RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 Promenade Street, Providence, Rhode Island 02908

CERTIFIED MAIL

November 13, 2020

Mr. Kevin Cleary
Town Engineer
Town of Smithfield
64 Farnum Pike
Smithfield, RI 02917

RE: Response to Permittee Comments on the 14-Day Draft Permit
Smithfield WWTF (RIPDES Permit No. RI0100251)

Dear Mr. Cleary:

On April 2, 2020, the Rhode Island Department of Environmental Management (DEM), Rhode Island Pollutant Discharge Elimination System (RIPDES) Program sent a copy of the proposed draft permit to the Town of Smithfield (Town) for comment. Comments were received from the Town by hard copy via a letter dated June 25, 2020. This correspondence is being written in response to the Town's June 25, 2020 comment letter on the proposed draft RIPDES permit. The following is a synopsis of the comments DEM received on the proposed draft permit, and DEM's response to those comments.

Comment 1. In the June 25, 2020 comment letter, the Town commented on the permit limits for bis (2-ethylhexyl) phthalate (DEHP). The Town notes DEHP is a common laboratory contaminate and that if samples, having suspected lab contamination, are removed from the priority pollutant scan data, then there is not a reasonable potential to exceed water quality criteria. The Town requested that the DEHP limit be removed from the permit or, at most, a monitor only requirement should be included.

Response 1. When characterizing effluent, DEM will include all relevant data to identify pollutants of concern, including priority pollutant scans and any other effluent monitoring. Per RIPDES regulations at 250-RICR-150-10-1.16(A)(5)(b), effluent limitations must control all pollutants which may be discharged at a level that has the reasonable potential to cause or contribute to an excursion above any State water quality criteria. Based on the permit reapplication data, dated May 14, 2018, DEHP was detected and quantified in the effluent sample. Therefore, DEM must determine if there is reasonable potential for the effluent to contribute to an excursion of water quality criteria. To determine if there is a reasonable potential to cause or contribute to an excursion of water quality standards, DEM determines if the effluent pollutant concentration is greater than or equal to 50% of the water quality criteria. The permit reapplication data showed a daily maximum and monthly average

concentration of 34.4 and 20 µg/L, respectively, an exceedance of greater than 50% of the chronic aquatic life criteria in the Rhode Island Water Quality Regulations at 250-RICR-150-05-1.26(J)(4) Therefore, there is reasonable potential for the effluent to contribute to an excursion of water quality criteria and DEM must establish effluent limitations for DEHP.

DEM recognizes that the data set in the permit reapplication used in the reasonable potential analysis is limited and may not be representative of typical effluent composition. Because of the limitations of the data and per the Town's comments and technical justification for DEHP detection in the priority pollutant scan, DEM has modified the Town's permit to include language that, if after one year of monitoring DEHP, all samples are reported as non-detected at the MDL specified in this permit, the monitoring for DEHP may be suspended.

Comment 2. Citing total phosphorus and dissolved oxygen data for the Woonasquatucket River, the Town requested that the river be reassessed for its impairment and a TMDL be completed prior to changing the permit limit. The Town notes that the closure of Alexion Pharmaceuticals could have improved water quality in the river.

Response 2. DEM separates the Woonasquatucket River into four segments, two of which are downstream of the Smithfield WWTF (RI0002007R-10C and RI0002007R-10D). Both segments are included on the DEM's 303(d) List of Impaired Waters for dissolved oxygen impairments.

In 2010 and 2011, the Environmental Protection Agency (EPA) conducted dissolved oxygen surveys in the Woonasquatucket River at the request of DEM to evaluate whether reductions in phosphorus loads had resulted in the waterbody achieving water quality standards. Continuous water quality monitoring equipment were installed at four impoundments – Greystone Mill Pond, Allendale Mill Pond, Lyman Mill Pond, and Manton Pond. Deployments lasted about one-week and many locations had two deployments each year. In 2010, oxygen dropped below the instantaneous criterion (5 mg/L) at Greystone Mill Pond, Allendale Mill Pond, and Lyman Mill Pond. In 2011, violations in the percent saturation criterium were observed at Manton Pond. There are also sporadic dissolved oxygen violations in the instantaneous criterion (5 mg/L) in grab samples collected by Watershed Watch between 2010 and 2017. As a result, DEM was not able to delist the oxygen impairments for the Woonasquatucket River because impairments were observed.

DEM recognizes that the closure of Alexion Pharmaceuticals may have reduced total phosphorus in the Smithfield WWTF influent, thereby reducing nutrient discharges from the treatment process. However, effluent limitations in RIPDES permits apply only to direct discharges and must be protective of water quality standards. Any issue the treatment facility encounters with high BOD or total phosphorus levels in the influent should be addressed through appropriate local limits for indirect dischargers via the Town's Industrial Pretreatment Program.

Comment 3. The Town requested that a compliance schedule be added to the permit should DEM decide to retain the lower total phosphorus limit and that DEM hold the permit limit in abeyance for the duration of the testing operational changes, which would be codified in a compliance schedule.

Response 3. Since the Rhode Island Water Quality Regulations do not allow for compliance schedules to be included in RIPDES permits, DEM is unable to include a compliance schedule directly in the permit. However, after review of the Town's comments, the DEM is willing to enter into a consent agreement with the Town that will establish interim limits based on all relevant historic discharge concentrations and a schedule for the permittee to evaluate their ability to meet the final limits and attain compliance with these limits. The Fact Sheet has been modified to indicate that the DEM is willing to enter into a consent agreement for total phosphorus.

In order for the DEM to enter a consent agreement, the Town must comment on any new permit conditions/limits that cannot be achieved during the public notice period (i.e., the new total phosphorus limit). This will preserve the Town's ability to enter into a consent agreement. The specific details of the consent agreement will be negotiated with the Town subsequent to permit issuance.

Please note that, although not part of the Town's June 25, 2020 comment letter, the DEM would like to acknowledge receipt of the Town's October 23, 2020 e-mail regarding the Providence Water Supply Board's use of ortho-phosphate in its municipal water supply for corrosion control. The Town indicated that it is concerned that the use of ortho-phosphate for corrosion control may result in increased phosphorus loadings to the WWTF and impact the Town's ability to meet the new phosphorus permit limit. The DEM recognizes that the use of ortho-phosphate may have impacts on the phosphorus levels in the WWTF's influent. As a result, the evaluation of potential impacts and treatment solutions will be included as part of the above-mentioned consent agreement's compliance schedule.

Comment 4. The Town had a comment regarding the total phosphorus limit, noting that no water quality data was presented by DEM in the Fact Sheet which supports the claim that the discharge of phosphorus from the Town's WWTF is impairing usages in the river. The Town commented that it is unclear when the Woonasquatucket River was last assessed based on publicly facing documents.

Response 4. As discussed in Response 2, both segments of the Woonasquatucket River downstream of the Smithfield WWTF are listed as impaired for dissolved oxygen and are not meeting the Fish and Wildlife Habitat designated use. As explained in the Fact Sheet, excessive levels of phosphorus will cause cultural eutrophication, promoting the growth of nuisance algae and rooted aquatic plants. The nuisance aquatic species contribute to the impairment through the consumption of more oxygen, reducing the dissolved oxygen level in the river. EPA regulations at 40

CFR § 122.44(d)(1)(i) state that "limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level that will cause, have the reasonable potential to cause, or **contribute to an excursion** above any state water quality standard, including state narrative criteria for water quality" [emphasis added]. Therefore, the Smithfield WWTF need not be the only contributor, or even the primary contributor of pollutants that cause cultural eutrophication for effluent limitations on nutrients to be established.

The Woonasquatucket River was last assessed in 2016 and was unable to be removed from the 303(d) list due to impairments, as discussed in Response 2. More information on the state 303(d) list can be found at http://www.dem.ri.gov/programs/water/quality/.

Comment 5. The Town had another comment on the total phosphorus limit, noting that the WWTF phosphorus almost always meets the proposed summertime limits but will need additional facility improvements to consistently meet the proposed reduced limit. As such, the Town requested a compliance schedule be added to allow time to make changes to the treatment process.

Response 5. DEM does agree that the Smithfield WWTF, as currently designed and operated, may not be able to meet the proposed total phosphorus limit. As indicated in Response 3, DEM is willing to establish interim limits and a schedule for compliance by entering into a consent agreement with the Town.

Comment 6. The Town had another comment about riverine total phosphorus concentrations, citing data from URI's Watershed Watch Program. The Town noted that from 2014 to 2017 the total phosphorus concentrations downstream of the site almost always met the ecoregion guideline of 23.75 µg/L.

Response 6. As discussed in Response 4, DEM must establish water quality-based effluent limitations for point sources when the discharge has a reasonable potential to contribute to an excursion above any state water quality standard. The Rhode Island Water Quality Regulations at 250-RICR-150-05-1.18(N)(1) requires the use of the seven-day 10-year low flow (7Q10) of the receiving stream to be used in calculating the concentrations of discharged pollutants for the purpose of developing RIPDES permit conditions. The RIPDES Program has recently reevaluated 7Q10 values using long-term stream gauges across Rhode Island. Based on the recent assessment, it was found that the 7Q10 for the Woonasquatucket River decreased from 4.240 to 2.689 cfs, resulting in a lower limit for total phosphorus due to a lower dilution factor. Per RIPDES Regulations at 250-RICR-150-10-1.18(B)(1), calculations for permit conditions shall be based on design flow of the treatment facility. The Smithfield WWTF design flow is 3.5 million gallons per day (MGD) based on the April 2010 Facilities Plan Amendment and 2011 Tertiary Treatment Upgrade documents. Although DEM recognizes that the actual in-stream phosphorus concentrations were below the target criterion in the URI Watershed

Watch data, the conditions during data collection are not reflective of how RIPDES permit limits are developed because the river and effluent are not at critical conditions (i.e., 7Q10 river flow and WWTF design flow).

Comment 7. Regarding the basis for the total phosphorus permit limit, the Town commented that suggested concentrations in the Gold Book are not a valid basis for setting site-specific permit limits. The Town cited the Gold Book, saying that certain waterways might not be subject to eutrophication at total phosphorus concentrations above 100 µg/L, and site-specific factors must be considered. The Town also mentioned that, as DEM acknowledges, just as ecoregion guidelines are not criteria the Gold Book guidelines should also not be considered criteria for the purpose of setting permit limits.

Response 7. As discussed in the Fact Sheet, § 1.10(B)(4) of the Rhode Island Water Quality Regulations requires that nutrients shall not exceed the limitations specified in §§ 1.10(D)(1) and 1.10(E)(1) and/or more site-specific limits necessary to prevent or minimize accelerated or cultural eutrophication. Per RIPDES Regulations at § 1.16(g)(1), when a chemical pollutant present in an effluent has the reasonable potential to contribute to an excursion above a narrative criterion within an applicable state water quality standard, permitting authorities may establish effluent limits using a calculated numeric criterion which the permitting authority demonstrates will maintain applicable narrative criteria and fully protect the designated use. DEM uses the Gold Book and ecoregion criteria to interpret narrative nutrient criteria for total phosphorus. DEM acknowledges, per the Gold Book, that certain streams may not be subject to eutrophication at concentrations greater than 100 µg/L. However, the Gold Book also notes that "eutrophication problems may occur in waters where the phosphorus concentration is less than that indicated above and, obviously, such waters would need more stringent nutrient limits." To further determine an appropriate total phosphorus criterion for Rhode Island Waters, DEM considered guidance from EPA nutrient guidelines developed for the Eastern Coastal Plain ecoregion, which specifically are intended to address cultural eutrophication. The concentration values presented in the ecoregion guidance "generally represent nutrient levels that protect against the adverse effects of nutrient overenrichment." The 23.75 µg/L value was determined by EPA to be a suitable target ("reference condition") for the Northern Coastal Zone subecoregion, where rivers and streams will be minimally impacted and protective of designated uses. Thus, while not site-specific, the 23.75 µg/L target is region-specific, and the higher DEM target of 67 µg/L provides for even more management flexibility. Moreover, per Rhode Island Water Quality Regulations, phosphates shall be removed from existing discharges to the extent that such removal is technically and reasonably feasible. As stated in the Fact Sheet, DEM has previously determined that a 0.1 mg/L total phosphorus effluent concentration are both technically and reasonably feasible using existing treatment technologies.

Comment 8. The Town had another comment on the basis for the total phosphorus permit limit. The Town presented data showing that from 2014 to 2017, the dissolved oxygen

concentrations downstream of the treatment facility generally have met the state water quality standard of 5 mg/L. The Town noted that two of the three violations were in 2016, which was a year with exceptionally low flow.

Response 8. As discussed in Response 2, DEM was unable to delist the impairment for dissolved oxygen during a previous assessment of the waterbody. Additionally, as mentioned in Response 6, the calculations used to develop permit conditions are based on critical effluent and stream flows, which are the wastewater treatment facility design flow and the 7Q10 flow, respectively. Therefore, although the segment of the Woonasquatucket River may generally meet the instantaneous water quality standard for dissolved oxygen when sampled, the flows (stream and WWTF) during data collection are not necessarily reflective of the critical conditions for the purpose of establishing permit limits. To that end, the violations of the dissolved oxygen standard during low flows in 2016, as shown in the comments, serve as further justification for the permit limit.

Comment 9. The Town had a comment regarding DEM's language in the Draft Permit Fact Sheet. Citing 40 CFR § 131.11 and § 122.44(d), Town noted that the Clean Water Act does not permit DEM's claim that the discharge of phosphorus may be contributing to an impairment. The Town noted that per the CWA and federal court cases, the approach taken to establish criteria must be scientifically defensible. The Town cited another court case which concluded that agency decisions may not be based on "sheer guess work" and noted that DEM may not claim that phosphorus is the cause of the impairment in the Woonasquatucket River because it has caused impairments in other waters. The Town claimed that § 303(d) and § 130 require a site-specific determination of an impairment and its cause.

