

Solids, total suspended Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	59.4291	78.7727
Minimum	31.	31.
Maximum	134.3	189.
Data Count	55	55

BOD, 5-day, percent removal Location= K

	MO AV MN %
Mean	75.8648
Minimum	20.
Maximum	97.5
Data Count	54

Solids, suspended percent removal Location= K

	MO AV MN %
Mean	88.8185
Minimum	42.
Maximum	743.
Data Count	54

ATTACHMENT A-9

**Comparison of Allowable Limits with Discharge Monitoring Report Data
and State User Fee Data**

Facility Name: Bucklin Point WWTF
RIPDES Permit #: RI0100072

Outfall #: 001A

NOTE: METALS LIMITS ARE TOTAL METALS

Parameter	CAS #	Concentration Limits (ug/L) Based on WQ Criteria		Antideg. Limits (ug/L) Monthly Ave	Ave UFP Data (ug/L) 6/07 - 10/11		Ave. DMR Data (ug/L) 7/09-6/14		Potential Limits (ug/L)		Reasonable Potential?	
		Daily Max	Monthly Ave		Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave		
PRIORITY POLLUTANTS												
TOXIC METALS AND CYANIDE												
ANTIMONY	7440360	No Criteria	1024.00	---	2	1.2	---	---	---	1024	N	
ARSENIC (limits are total recoverable)	7440382	62.10	1.48	---	1	1	---	---	62.1	1.48	N	
ASBESTOS	1332214	No Criteria	No Criteria	---	---	---	---	---	---	---	NA	
BERYLLIUM	7440417	No Criteria	No Criteria	---	---	---	---	---	---	---	NA	
CADMIUM (limits are total recoverable)	7440439	37.82	16.60	---	---	---	0.086	0.049	37.81512605	16.60189076	N	
CHROMIUM III (limits are total recoverable)	16065831	No Criteria	No Criteria	---	---	---	---	---	---	---	NA	
CHROMIUM VI (limits are total recoverable)	18540299	996.98	90.36	60	21	4.7	7.98	3.97	996.978852	60	N	
COPPER (limits are total recoverable)	7440508	6.45	6.45	---	17	10.6	14.83	9.27	6.447761194	6.447761194	Y	
CYANIDE	57125	0.80	0.80	---	---	---	3.61	2.25	0.8	0.8	Y	
LEAD (limits are total recoverable)	7439921	1369.57	105.08	31.6	4	2.7	1.17	0.58	1369.565217	31.6	N	
MERCURY (limits are total recoverable)	7439976	1.91	0.27	0.09	---	---	0.013	0.0047	1.905882353	0.09	N	
NICKEL (limits are total recoverable)	7440020	70.33	15.08	14.3	32	12.5	16.60	8.58	70.32734952	14.3	Y	
SELENIUM (limits are total recoverable)	7782492	261.52	127.99	---	4	4	---	---	261.5230461	127.9859719	N	
SILVER (limits are total recoverable)	7440224	3.50	No Criteria	---	---	---	0.54	0.31	3.4869932515	---	N	
THALLIUM	7440280	No Criteria	0.75	---	---	---	---	---	---	0.752	N	
ZINC (limits are total recoverable)	7440666	85.62	85.62	94.8	45	36	44.98	36.13	85.62367865	85.62367865	Y	
VOLATILE ORGANIC COMPOUNDS												
ACROLEIN	107028	No Criteria	464.00	---	---	---	---	---	---	464	N	
ACRYLONITRILE	107131	No Criteria	4.00	---	---	---	---	---	---	4	N	
BENZENE	71432	No Criteria	816.00	---	---	---	---	---	---	816	N	
BROMOFORM	75252	No Criteria	2240.00	---	---	---	---	---	---	2240	N	
CARBON TETRACHLORIDE	56235	No Criteria	25.60	---	---	---	---	---	---	25.6	N	
CHLOROBENZENE	108907	No Criteria	2560.00	---	---	---	---	---	---	2560	N	
CHLORODIBROMOMETHANE	124481	No Criteria	208.00	---	---	---	---	---	---	208	N	
CHLOROFORM	67663	No Criteria	7520.00	---	1.6	1.2	---	---	---	7520	N	
DICHLOROBROMOMETHANE	75274	No Criteria	272.00	---	---	---	---	---	---	272	N	
1,2DICHLOROETHANE	107082	No Criteria	592.00	---	---	---	---	---	---	592	N	
1,1DICHLOROETHYLENE	75354	No Criteria	11360.00	---	---	---	---	---	---	11360	N	
1,2DICHLOROPROPANE	78875	No Criteria	240.00	---	---	---	---	---	---	240	N	
1,3DICHLOROPROPYLENE	542756	No Criteria	33.60	---	---	---	---	---	---	33.6	N	
ETHYLBENZENE	100414	No Criteria	3360.00	---	---	---	---	---	---	3360	N	
BROMOMETHANE (methyl bromide)	74839	No Criteria	2400.00	---	---	---	---	---	---	2400	N	
CHLOROMETHANE (methyl chloride)	74873	No Criteria	No Criteria	---	---	---	---	---	---	---	NA	

