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

August 4, 2021

CERTIFIED MAIL

Mr. Kyle Zalaski, P.E.
Town Engineer
Town of Westerly
68 White Rock Road
Westerly, RI 02891

RE: **Final Permit for the Town of Westerly WWTF**
RIPDES Permit No. RI0100064

Dear Mr. Zalaski:

Enclosed is the Town of Westerly's (Town's) final Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit for the Westerly Wastewater Treatment Facility. State regulations, promulgated under Chapter 46-12 of the Rhode Island General Laws of 1956, as amended, require this permit to become effective on the date specified in the permit. Also enclosed is the "Response to Public Comments" received on the draft permit and information relative to hearing requests and stays of RIPDES Permits.

As noted in the Response to Public Comments and as indicated in the permit Fact Sheet, the Rhode Island Department of Environmental Management (RIDEM) is aware that the Town may not be able to immediately comply with certain limitations/conditions in the new permit. Therefore, the RIDEM is willing to enter into a Consent Agreement with the Town that will establish a compliance schedule for the Town to come into compliance with these requirements. Specifically, the RIDEM is willing to enter into a Consent Agreement that will include a compliance schedule for the Town to comply with its May-October Monthly Average Total Nitrogen Limit. In order for the RIDEM to be able to enter into a Consent Agreement with the Town, the Town must file an appeal of the above-mentioned permit requirements.

In order to appeal the permit, the Town must request an adjudicatory hearing pursuant to §1.50 of the RIPDES Regulations within thirty (30) days of receipt of this permit (see the attached sheet). Additionally, to obtain a stay of the contested limits for the duration of the appeal, the Town must also request a temporary stay for the duration of the adjudicatory hearing proceedings in accordance with §1.51 (see the attached sheet). The stay request must also be submitted to the RIDEM within thirty (30) days of receipt of this permit.

If there are any questions, regarding the enclosed permit or the process of entering into a Consent Agreement, feel free to contact Max Maher of the RIPDES staff at 401-222-4700, extension 77201.

Sincerely,

Joseph Haberek, P.E.
Environmental Engineer IV

ecc: Bill Beauregard, Town of Westerly
Alyson Packhem, Town of Westerly
Andrea Braga, Jacobs
Adam Federau, Jacobs
Jennifer Perry, CTDEEP
Carlos Esguerra, CTDEEP
Janice Sassi, Watch Hill Conservancy
David Prescott, Save the Bay
Francis Pijar, CUSH
Crystal Charbonneau, RIDEM
Angelo Liberti, RIDEM
Bill Patenaude, RIDEM
Heidi Travers, RIDEM
Jane Sawyers, RIDEM
Alex Pinto, RIDEM
Max Maher, RIDEM
Traci Iott, CTDEEP
Fred Sculco

Response to Public Comments
Town of Westerly
Westerly WWTF
RIPDES Permit No. RI0100064

The Rhode Island Department of Environmental Management (RIDEM) solicited public comments on the draft Rhode Island Pollutant Discharge Elimination System (RIPDES) permit for the Town of Westerly's (Town's) Wastewater Treatment Facility (WWTF) from May 7, 2021 to June 11, 2021.

The following is a synopsis of all significant comments received and the RIDEM's responses to those comments.

1. **Comments from Connecticut Department of Energy & Environmental Protection (CTDEEP) Submitted to RIDEM via Email Date June 11, 2021.**

COMMENT 1.A: In reference to the Receiving Water Description in the Draft Permit Fact Sheet, CTDEEP recommended that the Fact Sheet be modified to include information on the impairment status and associated Total Maximum Daily Loads (TMDLs) based on the CTDEEP Integrated Water Quality Report. CTDEEP noted that the impairment status identified in the CTDEEP Integrated Water Quality Report should be considered when developing permit requirements for the WWTF and should be called out in the Fact Sheet.

RESPONSE: The "Receiving Water Description" section of Part IV of the permit Fact Sheet has been updated to include a description of the Connecticut waterbody segments nearest to the Rhode Island receiving water. The impairment status of these segments and CT Pawcatuck River Watershed TMDL have been included in the permit development.

COMMENT 1.B: CTDEEP requested that a geometric mean limit of 88 colonies/100 ml be established in place of the "monitor only" requirement for Fecal Coliform. CTDEEP notes that this limit would be consistent with the CTDEEP Water Quality Standards, would address impairments in the receiving water, and is consistent with the requirements for the Stonington WPCF.

RESPONSE: After review of the CT Water Quality Standards and Pawcatuck River Watershed Bacteria TMDL, RIDEM agrees that a geometric mean limit of 88 MPN/100 ml for Fecal Coliform is appropriate. Accordingly, a monthly geometric mean limit of 88 MPN/100 ml has been established in the final permit. A discussion of the basis of this limit has also been included in the "Bacteria" subsection of Part IV of the permit Fact Sheet. The Westerly WWTF will be able to meet this limit through proper operation of the disinfection equipment at the facility.

COMMENT 1.C: CTDEEP requested clarification if the limit for Total Residual Chlorine applied before or after the dechlorination step in the treatment process. If the limit

applies after dechlorination, CTDEEP recommended modifying the permit limit to be performance based using analytical requirements, which would be more protective than the calculated water quality-based permit limits established in the Draft Permit.

RESPONSE: The effluent limitations and monitoring requirements for the Westerly WWTF RIPDES permit apply to Outfall 001A, which is the final discharge to the receiving water. Therefore, the sampling requirement for Total Residual Chlorine grab samples applies after the dechlorination step. The Total Residual Chlorine limitations are water-quality based effluent limitations based on standards in the Rhode Island Water Quality Regulations at 250-RICR-150-05-1.26(J)(6). The Westerly WWTF is also required to use and maintain a continuous TRC recorder after chlorination and prior to dechlorination to provide a record that proper disinfection was achieved at all times. These permit requirements will ensure that the WWTF provides proper disinfection at all times while also ensuring that it meets the applicable water quality-based limits for chlorine. No change has been made to the permit regarding the Total Residual Chlorine limit/monitoring.

COMMENT 1.D: CTDEEP recommended that the Total Nitrogen Monthly Average Limit of 5 mg/L apply during the full calendar year, not just from May through October. CTDEEP notes that treatment plants which have a 5 mg/l Total Nitrogen Limit can meet this limit year-round, citing the Stonington WPCF as an example. CTDEEP also pointed out that seasonal limits may affect recreational opportunities on the river, which is an issue as the Pawcatuck River and estuary are federally designated as having Outstanding Remarkable Value for Recreation.

RESPONSE: The May through October Monthly Average Total Nitrogen Limit is based on the growing season (i.e. the summer months) where cultural eutrophication and, by extension, violations of the Rhode Island Water Quality Regulations at 250-RICR-150-10-1.10(E)(1) may occur. In addition, Part I.D.5 of the permit requires the Town to submit to the RIDEM a Winter Nitrogen Removal BMP Plan, which will include a description of controls that will be used to ensure that Total Nitrogen is removed from the discharge to the maximum extent practicable (without chemical addition). These limits are water quality-based limitations imposed according to regulations at 40 CFR § 122.44(d)(vii). Although a specific effluent limit for Total Nitrogen is not in effective from November-April, the Town is still required to remove nitrogen to the maximum extent practicable, protecting water quality standards and designated uses. Therefore, no change has been made to the permit regarding the duration of the Total Nitrogen limit.

COMMENT 1.E: CT DEEP recommends including monitoring for BOD in addition to CBOD since it more accurately reflects the oxygen demand of the effluent.

RESPONSE: According to EPA Regulations at 40 CFR §133.102, RIDEM may substitute BOD_5 for $CBOD_5$ for secondary treatment works as long as the effluent quality levels set out in §133.102(a)(4) are met. The limits established in the final permit for $CBOD_5$ are more stringent than those set out in 40 CFR Part 133.

As discussed in the permit fact sheet, $CBOD_5$ tests measure the 5-day carbonaceous biochemical oxygen demand, while BOD_5 tests measure both the carbonaceous and nitrogenous biochemical oxygen demand. The reduced seasonal total nitrogen limit (from 15 mg/L to 5 mg/L) will increase the extent of nitrification required during treatment and, therefore, the $CBOD_5$ limit will serve as a more accurate measure of treatment plant performance. As noted in the Final Rule for 40 CFR Part 133 in the Federal Register (Vol.49, No. 184/Sept. 20, 1984, page 36988), nitrogenous oxygen demand (a component of BOD) may be exerted through the action of nitrogenous bacteria that oxidize ammonia to nitrate during nitrification. As the Rule continues, "When sufficient numbers of nitrifying-bacteria are present in the test sample they can exert a significant NOD in the BOD_5 test that would not be exerted in their absence. Since many of the factors conducive to improved secondary effluent quality are also conducive to the growth of nitrifying bacteria, the BOD test can erroneously indicate poorer effluent." Because the lower total nitrogen limit will require a greater extent of nitrification in the treatment process, RIDEM established $CBOD_5$ limits to eliminate the influence of nitrifying bacteria on compliance determinations.

Based on the above, $CBOD_5$ is an appropriate measure of oxygen demand in the effluent. Accordingly, no change has been made to the final permit regarding the $CBOD_5$ limits and BOD monitoring has not been established in the permit.

2. **Comments from Mr. Fred Sculco Submitted to RIDEM via Email on June 10, 2021.**

COMMENT 2.A: Mr. Sculco recommended that the May through October Total Nitrogen Monthly Average Limit be reduced from 5 mg/L to 3 mg/L, and that this limit apply from April through November. Mr. Sculco cited rising water temperatures and the correlation between water temperature and oxygen solubility as a reason for lowering the Total Nitrogen limit for 3 mg/L and extending the duration of the total nitrogen limit.

RESPONSE: As noted in the Permit Fact Sheet, the 5 mg/L May through October Total Nitrogen Limit is technically and economically feasible and necessary to control the discharge of nitrogen into the estuary. However, even at the 5 mg/L Total Nitrogen limit, the watershed nitrogen load would still need to be reduced by 86% in order to meet the 100 kg N ha^{-1} yr^{-1} loading target. At the WWTF *design flow* (3.3 MGD), reducing the Total Nitrogen limit from 5 mg/L to 3 mg/L would decrease the annual watershed load by only 2%. The actual realized nitrogen reductions would be even smaller, since the actual WWTF flow is typically below the design flow (Average Monthly Average flow from 2013 to 2020 is 2.28 MGD). Given the minimal difference between the nitrogen loading to the estuary with the WWTF at a 5 mg/L limit and a 3 mg/L limit, RIDEM assigned a limit of 5 mg/L in the final permit as part of an adaptive management approach. The stormwater point source and non-point source reductions pursued outside the scope of the permit will determine if further reductions in the effluent limit are necessary.

As explained in Response to Comment 1.D, the Total Nitrogen limit established in the permit is derived from and complies with the Rhode Island Water Quality Regulations. While RIDEM acknowledges that Rhode Island Coastal Waters have warmed in the winter in recent years, RIDEM does not have any evidence that cultural eutrophication is occurring in the months of April and November to an extent that would warrant extending the seasonal duration of the Total Nitrogen limit. Moreover, as also explained in Response to Comment 1.D, Part I.D.5 of the permit requires the WWTF to remove Nitrogen to the maximum extent practicable without chemical addition in the winter months. Based on the above, no change has been made to the permit regarding the nitrogen limit.

COMMENT 2.B: Citing the objective of the Rhode Island Water Quality Regulations, Mr. Sculco recommended that more frequent River and estuary monitoring be added to the permit. Mr. Sculco noted that population growth, development, and loss of permeable soil have put pressure on the River and estuary and making monitoring part of the permit will provide data to assess the watershed in the context of regional growth. Mr. Sculco also noted that the 2023 TMDL will require several more years before it is enacted and resulting policies to reduce nitrogen are put in place. Mr. Sculco commented that studies which quantify the benthic distribution of nitrogen and identify areas of accumulation have not been conducted.

RESPONSE: RIDEM, CTDEEP, and EPA have been working cooperatively to monitor the estuarine Pawcatuck River. See Response to Comment 4.B.

In 2019, RIDEM updated its monitoring strategy, which provides a framework to describe existing ambient monitoring and assessment programs. It also identifies the actions and investments needed over the coming years to address key data gaps or make needed enhancements to existing monitoring and assessment programs. More information on the Rhode Island's Water Monitoring Strategy can be found at: http://dem.ri.gov/programs/benviron/water/quality/surfwq/pdfs/ri-water-monitoring-strategy-19.pdf

RIDEM finds that programs to monitor the estuarine Pawcatuck River are appropriately captured in the Water Monitoring Strategy above, especially given that nitrogen loads to the estuary are shared between numerous point and non-point sources. Moreover, the May-October Monthly Average Total Nitrogen Limit established in the Westerly WWTF permit, as discussed in the Fact Sheet, is part of an adaptive management approach to reduce nitrogen loads to the Pawcatuck River and Little Narragansett Bay. Part II(v) of the permit also notes that RIDEM may make appropriate revisions to the permit in order to incorporate any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA or State law. Therefore, even though it will take a few more years to complete the TMDL and implement necessary controls and effluent limitations according to 40 CFR §122.44(d)(1)(vii)(B), nothing prohibits RIDEM from establishing more stringent limitations or monitoring requirements based on new water quality information, including that from the Rhode Island Water

Monitoring Strategy described above. As such, ambient water monitoring has not been established in the Final Permit.

3. **Comments from Janice Sassi, Manager of the Napatree Point Conservation Area (Watch Hill Conservancy) Submitted to RIDEM via Email on June 11, 2021.**

COMMENT 3.A: Ms. Sassi requested that the RIDEM establish the lowest possible Total Nitrogen limit for the WWTF. Ms. Sassi noted that lower nutrient loads entering Little Narragansett Bay will lead to less algae and, by extension, less hypoxia and a healthier marine ecosystem. Ms. Sassi highlighted the fact that Eelgrass and baitfish abundance in Little Narragansett Bay are driven by water quality, which is in part determined by nutrients. Ms. Sassi commented that Napatree Point is a biodiversity hotspot and is recognized as a Globally Important Bird Area by the National Audubon Society. Ms. Sassi also stated that the life history of endangered species which breed on Napatree Point, such as Piping Plovers, Osprey, Least Terns, and Horseshoe Crabs, require a healthy marine ecosystem.

RESPONSE: RIDEM acknowledges the importance of the Tidal Pawcatuck River and Little Narragansett Bay estuary to endangered species in the area. Please see the RIDEM's response to comment 2A regarding the appropriateness of the 5.0 mg/L total nitrogen limit.

4. **Comments from Save The Bay Submitted to the RIDEM via Email on June 9, 2021.**

COMMENT 4.A: Save The Bay requested that the permit include a Total Nitrogen Limit of 3 mg/L from April through November. Save The Bay notes that limits in the future will need to be recalculated to protect eelgrass, that warming waters have made more stringent nitrogen limits necessary, and that the limit of technology for nitrogen removal in wastewater will continue to improve. Save The Bay cites the Wood and Pawcatuck Rivers designation as part of the nation's Wild and scenic River system (WSRs) and the call for agencies to protect water quality of WSRs according to the WSR Act. Save The Bay claims that imposing the limit of technology for Total Nitrogen removal (an effluent limit of 3 mg/L) is necessary to protect the watershed. Save The Bay notes that nitrogen is a major cause of violations of the Rhode Island Water Quality Regulations and has caused the growth of *Cladophora sp.* in the Little Narragansett Bay, even in the April and November months. These algae blooms consume dissolved oxygen, cause foul smells, and affect the aesthetic quality of the waterway according to Save The Bay's comments.