Response 9. The 0.1 mg/L limit on total phosphorus based on narrative water quality criteria is scientifically defensible and consistent with the Clean Water Act. The impact that excessive phosphorus has on freshwater systems is known. As described in the Fact Sheet, because the Woonasquatucket River is a freshwater system, excessive levels of phosphorus will promote the growth of nuisance algae and rooted aquatic plants. Causing cultural eutrophication and impairing uses assigned to the waterbody is a violation of the Rhode Island Water Quality standards, per §§ 1.10(D)(1) and 1.10(E)(1).

As discussed in Response 4, per 40 CFR § 122.44(d) limitations must be placed on pollutants that have a reasonable potential to contribute to an excursion above any state water quality standard, including state narrative criteria for water quality. DEM does not claim that total phosphorus or the Smithfield WWTF effluent is the sole cause of eutrophication or usage impairment in the Woonasquatucket River, nor is DEM required to make these claims per Clean Water Act or EPA regulations. Based on the analysis done by DEM, the Smithfield WWTF effluent has a reasonable potential to contribute to an excursion of the state narrative criteria for nutrients. As a result, DEM is required to set effluent limitations on total phosphorus that bring the water body into attainment with state water quality

standards. The lower proposed limit for total phosphorus is based on a lower 7Q10 flow for the Woonasquatucket River segment. The need to identify the cause of an impairment does not absolve direct dischargers of effluent limitations based on the reasonable potential to contribute to an excursion of water quality criteria.

Comment 10. The Town had a comment on the requirement that the Town submit a Resiliency Plan and a schedule of short and long-term actions that will be taken to protect collection and treatment assets. The Town requested clarification of the terms "natural hazards" and "high hazard events" and that the permit be revised to reflect the clarification of terms.

Response 10. The intent of the required resiliency study is to both further the analysis of the 2017 DEM study and to incorporate other hazards that the DEM study did not evaluate but that the permittee believes to be reasonable threats to the operations and maintenance, and thus compliance, of the facility.

While flooding is the chief hazard that is typically examined within any study of infrastructure resiliency, other natural hazards should also be evaluated--especially those that are predicted to increase in frequency due to climate change. These may include but not be limited to wind (and associated wind-driven debris from neighboring structures), lightning, and snow (which may impact facility access).

Each facility/community is encouraged to consider what may be a "high hazard event" for the said facility. That is, natural hazards that may not have a high annual probability of occurrence at present but that would cause high levels of damage should they occur. For instance, hurricane-induced storm surge may be a high-hazard event for a coastal facility, even if the frequency of such storms is not currently high, but such storm surge and wave action would not be a factor at inland facilities.

As such, DEM has not formally defined these terms and is instead allowing the authors of the resiliency plan to develop a study that is most useful to the facility under consideration. DEM welcomes and encourages the study's authors to work with DEM's Operations and Maintenance staff at any time throughout the study's development should incremental and collaborative guidance be requested.

The law requires public notice to be given of the preparation of a draft permit to allow opportunity for public comments and, if necessary, a public hearing. The DEM appreciates Smithfield's cooperation throughout the development of this permit and, as can be seen from the attached public notice, the public comment period for this permit opens on November 13, 2020.

As indicated above, the DEM is willing to enter into a Consent Agreement that establishes interim limits and a compliance schedule for the Town to comply with any new/more stringent limits. In order for the DEM to enter into a consent agreement, it will be necessary for the Town to identify any limits that it will be unable to comply with (i.e., total phosphorus) and express a willingness

to enter into a consent agreement **in writing during the public notice period**. Following the close of the public comment period, the final permit will be issued provided that no new substantial questions are raised. If new questions develop during the comment period, it may be necessary to draft a new permit, revise the Fact Sheet, and/or reopen the public comment period. The DEM will work with the Town on the conditions of a consent agreement after the final permit has been issued.

If you have any questions or would like to discuss any of the conditions contained in this draft permit, do not hesitate to contact Max Maher of the State Permits Staff at (401) 222-4700, extension 7201.

Sincerely,

Joseph B. Haberek, P.E.
Environmental Engineer IV

ecc: Randy R. Rossi, MBA, CGFM, Town Manager
Kevin Regan, Project Manager, Veolia Water
Kevin Schott, PE, CDM-Smith
Traci Pena, DEM/OWR
Crystal Charbonneau, DEM/OWR

Enclosures

AUTHORIZATION TO DISCHARGE UNDER THE
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM

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

The Town of Smithfield
64 Farnum Pike
Smithfield, RI 02917

is authorized to discharge from a facility located at the

Smithfield Wastewater Treatment Plant
20 Esmond Mill Drive
Smithfield, Rhode Island 02917

to receiving waters named

Woonasquatucket River
RI0002007R-10C

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

This permit shall become effective on _____

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

This permit supersedes the permit issued on September 27, 2013.

This permit consists of 22 pages in Part I including effluent limitations, monitoring requirements, etc., 67 pages in the Fact Sheet including attachments, and 10 pages in Part II including General Conditions.

Signed this_____ day of _____, 2020.

DRAFT

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

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 001A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirements	
	Quantity - lbs/day		Concentration – units specified				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Flow	3.5 MGD					Continuous	Recorder
$CBOD_5$ (May-Oct)	292	496	10 mg/L	15 mg/L	17 mg/L	3/Week	24 hr comp.
$CBOD_5$ (Nov-Apr)	437	729	15 mg/L	25 mg/L	25 mg/L	3/Week	24 hr comp.
$CBOD_5$ % Removal			85%			1/Month	Calculated
TSS (May-Oct)	437	729	15 mg/L	20 mg/L	25 mg/L	3/Week	24 hr comp.
TSS (Nov-Apr)	437	729	15 mg/L	25 mg/L	25 mg/L	3/Week	24 hr comp.
TSS - % Removal			85%			1/Month	Calculated
Settleable Solids				--- ml/L	--- ml/L	1/Day	Grab
Oil and Grease					--- mg/L	1/Month	3 Grabs[1]

[1] Three (3) grab samples shall be taken, equally spaced over one (1) eight- (8-) hour working shift, with a minimum of three (3) hours between grabs. Each of the three (3) grab samples must be analyzed individually.

Testing for TSS and $CBOD_5$ shall be performed and reported on influent and effluent with appropriate allowances for hydraulic detention time. Sampling for TSS shall be performed on Tuesday, Thursday, and either Saturday or Sunday. Two (2) of the $CBOD_5$ samples shall be taken at the same time as two (2) of the TSS samples. Sampling for Flow and Settleable Solids shall be performed Sunday-Saturday.

---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 001A. (Final discharge after dechlorination).

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 001A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirements	
	Quantity - lbs/day		Concentration – units specified				
	Average Monthly	Maximum Daily	Average Monthly * (Minimum)	Average Weekly * (Average)	Maximum Daily * (Maximum)	Measurement Frequency	Sample Type
Enterococci			54 cfu[1] / 100 ml		175 cfu[1] / 100 ml	3/Week	Grab
Fecal Coliform			--- MPN[1] / 100 ml		--- MPN[1] / 100 ml	1/Month	Grab
Total Residual Chlorine (TRC)			16.1 µg/L[3]		27.8 µg/L	Continuous	Recorder[2]
pH			(6.5 SU)		(9.0 SU)	2/Day	Grab

[1] Two (2) of the three (3) Enterococci samples are to be taken on Tuesday and Thursday at the same time as one of the TRC samples. The Fecal Coliform sample shall be taken at the same time as one of the Enterococci samples. The Geometric Mean shall be used to obtain the "monthly average" for Enterococci.

[2] The use of a continuous TRC recorder after chlorination and prior to dechlorination is required to provide a record that proper disinfection was achieved at all times. Compliance with these limitations shall be determined by taking a minimum of three (3) grab samples, Monday-Friday (except Holidays), equally spaced over one (1) eight- (8-) hour working shift with a minimum of three (3) hours between grabs, and on Saturdays, Sundays, and Holidays by taking at least two (2) grab samples each day with a minimum of two (2) hours between grabs. The Maximum Daily and Average Monthly values are to be computed from the averaged grab sample results for each day. The following methods may be used to analyze the grab samples: (1) Low Level Amperometric Titration, Standard Methods (18th Edition) No. 4500-Cl E; and (2) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G.

[3]The limit at which compliance/noncompliance determinations will be based is the Quantitation Limit, which is defined as 20 ug/l for TRC. This value may be reduced by permit modification as more sensitive methods are approved by EPA and the State.

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

Sampling for TRC and pH shall be performed Sunday-Saturday.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A. (Final discharge after dechlorination).

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 001A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirements	
	Quantity - lbs/day		Concentration – units specified				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Phosphorus,Total (Apr-Oct)			0.1 mg/L		--- mg/L	3/Week	24-hr comp
Phosphorus,Total (Nov-Mar)			1.0 mg/L		--- mg/L	1/Week	24-hr comp
Ortho-phosphorus (Nov-Mar)			--- mg/L		--- mg/L	1/Week	24-hr comp
Nitrate,Total (as N) (May-Oct)			--- mg/L		--- mg/L	3/Week	24-hr comp
Nitrate,Total (as N) (Nov-Apr)			--- mg/L		--- mg/L	1/Month	24-hr comp
Nitrite, Total (as N) (May-Oct)			--- mg/L		--- mg/L	3/Week	24-hr comp
Nitrite,Total (as N) (Nov-Apr)			--- mg/L		--- mg/L	1/Month	24-hr comp
TKN (as N) (May-Oct)			--- mg/L		--- mg/L	3/Week	24-hr comp
TKN (as N) (Nov-Apr)			--- mg/L		--- mg/L	1/Month	24-hr comp
Total Nitrogen (TKN + NO_2 + NO_3) (May-Oct)	--- lb/day		10.0 mg/L[1]		--- mg/L	3/Week	Calculated
Total Nitrogen (TKN + NO_2 + NO_3) (Nov-Apr)	--- lb/day		--- mg/L[1]		--- mg/L[1]	1/Month	Calculated
Ammonia,Total (as N)) (May-Oct)			2.9 mg/L		35.3 mg/L	3/Week	24-hr comp
Ammonia,Total (as N) (Nov-Apr)			11.2 mg/L		68 mg/L	1/Week	24-hr comp

[1] 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 methanol addition.

--- 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 001A. (Final discharge after dechlorination).

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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

Effluent Characteristic	Discharge Limitations					Monitoring Requirements	
	Quantity - lbs/day		Concentration – units specified				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Total Cadmium			0.14 µg/L[1]		0.8 µg/L	1/Week	24-hr comp
Total Cyanide			6.2 µg/L		26.3 µg/L	1/Week	Composite[2]
Total Lead			0.86 µg/L		23.7 µg/L	1/Week	24-hr comp
Total Zinc			52.6 µg/L		57.0 µg/L	1/Week	24-hr comp
Total Copper			--- µg/L		--- µg/L	1/Quarter	24-hr comp
Total Nickel			--- µg/L		--- µg/L	1/Quarter	24-hr comp
Total Aluminum			--- µg/L		--- µg/L	1/Quarter	24-hr comp
Total Iron			--- µg/L		--- µg/L	1/Week	24-hr comp

[1]The limit at which compliance/noncompliance determinations will be made is the ML which is defined as 0.2 µg/L for Total Cadmium. This value may be reduced by permit modification as more sensitive methods are approved by EPA and the State.

[2] Compliance with these limitations shall be determined by taking three (3) grab samples per day with a minimum of three (3) hours between grabs and preserved immediately upon collection. All three samples shall be composited then analyzed. Samples must be collected during a dry weather period (no rain forty-eight (48) hours prior to or during sampling unless approved by RIDEM).

--- 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 001A. (Final discharge after dechlorination).

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 001A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirements	
	Quantity - lbs/day		Concentration – units specified				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Ceriodaphnia sp: LC_{50}[1]					100% or Greater[2]	1/Quarter	24-hr comp
C-NOEC[3]					75%[4]	1/Quarter	24-hr comp
IC25[5]					Report[6]	1/Quarter	24-hr comp

[1] LC_{50} is defined as the concentration of wastewater that causes mortality to 50% of the test organisms (Ceriodaphnia sp.).

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

[3] C-NOEC or Chronic – No Observed Effects Concentration is defined as the highest concentration of toxicant or effluent at which no adverse effects are observed.

[4] The 75% or greater limit is defined as a sample which is composed of 75% effluent.

[5] IC_{25} is defined as the concentration of wastewater that causes a 25% reduction in growth or reproduction of test organisms.

[6] A numeric limit is not associated with this parameter, but the IC_{25} must be reported as part of the test results from any chronic WET tests.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 001A. (Final discharge after dechlorination) and in accordance with I.B. of the permit.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 001A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirements	
	Quantity - lbs/day		Concentration – units specified				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Bis(2-ethylhexyl) phthalate			14.4 µg/L		664 µg/L	1/Month[1]	24-hr comp
Chloroform			38.3 µg/L		1730 µg/L	1/Month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 001A. (Final discharge after dechlorination).

[1]The permittee shall perform monthly testing on samples collected from the discharge at Outfall 001A. If the results of twelve (12) consecutive months of monitoring shows effluent concentrations below the applicable minimum detection limits from Part I.F, then the permittee is no longer required to continue sampling.

7.

a. The pH of the effluent shall not be less than 6.5 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. 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.

8. The permittee shall analyze its effluent annually for the EPA Priority Pollutants as listed in 40 CFR 122, Appendix D, Tables II and III. The results of these analyses shall be submitted to the Department of Environmental Management with the 3rd quarter bioassay by October 15th of each year. 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.

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

B. BIOMONITORING REQUIREMENTS AND INTERPRETATION OF RESULTS

1. General

Beginning on the effective date of the permit, the permittee shall perform four (4) chronic toxicity tests per year on samples collected from discharge Outfall 001A. 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 RIDEM) according to the following test frequency and protocols. Chronic and acute toxicity data shall be reported as outlined in part I.B.8. The chronic daphnid tests shall be used to calculate the acute LC_{50} at the forty-eight (48) hour exposure interval. The State may require additional screening, range finding, 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

For four (4) sampling events (one each calendar quarter), the permittee will conduct seven-day chronic toxicity tests on the species listed below, for a total of four (4) chronic toxicity tests per year. This requirement entails performing one-species testing as follows:

Species	Test Type	Frequency
Daphnid (Ceriodaphnia sp.)	Survival and Reproduction	Quarterly

A sampling event is defined as three 24-hour composites collected over the seven-day test period (see Part I.B.4).