RIPDESSum

Attachment A-9

METHYLENE CHLORIDE	75092	No Criteria	9440.00						9440	N
1,1,2,2-TETRACHLOROETHANE	79345	No Criteria	64.00						64	N
TETRACHLOROETHYLENE	127184	No Criteria	52.80	2.7	2.5				52.8	N
TOLUENE	108883	No Criteria	24000.00	1.2	1.2				24000	N
1,2-TRANS-DICHLOROETHYLENE	156605	No Criteria	16000.00						16000	N
1,1,1-TRICHLOROETHANE	71556	No Criteria	No Criteria							NA
1,1,2-TRICHLOROETHANE	79005	No Criteria	256.00						256	N
TRICHLOROETHYLENE	79016	No Criteria	480.00						480	N
VINYL CHLORIDE	75014	No Criteria	3.84						3.84	N
ACID ORGANIC COMPOUNDS										
2-CHLOROPHENOL	95578	No Criteria	240.00						240	N
2,4-DICHLOROPHENOL	120832	No Criteria	464.00						464	N
2,4-DIMETHYLPHENOL	105679	No Criteria	1360.00						1360	N
4,6-DINITRO-2-METHYL PHENOL	534521	No Criteria	448.00						448	N
2,4-DINITROPHENOL	51285	No Criteria	8480.00						8480	N
4-NITROPHENOL	88755	No Criteria	No Criteria							NA
PENTACHLOROPHENOL	87865	10.40	10.40				10.4		10.4	N
PHENOL	108952	No Criteria	272000.00						272000	N
2,4,6-TRICHLOROPHENOL	88062	No Criteria	38.40						38.4	N
BASE NEUTRAL COMPOUNDS										
ACENAPHTHENE	83329	No Criteria	1584.00						1584	N
ANTHRACENE	120127	No Criteria	64000.00						64000	N
BENZIDINE	92875	No Criteria	0.00						0.0032	N
POLYCYCLIC AROMATIC HYDROCARBONS										
BIS(2-CHLOROETHYL)ETHER	111444	No Criteria	0.29						0.288	N
BIS(2-CHLOROISOPROPYL)ETHER	108601	No Criteria	8.48						8.48	N
BIS(2-ETHYLHEXYL)PHTHALATE	117817	No Criteria	104000.00						104000	N
BUTYL BENZYL PHTHALATE	85687	No Criteria	35.20						35.2	N
2-CHLORONAPHTHALENE	91587	No Criteria	3040.00						3040	N
1,2-DICHLOROBENZENE	95501	No Criteria	2560.00						2560	N
1,3-DICHLOROBENZENE	541731	No Criteria	2080.00						2080	N
1,4-DICHLOROBENZENE	106467	No Criteria	1536.00						1536	N
3,3-DICHLOROBENZIDENE	91941	No Criteria	304.00						304	N
DIETHYL PHTHALATE	84662	No Criteria	0.45						0.448	N
DIMETHYL PHTHALATE	131113	No Criteria	70400.00	18.34	18.34				70400	N
Di-n-BUTYL PHTHALATE	84742	No Criteria	1760000.00						1760000	N
2,4-DINITROTOLUENE	121142	No Criteria	7200.00						7200	N
1,2-DIPHENYLHYDRAZINE	122667	No Criteria	54.40						54.4	N
FLUORANTHENE	206440	No Criteria	3.20						3.2	N
FLUORENE	86737	No Criteria	224.00						224	N
HEXACHLOROBENZENE	118741	No Criteria	8480.00						8480	N
HEXACHLOROBUTADIENE	87683	No Criteria	0.00						0.00464	N
HEXACHLOROCYCLOPENTADIENE	77474	No Criteria	288.00						288	N
		No Criteria	1760.00						1760	N