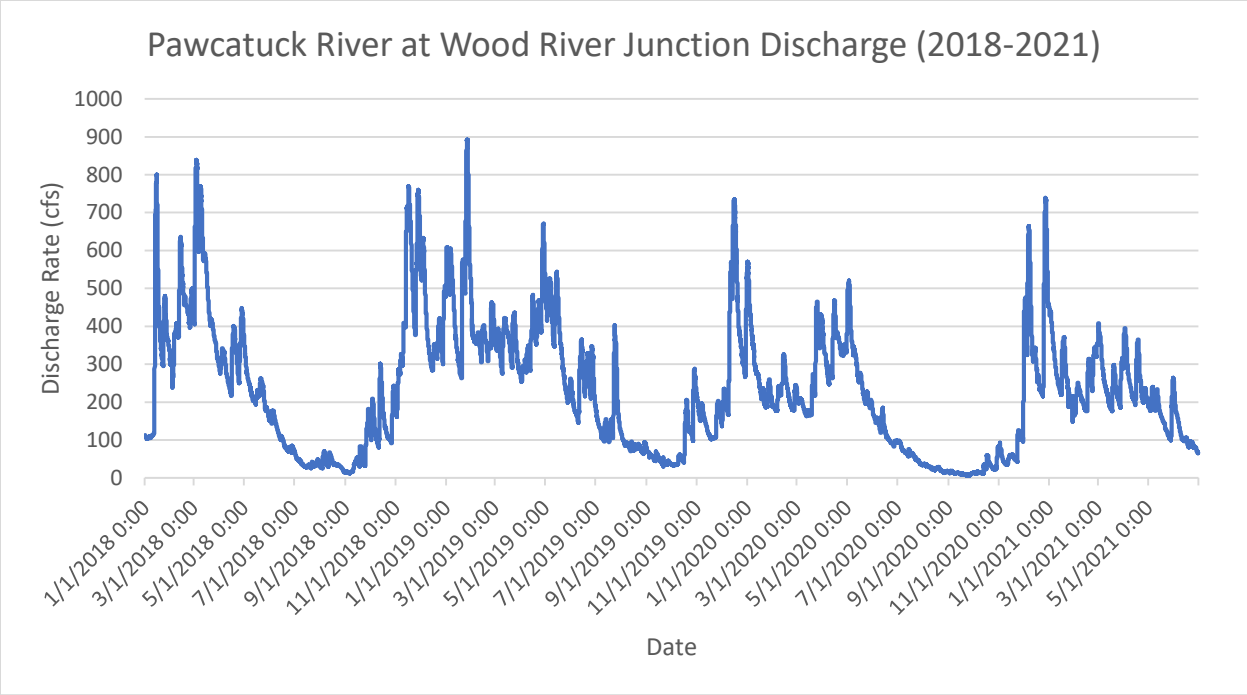
RESPONSE: Please see the RIDEM's response to comment 2A regarding the appropriateness of the 5.0 mg/L total nitrogen limit.

Rhode Island Water Quality Regulations at 250-RICR-150-05-1.10(E)(1) states that nutrients shall not be present in saltwaters "in such concentration that would impair any

usages specifically assigned to said Class, or cause undesirable or nuisance aquatic species associated with cultural eutrophication." While RIDEM acknowledges that coastal waters have warmed in recent years, it must be recognized that other factors also contribute to the growth of nuisance aquatic species, including *Cladophora sp.*, in estuarine ecosystems such as Little Narragansett Bay. Marine macro-algal nutrient uptake and growth depends on nitrogen concentration and follows a Michaelis-Menten-type curve, increasing linearly with N concentration before plateauing.[1] As discussed in the permit fact sheet, watershed nitrogen loads to the Tidal Pawcatuck River and Little Narragansett Bay are dominated by non-point sources and stormwater point sources, such as runoff. These sources would contribute around 90% of the calculated nitrogen load to the estuary even if the Stonington Pawcatuck WPCF and Westerly WWTF were operating at design flow and discharging at their respective permit limits. Previous studies of nitrogen loading to the estuary have noted that most of the nutrients during low flow conditions come from "groundwater, benthic remains in the shallow water column, and/or point sources along the river catchment," while during the wetter months, increased water discharge dilutes groundwater and point-source nutrients, decreasing in-stream nitrogen concentrations.[2] Therefore, while the May through October nitrogen limit is intended to prevent the growth of nuisance aquatic species by limiting the discharge of nutrients during the growing season – which are warmer months – these months are also drier than in the winter, with the river having a lower base flow.

Below is a graph showing 15-minute discharge rate measurements over time from 2018 to 2021 in the Pawcatuck River. As shown, flow rates in the freshwater Pawcatuck River generally remain higher in April and increase in November, with the lowest base flows occurring in July, August, and September.

[1]Michael E. Ross, Katharine Davis, Rory McColl, Michele S. Stanley, John G. Day, Andrea J.C. Semião, Algal Research, Volume 30,2018, Pages 1-10,ISSN 2211-9264, https://doi.org/10.1016/j.algal.2017.12.005. (https://www.sciencedirect.com/science/article/pii/S2211926417307518)
[2]Rollinson, Veronica, "Sources and Fluxes of Reactive N in a Southern New England River" (2020). Master's Theses. 1510.



The seasonal total nitrogen limit is intended to control nuisance aquatic species and prevent anoxic conditions during these especially low-flow months. Because base flows resulting from increased precipitation, groundwater surface flow, and groundwater recharge are higher during the winter months, reducing nitrogen concentrations, RIDEM finds that a May through October seasonal Total Nitrogen limit for the Westerly WWTF are appropriate.

Additionally, it must be understood that nitrogen exists in different forms in surface waters. This nitrogen composition in the receiving water can determine the extent of cultural eutrophication depending on the nuisance aquatic species of concern present. When characterizing wastewaters, Total Nitrogen is calculated as the sum of Nitrate, Nitrite, and Total Kjeldahl Nitrogen (TKN). TKN itself is comprised of Total Organic Nitrogen and Total Ammonia. While marine algae can uptake these different forms of nitrogen to produce more biomass, evidence suggests that various eukaryotic algae, cyanobacteria, and *Cladophora* have a strong preference for NH_4^+ over the more oxidized forms of nitrogen (NO_2^-, NO_3^-)[1,3], which need to be reduced to NH_4^+ for the algae's use. Literature has shown that the presence of NH_4^+ in *Cladophora* growth media greatly reduces the uptake of NO_2^- and NO_3^- by the algae, with at least one study suggesting that NO_3^- uptake could be completely suppressed in 1000-2000 µM concentrations of NH_4^+[4]. Ambient data for the Pawcatuck River upstream of the Westerly WWTF discharge have shown elevated ammonium levels:

[3]M.H. Abreu, R. Pereira, A. Buschmann, I. Sousa-Pinto, C. Yarish, Nitrogen uptake responses of Gracilaria vermiculophylla (Ohmi) Papenfuss under combined and single addition of nitrate and ammonium, J. Exp. Mar. Biol. Ecol. 407 (2011) 190–199.
[4]J.A. Raven, B. Wollenweber, L.L. Handley, A comparison of ammonium and nitrate as nitrogen sources for photolithotrophs, New Phytol. 121 (1992) 19–32

Figure 1: Pawcatuck River Ammonium Data (µg/L)[5]

Year	May	June	July	August	September	October	Average
2008		30	10	40	20	10	22
2009	10	60	15	10	30	70	33
2010	100	40	60	60	40	70	62
2011	50	80	65	35	65	20	53
2012	50	55	55	20		45	45
2013	50	75	35	25	60	20	44
2014	70	70	45	30	45	30	48
2015	60	60	45	30	25	35	43
2016	35	8	8	45	100	40	39
2017	50	105	130	20	30	25	60
2018	75	145	100	105	75	30	88
2019	55	40	25	20	85	60	48

As shown in Attachment B of the Final Permit Fact Sheet, concentrations of ammonia in the Westerly WWTF have historically been low, as the treatment plant process involves oxidizing ammonia in raw wastewater to nitrate and nitrite. Treatment plant upgrades to meet the more stringent Total Nitrogen limit will increase the extent of nitrification achieved, further reducing ammonia concentrations in the effluent. Given the *Cladophora* preference for ammonium, which will approach non-detect levels in the discharge once the Westerly WWTF is upgraded to meet the new permit limits, over more oxidized forms of nitrogen and the background concentrations of ammonium in the Tidal Pawcatuck River, the presence of *Cladophora* are unlikely to be caused by the WWTF plant effluent. Upper watershed sources of ammonium include septic systems and runoff comingled with fertilizers, which will be appropriately addressed in the TMDL. As such, RIDEM has established a May through October Monthly Average Total Nitrogen limit of 5 mg/L in the Westerly WWTF RIPDES permit as part of an adaptive management approach. No change has been made to the permit on the duration of the Total Nitrogen limit.

COMMENT 4.B: Save The Bay requested that RIDEM allocate necessary resources and prioritize research for developing the Tidal Pawcatuck River TMDL due to the severity of the nutrient-related issues in the estuary.

RESPONSE: The Clean Water Act requires states to place all waters that are not meeting their designated uses on an Impaired Waters List with a schedule for TMDL development. On its 2018/20 303(d) list, RIDEM scheduled TMDL development for the estuarine Pawcatuck River for 2023 while CTDEEP scheduled its TMDL development for 2022. Both states have been working cooperatively over the last five years to better assess conditions in the estuarine Pawcatuck River as well as characterizing sources of pollution to the area. EPA has provided many resources towards these efforts. RIDEM also acknowledges that non-governmental partners, specifically Save The Bay, have expended resources to support this effort.

Since 2018, RIDEM, CTDEEP, and EPA have conducted nutrient and continuous dissolved oxygen monitoring in the Pawcatuck River estuary and Little Narragansett

[5]https://www.wpwa.org/waterdata

Bay. In 2018, CTDEEP received a grant from the Southeast New England Program (SNEP), which is funded by EPA, to conduct monitoring and computer modelling in the freshwater Pawcatuck River watershed. The goal of this effort was to evaluate nutrient conditions in upland watersheds as well as to identify and evaluate sources. Results from the upland model (HSPF) will be used in the WASP computer model to evaluate nutrient impacts on dissolved oxygen, water clarity, and chlorophyll *a* in the estuary. The EPA Atlantic Coastal Environmental Sciences Division (ACESD) Laboratory is working on the WASP model.

COMMENT 4.C: Save The Bay objected to the 100 kg ha^{-1} yr^{-1} loading target for total nitrogen established in the Draft Permit Fact Sheet. Save The Bay noted that both studies used to determine the appropriate total nitrogen loading target that will be protective of eelgrass conclude that 100 kg N ha^{-1} yr^{-1} represents the loading rate at which eelgrass cover either markedly decreases or is absent altogether from the estuary. Save The Bay cited conclusions of both studies which state that nitrogen loads above 20-30 kg ha^{-1} yr^{-1} decrease seagrass cover and that, at loads below 50 kg ha^{-1} yr^{-1}, the extent of eelgrass cover is determined by other ecosystem factors. Save The Bay claimed that the 100 kg ha^{-1} yr^{-1} total nitrogen loading target is not supported by the studies cited and RIDEM should impose a 50 kg N ha^{-1} yr^{-1} maximum threshold instead.

RESPONSE: RIPDES Regulations at 250-RICR-150-10-1.16(A)(5) note that limitations must control all pollutants which RIDEM determines have reasonable potential to cause or contribute to an excursion above a state water quality standard, including State narrative criteria for water quality. RIDEM has previously determined that the Westerly WWTF discharge has a reasonable potential to contribute to an excursion above the State narrative criteria for nutrients. Accordingly, RIDEM has established Total Nitrogen limits in the permit. RIPDES Regulations at 250-RICR-150-10-1.16(A)(5)(g) note that where the State has not established a water quality criterion for a specific chemical pollutant in the discharge that has reasonable potential to contribute to an excursion above a State water quality standard, RIDEM may establish effluent limits using a calculated numeric water quality criterion for the pollutant which RIDEM demonstrates will attain and maintain applicable narrative criteria and protect the designated use.

It is important to recognize that the loading target set out in the permit fact sheet, per RIPDES Regulations, is used to determine appropriate water quality-based effluent limitations for the WWTF, not to establish load allocations for stormwater point sources or non-point sources. RIDEM determined that the 15 mg/L Monthly Average Total Nitrogen limit established in the WWTF's current effective RIPDES permit is not stringent enough to protect water quality criteria, as the loading rate from the Westerly WWTF alone (at design flow) would approach 100 kg N ha^{-1} yr^{-1}. Therefore, RIDEM determined that reductions in nitrogen loadings from the Westerly WWTF were thus required. When evaluating the appropriateness of this limit, it must be understood that the Pawcatuck River watershed alone contributes almost 500 kg N ha^{-1} yr^{-1} to the estuary, not including the contributions from the Stonington WPCF and the Westerly WWTF. As Valiela and Cole note, the literature does not account for and balance many important factors such as "denitrification, burial, N fixation in bare sediments, particle

transport, tidal exchanges, and other processes that occur in different parts of estuaries," which also determine extent of seagrass cover and are unique to an individual estuary. With such a high percentage (~93%) of the total nitrogen load to the estuary being from non-point sources and stormwater point sources, and considering inherent scientific uncertainty about what nitrogen loading rate is sufficient to protect seagrasses, RIDEM assigned a Monthly Average limit of 5 mg/L as part of an adaptive management approach. The waterbody will be reassessed as part of the joint RIDEM/CTDEEP TMDL development, which will ultimately determine an appropriate loading target for total nitrogen.

COMMENT 4.D: Save The Bay noted that the 5 mg/L Total Nitrogen limit does not represent the limit of technology for nitrogen removal, which is 3 mg/L. Save The Bay stated that RIDEM is obliged to require the reduction of nitrogen discharges using the best available technology according to the Clean Water Act. Save The Bay also noted that without detailed financial information for the facility upgrades it is not possible to determine affordability for the Town.

RESPONSE: 40 CFR §122.44(a)(1) requires RIPDES permits to include technology-based effluent limitations and standards based on: "effluent limitations and standards promulgated under section 301 of the CWA, or new source performance standards promulgated under section 306 of CWA, on case-by-case effluent limitations determined under section 402(a)(1) of CWA, or a combination of the three." As noted in the comments, 40 CFR Part 133 establishes secondary treatment standards for POTWs. Secondary treatment standards have not been established for total nitrogen. The total nitrogen limit is a water quality-based effluent limit established according to 40 CFR § 122.44(d)(vii) as explained in Response to Comment 1.D.

5. **RIDEM received a letter of support for the permit from Clean Up Sound and Harbors (CUSH). No changes to the permit were requested.**

HEARING REQUESTS

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

Mary Dalton, Clerk
Department of Environmental Management
Office of Administrative Adjudication
235 Promenade Street
3rd Floor, Rm 350
Providence, RI 02908

Any request for a formal hearing must conform to the requirements of §1.50 of the Regulations for the Rhode Island Pollutant Discharge Elimination System (RI Code of Regulations; 250-RICR-150-10-1.50).

STAYS OF RIPDES PERMITS

Should the Department receive and grant a request for a formal hearing, the contested conditions of the permit will not automatically be stayed. However, the permittee, in accordance with §1.51 of the Regulations for the Rhode Island Pollutant Discharge Elimination System (RI Code of Regulations; 250-RICR-150-10-1.51), may request a temporary stay for the duration of adjudicatory hearing proceedings. Requests for stays of permit conditions should be submitted to the Office of Water Resources at the following address:

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

All uncontested conditions of the permit will be effective and enforceable in accordance with the provisions of §1.50 of the Regulations for the Rhode Island Pollutant Discharge Elimination System (RI Code of Regulations; 250-RICR-150-10-1.50).