3. Testing Methods

Toxicity testing shall be conducted in accordance with the 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 after dechlorination shall be collected during a dry weather period (no rain forty-eight (48) hours prior to or during sampling unless approved by RIDEM). For each sampling event, the effluent samples shall be collected on days 0, 3 and 5 of the 7-day exposure period. The first sample is used for test initiation, Day 1, and for test solution renewal on Day 2. The second sample would be used for test solution renewal on Days 3 and 4. The third sample would be used for test solution renewal on Days 5, 6 and 7.

To eliminate the problem of potential rainfall interference during the five-day sampling period for the chronic tests, the permittee shall collect enough sample on Day 0 to properly store and use one-third on both Days 3 and 5 if rain has occurred since Day 0. In addition, if no rainfall has occurred since Day 3, enough sample shall also be collected on Day 3 to use for Day 5 if necessary.

In the laboratory, the initial sample (Day 0) will be split into two (2) subsamples, after thorough mixing, for the following:

A: Chemical Analysis
B: Chronic Toxicity Testing

Day 3 and 5 samples will be held until test completion. If either the Day 3 or 5 renewal sample is of sufficient potency to cause lethality to 50% or more test organisms in any of the dilutions for either species, then a chemical analysis shall be performed on the appropriate sample(s) as well.

All samples held overnight shall be refrigerated at 4°C.

5. Dilution Water

Dilution water used for freshwater chronic toxicity analyses should be of sufficient quality to meet minimum acceptability of test results (see Part I.B.6). For each species, natural freshwater shall be used as the dilution water. This water shall be collected from the Woonasquatucket River (RI0002007R-10A) at DEM's Water Quality Monitoring Station number WON01. This is the station at the Woonasquatucket River at Old Forge Rd. Details regarding this station can be found in Attachment L of the Permit Fact Sheet. If this natural freshwater diluent is found to be, or suspected to be toxic or unreliable, an alternate or laboratory source of water of known quality with a hardness and pH similar to that of the receiving water may be substituted AFTER RECEIVING APPROVAL FROM RIDEM.

6. Effluent Toxicity Test Conditions for the Daphnid

(Ceriodaphnia sp.) Survival and Reproduction Test[1]

Test conditions are required to be compliant with 40 CFR 136 using the following effluent concentrations:

Six (6) dilutions plus a control: 100%, 85%, 75%, 50%, 25%, 12.5%, and 0% effluent.

7. Chemical Analysis

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

Parameter	Effluent	Diluent	Minimum Detection Limit (mg/L)
Hardness	X	X	0.5
Alkalinity	X	X	2.0
pH	X	X	---
Specific Conductance	X	X	---
Total Solids and Suspended Solids	X	X	---
Ammonia	X	X	0.1
Total Residual Chlorine (TRC)	X	X	0.02
Total Organic Carbon	X		0.5
Cyanide	X		0.005

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

Total Metals	Effluent	Diluent	Minimum Detection Limit (µg/L)
Cu	X	X	1.0
Pb	X	X	1.0
Zn	X	X	5.0
Cd	X	X	0.1
Ni	X	X	1.0
Al	X	X	20.0

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.

In addition, the following chemical analyses shall be performed as part of each daily renewal procedures on each dilution and the controls.

Parameter	Beginning of 24-Hour Exposure Period	End of 24-Hour Exposure Period
Dissolved Oxygen	X	X
Temperature	X	
pH	X	
Specific Conductance	X	
Alkalinity	X[1]	
Hardness	X[1]	

[1]These are performed on the 100% effluent and control samples only.

8. 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.
- Raw data and laboratory sheets.
- Any other observations or test conditions affecting test outcome.
- Results of required chemical and physical analyses.

Toxicity test data shall include the following:

Chronic

- Daily survival of test organisms in the controls and all replicates in each dilution. Survival data should be analyzed by Fisher's Exact Test prior to analysis of reproduction data.
- Young per female for all replicates in each dilution for Ceriodaphnia and weight for minnow larvae.
- Dissolved oxygen, pH, specific conductance and temperature for each dilution.
- Results of Dunnett's Procedure and/or other EPA recommended or approved methods for analyzing the data.

- C-NOEC = Chronic No Observed Effect Concentration
- LOEC = Lowest Observed Effect Concentration
- MATC = Maximum Allowable Toxicant Concentration
- IC_{25} = Inhibition Concentration (the statistical calculation of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms)

Acute - (These data points are to be obtained 48 hours into the chronic test).

- Survival for each concentration and replication at time 24 and 48 hours.
- Dissolved oxygen, pH and specific conductance for each concentration.
- LC_{50} and 95% confidence limits using one of the following methods in order of preference: Probit, Trimmed Spearman Karber, Moving Average Angle, or the graphical method; printout or copy of these calculations. 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 (% 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), a LC_{50} may be estimated using the graphical method.

9. Reporting of Bioassay Testing

Bioassay Testing shall be reported as follows:

Quarter Testing to be Performed	Report Due No Later Than	Results Submitted on DMR for
January 1 - March 31	April 15	March
April 1 - June 30	July 15	June
July 1 - September 30	October 15	September
October 1 - December 31	January 15	December

Bioassay testing following the protocol described herein shall commence during the 1st quarter following the effective date of this permit.

A signed copy of these, and all other reports required herein, shall be submitted electronically in accordance with Part I.G.3.

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 Ordinance, 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. The permittee has an approved Local Limits Monitoring Plan that shall continue to be implemented at all times. The permittee's most recent technical evaluation of the need to revise local limits was approved in 2018.

b. At the time of renewal of this permit and in accordance with 40 CFR 122.44(j)(2), 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 procedures required by Part I.C.3.a of this permit and current RIPDES permit discharge limits, sludge disposal criteria, secondary treatment inhibition, and worker health and safety criteria.

4. Enforcement Response Plan (ERP)

The permittee has an approved ERP that meets the requirements of 40 CFR 403.8(f)(5). The permittee shall continue to implement its approved ERP 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 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 superseding 40 CFR 403 streamlining provisions have been adopted, whether each SIU requires a Slug Control Plan. If a Slug Control Plan is required, it shall include the contents specified by 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 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 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 approval by DEM.

   Within thirty (30) days of DEM's final approval of the proposed modification(s), the permittee shall implement the modification and submit proof that the local officials have endorse and/or approved the modification(s) to the DEM. Upon final approval

by the DEM and adoption by the permittee, this modification(s) 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 summarized in 40 CFR 403.5.

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)(viii), 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 40 CFR 403.3 and the permittee's sewer use ordinance.

The permittee shall notify each newly designated SIU of its classification as a SIU within thirty (30) days of identification and shall inform the SIU of the requirements of a 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(1) 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 Industrial Pretreatment Program shall contain information pertaining to the reporting year which shall extend from October 1 through September 30 and shall be submitted to the DEM by December 15 each year. 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, including dates 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 of the Compliance status of each Industrial User (IU), as of the end of last quarter covered by the annual report. The list shall identify all IUs in non-compliance, the pretreatment program requirement which the IU failed to meet, and the type, and date of the enforcement action initiated by the permittee in response to the violation. If applicable, the list shall also contain the date which IUs in non-compliance returned to compliance, a description of corrective actions ordered, and the penalties levied.

d. A list of industries which were determined, in accordance with Part I.C.5.(l) of this permit, to be in significant non-compliance required to be published in a local newspaper and a copy of proof of publication from the newspaper that the names of these violators has been published.

e. A summary 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 and dates of analysis, for each industrial user);

f. A summary of permit issuance/reissuance activities including the name of the industrial user, expiration date of previous permit, issuance date of new permit, and a brief description of any changes to the permit;

g. A list including the report/notification type, due date, and receipt date for each report/notification required by 40 CFR 403.12.

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 SUO, 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 Report Summary Sheet.

8. Interjurisdictional Agreement

The DEM has no interjurisdictional agreements on file regarding the contribution of industrial wastewater to the Smithfield WWTF. Any such interjurisdictional agreements which may become necessary must be submitted to the DEM in draft form for approval prior to signature and execution.

9. Sewer Use Ordinance

The permittee has an approved Sewer Use Ordinance which shall continue to be implemented at all times.

D. 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 of this permit 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 two years shall be submitted to RIDEM, Office of Water Resources, by the 15th day of January following the two-year period. The first report is due January 15, 2022.

3. Sewer System Overflows (SSOs)

The permittee shall report all SSOs, including SSOs that result in basement backups, to the DEM in accordance with the twenty-four-hour reporting requirements from Part II.(I)(5) of the permit.

4. Resiliency Planning

Within one year of the effective date of this permit, the permittee shall submit a Resiliency Plan and schedule of short and long-term actions that will be taken to maintain operation and protect key collection and treatment system assets. The plan shall be consistent with the DEM's Guidance for the Consideration of Climate Change Impacts in the Planning and Design of Municipal Wastewater Collection and Treatment Infrastructure and include consideration of the findings of the 2017 DEM report Implications of Climate Change for Rhode Island Wastewater Collection and Treatment Infrastructure. The Resiliency Plan shall include, but not be limited to: (i) an assessment of current and projected impacts from natural hazards on critical components within the collection and treatment systems, as well as on the systems themselves; (ii) a plan to adapt and protect vulnerable components and systems; (iii) an analysis that provides justification for selected adaptation methods. The analysis must consider component and system design life and sea-level rise projections. For the purposes of this Resiliency Plan, critical components are considered those necessary to ensure the forward flow and treatment of wastewater in accordance with the limits set forth in this permit. The Resiliency Plan shall also consider impacts on the WWTF from neighboring facilities during high hazard events. This Plan shall be subject to DEM review and approval. If DEM determines that modifications need to be made to the Plan, DEM shall notify the permittee in writing which elements of the Plan need to be modified and the reason for the needed modification. This notification shall include a schedule for making the changes, after such notification from the DEM, the permittee shall make changes to the Plan and submit the revisions to the DEM for approval.

E. 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 Sewage Sludge Management (250-RICR-150-10-3). The permittee shall comply with its Order of Approval for the disposal of sludge.

F. 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, and the following terms and conditions:

1. All analyses of parameters under this permit must comply with the *National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting* rule. Only sufficiently sensitive test methods may be used for analyses of parameters under this permit. The permittee shall assure that all testing required by this permit is performed 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 Rhode Island Pollutant Discharge Elimination System (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).

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

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

   a. "could not be analyzed" data shall be excluded and shall not be considered as a failure to comply with the permit sampling requirements.

   b. Results reported as less than the MDL shall be reported as zeros in accordance with the DEM's DMR Instructions.

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

LIST OF TOXIC POLLUTANTS

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

Volatiles - EPA Method 624.1		MDL µg/L (ppb)
1V	acrolein	10.0
2V	acrylonitrile	5.0
3V	benzene	1.0
5V	bromoform	1.0
6V	carbon tetrachloride	1.0
7V	chlorobenzene	1.0
8V	chlorodibromomethane	1.0
9V	chloroethane	1.0
10V	2-chloroethylvinyl ether	5.0
11V	chloroform	1.0
12V	dichlorobromomethane	1.0
14V	1,1-dichloroethane	1.0
15V	1,2-dichloroethane	1.0
16V	1,1-dichloroethylene	1.0
17V	1,2-dichloropropane	1.0
18V	1,3-dichloropropylene	1.0
19V	ethylbenzene	1.0
20V	methyl bromide	1.0
21V	methyl chloride	1.0
22V	methylene chloride	1.0
23V	1,1,2,2-tetrachloroethane	1.0
24V	tetrachloroethylene	1.0
25V	toluene	1.0
26V	1,2-trans-dichloroethylene	1.0
27V	1,1,1-trichloroethane	1.0
28V	1,1,2-trichloroethane	1.0
29V	trichloroethylene	1.0
31V	vinyl chloride	1.0

Acid Compounds - EPA Method 625.1		MDL µg/L (ppb)
1A	2-chlorophenol	1.0
2A	2,4-dichlorophenol	1.0
3A	2,4-dimethylphenol	1.0
4A	4,6-dinitro-o-cresol	1.0
5A	2,4-dinitrophenol	2.0
6A	2-nitrophenol	1.0
7A	4-nitrophenol	1.0
8A	p-chloro-m-cresol	2.0
9A	pentachlorophenol	1.0
10A	phenol	1.0
11A	2,4,6-trichlorophenol	1.0

Pesticides - EPA Method 608.3		MDL µg/L (ppb)
1P	aldrin	0.059
2P	alpha-BHC	0.058
3P	beta-BHC	0.043
4P	gamma-BHC	0.048
5P	delta-BHC	0.034
6P	chlordane	0.211
7P	4,4'-DDT	0.251
8P	4,4'-DDE	0.049
9P	4,4'-DDD	0.139
10P	dieldrin	0.082
11P	alpha-endosulfan	0.031
12P	beta-endosulfan	0.036
13P	endosulfan sulfate	0.109
14P	endrin	0.050
15P	endrin aldehyde	0.062
16P	heptachlor	0.029
17P	heptachlor epoxide	0.040

Pesticides - EPA Method 608.3		MDL µg/L (ppb)
18P	PCB-1242	0.289
19P	PCB-1254	0.298
20P	PCB-1221	0.723
21P	PCB-1232	0.387
22P	PCB-1248	0.283
23P	PCB-1260	0.222
24P	PCB-1016	0.494
25P	toxaphene	1.670

Base/Neutral - EPA Method 625.1		MDL µg/L (ppb)
1B	acenaphthene *	1.0
2B	acenaphthylene *	1.0
3B	anthracene *	1.0
4B	benzidine	4.0
5B	benzo(a)anthracene *	2.0
6B	benzo(a)pyrene *	2.0
7B	3,4-benzofluoranthene *	1.0
8B	benzo(ghi)perylene *	2.0
9B	benzo(k)fluoranthene *	2.0
10B	bis(2-chloroethoxy)methane	2.0
11B	bis(2-chloroethyl)ether	1.0
12B	bis(2-chloroisopropyl)ether	1.0
13B	bis(2-ethylhexyl)phthalate	1.0
14B	4-bromophenyl phenyl ether	1.0
15B	butylbenzyl phthalate	1.0
16B	2-chloronaphthalene	1.0
17B	4-chlorophenyl phenyl ether	1.0
18B	chrysene *	1.0
19B	dibenzo (a,h)anthracene *	2.0
20B	1,2-dichlorobenzene	1.0
21B	1,3-dichlorobenzene	1.0
22B	1,4-dichlorobenzene	1.0
23B	3,3'-dichlorobenzidine	2.0
24B	diethyl phthalate	1.0
25B	dimethyl phthalate	1.0
26B	di-n-butyl phthalate	1.0
27B	2,4-dinitrotoluene	2.0
28B	2,6-dinitrotoluene	2.0
29B	di-n-octyl phthalate	1.0
30B	1,2-diphenylhydrazine (as azobenzene)	1.0
31B	fluoranthene *	1.0
32B	fluorene *	1.0
33B	hexachlorobenzene	1.0
34B	hexachlorobutadiene	1.0
35B	hexachlorocyclopentadiene	2.0
36B	hexachloroethane	1.0
37B	indeno(1,2,3-cd)pyrene *	2.0
38B	isophorone	1.0
39B	naphthalene *	1.0
40B	nitrobenzene	1.0
41B	N-nitrosodimethylamine	1.0
42B	N-nitrosodi-n-propylamine	1.0
43B	N-nitrosodiphenylamine	1.0
44B	phenanthrene *	1.0
45B	pyrene *	1.0
46B	1,2,4-trichlorobenzene	1.0

OTHER TOXIC POLLUTANTS

	MDL µg/L (ppb)
Antimony, Total	3.0
Arsenic, Total	1.0
Beryllium, Total	0.2
Cadmium, Total	0.1
Chromium, Total	1.0
Chromium, Hexavalent	10.0
Copper, Total	1.0
Lead, Total	0.2
Mercury, Total	0.2
Nickel, Total	1.0
Selenium, Total	2.0
Silver, Total	0.5
Thallium, Total	1.0
Zinc, Total	5.0
Asbestos	**
Cyanide, Total	5.0
Phenols, Total	50.0
Aluminum, Total	20.0
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0

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

NOTE:

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

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

For Methods 624.1 and 625.1 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 624.1 and 625.1 subparts 8.3.1 and 8.3.11).

G. 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. 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.

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

   - DMR Cover Letters
   - Below Detection Limit summary tables
   - Monthly Operating Reports
   - Priority Pollutant Scan results for Outfall 001
   - Bioassay testing (Part I.B.9)

4. 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 when submitted to DEM.

   - Written notifications required under Part II
   - Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
   - Infiltration/Inflow Reports
   - Pretreatment 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

5. 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 DEM. This includes verbal reports and notifications which require reporting within 24 hours. (See Part II(I)(5) General Requirements for 24-hour reporting). Verbal reports and verbal notifications shall be made to DEM at (401) 222-4700 or (401) 222-3070 at night.

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

FACT SHEET

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

RIPDES PERMIT NO. RI0100251

NAME AND ADDRESS OF APPLICANT:

Town of Smithfield
64 Farnum Pike
Smithfield, RI 02917

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Smithfield Wastewater Treatment Facility
20 Esmond Mill Drive
Smithfield, RI 02917

RECEIVING WATER: **Woonasquatucket River**
WBID: RI0002007R-10C

CLASSIFICATION: **B1**

Fact Sheet Table of Contents

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

The above-named applicant has applied to the Rhode Island Department of Environmental Management for reissuance of a RIPDES Permit to discharge into the designated receiving water. The facility is engaged in the treatment of domestic and industrial sewage. The discharge consists of wastewater resulting from treated domestic and industrial sewage.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters based on DMR data from November 1, 2013 through October 31, 2018 is shown on Attachment A. Based on a review of available effluent data submitted with the most recent permit application, Priority Pollutant Scans, and historical Discharge Monitoring Report (DMR) data, the facility may not be able to comply with its final permit limits at Outfall 001 for Bis(2-ethylhexyl) phthalate, Total Phosphorus, and Chloroform. It is anticipated that a Consent Agreement will be necessary in order to establish interim limits and a schedule that will provide time for Smithfield WWTF to bring the discharge into compliance with these limitations.

III. Permit Limitations and Conditions

The final effluent limitations and monitoring requirements may be found in the permit.

IV. Permit Basis and Explanation of Effluent Limitation Derivation

Variances, Alternatives, and Justifications for Waivers of Application Requirements

No variances or alternatives to required standards were requested or granted.

No waivers were requested or granted for any application requirements per §1.11(G) of the RIPDES Regulations (250-RICR-150-10).

Facility Description

The Town of Smithfield owns the Wastewater Treatment Facility (WWTF) located on 20 Esmond Mill Drive in Smithfield, and the WWTF is operated by Veolia Water. The discharge to the Woonasquatucket River consists of treated sewage contributed by the Town of Smithfield and a portion of the Town of Johnston. The WWTF services a total population of approximately 17,775. As of December 13, 2019, for the end of Smithfield WWTF's most recent Industrial Pretreatment Program reporting year, there was one (1) Significant Industrial Users (SIUs) and two (2) other (i.e., non-SIU) permitted industrial users contributing wastewater to the Smithfield WWTF.

The Smithfield WWTF treatment process consists of the following: Preliminary Treatment, Primary Settling, Activated Sludge, Secondary Clarification, Actiflo Phosphorous Removal, and Chlorination/Dechlorination. Treatment begins with Preliminary Treatment, involving screening and grinding before Primary Settling. Flow is measured prior to entry into the primary clarifiers, where Primary Settling and scum removal takes place. Flow from the primary tanks is pumped to the modified Activated Sludge (A2O) Process, where the mixed liquor is maintained in an A2O process condition. After the A2O process, the flow enters the secondary clarifiers for settling. The secondary effluent then passes through the "Actiflo" system for advanced treatment prior to entering the chlorine contact tanks. The Actiflo system treats the sewage flow with ferric chloride to provide additional phosphorous removal. Flow entering the chlorine contact tanks are treated with sodium hypochlorite for disinfection, and then dechlorinated with sodium bisulfite prior to the final discharge into the Woonasquatucket River. A process flow diagram is attached as Attachment B.

Smithfield WWTF's most recent RIPDES permit, authorizing discharges from the above-mentioned facility, was issued on September 27, 2013. This permit became effective on November 1, 2013 and expired on November 1, 2018. The facility submitted an application for permit reissuance to the DEM on March 1, 2018. On May 21, 2018, the DEM issued an application complete letter to the facility. In accordance with 250-RICR-150-10-1 §13 of the Regulations for the Rhode Island Pollutant Discharge

Elimination System, the facility's November 1, 2013 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 November 1, 2013 permit.

Receiving Water Description

The water body segment for the Woonasquatucket River is RI0002007R-10C and is located in Smithfield, Rhode Island. This segment is delineated by the Woonasquatucket River and tributaries from the Smithfield WWTF discharge point at Edmond Mill Drive to the CSO outfall at Glenbridge Avenue in Providence. This segment is listed on DEM's 2016 303(d) impaired waters listed for not supporting Fish and Wildlife Habitat due to Dioxin (including 2,3,7,8-TCDD), Mercury, Non-Native Aquatic Plants, Dissolved Oxygen, and Polychlorinated biphenyls (PCBs). Additionally, this segment is listed for not supporting Fish Consumption due to Dioxin (including 2,3,7,8-TCDD), Mercury in Fish Tissue, and PCB in Fish Tissue. This segment is also listed for not supporting Primary Contact Recreation due to Fecal Coliform and not supporting Secondary Contact Recreation due to Fecal Coliform. This segment has an approved Total Maximum Daily Load (TMDL) for Fecal Coliform, approved as of July 3, 2007. The TMDL indicates that the Smithfield WWTF is not a significant Fecal Coliform source to the Woonasquatucket River, because: "the facility's monthly and weekly reported fecal coliform effluent concentrations are lower than both the geometric mean value at the most upstream station at Esmond Mill Drive (RM 8.3)." The Dioxin, Mercury, and PCB impairments are caused by hazardous waste site contamination or atmospheric deposition and are not related to the WWTF's discharge. Permit limits for the Smithfield WWTF were developed to be consistent with water quality regulations and the wasteload allocation.

This segment of the Woonasquatucket River is designated as a Warmwater habitat for fisheries and has a Waterbody Classification of B1; B1 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.

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. RIDEM's primary authority over the permit comes from EPA's delegation of the program in September 1984 under the Federal Clean Water Act (CWA).

Development of RIPDES permit limitations is a multi-step process consisting of the following steps: calculating allowable water quality-based discharge levels based on instream criteria, background data, and available dilution; identifying any technology based limits that apply to the facility; assigning appropriate Best Professional Judgment (BPJ) limits; setting the most stringent of these limits (water quality-based, technology-based, and BPJ-based) as the final allowable discharge levels; comparing existing permit limits to the new allowable discharge levels; and evaluating the ability of the facility to meet the final permit effluent limits. It should be noted that all water quality-based permit limits included in this permit have been developed to be consistent with the Woonasquatucket River Total Maximum Daily Load (TMDL) that was finalized and approved by EPA in 2007.

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

Technology-Based Permit Limitations

40 CFR Part 133 establishes secondary treatment standards based on an evaluation of performance data for POTWs practicing a combination of physical and biological treatment. The regulation applies to all POTWs and identifies the technology-based performance standards achievable based on secondary treatment for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. These standards are summarized below:

Parameter	30-day average	7-day average
BOD_5	30 mg/L (or 25 mg/L $CBOD_5$)	45 mg/L (or 40 mg/L $CBOD_5$)
TSS	30 mg/L	45 mg/L
BOD_5 and TSS removal (concentration)	Not less than 85%	---
pH	Within the limits of 6.0 – 9.0*	

* Unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0.

$CBOD_5$ and TSS % Removal

The "Percent Removal" requirements for $CBOD_5$ and TSS are assigned in accordance with 40 CFR 133.102(a) and (b) respectively. A summary of final permit limits and their derivation is included in Attachment C.

Best Professional Judgment (BPJ)-Based Permit Limitations

Flow Limits

The basis for the facility's average monthly flow limit of 3.5 MGD is the facility's "Facilities Plan" dated April 9, 2010. Conditions are included in the permit so that when the effluent discharged for a period of 90 consecutive days exceeds 80 percent of the design flow, the permittee must submit 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.

Settleable Solids

DEM and EPA agree that Total Suspended Solids (TSS) are an appropriate measure of the solids content being discharge to the receiving waters and that settleable solids are a "process-control parameter" that can aid in assessment of the operation of the plant but need not be an effluent limit. Therefore, DEM assigned a permit limit of monitor only for Settleable Solids.

Oil and Grease

Oil and Grease monitoring requirements are assigned in the permit in order to serve as a process control parameter. Monitoring data will serve as an indicator of excessive levels of Oil and Grease that may result in blockages in the collection system and that are typically attributed to restaurants and other sources of Oil and Grease loading which discharge to the sewer collection system. The facility 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.

$CBOD_5$ and TSS

The average monthly, average weekly, and daily maximum $CBOD_5$ and TSS limits are set at levels more stringent than those specified in 40 CFR 133.102 (a)-(c) due to increased removal from the operation of nutrient removal equipment. These limits are the same as those included in the 2013 Smithfield WWTF RIPDES permit and the 2007 Smithfield WWTF RIPDES permit. A review of historical discharge data shows that the Smithfield WWTF is able to comply with these limitations.

Water Quality-Based Permit Limitations

Water Quality-Based Limit (WQBEL) 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 instream 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 (250-RICR-150-05-1). 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 Smithfield WWTF 2013 RIPDES permit also contained WQBELs.

Mixing Zones and Dilution Factors

Mixing for the Smithfield WWTF discharge to the Woonasquatucket River is assumed to be instantaneous and complete. Therefore, the whole flow of the river at critical flow conditions is used when calculating limits and accounting for dilution.

The Rhode Island Water Quality Regulations at 250-RICR-150-05-1.18(N)(1) require in-stream concentrations of discharged pollutants to be determined by specific formulas, or other methods which may be found to be acceptable. These formulas require the use of the seven-day, 10-year, low flow of the receiving stream immediately upstream of the discharge to be used in calculating the concentrations of discharged pollutants for the purpose of developing RIPDES permit conditions. This 7Q10 value is protective of water quality standards under critical flow conditions.

The 2013 RIPDES permit determined the 7Q10 flow based on the nearest USGS gauging station on the Woonasquatucket River, located downstream of the Smithfield facility at the Centerdale Gauging Station (Number 01114500) and subtracted the average WWTF flow from this value.