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 Westerly
45 Broad Street
Westerly, Rhode Island 02891

is authorized to discharge from the facility located at

Westerly Wastewater Treatment Facility
87 Margin Street
Westerly, Rhode Island 02891

to receiving waters named

Pawcatuck River
(WBID: RI0008038E-01A)

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

This permit shall become effective on October 1, 2021.

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

This permit supersedes the permit issued on August 23, 2013.

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

Signed this 4th day of August, 2021.

Angelo S. Liberti

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

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

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

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Flow	3.3 MGD	--- MGD				Continuous	Recorder
$CBOD_5$							
(May 1 – October 31)	550	826	20 mg/l	20 mg/l	30 mg/l	3/Week	24-Hr. Comp.
(November 1 – April 30)	688	1238	25 mg/l	40 mg/l	45 mg/l	3/Week	24-Hr. Comp.
$CBOD_5$ - % Removal			85%			1/Month	Calculated
TSS							
(May 1 – October 31)	550	826	20 mg/l	20 mg/l	30 mg/l	3/Week	24-Hr. Comp.
(November 1 – April 30)	826	1376	30 mg/l	45 mg/l	50 mg/l	3/Week	24-Hr. Comp.
TSS - % Removal			85%			1/Month	Calculated
Settleable Solids			--- ml/l	--- ml/l	--- ml/l	1/Day	Grab

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

Sampling for TSS shall be performed 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. All $CBOD_5$ and TSS samples shall be taken and reported for the influent and effluent with appropriate allowances for hydraulic detention (flow-through) time.

Sampling for Flow and Settleable Solids shall be performed Sunday-Saturday.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A.

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

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

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Enterococci			35 cfu[1] / 100 ml		276 cfu[1] / 100 ml	3/Week	Grab
Fecal Coliform			88 MPN[1] / 100 ml		--- MPN[1] / 100 ml	3/Week	Grab
Total Residual Chlorine (TRC)			65 ug/l[2]		65 ug/l[2]	3/Day	Grab
pH			(6.5 SU)		(8.5 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 samples shall be taken at the same time as the Enterococci samples. The Geometric Mean shall be used to obtain the "monthly average" for Fecal Coliform and 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 three grab samples per day, Monday - Friday (except holidays), equally spaced over one (1) day with a minimum of three hours between grabs, and on Saturdays, Sundays, and Holidays by taking at least (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) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G; (2) DPD Titrimetric, EPA No. 330.4 or Standard Methods (18th Edition) No. 4500-Cl F; (3) Amperometric Titration, EPA No. 330.1 or Standard Methods (18th Edition) No. 4500-Cl D or ASTM No. D1253-86(92).

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

Sampling for pH and Chlorine Residual shall be performed Sunday-Saturday.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A.

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

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

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Oil and Grease					--- mg/l	1/Month	3 Grabs[1]
TKN							
(May 1-October 31)			--- mg/l		--- mg/l	3/Week	24-Hr. Comp.
(November 1-April 30)			--- mg/l		--- mg/l	2/Month	24-Hr. Comp
Nitrate, Total (as N)							
(May 1-October 31)			--- mg/l		--- mg/l	3/Week	24-Hr. Comp.
(November 1- April 30)			--- mg/l		--- mg/l	2/Month	24-Hr. Comp.
Nitrite, Total (as N)							
(May 1-October 31)			--- mg/l		--- mg/l	3/Week	24-Hr. Comp.
(November 1- April 30)			--- mg/l		--- mg/l	2/Month	24-Hr. Comp.
Nitrogen, Total [TKN + Nitrate + Nitrite, as N]							
(May 1-October 31)	138 lb/d		5 mg/l		--- mg/l	3/Week	Calculated
(November 1- April 30)	--- lb/d[2]		--- mg/l[2]		--- mg/l[2]	2/Month	Calculated
Ammonia, Total (as N)							
(May 1-October 31)			1.7 mg/l		5.7 mg/l	3/Week	24-Hr. Comp.
(November 1- April 30)			30.9 mg/l		101.9 mg/l	2/Month	24-Hr. Comp.

[1] Three (3) grab samples shall be spaced over the course of a day with a minimum of three (3) hours between samples. Each grab sample must be analyzed individually and the maximum values reported.

[2] The Permittee shall operate the treatment facility to reduce the discharge of Total Nitrogen during the months of November through April to the maximum extent possible using all available treatment equipment in place at the facility except for carbon 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 Monday through Friday at the following locations: Outfall 001A.

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

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

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Copper Total[1,2]			23 ug/l		23 ug/l	2/Week	24-Hr. Comp.
Cyanide, Available[1,2]			4.0 ug/l[3]		4.0 ug/l[3]	2/Month[4]	Composite[5]
Arsenic, Total			11 ug/l		276 ug/l	1/Month[6]	24-Hr. Comp.
Cadmium, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Chromium, Hexavalent[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Lead, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Zinc, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Nickel, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Aluminum, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.

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

[1] Monitoring data may be obtained in conjunction with bioassay testing.
[2] Samples shall be taken on the influent and effluent with appropriate allowances for hydraulic detention (flow-through) time.
[3] The limit at which compliance/noncompliance determinations will be based is the Quantitation Limit which is defined as 10.0 ug/l for Cyanide. These values may be reduced by permit modification as more sensitive methods are approved by EPA and the State.
[4] The permittee shall perform twice monthly testing on samples collected from the discharge at Outfall 001A. If the results of twelve (12) consecutive months of monitoring show effluent concentrations below the applicable minimum detection limits from Part I.F, then the monitoring frequency shall be reduced to once per quarter.
[5] Compliance with these limitations shall be determined by taking three grab samples per day, spaced over one (1) day with a minimum of three hours between grabs, and preserved immediately upon collection. All three (3) samples shall be composited, then analyzed for Available Cyanide.
[6] 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 show effluent concentrations below the applicable minimum detection limits from Part I.F, then the monitoring frequency shall be reduced to once per quarter.

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday at the following locations: Outfall 001A.

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

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

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Mysidopsis bahia LC50[1]					100% or Greater[2]	1/Quarter	24-Hr. Comp.
Arabacia punctulata C-NOEC[3]					10% or Greater	1/Quarter	24-Hr. Comp.

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

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

[3]Chronic-No Observed Effects Concentration (C-NOEC) is the highest concentration of toxicant or effluent to which the organisms are exposed in a life-cycle or partial life-cycle which causes no adverse effect on growth, survival or reproduction (see Part I.B).

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

6. a. The pH of the effluent shall not be less than 6.5 nor greater than 8.5 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 ninety (90) consecutive days exceeds 80 percent of the design flow, the permittee shall submit to the DEM a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans.

f. The permittee shall analyze its effluent 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 by January 15th of each year for the previous calendar year's sample. If the priority pollutant scan is to be used to satisfy part I.B.9, the scan must be submitted with the 3rd quarter bioassay by October 15th. All sampling and analysis shall be done in accordance with EPA Regulations, including 40 CFR, Part 136; grab and composite samples shall be taken as appropriate.

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

7. a. Within ninety (90) days of the effective date of this permit, the Town shall submit a Scope of Work for a Sewer Lateral Connection Investigation (SLCI). The SLCI shall include:

i. An Infiltration Reduction Summary Report that summarizes the measures taken to address infiltration/inflow since the issuance of the Town's prior RIPDES permit (issued on August 23, 2013)

ii. A description of any work remaining to be performed as part of the Town's approved Sewer System Evaluation Survey (SSES)

iii. An evaluation of any remaining SSES work's ability to reduce infiltration into the sewer system

iv. A schedule to investigate causes of private inflow into the sewer system, and

v. A schedule to submit an SLCI Report to the DEM.

b. The SLCI Scope of Work shall be subject to DEM review and approval.

c. Upon DEM approval of the SLCI Scope of Work, the Town must initiate work on its SLCI and submit a SLCI Report to the DEM in accordance with the approved schedule. The SLCI Report must include a detailed corrective action plan that identifies areas of excessive Inflow and provides a recommended schedule for the implementation of corrective actions to remove excessive inflow. This analysis must be completed for all sub-areas. The SLCI Report and its recommended corrective actions shall be subject to DEM review and approval.

d. Upon DEM approval of the SLCI Report, the Town shall implement its recommendations in accordance with the approved schedule. The Town shall submit semi-annual progress reports on the implementation of the corrective actions to DEM on January 15th and July 15th of each year. The semi-annual progress reports shall be required until the work required under the approved SLCI Scope of Work is complete. The semi-annual progress reports may be combined with the semi-annual infiltration and inflow reports in Part I.D.2.

e. Upon completion of implementation of the SLCI Report's recommendations, the DEM shall determine if additional measures are necessary to remove excessive I/I to ensure that the Town maintains compliance with permit limits.

B. BIOMONITORING REQUIREMENTS AND INTERPRETATION OF RESULTS

1. General

Beginning on the effective date of the permit, the permittee shall perform four (4) chronic and four (4) acute 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 toxicity data shall be collected from the Arbacia punctulata tests. Acute toxicity data shall be collected from the Mysidopsis bahia tests. Chronic and acute toxicity data shall be reported as outlined in Part I.B.10. 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 identify the specific toxic parameter(s) that need to be limited in the effluent.

2. Test Frequency

On four (4) sampling events, (one (1) each calendar quarter) the permittee shall conduct toxicity testing on the two (2) species listed below, for a total of four (4) chronic toxicity tests on the first species and four (4) acute toxicity tests on the second species each year. This requirement entails performing two- (2-) species testing as follows:

Species	Test Type	Frequency
Arbacia punctulata	Sea Urchin 1 Hour Fertilization Test (Chronic)	Quarterly

Species	Test Type	Frequency
Mysids (Mysidopsis bahia)	Definitive 48-Hour Acute Static (LC_{50})	Quarterly

3. Testing Methods

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

4. Sample Collection

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

A: Chemical Analysis

B: Acute Toxicity Testing

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

5. Salinity Adjustment

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

6. Dilution Water

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

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

a.	Test Type	48-Hour Static Acute Definitive
b.	Salinity	25 ppt ± 10% for all dilutions
c.	Temperature (C)	25° ± 1°C
d.	Light Quality	Ambient laboratory illumination
e.	Photoperiod	8 - 16 Hour Light/24-Hour
f.	Test Chamber Size	250 ml
g.	Test Solution Volume	200 ml
h.	Age of Test Organisms	1 - 5 Days
i.	No. Mysids Per Test Chamber	10
j.	No. of Replicate Test Chamber Per Concentration	2
k.	Total No. Mysids Per Test Concentration	20
l.	Feeding Regime	Light feeding (two (2) drops concentrated brine shrimp nauplii, approx.

		100 nauplii per mysid twice daily).
m.	Aeration	None, unless dissolved oxygen concentration falls below 40% of saturation at which time gentle single-bubble aeration should be started.
n.	Dilution Water	Narragansett Bay water as discussed above.
o.	Dilutions	Five (5) dilutions plus a control: 100%, 50%, 25%, 12.5%, 6.25% and 0% effluent.
p.	Effect Measured and Test	Mortality - no movement of body test duration or appendages on gentle prodding, 48-hour LC_{50} and NOAEL.
q.	Test Acceptability	90% or greater survival of test organisms in control solution.
r.	Sampling Requirements	Samples are collected and used within 24 hours after the last sample of the composite is collected.
s.	Sample Volume Required	Minimum four (4) liters

8. Test Conditions for Arbacia Punctulata Fertilization Test

a.	Test Type	Static
b.	Salinity	30 ppt $\pm$ 2 ppt
c.	Temperature (C)	$20^{o} \pm 1^{o}C$
d.	Light Quality	Ambient laboratory light during test preparation
e.	Light Intensity	10-20 uE/m^2/s, or 50-100 ft-c (Ambient Laboratory Levels)
f.	Test Vessel Size	Disposable (glass) liquid scintillation vials (20 ml capacity), not pre-cleaned
g.	Test Solution Volume	5 ml
h.	Number of Sea Urchins	Pooled sperm from four (4) males and pooled eggs from four (4) females and used per test.
i.	Number of Egg and Sperm Cells Per Chamber	About 2,000 eggs and 5,000,000 sperm cells per vial
j.	No. of Replicate Test Chambers Per Concentration	4 (Minimum of 3)

k.	Dilution Water	Narragansett Bay water as discussed above
l.	Dilution Factor	Approximately 0.5
m.	Test Duration	1 Hour and 20 Minutes
n.	Effects Measured	Fertilization and sea urchin eggs
o.	Number of Treatments Per Test	Minimum of five (5) effluent concentrations and a control. An additional dilution at the permitted effluent concentration (10% effluent) is required
p.	Acceptability of Test Results	Recommended sperm : egg ratio should result in fertilization of a minimum of 70% of the eggs in the control chambers
q.	Sample Volume Required	Minimum two (2) liters

9. Chemical Analysis

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

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

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

Total Metals	Effluent	Saline Diluent	Detection Limit (µg/l)
Total Aluminum	X	X	5.0
Total Cadmium	X	X	0.1
Total Copper	X	X	1.0

Hexavalent Chromium	X	X	20.0
Total Lead	X	X	1.0
Total Nickel	X	X	1.0
Total Zinc	X	X	5.0

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

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

10. Toxicity Test Report Elements

A report of results will include the following:

- Description of sample collection procedures and site description.
- Names of individuals collecting and transporting samples, times, and dates of sample collection and analysis.
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests (quality assurance); light and temperature regime; dilution water description; other information on test conditions if different than procedures recommended.
- The method used to adjust the salinity of the effluent must be reported.
- All chemical and physical data generated (include detection limits).
- Raw data and bench sheets.
- Any other observations or test conditions affecting test outcome.

Toxicity test data shall include the following:

Chronic

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

Acute

- Survival for each concentration and replication at time twenty-four (24) and forty-eight (48) hours.

- LC_{50} and 95% confidence limits shall be calculated using one of the following methods in order of preference: Probit, Trimmed Spearman Karber, Moving Average Angle, or the graphical method. All printouts (along with the name of the program, the date, and the author(s)) and graphical displays must be submitted. When data is analyzed by hand, worksheets should be submitted. The report shall also include the No Observed Acute Effect Level (NOAEL) which is defined as the highest concentration of the effluent (in % effluent) in which 90% or more of the test animals survive.

- The Probit, Trimmed Spearman Karber, and Moving Average Angle methods of analyses can only be used when mortality of some of the test organisms are observed in at least two (2) of the (percent effluent) concentrations tested (i.e., partial mortality). If a test results in a 100% survival and 100% mortality in adjacent treatments ("all or nothing" effect), an LC_{50} may be estimated using the graphical method.

11. Special Condition

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

12. Reporting of Bioassay Testing

Bioassay Testing shall be reported as follows:

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

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

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 Monitoring Plan

The permittee has an approved Local Limits Monitoring Plan (LLMP) that shall continue to be implemented at all times.

4. Local Limits

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

a. Within one hundred twenty (120) days of the effective date of this permit and in accordance with 40 CFR 122.44(j)(2)(ii), the permittee shall submit to the DEM a technically based local limits evaluation. The evaluation must address whether the permittee will need to revise its current local limits in order to meet the discharge requirements contained in this permit, meet the permittee's current sludge disposal option criteria, protect against WWTF interference, and ensure protection of WWTF worker health and safety. If revision is required, the evaluation shall contain proposed numerical limitations developed by the permittee in accordance with the procedures set forth in the EPA's July 2004 Local Limits Guidance Manual. All supporting data and calculations must be submitted with the evaluation. Upon review, the DEM will provide written notification either granting preliminary approval of the local limits evaluation or stating the deficiencies revealed therein. Should the DEM determine that a deficiency exists in the local limits evaluation submittal, the permittee shall submit to the DEM, within thirty (30) days of the receipt of said notice (unless a longer timeframe is specified therein), a revised evaluation consistent with the DEM's notice of deficiency.

b. Should the evaluation determine the need to revise local limits, within sixty (60) days (unless a longer timeframe is specified) of the receipt of preliminary approval of the proposed limits, the permittee shall submit to the DEM a request for a pretreatment program modification in accordance with 40 CFR 403.18 and Part I.C.6.e of this permit. Upon final approval by the DEM and adoption by the permittee, these limits shall be deemed Pretreatment Standards for the purposes of Section 307(d) of the Clean Water Act. No longer than thirty (30) days (unless a longer timeframe is specified) following the DEM's final approval of the proposed local limits, the permittee shall commence implementation of the revised local limits and reissue or modify all the applicable industrial user permits to contain the modified local limits.