In accordance with the RIPDES 7Q10 Policy, revised December 2019, the 7Q10 flow for the Woonasquatucket River at the Smithfield WWTF was calculated by multiplying the drainage area ratio between the facility and the USGS gauge by the 7Q10 flow at the USGS gauge and subtracting out the average flow of the WWTF.

$$7Q10_{WWTF} = \left(\frac{Drainage\ Area_{WWTF}}{Drainage\ Area_{Gauge}}\right) \cdot 7Q10_{Gauge} - Average\ Flow_{WWTF}$$

Where: Drainage Area for the WWTF = 36.1 square miles
Drainage Area for the Gauge = 38.3 square miles
7Q10 for the Gauge = 6.1 cubic feet per second (cfs)
Average Flow for the WWTF = 1.9873 MGD = 3.06 cfs (average monthly flow from previous permit 11/1/2013 – 10/31/-2018; See Attachment A)

$$7Q10_{WWTF} = \left(\frac{36.1\ sq.mi.}{38.3\ sq.mi.}\right) \cdot 6.1\ cfs - 3.06\ cfs$$

$$7Q10_{WWTF} = 2.689\ cfs$$

Using the upstream 7Q10 river flow of 2.689 cfs (for aquatic life criteria) and a mean harmonic flow of 31.399 cfs (for human health criteria) the appropriate dilution factors were determined. Using the facility's design flow of 3.5 MGD (5.416 cfs), a water quality dilution factor of 1.497 for acute and chronic criteria and a human health dilution factor of 6.798 were calculated using the following equation:

$$DF = \frac{Q_D + Q_U}{Q_D}$$

Where: DF = Dilution Factor
Q_D = Design Flow
Q_U = Flow upstream of the WWTF (Receiving Water Flow)

An exception to these dilution factors was made for Ammonia limitations. Ammonia removal is strongly dependent on temperature (nitrification rate decreases as temperature decreases). Since Ammonia does not bioaccumulate or accumulate in sediment, seasonal dilution factors and historical pH and temperature background data were used to determine the appropriate Ammonia limitations. A winter 7Q10 river flow of 10.219 cfs was used to yield a dilution factor of 2.887 and a summer 7Q10 of 2.689 cfs used to give a dilution factor of 1.497.

Hardness

It has been observed that there is generally a strong inverse correlation between river flow and hardness. This is due to the fact that major components of hardness (Mg^{2+}, Ca^{2+}) are more prevalent in groundwater rather than surface water. Therefore, during low flow periods, when the majority of flow in the river or stream is groundwater, hardness will be higher.

DEM develop a log-log relationship between flow and hardness using data collected at various gaging stations for a number of freshwater rivers in the State. However, DEM could not develop a similar relationship for the Woonasquatucket River as flow-hardness data is currently unavailable. Therefore, the hardness value used in calculating Water Quality-Based Effluent Limits is based on the average dry weather hardness of 30 mg/L, as established by the RIPDES Program and TMDL Program in the Office of Water Resources. The 30 mg/L value represents the average dry weather hardness for the segment of the Woonasquatucket River immediately downstream of the treatment plant. Hardness data used in the development of the permit was gathered by the TMDL Program in 1998.

Limit Calculations

Based on the above dilution factors and the freshwater aquatic life and non-Class A human health criteria, from the Rhode Island Water Quality Regulations, allowable discharge concentrations were established using 80% allocation for pollutants without background data, 90% allocation for pollutants with background data, and 100% allocation of total residual chlorine (TRC) due to the fact that Chlorine is not expected to be found in ambient water and it is a non-conservative pollutant.

Using the above dilution factors and hardness, 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.

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

Where: DF = acute or chronic dilution factor, as appropriate
Note: The right side of this formula is divided by the appropriate metals translator when this formula is used to calculate limits for metals.

b) Using available background concentration data (See Attachment G)

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

Where: DF = acute or chronic dilution factor, as appropriate
Note: The right side of this formula is divided by the appropriate metals translator when this formula is used to calculate limits for metals.

Because background concentrations were available for Aluminum, Cadmium, Copper, Lead, Zinc, and Ammonia, 90% of criteria was allocated for these pollutants. All other limits were calculated using 80% allocation, due to a lack of background data.

Reference Attachment D for calculations of allowable limits based on Aquatic Life and Human Health Criteria.

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

I. 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.

II. Total residual chlorine. The limits for total residual chlorine (TRC) were established in accordance with the RIDEM 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.

III. 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.

In accordance with 40 CFR Part 122.4(d)(1)(iii), it is only necessary to establish limitations for those pollutants in the discharge which have the reasonable potential to cause or contribute to the exceedance of the in-stream criteria. In order to evaluate the need for permit limitations, the allowable discharge levels (permit limits) were compared to Discharge Monitoring Report (DMR) data, Priority Pollutant Scan data, and data provided in the permit application (See Attachment E). An assessment was made to determine if limits were necessary, using the data collected during the previous five (5) years. Based on these comparisons, water quality limitations have been deemed necessary for Total Residual Chlorine, Ammonia, Cadmium, Cyanide, Lead, Zinc, Bis(2-ethylhexyl) phthalate, and Chloroform. In addition, monitoring for Copper, Nickel, Aluminum, and Iron has been included in the permit. Since the data set used to establish the bis(2-ethylhexyl)phthalate effluent limitation was limited, if twelve months of monitoring shows effluent concentrations below the applicable detection limits for bis(2-ethylhexyl)phthalate (i.e., that the pollutant is not present in the discharge), the permittee is no longer required to continue sampling.

The permit requires quarterly monitoring for cyanide, copper, lead, zinc, cadmium, nickel, and aluminum as part of the bioassay process (see WET Testing section below). Water quality-based limits were already deemed necessary for cyanide, cadmium, lead, and zinc. However, although water quality-based limits are not necessary for copper, nickel, and aluminum, the permit includes quarterly reporting of the concentrations of these pollutants based on the monitoring associated with the bioassay testing. The iron monitoring requirement is required on a weekly basis as the facility adds iron in the form of ferric chloride in the treatment process.

WET Testing

The biomonitoring requirements are set forth in 40 CFR 131.11 and in the State's Water Quality Regulations, containing narrative conditions at 250-RICR-150-05-1.10(B) that state, at a minimum, all waters shall be free of pollutants in concentrations or combinations or from anthropogenic activities subject to these regulations that: adversely affect the composition of fish and wildlife; adversely affect the physical, chemical, or biological integrity of the habitat; interfere with the propagation of fish and wildlife; adversely alter the life cycle functions, uses, processes, and activities of fish and wildlife; or adversely affect human health. In order to determine compliance with many of these conditions, WET testing is required.

RIDEM's toxicity permitting policy is based on past toxicity data and the level of available dilution. The bioassay requirements in the permit consist of chronic toxicity tests, where the chronic test can be used to calculate the acute data (LC_{50}), with an acute toxicity limit of $LC_{50} \geq 100\%$ effluent. Calculation of the chronic limit (C-NOEC) resulted in a chronic toxicity limit of C-NOEC = 75% effluent. If recurrent toxicity is demonstrated, then toxicity identification and reduction will be required. Details on the calculations regarding the WET (bioassay) limits can be found in Attachment F. Additionally, the permit requires that the IC_{25} value be reported on DMRs for bioassay testing. This value is already

included in bioassay results provided by the lab and should result in no additional cost to the facility to report on NetDMR.

Bacteria

The Rhode Island Water Quality Regulations include Enterococci criteria for primary contact/swimming of a geometric mean of 54 colonies/100mL and a single sample maximum of 61 colonies/100mL. The "single sample maximum" value is only used to evaluate swimming advisories at designated public beaches and does not apply to the receiving water in the area of the outfall. EPA's November 12, 2008 memorandum regarding "Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation" clarifies 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 54 colonies/100mL. The daily maximum enterococci limit has been set at the 90% upper confidence level value for "lightly used full body contact recreation" of 175 colonies/100mL.

Fecal Coliform monitoring is required in this permit due to this segment of the Woonasquatucket River having an approved TMDL for Fecal Coliform. This requirement will continue to ensure the Smithfield WWTF does not constitute a significant fecal coliform source to the Woonasquatucket River. The approved TMDL notes that Smithfield WWTF is not a significant fecal coliform source to the Woonasquatucket River because historical discharge data remains well below the geometric mean value at the most upstream station at Esmond Mill Drive (RM 8.3). Based on Smithfield WWTF's compliance with Fecal Coliform limits in the past, and recent monitoring data continues to be well below the geometric mean data identified in the TMDL, DEM has reduced the Fecal Coliform monitoring frequency from weekly to monthly, and removed the requirement to report a weekly average on DMRs. This will continue to ensure Smithfield WWTF is not contributing to the impairment in accordance with the approved TMDL.

pH

§1.10(D)(1) of the Rhode Island Water Quality Regulations details the class specific criteria for freshwaters, stating that pH shall be 6.5 – 9.0 standard units, or as naturally occurs. In order to ensure that these class specific criteria are met for the Woonasquatucket River, the permit include pH limitations with a minimum pH of 6.5 s.u., and a maximum pH of 9.0 s.u. Based on a review of historical data for the Smithfield WWTF, the facility will be able to meet these pH limitations.

Phosphorous

§1.10(B)(4) of the Rhode Island Water Quality Regulations requires that nutrients shall not exceed the limitations specified in §1.10(D)(1) and 1.10(E)(1) and/or more stringent site-specific limits necessary to prevent or minimize accelerated or cultural eutrophication. §1.10(D)(1) of the Rhode Island Water Quality Regulations requires that nutrients shall not be discharged "in such concentration that would impair any usages specifically assigned to said Class, or cause undesirable or nuisance aquatic species associated with cultural eutrophication" and also requires that "phosphates shall be removed from existing discharges to the extent that such removal is or may become technically and reasonably feasible." In freshwater systems, phosphorous is typically the limiting nutrient and controls the production of aquatic plants and algae in the water.

As stated previously, the segment of the Woonasquatucket River that receives discharge from the Smithfield WWTF is currently not supporting the Fish and Wildlife Habitat use due to impairments associated with dissolved oxygen as provided in DEM's 2016 303(d) list of impaired waters. Reaches of the Woonasquatucket River suffer from cultural eutrophication caused by excessive nutrients entering and accumulating in the river. Because the Woonasquatucket River is a freshwater system, excessive levels of phosphorous will promote the growth of nuisance algae and rooted aquatic plants. This excessive algal and/or plant growth results in reduced water clarity and poor aesthetic quality. As a result, the discharge of phosphorous from the Smithfield WWTF may be impairing usages assigned to this segment of the Woonasquatucket River by causing the growth of undesirable and nuisance aquatic species and causing cultural eutrophication. Therefore, the DEM determined that in accordance with §1.10(D)(1) of the Rhode Island Water Quality Regulations that the discharge of

phosphorous must be reduced to the lowest levels that are technically and reasonably feasible.

The DEM has previously determined that total phosphorous levels of 0.1 mg/L are both technically and reasonably achievable using existing treatment technologies. In addition to ensuring that the 0.1 mg/L total phosphorous limit is technically and reasonably feasible, the DEM also performed an analysis to determine if the 0.1 mg/L limit will be protective of water quality. EPA has produced several guidance documents, which contain recommended total phosphorous criteria for flowing waterbodies. The 1986 Quality Criteria of Water ("the Gold Book") recommends in-stream phosphorous concentrations of 0.1 mg/L for any stream not discharging directly to lakes or impoundments. The DEM reviewed the flow characteristics of the Woonasquatucket River segment to determine if the river is impounded. Based on this analysis, the DEM has determined that the river is not impounded. Therefore, the recommended total phosphorous criteria that would apply to the Woonasquatucket River from the Gold Book is 0.1 mg/L. In addition, in December 2000, EPA published updated nutrient guidelines, which vary by eco-region. The recommended EPA criteria applicable to Rhode Island waters are described in the document titled *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion XIV (EPA 822-B-00-022, December 2000)*. This document identifies the EPA recommended guidelines applicable to Rhode Island waters as 23.75 ug/L in rivers. However, these recommended guidelines do not substitute for the CWA or EPA's regulations, nor are the documents themselves regulations. Thus, they cannot impose legally binding requirements on EPA, States, Indian tribes, or the regulated community. Using the WWTF's design flows and the 7Q10 flow of the Woonasquatucket River, the DEM has determined that by assigning a total phosphorous limit of 0.1 mg/L the in-stream phosphorous concentration would be approximately 0.067 mg/L, which falls between the Gold Book and Ecoregion criteria. Therefore, the DEM made a determination that a total phosphorous limit of 0.1 mg/L is appropriate.

The total phosphorous limit (0.1 mg/L) is a monthly average limit in effect from April 1 to October 31. The maximum daily value must also be reported for each month. In addition, the permit also contains a total phosphorous monthly average limit of 1.0 mg/L during November 1 through March 31. The winter period limitation on phosphorous is necessary to ensure that the higher levels of phosphorous discharged in the winter period do not result in the accumulation of phosphorous in the sediments. The limitation assumes that the dissolved fraction of the total phosphorous will pass through the system given the short detention time of the Woonasquatucket River and the lack of plant growth in the winter months. A monitoring requirement for orthophosphorous has been included for the winter period in order to determine the particulate fraction. The Total Phosphorous limits in this permit are consistent with the above requirements. Based on historical DMR data, the Smithfield WWTF can meet this 0.1 mg/L monthly average limit in the summer months, and 1.0 mg/L monthly average limit in the winter months.

Previous Discharge Monitoring Report (DMR) data shows that the facility may not be able to comply with its final permit limits at outfall 001A for Total Phosphorus. It is anticipated that a Consent Agreement will be necessary in order to establish interim limits and a schedule that will provide time for Smithfield to bring the discharge into compliance with these limitations.

Nitrogen

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

DEM previously hired a consultant and worked 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, DEM 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 by 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 even if the wastewater treatment facility discharges are reduced to the limit of technology (Total Nitrogen of 3 mg/L), the Seekonk River and portions of the Providence River would not fully comply with the existing water quality standards for dissolved oxygen (minimum of 5.0 mg/L "except as naturally occurs") and may not meet Environmental Protection Agency (EPA) guidelines established in the October 2000 document titled *Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras* EPA-822-R-00-012.

Based on this evaluation of the sources of excessive nitrogen levels in the rivers, the DEM has determined that it would be appropriate to establish seasonal (May – October) limits for Total Nitrogen of 10.0 mg/L to the Smithfield WWTF. Total Nitrogen limits were previously established to 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 addition to assigning a seasonal Total Nitrogen limit of 10.0 mg/L, this permit also requires that the permittee operate the 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 seasonally 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 the Massachusetts WWTFs is significant and DEM is continuing to work with the MassDEP and EPA to pursue appropriate nitrogen reductions.