5. 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.

6. 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.8 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 must include, at a minimum, those elements contained in 40 CFR 403.8(f)(2)(vi).

b. The permittee shall reissue all necessary Industrial User (IU) control mechanisms within thirty (30) days of their expiration date. The permittee shall issue, within sixty (60) days after the determination that an IU is a Significant Industrial User (SIU), all SIU control mechanisms. All SIU control mechanisms must contain, at a minimum, those conditions stated in 40 CFR 403.8(f)(1)(iii). 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 that 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 a statement (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 endorsed 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(b).

i. The permittee shall require all Industrial Users to notify the permittee of substantial changes in discharge as specified in 40 CFR 403.12(j).

j. The permittee shall require New Sources to install and have in operation all pollution control equipment required to meet applicable Pretreatment Standards before beginning to discharge. In addition, the permittee shall require New Sources to meet all applicable Pretreatment Standards within the shortest feasible time which shall not exceed ninety (90) days in accordance with 40 CFR 403.6(b).

k. The permittee shall require all Industrial Users who are required to sample their effluent and report the results of analysis to the POTW to comply with signatory requirements contained in 40 CFR 403.12(l) when submitting such reports.

l. The permittee shall determine, based on the criteria set forth in 40 CFR 403.8(f)(2)(vii), using the EPA method of "rolling quarters", the compliance status of each Industrial User. Any Industrial User determined to meet Significant Non-Compliance (SNC) criteria shall be included in an annual public notification as specified in 40 CFR 403.8(f)(2)(viii).

m. The permittee shall require Industrial Users to comply with the notification and certification requirements of 40 CFR 403.12(p)(1), (3) and (4) pertaining to the discharge of substances to the POTW, which if disposed of otherwise, would be a hazardous waste under 40 CFR Part 261.

n. The permittee shall continue to designate, as SIUs, those Industrial Users (IUs) which meet the definition contained in 40 CFR 403.3 and in the permittee's sewer use ordinance.

The permittee shall notify each newly designated SIU of its classification as an SIU within thirty (30) days of identification and shall inform the SIU of the requirements of an SIU contained in 40 CFR 403.12.

7. 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.

8. Annual Report

The annual report for the permittee's program shall contain information pertaining to the reporting year which shall extend from January 1st through December 31st and shall be submitted to the DEM by March 15th each year. The annual report shall be submitted electronically as NetDMR attachments in Part I.G.2.b of this permit. The requirements for the annual report are included in Attachment G of this permit.

9. Sewer Use Ordinance (SUO)

The permittee has an approved SUO that 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 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 six (6) months shall be submitted to RIDEM, Office of Water Resources, by the 15th day of January and July of each year.

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.(l)(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 their approval.

5. Winter Nitrogen Removal BMP Plan

Within six (6) months of the effective date of this permit, the Town shall submit a Best Management Practices (BMP) Plan for minimizing the discharge of Total Nitrogen during the winter months (November – April). The BMP Plan shall include detailed procedures and a description of controls that will be used to ensure that Total Nitrogen is removed from the discharge to the maximum extent practicable without the addition of carbon. The BMP Plan shall also include recommendations for improvements that could be made at the wastewater treatment facility (WWTF) that would allow the WWTF to optimize the removal of Total Nitrogen without carbon addition. The BMP Plan shall be subject to DEM review and approval. Should the DEM determine that a deficiency exists, the permittee shall submit to the DEM, within (30) days of the receipt of said notice (unless a longer timeframe is specified therein), a revised BMP Plan consistent with the DEM's notice of deficiency.

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 the Treatment, Disposal, Utilization and Transportation of Sewage Sludge. The permittee shall comply with its RIDEM 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		MDL ug/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		MDL ug/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		MDL ug/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		MDL ug/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		MDL ug/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 ug/l (ppb)
Antimony, Total	3.0
Arsenic, Total	1.0
Beryllium, Total	0.2
Cadmium, Total	0.1
Chromium, Total	1.0
Chromium, Hexavalent	20.0
Copper, Total	1.0
Lead, Total	1.0
Mercury, Total	0.2
Nickel, Total	1.0
Selenium, Total	2.0
Silver, Total	0.5
Thallium, Total	1.0
Zinc, Total	5.0
Asbestos	**
Cyanide, Available	10.0
Phenols, Total	50.0
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0

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

NOTE:

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

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

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

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

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

b. Submittal of Reports as NetDMR Attachments

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

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

c. Submittal of Reports in Hard Copy Form

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

- Written notifications required under Part II
- Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
- Priority Pollutant Scan results for Outfall 001A
- Infiltration/Inflow Reports

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

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

d. Verbal Reports and Verbal Notifications

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

PART II
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GENERAL REQUIREMENTS

DEFINITIONS

GENERAL REQUIREMENTS

(a) Duty to Comply

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

(1) The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

(2) The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307 or 308 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment of not more than 1 year, or both.

(3) Chapter 46-12 of the Rhode Island General Laws provides that any person who violates a permit condition is subject to a civil penalty of not more than $5,000 per day of such violation. Any person who willfully or negligently violates a permit condition is subject to a criminal penalty of not more than $10,000 per day of such violation and imprisonment for not more than 30 days, or both. Any person who knowingly makes any false statement in connection with the permit is subject to a criminal penalty of not more than $5,000 for each instance of violation or by imprisonment for not more than 30 days, or both.

(b) Duty to Reapply

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

(c) Need to Halt or Reduce Not a Defense

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

(d) Duty to Mitigate

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

(e) Proper Operation and Maintenance

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

(f) Permit Actions

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

(g) Property Rights

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

(h) Duty to Provide Information

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

(i) Inspection and Entry

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

(1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(2) Have access to and copy, at reasonable times any records that must be kept under the conditions of this permit;

(3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

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

(j) Monitoring and Records

(1) Samples and measurements taken for the purpose of monitoring shall be representative of the volume and nature of the discharge over the sampling and reporting period.

(2) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings from continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 5 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

(3) Records of monitoring information shall include:

(i) The date, exact place, and time of sampling or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) The date(s) analyses were performed;

(iv) The individual(s) who performed the analyses;

(v) The analytical techniques or methods used; and

(vi) The results of such analyses.

(4) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136 and applicable Rhode Island regulations, unless other test procedures have been specified in this permit.

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall upon conviction, be punished by a fine of not more than $10,000 per violation or by imprisonment for not more than 6 months per violation or by both. Chapter 46-12 of the Rhode Island General Laws also provides that such acts are subject to a fine of not more than $5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.

(6) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

(7) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR Part 136, applicable State regulations, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(k) Signatory Requirement

All applications, reports, or information submitted to the Director shall be signed and certified in accordance with 250-RICR-150-10-1.12 of the Rhode Island Pollutant Discharge Elimination System (RIPDES) Regulations. Rhode Island General Laws, Chapter 46-12 provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.

(l) Reporting Requirements

(1) Planned changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility.

(2) Anticipated noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with the permit requirements.

(3) Transfers. This permit is not transferable to any person except after written notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under State and Federal law.

(4) Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(5) Twenty-four hour reporting. The permittee shall immediately report any noncompliance which may endanger health or the environment by calling DEM at (401) 222-4700 or (401) 222-3070 at night.

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

The following information must be reported immediately:

(i) Any unanticipated bypass which causes a violation of any effluent limitation in the permit; or

(ii) Any upset which causes a violation of any effluent limitation in the permit; or

(iii) Any violation of a maximum daily discharge limitation for any of the pollutants specifically listed by the Director in the permit.

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

(6) Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs (1), (2), and (5), of this section, at the time monitoring reports are submitted. The reports shall contain the information required in paragraph (l)(5) of the section.

(7) Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, they shall promptly submit such facts or information.

(m) Bypass

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

(1) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (2) and (3) of this section.

(2) Notice.

(i) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.

(ii) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in 250-RICR-150-10-1.14(R) of the RIPDES Regulations.

(3) Prohibition of bypass.

(i) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

(A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, where "severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production;

(B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(C) The permittee submitted notices as required under paragraph (2) of this section.

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

(n) Upset

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

(1) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph (2) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(2) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(a) An upset occurred and that the permittee can identify the cause(s) of the upset;

(b) The permitted facility was at the time being properly operated;

(c) The permittee submitted notice of the upset as required in 250-RICR-150-10-1.14(R) of the RIPDES Regulations; and

(d) The permittee complied with any remedial measures required under 250-RICR-150-10-1.14(E) of the RIPDES Regulations.

(3) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(o) Change in Discharge

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

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

(p) Removed Substances

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

(q) Power Failures

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

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

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

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

(r) Availability of Reports

Except for data determined to be confidential under paragraph (w) below, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the DEM, 235 Promenade Street, Providence, Rhode Island 02908. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA and under Section 46-12-14 of the Rhode Island General Laws.

(s) State Laws

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

(t) Other Laws

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

(u) Severability

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

(v) Reopener Clause

The Director reserves the right to make appropriate revisions to this permit in order to incorporate any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA or State law. In accordance with 250-RICR-150-10-1.16 and 250-RICR-150-10-1.24 of the RIPDES Regulations, if any effluent standard or prohibition, or water quality standard is promulgated under the CWA or under State law which is more stringent than any limitation on the pollutant in the permit, or controls a pollutant not limited in the permit, then the Director may promptly reopen the permit and modify or revoke and reissue the permit to conform to the applicable standard.

(w) Confidentiality of Information

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

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

(i) The name and address of any permit applicant or permittee;

(ii) Permit applications, permits and any attachments thereto; and

(iii) NPDES effluent data.

(x) Best Management Practices

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

(y) Right of Appeal

Within thirty (30) days of receipt of notice of a final permit decision, the permittee or any interested person may submit a request to the Director for an adjudicatory hearing to reconsider or contest that decision. The request for a hearing must conform to the requirements of 250-RICR-150-10-1.50 of the RIPDES Regulations.

DEFINITIONS

1. For purposes of this permit, those definitions contained in the RIPDES Regulations and the Rhode Island Pretreatment Regulations shall apply.

2. The following abbreviations, when used, are defined below.

cu. M/day or M^3/day	cubic meters per day
mg/l	milligrams per liter
ug/l	micrograms per liter
lbs/day	pounds per day
kg/day	kilograms per day
Temp. ^oC	temperature in degrees Centigrade
Temp. ^oF	temperature in degrees Fahrenheit
Turb.	turbidity measured by the Nephelometric Method (NTU)
TNFR or TSS	total nonfilterable residue or total suspended solids
DO	dissolved oxygen
BOD	five-day biochemical oxygen demand unless otherwise specified
TKN	total Kjeldahl nitrogen as nitrogen
Total N	total nitrogen
NH_3-N	ammonia nitrogen as nitrogen
Total P	total phosphorus
COD	chemical oxygen demand
TOC	total organic carbon
Surfactant	surface-active agent
pH	a measure of the hydrogen ion concentration
PCB	polychlorinated biphenyl
CFS	cubic feet per second
MGD	million gallons per day
Oil & Grease	Freon extractable material
Total Coliform	total coliform bacteria
Fecal Coliform	total fecal coliform bacteria
ml/l	milliliter(s) per liter
NO_3-N	nitrate nitrogen as nitrogen
NO_2-N	nitrite nitrogen as nitrogen
NO_3-NO_2	combined nitrate and nitrite nitrogen as nitrogen
$C1_2$	total residual chlorine

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. RI0100064

NAME AND ADDRESS OF APPLICANT:

Town of Westerly
45 Broad Street
Westerly, Rhode Island 02891

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Westerly Wastewater Treatment Facility
87 Margin Street
Westerly, Rhode Island 02891

RECEIVING WATER: **Pawcatuck River**
WBID: RI008038E-01A

CLASSIFICATION: **SB1**

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 treated effluent from the Westerly Wastewater Treatment Facility. A process diagram of the facility is shown in Attachment A.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters based on DMR data from September 2013 to December 2020 is shown on Attachment B. A review of the historic discharge data demonstrated that the Westerly WWTF can comply with the all the limitations given, except for the May-October Total Nitrogen and Total Ammonia limits. The DEM anticipates entering into a Consent Agreement with the Town of Westerly for the May-October Total Nitrogen limit and May-October Total Ammonia limit.

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 40 CFR §122.21(j) or (q).

Facility Description

The Town of Westerly owns and operates the Wastewater Treatment Facility located on 87 Margin Street Westerly, Rhode Island. The discharge to the Pawcatuck River consists of treated domestic and industrial wastewater effluent. As of December 2020, the end of Westerly's most recent Industrial Pretreatment Program reporting year, there were three (3) permitted Significant Industrial Users (SIUs) contributing wastewater to the Westerly Wastewater Treatment Facility.

Treatment consists of the following: Coarse Screening, Primary Settling, Biological Treatment, Secondary Settling, Chlorination, and Dechlorination. A process flow diagram is attached as Attachment A.

The Westerly WWTF's most recent RIPDES permit, authorizing discharges from the above-mentioned facility, was issued on August 26, 2013. This permit became effective on September 1, 2013 and expired on August 31, 2018. The facility applied for permit reissuance to the DEM on February 9, 2018. On February 14, 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 September 1, 2013 permit remains in effect since the DEM has determined that a timely and complete permit application was submitted. This permit supersedes the September 1, 2013 permit.

Receiving Water Description

The water body segment for the Pawcatuck River is identified at the point of discharge by water body ID RI0008038E-01A in Westerly, Rhode Island. This segment of the Pawcatuck River is described in the RI Water Quality Regulations as the Tidal Pawcatuck River from Route 1 highway bridge to Pawcatuck Rock in Westerly and is classified as an SB1 water body. SB1 classified water bodies are designated for primary and secondary contact recreational activities and fish and wildlife habitat. They shall be suitable for aquacultural uses, navigation, and industrial cooling. These waters shall have good aesthetic value. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. This segment is listed on DEM's 2016 303(d) impaired waters list for fecal coliform and for not supporting Fish and Wildlife habitat due to dissolved oxygen (DO) impairments. A TMDL to address the DO impairment is scheduled to be completed in 2023 according to the 2020 303(d) impaired waters list. This segment has a completed TMDL (approved in 2010) for fecal coliform which is impairing primary and secondary contact

recreation uses in the estuary. The TMDL concluded that the excessive bacteria levels are caused by stormwater runoff, illegal connection of sewage into storm drains, failing septic systems, wildlife, waterfowl, domestic pets, and agricultural practices. Fecal Coliform impairments did not stem from the wastewater treatment facility.

The Connecticut waterbody segments most closely associated with the Rhode Island waterbody segment which receives the Westerly discharge are identified as CT-E1_001-SB and CT-E1_002-SB according to the Connecticut Department of Energy and Environment (CTDEEP) Integrated Water Quality Report. Both segments make up the Pawcatuck Estuary and have a water quality classification of SB. Designated uses include commercial shellfish harvesting, recreation, habitat for marine fish and other aquatic life and wildlife, industrial water supply, and navigation. According to the 2014 CT Pawcatuck River Watershed Bacteria TMDL, CT-E1_001-SB is impaired for commercial shellfish harvesting and recreation uses due to elevated bacteria concentrations and CT-E1_002-SB is impaired for the designated use of commercial shellfish harvesting. Permit limits for the Westerly WWTF were developed to be consistent with both Rhode Island and Connecticut water quality regulations.