An integral component of this phased implementation approach is monitoring and assessment of water quality changes to determine if additional reductions are necessary to meet applicable standards. DEM, in partnership with other agencies, will monitor the water quality of the Providence and Seekonk Rivers. This monitoring will provide the data necessary to evaluate compliance with EPA's DO guidelines and the State's DO water quality standards.

The effluent monitoring requirements have been specified in accordance with the RIPDES regulations as well as 40 CFR 122.41 (j), 122.44 (i), and 122.48 to yield data representative of the discharge. The requirement of testing for nutrients; phosphorus, nitrogen, and ammonia, is necessary to make a determination on nutrient loadings in the receiving water. The latest Rhode Island Water Quality Regulations lists Water Quality Classifications (250-RICR-150-05 §1.25), and lists the segment of the Woonasquatucket River that the facility discharges to as a warmwater habitat. Therefore, salmonids are assumed absent, and ammonia criteria from the RIDEM Ambient Water Quality Criteria and Guidelines for Toxic Pollutants (250-RICR-150-05 §1.26(L)) are used based on that designation.

The DEM used instream pH and temperature data to evaluate the upper 90th percentile of temperature data in each month to determine the most stringent ammonia standards that are applicable to the summer and winter ammonia limits. For pH data, only June, July, August, and September had an adequate number of pH measurements to determine a month-specific upper 90th percentile. For the other months, the overall upper 90th percentile was used. These pH values are shown in the table below:

Month	Upper 90th Percentile pH (standard units)
June	7.1
July	7.2
August	7.3
September	6.9
All other months	7.3

All temperature and pH data used for the ammonia limits can be seen in Attachment I. The calculation of water quality-based freshwater discharge limits can be seen in Attachment D.

Antibacksliding

Provided below is a brief introduction to Antibacksliding and Antidegradation; as well as a discussion on how the two policies were used to calculate water quality-based limits.

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:

1. 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.

2. 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 asked 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 pollutant levels, which would result after the consideration of all currently valid RIPDES permit limits or historical discharge data (whichever is greater), background data (when available), and any new information (e.g., dilution factors).

Antidegradation

The DEM's "*Policy on the Implementation of the Antidegradation Provisions of the Rhode Island Water Quality Regulations July 2006*" (the Policy) established four tiers of water quality protection:

Tier 1. In all surface waters, existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

Tier 2. In waters where the existing water quality criteria exceeds the levels necessary to support the propagation of fish and wildlife and recreation in and on the water, that quality shall be maintained and protected except for insignificant changes in water quality as determined by the Director and in accordance with the Antidegradation Implementation Policy, as amended. In addition, the Director may allow significant degradation, which is determined to be necessary to achieve important economic or social benefits to the State in accordance with the Antidegradation Policy.

Tier 2½. Where high quality waters constitute Special Resource Protection Waters SRPWs[1], there shall be no measurable degradation of the existing water quality necessary to protect the characteristics which cause the waterbody to be designated a SRPW. Notwithstanding that all public drinking water supplies are SRPWs, public drinking water suppliers may undertake temporary and short-term activities within the boundary perimeter of a public drinking water supply impoundment for essential maintenance or to address emergency conditions in order to prevent adverse effect on public health or safety. These activities must comply with the requirements set forth in Tier 1 and Tier 2.

Tier 3. Where high quality waters constitute an Outstanding Natural Resource ONRWs[2], that water quality shall be maintained and protected. The State may allow some limited activities that result in temporary or short-term changes in the water quality of an ONRW. Such activities must not permanently degrade water quality or result in water quality lower than necessary to protect the existing uses in the ONRW.

The formulas previously presented ensure that permit limitations are based upon water quality criteria

[1] SRPWs are surface waters identified by the Director as having significant recreational or ecological uses.
[2] ONRWs are a special subset of high-quality water bodies, identified by the State as having significant recreational or ecological water uses.

and methodologies established to ensure that all designated uses will be met.

In terms of the applicability of Tier 2 of the Policy, a water body is assessed as being high quality on a parameter-by-parameter basis. In accordance with Part II of the Policy, "Antidegradation applies to all new or increased projects or activities which may lower water quality or affect existing water uses, including but not limited to all 401 Water Quality Certification reviews and any new, reissued, or modified RIPDES permits." Part VI.A of the Policy indicates that it is not applicable to activities which result in insignificant (i.e., short-term minor) changes in water quality and that significant changes in water quality will only be allowed if it is necessary to accommodate important economic and social development in the area in which the receiving waters are located (important benefits demonstration). Part VI.B.4 of the Policy states that: "Theoretically, any new or increased discharge or activity could lower existing water quality and thus require the important benefits demonstration. However, DEM will: 1) evaluate applications on a case-by-case basis, using BPJ and all pertinent and available facts, including scientific and technical data and calculations as provided by the applicant; and 2) determine whether the incremental loss is significant enough to require the important benefits demonstration described below. [If not then as a general rule DEM will allocate no more than 20%.] Some of the considerations which will be made to determine if an impact is significant in each site specific decision are: 1) percent change in water quality parameter value and their temporal distribution; 2) quality and value of the resource; 3) cumulative impact of discharges and activities on water quality to date; 4) measurability of the change; 5) visibility of the change; 6) impact on fish and wildlife habitat; and 7) impact on potential and existing uses. As a general guide, any discharge or activity which consumes greater than 20% of the remaining assimilative capacity may be deemed significant and invoke full requirements to demonstrate important economic or social benefits."

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 in 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.

Use the above-mentioned criteria, the present instream water quality C_p is defined as:

$$C_p = \frac{(DF - 1) \cdot C_B + (1 \cdot C_d)}{DF}$$

where: C_b = background concentration[3]
C_d = discharge data[4]
DF = dilution factor

In this permit, the monthly average limits for Total Ammonia (May – October), Total Ammonia (November – April), and Total Zinc were calculated to be higher than the 2013 permit for water quality-based permit limitations. Because this constitutes a relaxation of permit limitations, Antibacksliding and Antidegradation apply. Each of the above-mentioned parameters was evaluated to be consistent with the Department's Antidegradation policy and relevant regulations. The Antidegradation limit calculations and data are presented in Attachment K of this Fact Sheet.

Other Permit Conditions

[3] Data collected at a location that is unimpacted by significant point source discharges.
[4] Discharge data refers to the maximum of the permit limit or the historical discharge level. The historical discharge level is determined by calculating the upper 95th 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.

Priority Pollutants

The required priority pollutant scans are to be performed annually for the EPA Priority Pollutants as listed in 40 CFR 122, Appendix D, Tables II and III. The priority pollutant scans are typically performed during the third calendar quarter bioassay sampling event.

Sludge Requirements

The permit contains requirements for the permittee to comply with the State's Rules and Regulations for Sewage Sludge Management (250-RICR-150-10-3) and RIDEM's Order of Approval for sludge disposal in accordance with Section 405(d) of the Clean Water Act (CWA). 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 RIDEM Sludge Order of Approval sets forth the conditions to ensure this compliance.

Resiliency Planning Requirements

On March 30, 2017, DEM's Office of Water Resources issued *Guidance for the Consideration of Climate Change Impacts in the Planning and Design of Municipal Wastewater Collection and Treatment Infrastructure*. This guidance built on and clarified existing studies, resources, and coastal efforts, including the "TR-16" *Guide for the Design of Waste Treatment Works* that was issued by the New England Interstate Water Pollution Control Commission and the DEM report *Implications of Climate Change for RI Wastewater Collection and Treatment Infrastructure*. DEM's goal with Resiliency Plan requirements is to protect systems from interruptions in operations, damages to structural and electrical integrity, and achievement of these protections to the maximum extent practicable. Therefore, DEM determined that the requirement for the submission of a Resiliency Plan within 1 year of the effective date of the permit was appropriate.

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.

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 250-RICR-150-10-1.50 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:

Max Maher, Environmental Engineering Associate
Department of Environmental Management - Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-4700, ext: 7201
Email: Maximilian.Maher@dem.ri.gov

11/6/2020
Date

Joseph B. Haberek, P.E.
Environmental Engineer IV
RIPDES Program
Office of Water Resources
Department of Environmental Management

ATTACHMENT A – Average Effluent Characteristics 2013-2018

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

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE:

PARAMETER	AVERAGE[1]	MAXIMUM[2]
FLOW	1.9783 MGD	3.2 MGD
$CBOD_5$	0.683 mg/L	3.47 mg/L
$CBOD_5$ load	28.25 lb/day	53.5 lb/day
$CBOD_5$ % removal	99.7 %	
TSS	1.82 mg/L	4.77 mg/L
TSS load	42.85 lb/day	86.47 lb/day
TSS % removal	99.34 %	
pH	7.22 S.U.(Minimum)	8.08 S.U.(Maximum)
Coliform, Fecal	2.22 MPN/100 mL	5.68 MPN/100 mL
Enterococci	2.16 CFU/100 mL	30.33 CFU/100 mL
Settleable Solids	0.1 mL/L	0.12 mL/L
Oil & Grease	---	3.18 mg/L
Chlorine Residual	8.7 µg/L	24.4 µg/L
Nitrogen, Nitrate	7.77 mg/L	9.83 mg/L
Nitrogen, Nitrite	0.022 mg/L	0.094 mg/L
Nitrogen, Total	8.64 mg/L	10.14 mg/L
Nitrogen, Total Kjeldhal	0.80 mg/L	1.59 mg/L
Ammonia (May-Oct)	0.23 mg/L	0.56 mg/L
Ammonia (Nov-Apr)	0.27 mg/L	0.62 mg/L
Phosphorus	0.09 mg/L	0.17 mg/L
Phosphorous, Orthophosphate	0.04 mg/L	0.06 mg/L
Aluminum	34.4 µg/L	34.5 µg/L
Cadmium	0.033 µg/L	0.074 µg/L
Copper	4.87 µg/L	4.55 µg/L
Cyanide	<10 µg/L	<10 µg/L
Iron	432.5 µg/L	549.8 µg/L
Lead	0.62 µg/L	1.49 µg/L
Nickel	3.04 µg/L	3.28 µg/L
Zinc	33.0 µg/L	39.3 µg/L

[1]Data represents the mean of the monthly average data from November 2013 to October 2018.
[2]Data represents the mean of the daily maximum data from November 2013 to October 2018.

Whole Effluent Toxicity Testing Results (percent effluent)

Species: Ceriodaphnia Dubia

Monitoring Quarter	LC50 Result	C-NOEC Result
4th Quarter 2013	=100%	100%
1st Quarter 2014	=100%	100%
2nd Quarter 2014	=100%	100%
3rd Quarter 2014	=100%	100%
4th Quarter 2014	=100%	50%
1st Quarter 2015	=100%	100%
2nd Quarter 2015	=100%	100%
3rd Quarter 2015	=100%	100%
4th Quarter 2015	=100%	100%
1st Quarter 2016	=100%	100%
2nd Quarter 2016	=100%	100%
3rd Quarter 2016	=100%	100%
4th Quarter 2016	=100%	100%
1st Quarter 2017	=100%	50%
2nd Quarter 2017	=100%	100%
3rd Quarter 2017	=100%	100%
4th Quarter 2017	=100%	100%
1st Quarter 2018	=100%	100%
2nd Quarter 2018	=100%	100%
3rd Quarter 2018	=100%	100%

ATTACHMENT B – Smithfield WWTF Treatment Process Schematic

ATTACHMENT C – Summary of Permit Limits and Derivation

NOTE: Part I.A of the permit should be referenced for all final permit limitations and other requirements related to monitoring, including sample type.

Parameter	Monthly Average	Weekly Average	Daily Maximum	Measurement Frequency	Derivation
Flow	3.5 MGD			Continuous	BPJ
$CBOD_5$ load (May-Oct)	292 lb/d		496 lb/d	3/Week	BPJ
$CBOD_5$ (May-Oct)	10 mg/L	15 mg/L	17 mg/L	3/Week	BPJ
$CBOD_5$ load (Nov-Apr)	437 lb/day		729 lb/day	3/Week	BPJ
$CBOD_5$ (Nov-Apr)	15 mg/L	25 mg/L	25 mg/L	3/Week	BPJ
$CBOD_5$ % Removal	85 %			1/Month	TBEL
TSS load (May-Oct)	437 lb/day		729 lb/day	3/Week	BPJ
TSS (May-Oct)	15 mg/L	20 mg/L	25 mg/L	3/Week	BPJ
TSS load (Nov-Apr)	437 lb/d		729 lb/d	3/Week	BPJ
TSS (Nov-Apr)	15 mg/l	25 mg/l	25 mg/l	3/Week	BPJ
TSS % Removal	85 %			1/Month	TBEL
Settleable Solids		--- ml/L	--- ml/L	1/Day	BPJ
Oil & Grease			--- mg/L	1/Month	BPJ
Enterococci	54 cfu 100 ml		175 cfu 100 ml	3/Week	WQBEL
Fecal Coliform	--- MPN 100 ml		--- MPN 100 ml	1/Month	WQBEL
Total Residual Chlorine	16.1 µg/L[1]		27.8 µg/L	See Part I.A.2	WQBEL
pH	6.5 SU (min.)		9.0 SU (max.)	2/Day	WQBEL
Total Phosphorus (April-Oct.)	0.1 mg/L		--- mg/L	3/Week	WQBEL
Total Phosphorus (Nov-March)	1.0 mg/L		--- mg/L	1/Week	WQBEL
Orthophosphorus (Nov-March)	--- mg/L		--- mg/L	1/Week	BPJ
Total Nitrate (as N) (May-Oct)	--- mg/L		--- mg/L	3/Week	BPJ
Total Nitrate (as N) (Nov-Apr)	--- mg/L		--- mg/L	1/Month	BPJ
Total Nitrite (as N) (May-Oct)	--- mg/L		--- mg/L	3/Week	BPJ
Total Nitrite (as N) (Nov-Apr)	--- mg/L		--- mg/L	1/Month	BPJ
TKN (as N) (May-Oct)	--- mg/L		--- mg/L	3/Week	BPJ
TKN (as N) (Nov-Apr)	--- mg/L		--- mg/L	1/Month	BPJ
Tot. Nitrogen (TKN + NO_2 + NO_3) (May-Oct)	10.0 mg/L		--- mg/L	3/Week	WQBEL
Tot. Nitrogen (TKN + NO_2 + NO_3) (Nov-Apr)	--- mg/L		--- mg/L	1/Month	WQBEL
Total Ammonia (as N) (May-Oct)	2.9 mg/L		35.3 mg/L	3/Week	WQBEL
Total Ammonia (as N) (Nov-Apr)	11.2 mg/L		68 mg/L	1/Week	WQBEL
Total Cadmium	0.14 ug/L		0.8 ug/L	1/Week	WQBEL
Total Cyanide	6.2 ug/L		26.3 ug/L	1/Week	WQBEL
Total Lead	0.86 ug/L		23.7 ug/L	1/Week	WQBEL
Total Zinc	52.6 ug/L		57.0 ug/L	1/Week	WQBEL
Total Copper	--- ug/L		--- ug/L	1/Week	WQBEL
Total Nickel	--- ug/L		--- ug/L	1/Quarter	WQBEL
Total Aluminum	--- ug/L		--- ug/L	1/Quarter	WQBEL
Total Iron	--- ug/L		--- ug/L	1/Week	WQBEL
Ceriodaphnia dubia – LC50			100% or greater	1/Quarter	WQBEL
Ceriodaphnia dubia – C-NOEC			75%	1/Quarter	WQBEL
Ceriodaphnia dubia – IC25			--- %	1/Quarter	WQBEL
Bis(2-ethylhexyl) phthalate	14.4 ug/L		664 ug/L	1/Month	WQBEL
Chloroform	38.3 ug/L		1730 ug/L	1/Month	WQBEL

[1]The limit at which compliance/noncompliance determinations will be based is the Quantitation Limit, which is defined as 20 ug/l for Total Residual Chlorine.