Pretreatment

The Westerly WWTF has an approved industrial pretreatment program. The Westerly pretreatment program was first approved in 1997.

Local Limits

The permit requires that Westerly submit a technical evaluation of local limits within one hundred twenty (120) days of the effective date of this permit in accordance with 40 CFR 122.44. This is a change from the previous permit issuance, which required the local limits evaluation alongside the permit application.

Annual Report

The permit requires that Westerly submit an annual report for their industrial pretreatment program pertaining to the reporting year (January 1st – December 31st) by March 15th every year. This is an extension of the deadline in the previous permit (February 15th) to allow adequate time to prepare the report. These reports are to be submitted as NetDMR attachments as outlined in Part I.G.2 of this permit. The requirements for the annual report are also outlined in Attachment G of this permit.

The permit contains a reporting requirement for a local program to regulate industrial discharges to the sewer system (referred to as a pretreatment program). This program is required under authority of Section 402 (b)(8) of the CWA and 40 CFR 122.44 (j) and 403.8, as the Town receives significant discharges of industrial waste-water from three (3) SIUs (see above).

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: determining if Federal effluent guidelines apply; calculation of allowable water quality-based discharge levels based on background data and available dilution; assigning appropriate Best Professional Judgement (BPJ) based limits; comparing existing and proposed limits; comparing discharge data to proposed limits; performing an antidegradation/antibacksliding analysis to determine the final permit limits; and developing interim limits as appropriate.

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

WWTF Conventional Pollutant Permit Limitations

Flow Limits

The basis for the facility's average monthly flow limit of 3.3 MGD is the facility's "Wastewater Facilities Plan Amendment" dated February 2018.

$CBOD_5$, TSS, and pH

The permit incorporates new "Average Monthly" and "Average Weekly" $CBOD_5$ (20 mg/l for both) and TSS (also 20 mg/l for both) limits for May-October, replacing the BOD_5 and TSS limits established in the 2013 Westerly WWTF RIPDES permit. $CBOD_5$ tests measure the 5-day carbonaceous biochemical oxygen demand, while BOD_5 tests measure both the carbonaceous and nitrogenous biochemical oxygen demand. The reduced seasonal total nitrogen limit (from 15 mg/L to 5 mg/L) will increase the extent of nitrification required during treatment and, therefore, the $CBOD_5$ limit will serve as a more accurate measure of treatment plant performance. Per EPA regulations at 40 CFR § 133.102(a)(4), DEM as the permitting authority may substitute the parameter $CBOD_5$ for the parameter BOD_5 provided that the effluent limitations are no less stringent than the $CBOD_5$ limits that are equivalent to secondary treatment standards as established in Part 133. The new $CBOD_5$ limits are at least as stringent as those set out in § 133.102(a)(4). The more stringent TSS limits are due to the increased pollutant removal that is achieved with nutrient removal equipment.

The November-April "Average Monthly" and "Average Weekly" $CBOD_5$ (25 and 40 mg/l respectively) and TSS (30 and 45 mg/l, respectively) limits are set at levels according to the secondary treatment standards set out in 40 CFR Part 133. EPA Regulations at § 133.102(a)(4) state that, when $CBOD_5$ is substituted for the BOD_5 parameter, the 30-day average shall not exceed 25 mg/l and the 7-day average shall not exceed 40 mg/l. Historic DMR data has shown that the Westerly WWTF consistently reports BOD_5 and TSS values that are significantly lower than the secondary treatment limits found at 40 CFR 133.

RIPDES Regulations at 250-RICR-150-10-1.18(E)(2) state that limitations for POTWs shall be stated as "Maximum daily, average weekly and average monthly discharge limitations" unless impracticable. Accordingly, "Maximum Daily" $CBOD_5$ and TSS limits were established using Best Professional Judgement (BPJ). Therefore, May-October "Maximum Daily" $CBOD_5$ and TSS limits of 30 mg/l and November–April "Maximum Daily" $CBOD_5$ and TSS limits of 45 mg/l and 50 mg/l have been assigned in the permit. The treatment facility has historically been able to achieve the more stringent limits during normal operations. In addition, pollutant removals will be increased once the treatment facility is upgraded to meet the more stringent Total Nitrogen limits in the permit. Therefore, the treatment facility should be able to meet the proposed limits.

The mass-based (i.e. lb/day) $CBOD_5$ and TSS limits were calculated using the concentration-based limits in mg/L, the WWTF's monthly average design flow in MGD, and the conversion factor of 8.34 ($L \cdot lbs \cdot mg^{-1} \cdot gal^{-6}$). pH minimum and maximum limits are based on the Class Specific Criteria for Saltwaters from the Rhode Island Water Quality Regulations. Review of historic discharge data has shown that the Westerly WWTF effluent has occasional excursions of the pH limits. DEM is willing to enter into a consent agreement with the Town for the pH limits.

Settleable Solids

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

Bacteria

Table 2.8.D(3) of the RI Water Quality Regulations includes Enterococci criteria for primary contact/swimming of a geometric mean of 35 colonies/100 mL and a single sample maximum of 104 colonies/100mL. However, the "single sample maximum" value is only used by the Rhode Island Department of Health to evaluate swimming advisories at public beaches and is not applied to the receiving water in the area of the Westerly WWTF's outfall. EPA's November 12, 2008 memorandum regarding "Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation" specifies that it is not appropriate to use dilution for bacteria criteria in receiving waters that are designated for primary contact recreation. Therefore, because the receiving water is designated for primary contact recreation, the

Rhode Island Department of Environmental Management (DEM) has assigned a monthly average Enterococci limit of 35 colonies/100 mL. This limit is consistent with the water quality criteria from Table 2.8.D(3) of the RI Water Quality Regulations. The daily maximum enterococci limit has been set at the 90% upper confidence level value for "lightly used full body contact recreation" of 276 colonies/100 mL.

According to the CT Pawcatuck River Watershed TMDL, non-stormwater NPDES permitted sources are to have a wasteload allocation of 88 colonies/100mL. Moreover, CT Water Quality Standards note that Class SB Waterbodies are to have a geometric mean of less than 88 colonies/100mL. EPA Regulations at 40 CFR §122.44(d)(1) require DEM to establish effluent limitations necessary to achieve water quality standards established under section 303 of the CWA. §122.44(d)(1)(vii)(B) also requires DEM to develop effluent limits to protect numeric water quality criteria consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7. Therefore, DEM has also established an Average Monthly Geometric Mean Fecal Coliform Limit of 88 MPN/100 mL in the permit. Review of historic fecal coliform discharge data has shown that the Westerly WWTF can meet this effluent limitation through proper operation of the disinfection equipment at the facility.

WWTF Toxic Pollutant Limits

Water Quality-Based Limit (WQBEL) Calculations

The allowable effluent limitations were established based on 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 Westerly WWTF 2013 permit also contained WQBELs. The town's first permit to contain WQBELs was issued in 1997.

Mixing Zones and Dilution Factors

According to RIPDES Regulations at 250-RICR-150-10-1.16(A)(5)(c), when determining if a discharge has the reasonable potential to cause an excursion above a numeric or narrative water quality criteria, DEM shall account for, where appropriate, the dilution of the effluent in the receiving water. Because the Pawcatuck River at the point of discharge is tidally influenced, the assumption of a one-dimensional critical low flow for developing a steady-state water quality model does not hold for the purposes of determining available dilution. In cases where the discharge and receiving water do not mix rapidly and completely, according to Rhode Island Water Quality Regulations, DEM may establish a limited mixing zone on a case-by-case basis. All mixing zones must meet the requirements set out in the Water Quality Regulations at §1.10(B)(7).

In 1991, the Town of Westerly contracted Aquatec, Inc. to perform the effluent dye study to determine the degree of dilution of the effluent with the river water. Based on the findings of the dye studies, the acute mixing zone is defined as a rectangular area with a length of 175 feet, a width of 120 feet and an associated dilution factor of 5 and the chronic mixing zone is defined as a rectangular area with a length of 400 feet, a width of 250 feet and a dilution factor of 10. The outfall is not located in the center of the acute mixing zone; it is located 200 feet east of the northwest corner of the defined chronic zone.

The *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991), or TSD, provides guidance on the performance and applicability of dye/tracer studies. According to EPA guidance, the tracer study must be made at critical design conditions in order to use the results directly for wasteload allocations. The Pawcatuck River and Little Narragansett Bay TMDLs note that the large freshwater flow from the Pawcatuck River creates a stratified condition in the estuary when mixed with the tidally introduced saltwater. For estuaries with stratification, a site-specific analysis is required to determine the

period which creates the lowest dilution of the effluent with the receiving water. The effluent dye study referenced above was conducted during the summer low flow conditions and was determined to represent a time where the lowest available dilution was expected. Moreover, the effluent and receiving water mixture was determined to not have the potential to disrupt any critical resource areas (drinking water, shellfishing, etc.).

Rhode Island Water Quality Regulations define acute and chronic aquatic life and human health criteria for both freshwater and saltwater. When DEM determines that a discharge has a reasonable potential to contribute to an excursion above any State water quality criteria, effluent limitations must be established in RIPDES permits to control the pollutants of concern. Permit limits are derived by establishing a two-value wasteload allocation for the discharge; one that is protective of acute criteria, and one that is protective of chronic and human health criteria. EPA guidance requires that the method used to derive permit limits be consistent with the nature of the wasteload allocation. The wasteload allocations are based on ambient criteria and the exposure of the resident aquatic community and humans to toxic conditions in both the short term (acute) and long term (chronic). Therefore, when calculating effluent limits for toxic pollutants, DEM uses acute criteria and the acute dilution factor to determine the maximum daily limit. The average monthly limit is calculated first using the chronic criteria and chronic dilution factor, then the human health criteria and human health dilution factor, with the more stringent result being set as the permit limit.

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

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

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

b) Using available background concentration data.

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

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

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

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.

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.

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 (RIDEM, July 2006).

Calculation of allowable limits based on the Aquatic Life and Human Health Criteria from the RIDEM Water Quality Regulations can be found in Attachment C.

Wasteload Allocation

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 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.

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. An assessment was made to determine if limits were necessary, using the data collected during the previous permit term.

After analyzing discharge monitoring report data from 2013 to 2020, it was determined that the discharge has a reasonable potential to cause or contribute to an excursion of the state water criteria for both copper and cyanide. Therefore, effluent limitations and monitoring requirements for copper and cyanide have been maintained from the 2013 permit. Effluent limitations for Total Residual Chlorine were also maintained due to there being a reasonable potential to cause an excursion above the water quality criterion for chlorine and to ensure proper dechlorination of the effluent prior to discharge. After analyzing the Priority Pollutant Scan Data from 2013 to 2020, it was also determined that the discharge has a reasonable potential to cause or contribute to an excursion of the state water quality criterion for Arsenic. Therefore, effluent limitations and monitoring requirements for Total Arsenic have been established in the permit. If twelve (12) consecutive months of monitoring (at the monitoring frequencies established in the permit) show effluent concentrations below detection for Total Arsenic and Available Cyanide, the monitoring for both pollutants shall be reduced to once per quarter.

Although these pollutants did not have reasonable potential, quarterly monitoring for Total Cadmium, Hexavalent Chromium, Total Lead, Total Zinc, Total Nickel, and Total Aluminum have been included in the permit as part of the standard list of pollutants monitored as part of the quarterly bioassay testing.

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 performed during the third calendar quarter bioassay sampling event.

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. Based on past toxicity results and available dilution, the permit sets out an $LC_{50} \geq 100\%$ effluent limit for quarterly acute tests conducted on mysids. Calculation of the chronic C-NOEC with a chronic toxicity limit of > 10% effluent is also required. If recurrent toxicity is demonstrated, then toxicity identification and reduction will be required.

Nutrients

The permit has a seasonal monthly average Total Nitrogen limit of 5.0 mg/L that is applied May - October, a reduction from the 15.0 mg/L limit in the 2013 permit, in addition to maintaining the requirement that the treatment facility be operated to maximize nitrogen removal during the November – April time period using all available treatment equipment except carbon addition. In addition, the permit also includes a monthly average mass-based (i.e. lb/day) May – October Total Nitrogen limit calculated using the concentration-based limit in mg/L, the WWTF's design flow in MGD, and the conversion factor of 8.34 ($L \cdot lbs \cdot mg^{-1} \cdot gal^{-6}$). According to Rhode Island Water Quality Regulations at 250-RICR-150-05-1.10(E)(1), nutrients are not allowed in Class SB1 waterbodies in such concentration that would "cause undesirable or nuisance aquatic species associated with cultural eutrophication." RIPDES Regulations at 250-RICR-150-10-1.16(A)(5)(g) also state that, where there is no criterion for a specific chemical pollutant present in an effluent that has the reasonable potential to contribute to an excursion above a narrative criterion, DEM may establish effluent limits "using a calculated numeric water quality criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use."

According to the 2020 Rhode Island 303(d) List of Impaired Waters, the tidal Pawcatuck River is currently not supporting the Fish and Wildlife habitat use due to low dissolved oxygen. In saltwater systems, nitrogen is the limiting nutrient and controls the growth of aquatic plants and algae in the water. These organisms reduce water clarity and consume oxygen in the water as they decompose, thus decreasing dissolved oxygen levels. Therefore, control of discharges containing nitrogen through effluent limitations is necessary to address the dissolved oxygen impairment in the Tidal Pawcatuck River.

Given the relationship between nitrogen loading in estuarine environments and the associated decrease in dissolved oxygen levels, which impairs designated uses, DEM sought to develop a numeric loading target for total nitrogen into the tidal Pawcatuck River. In the Little Narragansett Bay and estuarine Pawcatuck River, eelgrass serves as an important source of food and shelter for coastal sea life, and eelgrass cover is seen as an indicator of the overall health of the estuary. As discussed above, the mechanism by which nitrogen loading reduces dissolved oxygen is through the growth of nuisance aquatic species. These aquatic species can harm the estuarine environment through the reduction in dissolved oxygen (e.g. fish kills during the summer), but it can also decrease seagrass cover by reducing water clarity. Therefore, given the importance of eelgrass to designated uses, and because the extent of eelgrass cover is indicative of cultural eutrophication in estuarine environments, DEM surveyed literature that discuss the relationship between total nitrogen loading and seagrass cover in estuaries. Several studies expressed critical nitrogen loading thresholds in terms of the annual mass loading per unit area of the estuary (e.g. kg ha^{-1} yr^{-1}) and related these annual loadings to reduction in estuarine seagrass cover.

One study compiled information on various estuarine systems to determine the relationship between annual nitrogen loads, seagrass, macroalgae, and phytoplankton production rates, and extent of past and present seagrass. The study also examines how fringing wetlands in estuarine systems mitigate the effects of nitrogen loading. The study confirmed the high sensitivity of eelgrass on increases in terrestrial nitrogen loading found in the literature, noting that “nearly the entire seagrass habitat cover was lost in estuaries exposed to land-derived N loads greater than 100 kg N per hectare of estuary per year.” In other shallow coastal waters, the study found that land-derived N loads “in excess of 20-30 kg N ha^{-1} yr^{-1} were sufficient to decrease seagrass cover.” In multiple geographic locations, however, loadings above the 100 kg N ha^{-1} yr^{-1} threshold were consistently shown to have a marked decrease in seagrass cover. (Valiela & Cole, 2002)

Another study quantified the extent of eelgrass as a function of watershed nitrogen loading for small and medium shallow estuaries in New England. The study found that at loadings below 50 kg N ha^{-1} yr^{-1}, the extent of eelgrass cover is controlled by other ecosystem factors not related to water quality. However, at loading levels above the 100 kg ha^{-1} yr^{-1} threshold for nitrogen, there is “essentially no eelgrass” present in the estuary. (Latimer & Rego, 2010)

Based on nitrogen loading thresholds in the literature and the corresponding effects on seagrass populations at each loading level, DEM chose the 100 kg ha^{-1} yr^{-1} loading rate as an appropriate interpretation of the narrative criterion allowed by RIPDES Regulations.

Given the above loading target, DEM evaluated the nitrogen loadings into the Pawcatuck River to determine if the discharge of nitrogen is at a level that has the reasonable potential to contribute to an excursion of water quality standards. Broadly speaking, the overall total nitrogen loading into the tidal Pawcatuck River can be divided into: The Westerly WWTF effluent, the Stonington WPCF effluent, and watershed sources. The annual mass loading of nitrogen for the Westerly WWTF was calculated as 188 kg/day using permit conditions (design flow of 3.3 MGD and total nitrogen limit of 15 mg/L). The Stonington WPCF and watershed loads were measured to be 10.9 kg/day and 1076.6 kg/day, respectively, based on the WPCF permit conditions and USGS data from 2016 to 2020. The area of the tidal Pawcatuck River and Little Narragansett Bay, 794 acres, was taken from DEM’s Rhode Island Geographic Information Systems and from the 2020 CT DEEP Integrated Report. Based on the loading rate from each source and the area of the water body, the annual total nitrogen loading rate for the tidal Pawcatuck River and Little Narragansett Bay was found to be 586 kg ha^{-1} yr^{-1}, well above the target 100 kg ha^{-1} yr^{-1} threshold, exceeding the assimilative capacity of the estuary. Therefore, the Westerly WWTF effluent does have a reasonable potential to cause or contribute to an excursion above a State water quality criterion and, according to RIPDES Regulations at 250-RICR-150-10-1.16(A)(5)(d), limitations on the nitrogen in the effluent must be established.

In addition to having reasonable potential to cause or contribute to an excursion above a State water quality criterion which would require Total Nitrogen reductions, the DEM also had Westerly evaluate process upgrades that would be required to meet more stringent Total Nitrogen permit limits (i.e., Total Nitrogen limits

lower than 15 mg/L) as part of the Town's evaluation of modifications to the WWTF that it was already conducting to address flow restrictions at its vortex grit chamber and the facility approaching the end of its design life for the aeration system's sponges,. After review of the evaluation presented in Westerly's report titled *Integrated Fixed-Film Activated Sludge (IFAS) Process Evaluation for Nitrogen Removal*, DEM determined that a May – October Total Nitrogen permit limit of 5.0 mg/l is technically and economically feasible and necessary to address the nutrient discharges from the Westerly treatment facility. Although, even with the Westerly WWTF at 5.0 mg/L Total Nitrogen, the watershed load would need to be reduced by 86% to meet the 100 kg ha^{-1} yr^{-1} target, it was determined that reducing the Westerly WWTF permitted nitrogen load to 3 mg/L would result in a negligible change in the required watershed reduction. Therefore, applying a 5.0 mg/L Total Nitrogen is consistent with the RI Water Quality Regulations at 250-RICR-150-05-1.10(E)(1) indicating that nitrates and ammonia may be assigned site-specific permit limits based on reasonable Best Available Technologies. In addition to assigning a 5 mg/L total nitrogen limit for the Westerly WWTF, the DEM will also pursue reductions in the non-point source loadings as part of an adaptive management approach to meet the 100 kg ha^{-1} yr^{-1} target as discussed below.

The seasonal total nitrogen limit in this permit and the actions taken outside the scope of this permit are part of an adaptive management approach to address impairments in the estuarine Pawcatuck River. The adaptive management approach is a process where the waterbody is continually evaluated using collected data and reassessed after the implementation of nitrogen controls on the treatment plant effluent, stormwater, and non-point sources discharges. As discussed above, the 100 kg nitrogen ha^{-1} yr^{-1} target was determined from the literature to be the loading level where seagrasses are absent from estuaries, with various extents of seagrass cover being seen at lower loading levels. Consistent with the adaptive management approach, this loading target will also be evaluated for its applicability to the Pawcatuck River as the nitrogen loading rate decreases. Activities that will be carried out to collect data, assess the level of impairment, and implement appropriate stormwater point source and non-point source nitrogen controls are described below.

DEM and CT DEEP are currently working to develop a TMDL for the Pawcatuck River dissolved oxygen impairments. According to the 2020 Rhode Island 303(d) list, the dissolved oxygen TMDL is scheduled to be completed in 2023. Upon approval by the EPA, the dissolved oxygen TMDL will identify load allocations (LAs) and wasteload allocations (WLAs) that will be fully protective of the water quality criteria. DEM anticipates that Best Management Practices (BMPs), stormwater controls, and nitrogen control requirements to reduce the stormwater point-source loading consistent with the TMDL's WLA will be addressed in future MS4 and MSGP permits. In addition, non-point nitrogen loading reductions will also be captured in DEM's Nonpoint Source Management Program Plan. As part of the adaptive management approach, once these WLA and LA reductions have been implemented, in addition to the more stringent Total Nitrogen limits for the Westerly WWTF, DEM will reevaluate water quality data for the tidal Pawcatuck River and determine if further reduction in nitrogen loadings are necessary. The DEM is willing to enter into a consent agreement with the Town for the Total Nitrogen limit.

Ammonia

The 2013 RIPDES permit contained water quality-based "Monthly Average" and "Maximum Daily" ammonia limits for May – October and November - April. For the re-issuance of the permit, DEM re-calculated the "Monthly Average" and "Daily Maximum" limits for Total Ammonia (as N) based on acute and chronic aquatic life criteria. As discussed above, the DEM uses available in-stream dilution and an allocation factor of 80% when the background ammonia concentration is unknown. Based on the previous dye study, the DEM used an acute dilution of 5 and a chronic dilution of 10 and used an 80% allocation factor as the background in the Pawcatuck River is unknown. The water quality criteria for Ammonia are a function of salinity, pH and temperature. Consistent with the values utilized to develop limits in the 2013 Permit, a salinity equal to 10 parts per thousand is appropriate for the Westerly WWTF as this location is influenced by freshwater inputs from the Pawcatuck River. The DEM obtained 2019-2020 pH and temperature data from the USGS gauging station on the Pawcatuck River at Westerly. The acute and chronic aquatic life ammonia criteria for saltwaters, as outlined in Rhode Island Water Quality Regulations § 1.26(J)(2), are functions of the in-stream temperature and pH. Accordingly, DEM reviewed the available in-stream temperature and pH data for the Pawcatuck River. From the review, it was noted that for the summer months (May-October), in-stream temperature and pH were generally positively correlated, with pH > 8.0 and temperatures above 29 °C occurring in August 2020. It was also noted that for the winter months (November – April) maximum pH values (where pH ≥ 6.5) were recorded when the in-stream temperature was 10 °C, with lower in-stream pH measurements occurring at higher winter temperatures (~15 °C). Accordingly, the summer acute and chronic aquatic life ammonia criteria were established at a temperature

of 30 °C and pH of 8.3. The winter criteria were established at a temperature of 10 °C and a pH of 7.0 to account for the freshwater influence of the Pawcatuck River and for consistency with Rhode Island Water Quality Regulations. Based on the water quality criteria, May-October "Monthly Average" and "Daily Maximum" limits of 1.7 mg/l and 5.7 mg/l, respectively, were established in the permit. The facility has demonstrated the ability to comply with the previous permits' winter Average Monthly and Maximum Daily Ammonia limits of 30.9 mg/L and 101.9 mg/L. Therefore, since the Antibacksliding Provisions of the Clean Water Act prohibit issuing a permit containing less stringent effluent limits than the comparable limits from the previous permit, the RIDEM has maintained winter (November-April) Average Monthly and Maximum Daily Ammonia limits of 30.9 mg/L and 101.9 mg/L respectively.

Operation & Maintenance

Infiltration/Inflow (I/I)

Section 402(a) of the Clean Water Act makes clear that RIPDES permits "shall be subject to such conditions as the Administrator determines are necessary to carry out the provisions of [the CWA]." This includes Section 301 of the CWA, which requires POTWs to meet performance-based requirements based on secondary treatment technology. With respect to secondary treatment, minimizing the amount of infiltration/inflow (I/I) is necessary because high levels of I/I dilute the strength of influent wastewater and increase the hydraulic load on treatment plants, which can reduce treatment efficiency. Accordingly, DEM has established I/I requirements for Westerly in their RIPDES permit.

Part I.6.e of Westerly's September 14, 2007 RIPDES permit required that Westerly 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" to the DEM. On December 27, 2007 BETA Engineering submitted this information to the DEM, on behalf of Westerly, in a Capacity Analysis Report. The Capacity Analysis was subsequently updated on May 1, 2012 and May 21, 2012. Both the 2007 and the updated Capacity Analysis indicate that, despite periodic exceedances of the maximum monthly average flow limit, Westerly's existing WWTF has adequate capacity to maintain satisfactory treatment for the projected 20-year pollutant loads from Westerly's current service area and the following neighborhoods: Mount Moriah/Springbrook, Apache Drive/Ledward Avenue, and Misquamicut. Although the Capacity Analysis indicated that the WWTF has adequate capacity to treat the projected 20-year pollutant loads, it also indicated that there is significant Infiltration and Inflow (I/I) into its collection system and recommended that Westerly "continue to pursue the removal of peak infiltration and inflow." Westerly's most recent I/I study was completed in 1994 and divided Westerly's collection system into 20 sub-areas, 12 of which were deemed to have excessive infiltration. Therefore, the I/I study recommended a 2 phase Sewer System Evaluation Study (SSES) to identify and remediate sources in the 12 priority areas which was completed in 2007. Even after the completion of the recommendations from the SSESs, Westerly occasionally exhibits elevated I/I.

Westerly's 2013 permit required that a new SSES Scope of Work, which included identifying areas of excessive I/I, flow monitoring, manhole inspections, smoke/dye testing, and TV-ing areas with excessive infiltration, be submitted to the DEM. BETA Engineering submitted an I/I Analysis report to document investigative work performed and to recommend work to reduce excessive I/I on September 4, 2015. In December 2015, the DEM approved the SSES report in accordance with Part I.A.7.c of the 2013 RIPDES permit. In 2017, the Town issued bonds to raise funds for sewer improvements consistent with the schedule approved by DEM and began constructing improvements in 2018.

By July 2020, Westerly had completed a significant portion of the approved SSES Project Plan. A letter from the Town sent on June 16, 2020 updated DEM on the work planned to address infiltration. This letter included an attached Sewer Lateral Connection Investigation memo from Weston & Sampson. The memo described the results of television inspection of the sewer system, which was conducted in 2015 and 2018-2019. The memo concluded that there were a significant number of laterals with unidentified flow and recommended that the Town move forward with a sewer building survey project. Moreover, a letter dated August 18, 2020 from the Westerly Department of Public Works confirmed that despite the efforts to reduce infiltration, there has been "no appreciable reduction to the flows in the system." Accordingly, the permit requires the Town to submit a Scope of Work for identifying the causes of private inflow into the sewer system, subject to DEM approval. The permit also requires the Town to evaluate if the remaining items as part of the approved SSES Project Plan are an effective way to reduce flows into the sewer system.

The permit also requires that the Town submit a summary report of all actions taken to minimize infiltration/inflow during the previous six (6) months to DEM by the 15th day of January and July of each year.

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 per Part I.D.4 of the permit was appropriate.

Winter Nitrogen Removal BMP Plan

The permit incorporates a BMP Plan requirement for the optimization of Total Nitrogen removal from the discharge during the winter months (November – April) without the use of carbon addition. EPA Regulations at 40 CFR § 122.44(k) state that permitting authorities may require BMPs when they are "reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the Clean Water Act." 33 U.S.C. § 1251 states that the goal of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." As discussed in the Nutrients section, the discharge of excess Total Nitrogen into estuarine environments contributes to cultural eutrophication. In the case of the Tidal Pawcatuck River and Little Narragansett Bay, this can limit the growth of seagrasses, hurting the biological integrity of the waterbody. The surveyed literature confirmed the empirical relationship between annual nitrogen loadings and the extent of seagrass cover in estuaries, with seagrasses being less prevalent at higher loading rates. The literature also noted that the extent of seagrass cover was related to the assimilative capacity and size of fringing wetlands. Therefore, DEM has determined that it is necessary to remove Total Nitrogen to the maximum extent practicable during the winter months in order to protect fringing wetlands and minimize the accumulation of nitrogen in sediment. Minimizing the discharge of nitrogen during the winter months will reduce the annual nitrogen loading rate, serving to protect the biological integrity of the waterway per the goal of the CWA. Therefore, the BMP Plan requirement is established in the permit per 40 CFR § 122.44(k).

Sludge Requirements

The permit contains requirements for the permittee to comply with the State's Sludge Regulations 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.

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:

Section 303(d)(4)

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 historic discharge data (whichever is greater), background data (when available), and any new information (i.e., 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 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

[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.

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, all monthly average limitations are either the same as or more stringent than the limits in the 2013 permit. Therefore, the limits contained in this permit are consistent with the Department's anti-degradation policy.

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

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.

[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 historic discharge level. The historic 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.

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:

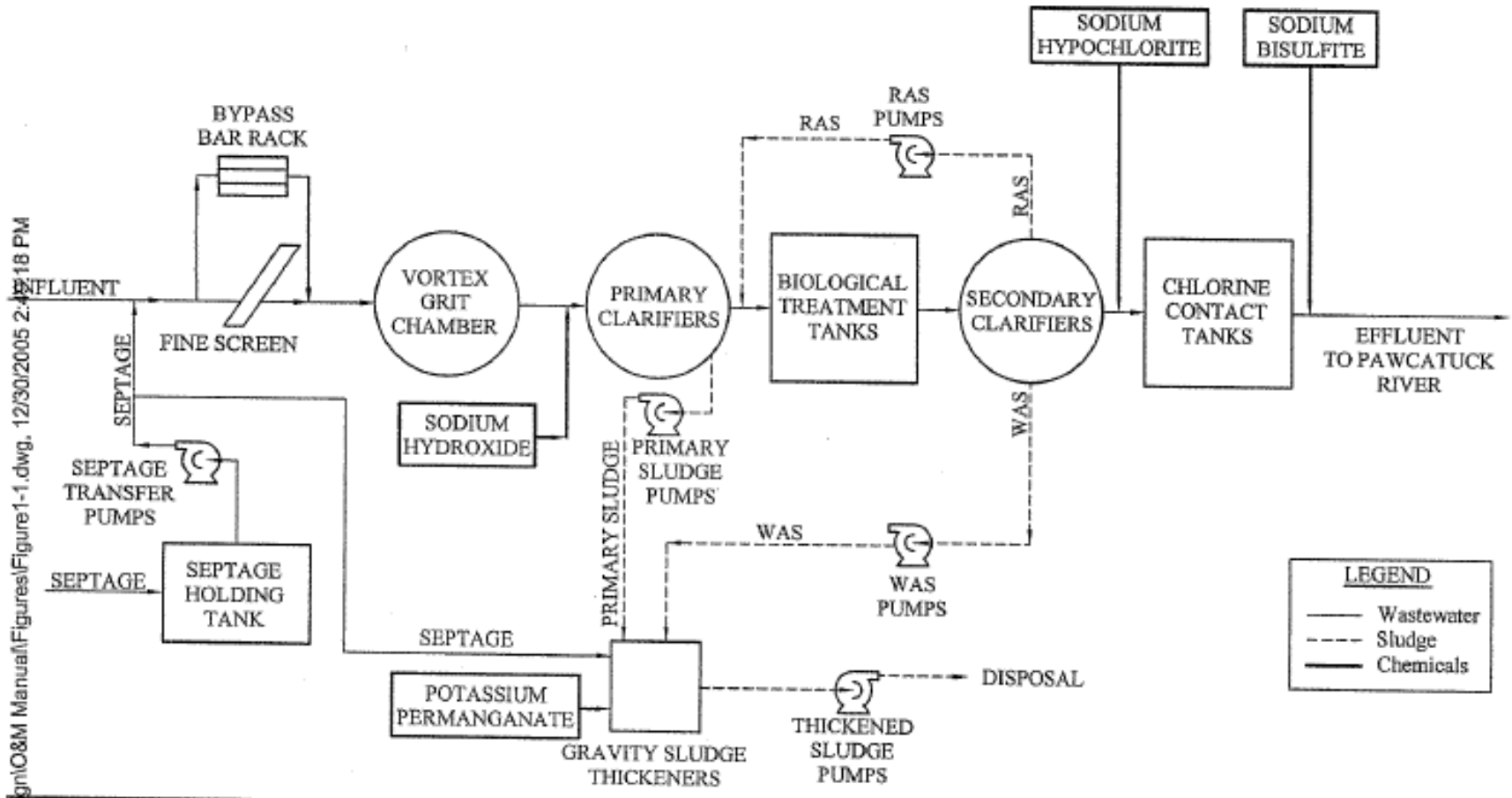
Max Maher, Environmental Engineer I
Department of Environmental Management/ Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-4700, ext: 77201
Email: Maximilian.Maher@dem.ri.gov