ATTACHMENT D – Summary of Applicable Water Quality Based Limits

ATTACHMENT E – Comparison of Allowable Limits with Discharge Monitoring Report Data, Permit Application Data, and Annual Priority Pollutant Scan Data

ATTACHMENT F – WET Limit Calculations

Reasonable potential for WET limits has been previously established for Smithfield's WWTF. To calculate WET limits, the following steps are taken:

1. The in-stream waste concentration (IWC) is calculated.

$$IWC = \frac{Facility\ Flow\ (cfs)}{Critical\ Flow\ 7Q10\ (cfs) + Facility\ Flow\ (cfs)} \cdot 100\%$$

$$IWC = \frac{5.416\ cfs}{2.689\ cfs + 5.416\ cfs} \cdot 100\%$$

$$\boldsymbol{IWC = 66.8\%}$$

2. The Acute Wasteload Allocation (WLA_a) is calculated.

$$WLA_a = \frac{(Facility\ Flow + Critical\ Flow) \cdot Acute\ Criteria - Critical\ Flow\ \cdot Background\ Acute\ Toxicity}{Facility\ Flow}$$

$$WLA_a = \frac{(5.416\ cfs + 2.689\ cfs) \cdot 0.3\ TU_a - 2.689\ cfs\ \cdot 0\ TU_a}{5.416\ cfs}$$

The acute criteria is defined as 0.3 Toxicity Units Acute (TU_a) (See EPA's *Technical Support Document (TSD) For Water Quality-based Toxics Control,* March 1991). A PDF of this document can be found at the following web address: https://www3.epa.gov/npdes/pubs/owm0264.pdf. The background acute toxicity for this facility is assumed to be 0 TU_a.

$$\boldsymbol{WLA_a = 0.449\ TU_a}$$

3. The Chronic Wasteload Allocation (WLA_c) is calculated.

$$WLA_c = \frac{(Facility\ Flow + Critical\ Flow) \cdot Chronic\ Criteria - Critical\ Flow\ \cdot Background\ Chronic\ Toxicity}{Facility\ Flow}$$

$$WLA_c = \frac{(5.416\ cfs + 2.689\ cfs) \cdot 1.0\ TU_c - 2.689\ cfs\ \cdot 0\ TU_c}{5.416\ cfs}$$

The chronic criteria is defined as 1.0 Toxicity Units Chronic (TU_c) (See EPA's TSD). The background chronic toxicity for this facility is assumed to be 0 TU_c.

$$\boldsymbol{WLA_c = 1.496\ TU_c}$$

4. The acute and chronic wasteload allocations are compared by multiplying the WLA_a by the Acute to Chronic Ratio (ACR) multiplier.

$$WLA_{a,c} = WLA_a\ \cdot ACR$$

The ACR is assumed to be 10 (See EPA's TSD).

$$WLA_{a,c} = 0.449\ TU_a \cdot 10$$

$$\boldsymbol{WLA_{a,c} = 4.49\ TU_{a,c}}$$

5. The Acute Long-Term Average ($LTA_{a,c}$) is calculated using the acute-to-chronic WLA.

$$LTA_{a,c} = WLA_{a,c} \cdot\ WLA_{a,c}\ Multiplier$$

The $WLA_{a,c}$ multiplier is found in Table 5-1, Acute, from the TSD, using the 99th percentile and a Coefficient of Variation (CV) calculated based on the facility's reported WET data. Calculating a CV requires at least 10 samples, which the Smithfield WWTF has. The CV is calculated as the standard

deviation divided by the mean. Using the data from March 2014 to December 2018, the CV for WET data reported by Smithfield's WWTF is 0.27. The data used to calculate the mean and standard deviation is provided in the table below.

Ceriodaphnia dubia

CHRONIC - Method 1002.0		
Date	NOEC	TUc*
3/31/2014	100	1
6/30/2014	100	1
9/30/2014	100	1
12/31/2014	50	2
3/31/2015	100	1
6/30/2015	100	1
9/30/2015	100	1
12/31/2015	100	1
3/31/2016	100	1
6/30/2016	100	1
9/30/2016	100	1
12/31/2016	100	1
3/31/2017	50	2
6/30/2017	100	1
9/30/2017	100	1
12/31/2017	100	1
3/31/2018	100	1
6/30/2018	100	1
9/30/2018	100	1
12/31/2018	100	1
		Average TU_c = 1.1
		Standard Deviation = 0.3
		Coefficient of Variation = 0.3/1.1 = 0.27

The $WLA_{a,c}$ multiplier (found in Table 5-1 from the TSD using the 99th percentile) and the calculated CV of 0.27 is 0.559. The Acute Long-Term Average is then calculated:

$$LTA_{a,c} = 4.49\ TU_{a,c} \cdot 0.559$$

$$\boldsymbol{LTA_{a,c} = 2.510\ TU_{a,c}}$$

6. The Chronic Long-Term Average (LTA_c) is calculated using the chronic WLA.

$$LTA_c = WLA_c \cdot WLA_c\ Multiplier$$

The WLA_c multiplier is found in Table 5-1, Chronic, from the TSD, using the 99th percentile and the same CV as calculated in Step 5. The chronic WLA Multiplier 0.738.

$$LTA_c = 1.496\ TU_c \cdot 0.738$$

$$\boldsymbol{LTA_c = 1.104\ TU_c}$$

7. The limiting LTA is used to calculate a Maximum Daily Limit (MDL), which is the LC_{50}.

$$MDL = Limiting\ LTA \cdot LTA\ Multiplier\ for\ MDL$$

Comparing the $LTA_{a,c}$ from Step 5 to the LTA_c from Step 6, it can be seen that then LTA_c is the smaller value, and thus the more limiting LTA. The LTA multiplier for MDLs is found in Table 5-2 of the TSD, for

the 99th percentile and with the CV calculated in Step 5. The LTA multiplier for MDL is 1.789. The MDL is then calculated:

$$MDL = 1.107\,TU_c \cdot 1.789$$

$$MDL = 1.975\,TU_c$$

The MDL represents the value used for an acute limit, so to convert from TU_c to TU_a the MDL value calculated above is divided by the ACR, which is 10.

$$MDL = \frac{1.975\,TU_c}{10}$$

$$MDL = 0.1975\,TU_a$$

The LC_{50} limit is presented as a percent of effluent, and this is calculated by dividing one (1) by the TU_a.

$$LC_{50} = \frac{1}{0.1975\,TU_a} \cdot 100\%$$

$$LC_{50} = 506\%$$

LC_{50} is defined as the concentration of wastewater that causes mortality to 50% of the test organisms. Since the concentration of wastewater in testing cannot be greater than 100%, the LC_{50} limit is then set to greater than or equal to 100%.

$$\boldsymbol{LC_{50} \geq 100\%}$$

8. The limiting LTA is used to calculate an Average Monthly Limit (AML), which is the C-NOEC.

$$AML = Limiting\ LTA \cdot LTA\ Multiplier\ for\ AML$$

Comparing the $LTA_{a,c}$ from Step 5 to the LTA_c from Step 6, it can be seen that then LTA_c is the smaller value, and thus the more limiting LTA. The LTA multiplier for AMLs is found in Table 5-2 of the TSD, for the 95th percentile, n=4 (for quarterly sampling) and with the CV calculated in Step 5. The LTA Multiplier for AML is 1.236. The AML is then calculated:

$$AML = 1.107\,TU_c \cdot 1.236$$

$$AML = 1.364\,TU_c$$

The AML represents the value used for a chronic limit. Since the units are already in chronic units, the C-NOEC can be calculated by dividing one (1) by the TU_c. The value is rounded to the nearest 5%.

$$C - NOEC = \frac{1}{1.364\,TU_c} \cdot 100\%$$

$$\boldsymbol{C - NOEC = 75\%}$$

C-NOEC is defined as the highest concentration of toxicant or effluent at which no adverse effects are observed. When chronic WET testing is performed, the limit calculated in Step 8 must be included in the dilution series, as described in Part I.B.6 of the permit.

ATTACHMENT G – Background Metals Data

ATTACHMENT H – Average pH Data

ATTACHMENT I – Temperature and pH Data for Ammonia Limit Calculations

ATTACHMENT J – USGS Gauge at Centerdale Data

Newly available data collected by USGS and DEM resulted in changes to the pH and background metals concentrations used when calculating water quality-based permit limitations. In certain cases, this caused the calculated water quality-based limits to be higher than the previous permit limitations. Because this constitutes a relaxation of permit limitations, Antibacksliding and Antidegradation regulations and policies apply. In this permit, the monthly average limits for Total Ammonia (May – October), Total Ammonia (November – April), and Total Zinc were calculated to be higher than the 2013 permit for water quality-based permit limitations. Each of these parameters was evaluated to be consistent with the Department's Antibacksliding and Antidegradation regulations (250-RICR-150-05 §1.20 and §1.27) and policies. Each of the above-mentioned parameters is evaluated below.

Total Ammonia (May – October)

As discussed under the *Antibacksliding* and *Antidegradation* section of this fact sheet, the first question that must be asked is whether or not the receiving water is attaining the water quality standard. The Office of Water Resources has determined that the most appropriate evaluation of existing water quality is by calculating pollutant levels that would result after the consideration of currently valid RIPDES permit limits or historical discharge data (whichever is greater), background data (when available), and any new information (e.g., dilution factors). This evaluation is performed according to steps a-d below.

a. Determine if the receiving water is a high-quality water for Total Ammonia.

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

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

where: C_b = background concentration
C_d = discharge data
DF = dilution factor

The C_b value is from data collected at a location that is unimpacted by significant point source discharges. For Ammonia, the DEM Ambient River Monitoring Program has collected 5 samples from the RI0002007R-10B segment of the Woonasquatucket River, upstream of the Smithfield WWTF. This data is presented in the following table:

Date	Ammonia Value (mg/L)
6/1/2009	0.1
8/25/2009	0.1
6/25/2014	0
8/5/2014	0.035
9/9/2014	0.057

Which results in an average C_b of 0.0584 mg/L. The DF of 1.497 has been established in the *Mixing Zones and Dilution Factor* section of this Fact Sheet. The C_d is the greater value of either the currently valid RIPDES permit limit or historical discharge data. The historical discharge data is determined by calculating the upper 95th confidence interval for the monthly average reported data for the past five (5) years. From the Smithfield WWTF's DMR data for the past 5 years, the historical discharge data for Total Ammonia (May - October) was calculated to be 0.39 mg/L. The 2013 permit limit was 2.6 mg/L. Therefore, the previous permit limit was used in the C_p calculation.

$$C_p = \frac{(1.497 - 1) \cdot 0.058\ mg/L + (1 \cdot 2.6\ mg/L)}{1.497}$$

$$\boldsymbol{C_p = 1.756\ mg/L}$$

b. Is Tier 2 of Antidegradation applicable?

Comparing the C_p value to the chronic water quality criteria for Ammonia (2.69 mg/L), the

calculated present instream water quality value is less than the water quality standard, therefore the receiving water is attaining the water quality standard, so the Tier 2 protections of Antidegradation apply.

c. Calculate a revised permit limit under Tier 2 Protection.

The remaining assimilative capacity of the receiving water must be calculated, using DEM's policy of allocating 20% of the available buffer to existing discharges without the need to complete an important benefits demonstration (and because the receiving water is not an ONRW). The remaining assimilative capacity is then:

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

where: C_{rac} = the remaining assimilative capacity of the receiving water
$C_{criteria}$ = the applicable standard for the most sensitive use
C_p = the calculated present water quality concentration

Plugging in the values from step a and b above:

$$C_{rac} = 2.69\ mg/L\ - 1.756\ mg/L$$

$$\boldsymbol{C_{rac} = 0.934\ mg/L}$$

Then, establish the percentage of the remaining assimilative capacity to be allocated to the permittee. Because Smithfield WWTF has a well-running approved pretreatment program, and based on Smithfield's compliance history, a 20% allocation of the remaining assimilative capacity is appropriate.