8/4/2021
Date

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

ATTACHMENT A

Westerly WWTF Process Flow Diagram



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WESTERLY WASTEWATER TREATMENT FACILITY

BASIC WASTEWATER FLOW DIAGRAM

FIGURE 1-1 BASIC FLOW DIAGRAM

ATTACHMENT B

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

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE:

PARAMETER	MONTHLY AVERAGE[1]	DAILY MAXIMUM[2]
FLOW (MGD)	2.28	2.29
BOD_5 (mg/l)		
May – October	9.23	16.05
November - April	8.77	15.02
BOD_5 (lb/day)		
May – October	155.32	270.89
November - April	194.98	362.19
TSS (mg/l)		
May – October	7.69	15.17
November - April	8.62	18.60
TSS (lb/day)		
May – October	129.28	254.32
November - April	192.78	430.41
Settleable Solids (mL/L)	0.04	0.04
Fecal Coliform (MPN/100ml)	2.11	28.01
pH (s.u.)	6.60 (Minimum)	7.04 (Maximum)
Chlorine Residual (ug/l)	37.41	40.43
Copper (ug/l)	9.18	13.79
Cyanide (ug/l)	3.70	5.81
Ammonia (Total as N) (mg/l)		
May – October	2.08	5.16
November - April	8.57	10.78
Nitrite (Total as N) (mg/l)	1.90	3.10
Nitrate (Total as N) (mg/l)	2.52	3.69
TKN (mg/l)	7.41	10.59
Total Nitrogen (mg/l)		
May – October	9.41	14.1
November - April	14.38	16.99
Total Nitrogen (lb/day)		
May – October	158.92	--
November - April	311.45	--
Oil and Grease (mg/l)	--	2.29

[1] Data represents the mean of the monthly average data from September 1, 2013 – October 31, 2020
[2] Data represents the mean of the daily maximum data from September 1, 2013 – October 31, 2020

Biotoxicity Data LC_{50} and NOEL Values (in percent effluent)

Mysidopsis bahia (LC50)	**2018 1st qtr.**	**2rd qtr.**	**3th qtr.**	**4st qtr.**	**2019 1nd qtr.**	**2rd qtr.**	**3th qtr.**	**4st qtr.**
	>100	>100	>100	>100	>100	>100	>100	>100
Arabacia punctulate (NOEL)	**2018 1nd qtr.**	**2rd qtr.**	**3th qtr.**	**4st qtr.**	**2019 1nd qtr.**	**2rd qtr.**	**3th qtr.**	**4st qtr.**
	50	25	50	50	50	100	50	50

ATTACHMENT C

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

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY SPECIFIC DATA INPUT SHEET

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

FACILITY NAME: **Westerly WWTF 2018**

RIPDES PERMIT #: **RI0100064**

	DISSOLVED BACKGROUND DATA (ug/L)	ACUTE METAL TRANSLATOR	CHRONIC METAL TRANSLATOR
ALUMINUM	NA	NA	NA
ARSENIC	NA	1	1
CADMIUM	NA	0.994	0.994
CHROMIUM III	NA	NA	NA
CHROMIUM VI	NA	0.993	0.993
COPPER	NA	0.83	0.83
LEAD	NA	0.951	0.951
MERCURY	NA	0.85	NA
NICKEL	NA	0.99	0.99
SELENIUM	NA	0.998	0.998
SILVER	NA	0.85	0.85
ZINC	NA	0.946	0.946

USE NA WHEN NO DATA IS AVAILABLE

NOTE 1: BACKGROUND DATA BASED ON AVERAGE CONCENTRATIONS IN ATTACHMENT B.

NOTE 2: METAL TRANSLATORS FROM RI WATER QUALITY REGS.

DILUTION FACTORS		
	ACUTE =	5 x
	CHRONIC =	10 x
	HUMAN HEALTH =	10 x

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

TOTAL AMMONIA CRITERIA (ug/L)		
WINTER	ACUTE =	131000
	CHRONIC =	20000
SUMMER	ACUTE =	1750
	CHRONIC =	260

NOTE 1: LIMITS ARE FROM TABLE 3 IN THE RI WATER QUALITY REGS.
USING:
SALINITY = 10 g/Kg
WINTER (NOV-APRIL) pH=7.0 s.u.;
SUMMER (MAY-OCT) pH=8.3 s.u.
WINTER (NOV-APRIL) TEMP=10.0 C;
SUMMER (MAY-OCT) TEMP=30.0 C.

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: Westerly WWTF 2018 RIPDES PERMIT #: RI0100064

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

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
PRIORITY POLLUTANTS:							
TOXIC METALS AND CYANIDE							
ANTIMONY	7440360			No Criteria		640	5120
ARSENIC (limits are total recoverable)	7440382	NA	69	276	36	1.4	11.2
ASBESTOS	1332214			No Criteria			No Criteria
BERYLLIUM	7440417			No Criteria			No Criteria
CADMIUM (limits are total recoverable)	7440439	NA	40	160.9657948	8.8		70.8249497
CHROMIUM III (limits are total recoverable)	16065831	NA		No Criteria			No Criteria
CHROMIUM VI (limits are total recoverable)	18540299	NA	1100	4431.01712	50		402.8197382
COPPER (limits are total recoverable)	7440508	NA	4.8	23.13253012	3.1		29.87951807
CYANIDE	57125		1	4.00	1	140	8
LEAD (limits are total recoverable)	7439921	NA	210	883.2807571	8.1		68.13880126
MERCURY (limits are total recoverable)	7439976	NA	1.8	8.470588235	0.94	0.15	1.2
NICKEL (limits are total recoverable)	7440020	NA	74	298.989899	8.2	4600	66.26262626
SELENIUM (limits are total recoverable)	7782492	NA	290	1162.324649	71	4200	569.1382766
SILVER (limits are total recoverable)	7440224	NA	1.9	8.941176471			No Criteria
THALLIUM	7440280			No Criteria		0.47	3.76
ZINC (limits are total recoverable)	7440666	NA	90	380.5496829	81	26000	684.9894292
VOLATILE ORGANIC COMPOUNDS							
ACROLEIN	107028			No Criteria		290	2320
ACRYLONITRILE	107131			No Criteria		2.5	20
BENZENE	71432			No Criteria		510	4080
BROMOFORM	75252			No Criteria		1400	11200
CARBON TETRACHLORIDE	56235			No Criteria		16	128
CHLOROBENZENE	108907			No Criteria		1600	12800
CHLORODIBROMOMETHANE	124481			No Criteria		130	1040
CHLOROFORM	67663			No Criteria		4700	37600
DICHLOROBROMOMETHANE	75274			No Criteria		170	1360
1,2DICHLOROETHANE	107062			No Criteria		370	2960
1,1DICHLOROETHYLENE	75354			No Criteria		7100	56800
1,2DICHLOROPROPANE	78875			No Criteria		150	1200
1,3DICHLOROPROPYLENE	542756			No Criteria		21	168
ETHYLBENZENE	100414			No Criteria		2100	16800
BROMOMETHANE (methyl bromide)	74839			No Criteria		1500	12000
CHLOROMETHANE (methyl chloride)	74873			No Criteria			No Criteria
METHYLENE CHLORIDE	75092			No Criteria		5900	47200

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: Westerly WWTF 2018 RIPDES PERMIT #: RI0100064

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

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,1,2,2TETRACHLOROETHANE	79345			No Criteria		40	320
TETRACHLOROETHYLENE	127184			No Criteria		33	264
TOLUENE	108883			No Criteria		15000	120000
1,2TRANSDICHLOROETHYLENE	156605			No Criteria		10000	80000
1,1,1TRICHLOROETHANE	71556			No Criteria			No Criteria
1,1,2TRICHLOROETHANE	79005			No Criteria		160	1280
TRICHLOROETHYLENE	79016			No Criteria		300	2400
VINYL CHLORIDE	75014			No Criteria		2.4	19.2
ACID ORGANIC COMPOUNDS							
2CHLOROPHENOL	95578			No Criteria		150	1200
2,4DICHLOROPHENOL	120832			No Criteria		290	2320
2,4DIMETHYLPHENOL	105679			No Criteria		850	6800
4,6DINITRO2METHYL PHENOL	534521			No Criteria		280	2240
2,4DINITROPHENOL	51285			No Criteria		5300	42400
4NITROPHENOL	88755			No Criteria			No Criteria
PENTACHLOROPHENOL	87865		13	52	7.9	30	63.2
PHENOL	108952			No Criteria		1700000	13600000
2,4,6TRICHLOROPHENOL	88062			No Criteria		24	192
BASE NEUTRAL COMPUNDS							
ACENAPHTHENE	83329			No Criteria		990	7920
ANTHRACENE	120127			No Criteria		40000	320000
BENZIDINE	92875			No Criteria		0.002	0.016
POLYCYCLIC AROMATIC HYDROCARBONS				No Criteria		0.18	1.44
BIS(2CHLOROETHYL)ETHER	111444			No Criteria		5.3	42.4
BIS(2CHLOROISOPROPYL)ETHER	108601			No Criteria		65000	520000
BIS(2ETHYLHEXYL)PHTHALATE	117817			No Criteria		22	176
BUTYL BENZYL PHTHALATE	85687			No Criteria		1900	15200
2CHLORONAPHTHALENE	91587			No Criteria		1600	12800
1,2DICHLOROBENZENE	95501			No Criteria		1300	10400
1,3DICHLOROBENZENE	541731			No Criteria		960	7680
1,4DICHLOROBENZENE	106467			No Criteria		190	1520
3,3DICHLOROBENZIDENE	91941			No Criteria		0.28	2.24
DIETHYL PHTHALATE	84662			No Criteria		44000	352000
DIMETHYL PHTHALATE	131113			No Criteria		1100000	8800000
DInBUTYL PHTHALATE	84742			No Criteria		4500	36000
2,4DINITROTOLUENE	121142			No Criteria		34	272

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: Westerly WWTF 2018 RIPDES PERMIT #: RI0100064

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

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,2DIPHENYLHYDRAZINE	122667			No Criteria		2	16
FLUORANTHENE	206440			No Criteria		140	1120
FLUORENE	86737			No Criteria		5300	42400
HEXACHLOROBENZENE	118741			No Criteria		0.0029	0.0232
HEXACHLOROBUTADIENE	87683			No Criteria		180	1440
HEXACHLOROCYCLOPENTADIENE	77474			No Criteria		1100	8800
HEXACHLOROETHANE	67721			No Criteria		33	264
ISOPHORONE	78591			No Criteria		9600	76800
NAPHTHALENE	91203			No Criteria			No Criteria
NITROBENZENE	98953			No Criteria		690	5520
NNITROSODIMETHYLAMINE	62759			No Criteria		30	240
NNITROSODINPROPYLAMINE	621647			No Criteria		5.1	40.8
NNITROSODIPHENYLAMINE	86306			No Criteria		60	480
PYRENE	129000			No Criteria		4000	32000
1,2,4trichlorobenzene	120821			No Criteria		70	560
PESTICIDES/PCBs							
ALDRIN	309002		1.3	5.2		0.0005	0.004
Alpha BHC	319846			No Criteria		0.049	0.392
Beta BHC	319857			No Criteria		0.17	1.36
Gamma BHC (Lindane)	58899		0.16	0.64		1.8	14.4
CHLORDANE	57749		0.09	0.36	0.004	0.0081	0.032
4,4DDT	50293		0.13	0.52	0.001	0.0022	0.008
4,4DDE	72559			No Criteria		0.0022	0.0176
4,4DDD	72548			No Criteria		0.0031	0.0248
DIELDRIN	60571		0.71	2.84	0.0019	0.00054	0.00432
ENDOSULFAN (alpha)	959988		0.034	0.136	0.0087	89	0.0696
ENDOSULFAN (beta)	33213659		0.034	0.136	0.0087	89	0.0696
ENDOSULFAN (sulfate)	1031078			No Criteria		89	712
ENDRIN	72208		0.037	0.148	0.0023	0.06	0.0184
ENDRIN ALDEHYDE	7421934			No Criteria		0.3	2.4
HEPTACHLOR	76448		0.053	0.212	0.0036	0.00079	0.00632
HEPTACHLOR EPOXIDE	1024573		0.053	0.212	0.0036	0.00039	0.00312
POLYCHLORINATED BIPHENYLS3	1336363			No Criteria	0.03	0.00064	0.00512
2,3,7,8TCDD (Dioxin)	1746016			No Criteria		0.000000051	0.000000408
TOXAPHENE	8001352		0.21	0.84	0.0002	0.0028	0.0016
TRIBUTYLTIN			0.42	1.68	0.0074		0.0592

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: Westerly WWTF 2018 RIPDES PERMIT #: RI0100064

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

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
ALUMINUM (limits are total recoverable)	7429905	NA		No Criteria			No Criteria
AMMONIA as N (winter/summer)	7664417		1E+05 | 1438.5	430728 5754	16440 | 213.7		131520 | 1709.76
4BROMOPHENYL PHENYL ETHER				No Criteria			No Criteria
CHLORIDE	16887006			No Criteria			No Criteria
CHLORINE	7782505		13	65	7.5		75
4CHLORO2METHYLPHENOL				No Criteria			No Criteria
1CHLORONAPHTHALENE				No Criteria			No Criteria
4CHLOROPHENOL	106489			No Criteria			No Criteria
2,4DICHLORO6METHYLPHENOL				No Criteria			No Criteria
1,1DICHLOROPROPANE				No Criteria			No Criteria
1,3DICHLOROPROPANE	142289			No Criteria			No Criteria
2,3DINITROTOLUENE				No Criteria			No Criteria
2,4DINITRO6METHYL PHENOL				No Criteria			No Criteria
IRON	7439896			No Criteria			No Criteria
pentachlorobenzene	608935			No Criteria			No Criteria
PENTACHLOROETHANE				No Criteria			No Criteria
1,2,3,5tetrachlorobenzene				No Criteria			No Criteria
1,1,1,2TETRACHLOROETHANE	630206			No Criteria			No Criteria
2,3,4,6TETRACHLOROPHENOL	58902			No Criteria			No Criteria
2,3,5,6TETRACHLOROPHENOL				No Criteria			No Criteria
2,4,5TRICHLOROPHENOL	95954			No Criteria			No Criteria
2,4,6TRINITROPHENOL	88062			No Criteria			No Criteria
XYLENE	1330207			No Criteria			No Criteria