The increased permit limit that would meet the Tier 2 protection is then calculated:

$$Chronic\ Limit = (C_p + 20\% * C_{rac}) * DF - (DF - 1) * C_b$$

$$Chronic\ Limit = (1.756\ mg/L + 20\% * 0.934) * 1.497 - (1.497 - 1) * 0.058\ mg/L$$

$$\boldsymbol{Chronic\ Limit = 2.9\ mg/L}$$

The chronic permit limit (monthly average limit) is 2.9 mg/L, which is less than the calculated water quality-based limit of 3.6 mg/L, and higher than the 2013 permit limit of 2.6 mg/L.

d. Calculate the acute permit limit using acute water quality criteria (26.2 mg/L), the acute dilution factor, background data (0.058 mg/L), and 90% allocation.

$$Acute\ Limit = \left(26.2\frac{mg}{L} * 90\% * 1.497\right) - (1.497 - 1) * 0.058\ mg/L$$

$$\boldsymbol{Acute\ Limit = 35.3\ mg/L}$$

Therefore, the final limits for Total Ammonia (April – November) are:
Monthly Average = 2.9 mg/L
Daily Maximum = 35.3 mg/L

Total Ammonia (November – April)

a. Determine if the receiving water is a high-quality water for Total Ammonia.

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

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

where: C_b = background concentration
C_d = discharge data
DF = dilution factor

The C_b value is from data collected at a location that is unimpacted by significant point source discharges. For Ammonia, the DEM Ambient River Monitoring Program has collected 5 samples from the RI0002007R-10B segment of the Woonasquatucket River, upstream of the Smithfield WWTF. This data is presented in the following table:

Date	Ammonia Value (mg/L)
6/1/2009	0.1
8/25/2009	0.1
6/25/2014	0
8/5/2014	0.035
9/9/2014	0.057

Which results in an average C_b of 0.0584 mg/L. The DF of 2.887 has been established in the *Mixing Zones and Dilution Factor* section of this Fact Sheet. The C_d is the greater value of either the currently valid RIPDES permit limit or historical discharge data. The historical discharge data is determined by calculating the upper 95th confidence interval for the monthly average reported data for the past five (5) years. From the Smithfield WWTF's DMR data for the past 5 years, the historical discharge data for Total Ammonia (November - April) was calculated to be 0.44 mg/L. The 2013 permit limit was 9.9 mg/L. Therefore, the previous permit limit was used in the C_p calculation.

$$C_p = \frac{(2.887 - 1) \cdot 0.058\ mg/L + (1 \cdot 9.9\ mg/L)}{2.887}$$

$$\boldsymbol{C_p = 3.467\ mg/L}$$

b. Is Tier 2 of Antidegradation applicable?

Comparing the C_p value to the chronic water quality criteria for Ammonia (8.2 mg/L), the calculated present instream water quality value is less than the water quality standard, therefore the receiving water is attaining the water quality standard, so the Tier 2 protections of Antidegradation apply.

c. Calculate a revised permit limit under Tier 2 Protection.

The remaining assimilative capacity of the receiving water must be calculated, using DEM's policy of allocating 20% of the available buffer to existing discharges without the need to complete an important benefits demonstration (and because the receiving water is not an ONRW). The remaining assimilative capacity is then:

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

where: C_{rac} = the remaining assimilative capacity of the receiving water
$C_{criteria}$ = the applicable standard for the most sensitive use
C_p = the calculated present water quality concentration

Plugging in the values from step a and b above:

$$C_{rac} = 5.71\ mg/L\ - 3.467\ mg/L$$

$$\boldsymbol{C_{rac} = 2.243\ mg/L}$$

Then, establish the percentage of the remaining assimilative capacity to be allocated to the permittee. Because Smithfield WWTF has a well-running approved pretreatment program, and

based on Smithfield's compliance history, a 20% allocation of the remaining assimilative capacity is appropriate.

The increased permit limit that would meet the Tier 2 protection is then calculated:

$$Chronic\ Limit = (C_p + 20\% * C_{rac}) * DF - (DF - 1) * C_b$$

$$Chronic\ Limit = \left(3.467\frac{mg}{L} + 20\% * 2.243\ mg/L\right) * 2.887 - (2.887 - 1) * 0.058\ mg/L$$

$$\boldsymbol{Chronic\ Limit = 11.2\ mg/L}$$

The chronic permit limit (monthly average limit) is 11.2 mg/L, which is less than the calculated water quality-based limit of 15.6 mg/L, and higher than the 2013 permit limit of 9.9 mg/L.

d. Calculate the acute permit limit using acute water quality criteria (26.2 mg/L), the acute dilution factor, background data (0.058 mg/L), and 90% allocation.

$$Acute\ Limit = \left(26.2\frac{mg}{L} * 90\% * 2.887\right) - (2.887 - 1) * 0.058\ mg/L$$

$$\boldsymbol{Acute\ Limit = 67.97\ mg/L}$$

Therefore, the final limits for Total Ammonia (December – March) are:
Monthly Average = 11.2 mg/L
Daily Maximum = 68 mg/L (WQBEL)

Total Zinc

a. Determine if the receiving water is a high-quality water for Total Zinc.

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

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

where: C_b = background concentration
C_d = discharge data
DF = dilution factor

The C_b value of 2.25 µg/L is from data collected by DEM's Ambient River Monitoring program and can be seen in Attachment G. The *DF* of 1.497 has been established in the *Mixing Zones and Dilution Factor* section of this Fact Sheet. The C_d is the greater value of either the currently valid RIPDES permit limit or historical discharge data. The historical discharge data is determined by calculating the upper 95th confidence interval for the monthly average reported data for the past five (5) years. From the Smithfield WWTF's DMR data for the past 5 years, the historical discharge data for Total Zinc was calculated to be 31.68 µg/L. The 2013 permit limit was 50.1 µg/L. Therefore, the previous permit limit was used in the C_p calculation.

$$C_p = \frac{(1.497 - 1) \cdot 2.25\ \mu g/L + (1 \cdot 50.1\ \mu g/L)}{1.497}$$

$$\boldsymbol{C_p = 34.214\ \mu g/L}$$

b. Is Tier 2 of Antidegradation applicable?

Comparing the C_p value to the chronic water quality criteria for Total Zinc (42.5949464 µg/L), the calculated present instream water quality value is less than the water quality standard, therefore the receiving water is attaining the water quality standard, so the Tier 2 protections of

Antidegradation apply.

c. Calculate a revised permit limit under Tier 2 Protection.

The remaining assimilative capacity of the receiving water must be calculated, using DEM's policy of allocating 20% of the available buffer to existing discharges without the need to complete an important benefits demonstration (and because the receiving water is not an ONRW). The remaining assimilative capacity is then:

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

where: C_{rac} = the remaining assimilative capacity of the receiving water
$C_{criteria}$ = the applicable standard for the most sensitive use
C_p = the calculated present water quality concentration

Plugging in the values from step a and b above:

$$C_{rac} = 42.5949464\ \mu g/L\ - 34.214\ \mu g/L$$

$$\boldsymbol{C_{rac} = 8.381\ \mu g/L}$$

Then, establish the percentage of the remaining assimilative capacity to be allocated to the permittee. Because Smithfield WWTF has a well-running approved pretreatment program, and based on Smithfield's compliance history, a 20% allocation of the remaining assimilative capacity is appropriate.

The increased permit limit that would meet the Tier 2 protection is then calculated:

$$Chronic\ Limit = (C_p + 20\% * C_{rac}) * DF - (DF - 1) * C_b$$

$$Chronic\ Limit = \left(34.214\frac{\mu g}{L} + 20\% * 8.381\ \mu g/L\right) * 1.497 - (1.497 - 1) * 2.25\ \mu g/L$$

$$\boldsymbol{Chronic\ Limit = 52.6\ \mu g/L}$$

The chronic permit limit (monthly average limit) is 52.6 µg/L, which is less than the calculated water quality-based limit of 57.0 µg/L, and higher than the 2013 permit limit of 50.1 µg/L.

d. Calculate the acute permit limit using acute water quality criteria (42.24934846 µg/L), the acute dilution factor, background data (2.25 µg/L), a dissolved to total Zinc conversion factor of 0.978, and 90% allocation.

$$Acute\ Limit = \frac{\left(42.249348\frac{\mu g}{L} * 90\% * 1.497\right) - (1.497 - 1) * 2.25\ \mu g/L}{0.978} = \frac{55.8}{0.978}$$

$$\boldsymbol{Acute\ Limit = 57\ \mu g/L}$$

Therefore, the final limits for Total Zinc are:
Monthly Average = 52.6 µg/L
Daily Maximum = 57.0 µg/L (WQBEL)

The limits for Total Ammonia (April – November), Total Ammonia (December – March), and Total Zinc have been increased based from the water quality-based limits in the 2013 RIPDES permit in accordance with the Antibacksliding and Antidegradation regulations and policies as detailed above. These limits are incorporated into the permit and can be found in Part I.A.

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

PUBLIC NOTICE OF PROPOSED PERMIT ACTION UNDER THE RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES) PROGRAM WHICH REGULATES DISCHARGES INTO THE WATERS OF THE STATE UNDER CHAPTER 46-12 OF THE RHODE ISLAND GENERAL LAWS OF 1956, AS AMENDED.

DATE OF NOTICE: November 13, 2020

PUBLIC NOTICE NUMBER: PN 20-05

DRAFT RIPDES PERMIT

RIPDES PERMIT NUMBER: **RI0100251**

NAME AND MAILING ADDRESS OF APPLICANT:

The Town of Smithfield
64 Farnum Pike
Smithfield RI, 02917

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Smithfield Wastewater Treatment Plant
20 Esmond Mill Drive
Smithfield, Rhode Island 02917

RECEIVING WATER: **Woonasquatucket River (WBID: RI0002007R-10C)**

RECEIVING WATER CLASSIFICATION: **B1**

The facility, which is the source of the discharge, is located in the Town of Smithfield and is engaged in the treatment of industrial and domestic wastewater from the sanitary sewer system in the Town of Smithfield and a portion of the Town of Johnston. The Rhode Island Department of Environmental Management (DEM) last issued the facility's RIPDES Permit in 2013. This draft permit reissues the authorization and includes more stringent limits for total phosphorus. The draft permit also establishes new limits for bis(2-ethylhexyl) phthalate and chloroform. The more stringent and newly incorporated limits are assigned to be protective of the receiving water (Woonasquatucket River). The DEM anticipates entering into a Consent Agreement, subsequent to issuance of this permit, which will establish enforceable compliance schedules to achieve compliance with the new permit limits.

FURTHER INFORMATION:

A Fact Sheet (describing the type of facility and significant factual, legal and policy questions considered in these permit actions) may be obtained at no cost by emailing or calling DEM as noted below:

Max Maher
Environmental Engineering Associate
Rhode Island Department of Environmental Management
Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908-5767
(401) 222-4700 ext. 7201
e-mail: maximilian.maher@dem.ri.gov

The administrative record containing all documents relating to these permit actions is on file and may be inspected, by appointment, at the DEM's Providence office mentioned above between 8:30 a.m. and 4:00 p.m., Monday through Friday, except holidays.

PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

Pursuant to Chapter 42-17.4 of the Rhode Island General Laws a public hearing has been scheduled to consider this permit if requested. Requests for a Public Hearing must be submitted to the attention of Max Maher as indicated above. Notice should be taken that if DEM receives a request from twenty-five (25) people, a governmental agency or subdivision, or an association having no less than twenty-five (25) members on or before 4:00 PM on Monday, December 14, 2020, a public hearing will be held at the following time:

5:00 PM Thursday, December 17, 2020

In accordance with Executive Order 20-25 the public hearing will be held virtually. The virtual public hearing, if held, may be accessed by members of the public using the following link:

Join Zoom Meeting
https://us02web.zoom.us/j/84822924114?pwd=MnFZUXlocHp1aWVqN0taSW1OcktTdz09

Meeting ID: 848 2292 4114
Passcode: 074366
One tap mobile
+13017158592,,84822924114#,,,,,,0#,,074366# US (Washington D.C)
+13126266799,,84822924114#,,,,,,0#,,074366# US (Chicago)

Dial by your location
+1 301 715 8592 US (Washington D.C)
+1 312 626 6799 US (Chicago)
+1 929 205 6099 US (New York)
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
+1 669 900 6833 US (San Jose)
Meeting ID: 848 2292 4114

Passcode: 074366
Find your local number: https://us02web.zoom.us/u/kkflCnYUX

Interested persons should contact DEM to confirm if a hearing will be held at the time noted above.

If communication assistance (readers/interpreters/captioners) is needed, or any other accommodation to ensure equal participation, please call DEM at the number listed above or RI Relay 711 at least three (3) business days prior to the meeting so arrangements can be made to provide such assistance at no cost to the person requesting.

Interested parties may submit comments on the permit actions and the administrative record to the address above no later than 4:00 PM Friday, December 18, 2020.

If, during the public comment period, significant new questions are raised concerning the permit, DEM may require a new draft permit or fact sheet or may reopen the public comment period. A public notice will be issued for any of these actions.

Any person, including the permittee/applicant, who believes these permit actions are inappropriate, must raise all reasonably ascertainable issues and submit all reasonably available arguments and factual grounds supporting their position, including all supporting material, by the close of the public comment period under 250-RICR-150-10-1.42 of the Regulations of the Rhode Island Pollutant Discharge Elimination System. The public comment period is from Friday, November 13, 2020 to Friday, December 18, 2020. Commenters may request a longer comment period if necessary, to provide a reasonable opportunity to comply with these requirements. Comments should be directed to DEM as noted above.

FINAL DECISION AND APPEALS:

Following the close of the comment period, and after a public hearing, if such hearing is held, the Director will issue a final decision and forward a copy of the final decision to the permittee and each person who has submitted written comments or requested notice. Within 30 days following the notice of the final decision, any interested person may submit a request for a formal hearing in accordance with the requirements of 250-RICR-150-10-1.50 of the Regulations of the Rhode Island Pollutant Discharge Elimination System.

11/6/2020
Date

Joseph B. Haberek, P.E.
Environmental Engineer IV
RIPDES, Office of Water Resources
Department of Environmental Management