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: Westerly WWTF 2018 RIPDES PERMIT #: RI0100064

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
PRIORITY POLLUTANTS:			
TOXIC METALS AND CYANIDE			
ANTIMONY	7440360	No Criteria	5120.00
ARSENIC, TOTAL	7440382	276.00	11.20
ASBESTOS	1332214	No Criteria	No Criteria
BERYLLIUM	7440417	No Criteria	No Criteria
CADMIUM, TOTAL	7440439	160.97	70.82
CHROMIUM III, TOTAL	16065831	No Criteria	No Criteria
CHROMIUM VI, TOTAL	18540299	4431.02	402.82
COPPER, TOTAL	7440508	23.13	23.13
CYANIDE	57125	4.00	4.00
LEAD, TOTAL	7439921	883.28	68.14
MERCURY, TOTAL	7439976	8.47	1.20
NICKEL, TOTAL	7440020	298.99	66.26
SELENIUM, TOTAL	7782492	1162.32	569.14
SILVER, TOTAL	7440224	8.94	8.94
THALLIUM	7440280	No Criteria	3.76
ZINC, TOTAL	7440666	380.55	380.55
VOLATILE ORGANIC COMPOUNDS			
ACROLEIN	107028	No Criteria	2320.00
ACRYLONITRILE	107131	No Criteria	20.00
BENZENE	71432	No Criteria	4080.00
BROMOFORM	75252	No Criteria	11200.00
CARBON TETRACHLORIDE	56235	No Criteria	128.00
CHLOROBENZENE	108907	No Criteria	12800.00
CHLORODIBROMOMETHANE	124481	No Criteria	1040.00
CHLOROFORM	67663	No Criteria	37600.00
DICHLOROBROMOMETHANE	75274	No Criteria	1360.00
1,2DICHLOROETHANE	107062	No Criteria	2960.00
1,1DICHLOROETHYLENE	75354	No Criteria	56800.00
1,2DICHLOROPROPANE	78875	No Criteria	1200.00
1,3DICHLOROPROPYLENE	542756	No Criteria	168.00
ETHYLBENZENE	100414	No Criteria	16800.00
BROMOMETHANE (methyl bromide)	74839	No Criteria	12000.00
CHLOROMETHANE (methyl chloride)	74873	No Criteria	No Criteria
METHYLENE CHLORIDE	75092	No Criteria	47200.00
1,1,2,2TETRACHLOROETHANE	79345	No Criteria	320.00
TETRACHLOROETHYLENE	127184	No Criteria	264.00
TOLUENE	108883	No Criteria	120000.00
1,2TRANSDICHLOROETHYLENE	156605	No Criteria	80000.00
1,1,1TRICHLOROETHANE	71556	No Criteria	No Criteria
1,1,2TRICHLOROETHANE	79005	No Criteria	1280.00
TRICHLOROETHYLENE	79016	No Criteria	2400.00
VINYL CHLORIDE	75014	No Criteria	19.20
ACID ORGANIC COMPOUNDS			
2CHLOROPHENOL	95578	No Criteria	1200.00
2,4DICHLOROPHENOL	120832	No Criteria	2320.00
2,4DIMETHYLPHENOL	105679	No Criteria	6800.00
4,6DINITRO2METHYL PHENOL	534521	No Criteria	2240.00
2,4DINITROPHENOL	51285	No Criteria	42400.00
4NITROPHENOL	88755	No Criteria	No Criteria
PENTACHLOROPHENOL	87865	52.00	52.00
PHENOL	108952	No Criteria	13600000.00
2,4,6TRICHLOROPHENOL	88062	No Criteria	192.00
BASE NEUTRAL COMPUNDS			
ACENAPHTHENE	83329	No Criteria	7920.00
ANTHRACENE	120127	No Criteria	320000.00
BENZIDINE	92875	No Criteria	0.02
PAHs		No Criteria	1.44
BIS(2CHLOROETHYL)ETHER	111444	No Criteria	42.40
BIS(2CHLOROISOPROPYL)ETHER	108601	No Criteria	520000.00
BIS(2ETHYLHEXYL)PHTHALATE	117817	No Criteria	176.00
BUTYL BENZYL PHTHALATE	85687	No Criteria	15200.00
2CHLORONAPHTHALENE	91587	No Criteria	12800.00
1,2DICHLOROBENZENE	95501	No Criteria	10400.00
1,3DICHLOROBENZENE	541731	No Criteria	7680.00
1,4DICHLOROBENZENE	106467	No Criteria	1520.00
3,3DICHLOROBENZIDENE	91941	No Criteria	2.24
DIETHYL PHTHALATE	84662	No Criteria	352000.00
DIMETHYL PHTHALATE	131113	No Criteria	8800000.00
DI-n-BUTYL PHTHALATE	84742	No Criteria	36000.00
2,4DINITROTOLUENE	121142	No Criteria	272.00
1,2DIPHENYLHYDRAZINE	122667	No Criteria	16.00
FLUORANTHENE	206440	No Criteria	1120.00

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: Westerly WWTF 2018 RIPDES PERMIT #: RI0100064

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
FLUORENE	86737	No Criteria	42400.00
HEXACHLOROBENZENE	118741	No Criteria	0.02
HEXACHLOROBUTADIENE	87683	No Criteria	1440.00
HEXACHLOROCYCLOPENTADIENE	77474	No Criteria	8800.00
HEXACHLOROETHANE	67721	No Criteria	264.00
ISOPHORONE	78591	No Criteria	76800.00
NAPHTHALENE	91203	No Criteria	No Criteria
NITROBENZENE	98953	No Criteria	5520.00
N-NITROSODIMETHYLAMINE	62759	No Criteria	240.00
N-NITROSODI-N-PROPYLAMINE	621647	No Criteria	40.80
N-NITROSODIPHENYLAMINE	86306	No Criteria	480.00
PYRENE	129000	No Criteria	32000.00
1,2,4trichlorobenzene	120821	No Criteria	560.00
PESTICIDES/PCBs			
ALDRIN	309002	5.20	0.00
Alpha BHC	319846	No Criteria	0.39
Beta BHC	319857	No Criteria	1.36
Gamma BHC (Lindane)	58899	0.64	0.64
CHLORDANE	57749	0.36	0.03
4,4DDT	50293	0.52	0.01
4,4DDE	72559	No Criteria	0.02
4,4DDD	72548	No Criteria	0.02
DIELDRIN	60571	2.84	0.00
ENDOSULFAN (alpha)	959988	0.14	0.07
ENDOSULFAN (beta)	33213659	0.14	0.07
ENDOSULFAN (sulfate)	1031078	No Criteria	712.00
ENDRIN	72208	0.15	0.02
ENDRIN ALDEHYDE	7421934	No Criteria	2.40
HEPTACHLOR	76448	0.21	0.01
HEPTACHLOR EPOXIDE	1024573	0.21	0.00
POLYCHLORINATED BIPHENYLS3	1336363	No Criteria	0.01
2,3,7,8TCDD (Dioxin)	1746016	No Criteria	0.00
TOXAPHENE	8001352	0.84	0.00
TRIBUTYLTIN		1.68	0.06

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
NON PRIORITY POLLUTANTS:			
OTHER SUBSTANCES			
ALUMINUM, TOTAL	7429905	No Criteria	No Criteria
AMMONIA (as N), WINTER (NOV-APR	7664417	430728.00	131520.00
AMMONIA (as N), SUMMER (MAY-OC	7664417	5754.00	1709.76
4BROMOPHENYL PHENYL ETHER		No Criteria	No Criteria
CHLORIDE	16887006	No Criteria	No Criteria
CHLORINE	7782505	65.00	65.00
4CHLORO2METHYLPHENOL		No Criteria	No Criteria
1CHLORONAPHTHALENE		No Criteria	No Criteria
4CHLOROPHENOL	106489	No Criteria	No Criteria
2,4DICHLORO6METHYLPHENOL		No Criteria	No Criteria
1,1DICHLOROPROPANE		No Criteria	No Criteria
1,3DICHLOROPROPANE	142289	No Criteria	No Criteria
2,3DINITROTOLUENE		No Criteria	No Criteria
2,4DINITRO6METHYL PHENOL		No Criteria	No Criteria
IRON	7439896	No Criteria	No Criteria
pentachlorobenzene	608935	No Criteria	No Criteria
PENTACHLOROETHANE		No Criteria	No Criteria
1,2,3,5tetrachlorobenzene		No Criteria	No Criteria
1,1,1,2TETRACHLOROETHANE	630206	No Criteria	No Criteria
2,3,4,6TETRACHLOROPHENOL	58902	No Criteria	No Criteria
2,3,5,6TETRACHLOROPHENOL		No Criteria	No Criteria
2,4,5TRICHLOROPHENOL	95954	No Criteria	No Criteria
2,4,6TRINITROPHENOL	88062	No Criteria	No Criteria
XYLENE	1330207	No Criteria	No Criteria

ATTACHMENT D

Westerly WWTF Priority Pollutant Scan Data 2013-2020

Westerly WWTF - 2013 to 2020 Priority Pollutant Scan Results				
Parameter	Date	Concentration (µg/L)	Max	Average
Arsenic	5-Aug-20	0.6	18	6.333333
Arsenic	24-Jul-19	0.4		
Arsenic	5-Sep-17	18		
Barium	21-Jul-14	61	61	36.5
Barium	24-Sep-13	12		
Chromium	5-Aug-20	6.6	55	17.01429
Chromium	24-Jul-19	7.5		
Chromium	25-Jul-18	10		
Chromium	5-Sep-17	4		
Chromium	19-Jul-16	26		
Chromium	21-Jul-14	55		
Chromium	24-Sep-13	10		
Copper	5-Aug-20	3	61	16.68333
Copper	24-Jul-19	3		
Copper	25-Jul-18	9		
Copper	20-Sep-17	4.1		
Copper	19-Jul-16	20		
Copper	21-Jul-14	61		
Nickel	5-Aug-20	3	4.6	2.92
Nickel	24-Jul-19	2		
Nickel	25-Jul-18	2		
Nickel	5-Sep-17	3		
Nickel	19-Jul-16	4.6		
Lead	5-Aug-20	0.2	0.3	0.25
Lead	24-Jul-19	0.3		
Antimony	5-Aug-20	12.4	20	10.875
Antimony	24-Jul-19	2.1		
Antimony	25-Jul-18	9		
Antimony	5-Sep-17	20		
Zinc	5-Aug-20	42	156	62.42857
Zinc	24-Jul-19	26		
Zinc	25-Jul-18	43		
Zinc	5-Sep-17	32		
Zinc	19-Jul-16	64		
Zinc	21-Jul-14	156		
Zinc	24-Sep-13	74		
Bromodichloromethane	5-Aug-20	17	17	6.625
Bromodichloromethane	24-Jul-19	2		
Bromodichloromethane	25-Jul-18	11		
Bromodichloromethane	31-Aug-17	4		
Bromodichloromethane	19-Jul-16	4		
Bromodichloromethane	7-Jul-15	2		
Bromodichloromethane	21-Jul-14	6		
Bromodichloromethane	24-Sep-13	7		

Bromoform	5-Aug-20	2	2	2
Chloroform	5-Aug-20	16	37	18.57143
Chloroform	24-Jul-19	8		
Chloroform	25-Jul-18	11		
Chloroform	19-Jul-16	14		
Chloroform	7-Jul-15	19		
Chloroform	21-Jul-14	37		
Chloroform	24-Sep-13	25		
Dibromochloromethane	5-Aug-20	9	9	3.833333
Dibromochloromethane	25-Jul-18	6		
Dibromochloromethane	31-Aug-17	2		
Dibromochloromethane	19-Jul-16	2		
Dibromochloromethane	21-Jul-14	1		
Dibromochloromethane	24-Sep-13	3		
Toluene	5-Aug-20	1	1	1
Aluminum	24-Jul-19	15	18	16.5
Aluminum	19-Jul-16	18		
Bis(2-ethylhexyl)phthalate	24-Jul-19	7	11	9
Bis(2-ethylhexyl)phthalate	25-Jul-18	11		
TOC	19-Jul-16	1000	1000	1000
Hexavalent Chromium	29-Aug-17	10	10	10
2,4,6-Trichlorophenol	5-Sep-17	1	1	1
Anthracene	5-Sep-17	1	1	1
Benzo(g,h,i)perylene	5-Sep-17	2	2	2

ATTACHMENT E

Comparison of Allowable Limits with Discharge Monitoring Report Data and Priority Pollutant Scan Data

Facility Name: *Westerly WWTF*
RIPDES Permit #: *RI0100064*
Outfall #: *001A*

NOTE: METALS LIMITS ARE TOTAL METALS

Parameter	CAS #	Concentration Limits (ug/L) Based on WQ Criteria		Antideg. Limits (ug/L)	Ave UFP Data (ug/L) 9/13 - 11/20		Ave. DMR Data (ug/L) 9/13-11/20		Potential Permit Limits (ug/L)	
		Daily Max	Monthly Ave	Monthly Ave	Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
PRIORITY POLLUTANTS										
TOXIC METALS AND CYANIDE										
ANTIMONY	7440360	No Criteria	5120.00		20	10.875			---	5120
ARSENIC (limits are total recoverable)	7440382	276.00	11.20		18	6.33			276	11.2
ASBESTOS	1332214	No Criteria	No Criteria						---	---
BERYLLIUM	7440417	No Criteria	No Criteria						---	---
CADMIUM (limits are total recoverable)	7440439	160.97	70.82				0.45	0.45	160.9657948	70.8249497
CHROMIUM III (limits are total recoverable)	16065831	No Criteria	No Criteria						---	---
CHROMIUM VI (limits are total recoverable)	18540299	4431.02	402.82		55	17.01	10.43	10.54	4431.01712	402.8197382
COPPER (limits are total recoverable)	7440508	23.13	23.13	23			13.79	9.18	23.13253012	23
CYANIDE	57125	4.00	4.00	4			5.81	3.70	4	4
LEAD (limits are total recoverable)	7439921	883.28	68.14		0.3	0.25	0.88	0.88	883.2807571	68.13880126
MERCURY (limits are total recoverable)	7439976	8.47	1.20						8.470588235	1.2
NICKEL (limits are total recoverable)	7440020	298.99	66.26		4.6	2.92	3.15	3.15	298.989899	66.26262626
SELENIUM (limits are total recoverable)	7782492	1162.32	569.14						1162.324649	569.1382766
SILVER (limits are total recoverable)	7440224	8.94	8.94						8.941176471	8.941176471
THALLIUM	7440280	No Criteria	3.76						---	3.76
ZINC (limits are total recoverable)	7440666	380.55	380.55		156	62.43	39.82	39.82	380.5496829	380.5496829
VOLATILE ORGANIC COMPOUNDS										
ACROLEIN	107028	No Criteria	2320.00	---			---	---	---	2320
ACRYLONITRILE	107131	No Criteria	20.00	---			---	---	---	20
BENZENE	71432	No Criteria	4080.00	---			---	---	---	4080
BROMOFORM	75252	No Criteria	11200.00	---	2	2	---	---	---	11200
CARBON TETRACHLORIDE	56235	No Criteria	128.00	---			---	---	---	128
CHLOROBENZENE	108907	No Criteria	12800.00	---			---	---	---	12800
CHLORODIBROMOMETHANE	124481	No Criteria	1040.00	---	9	3.83	---	---	---	1040
CHLOROFORM	67663	No Criteria	37600.00	---	37	18.57	---	---	---	37600
DICHLOROBROMOMETHANE	75274	No Criteria	1360.00	---	17	6.63	---	---	---	1360
1,2DICHLOROETHANE	107062	No Criteria	2960.00	---			---	---	---	2960
1,1DICHLOROETHYLENE	75354	No Criteria	56800.00	---			---	---	---	56800
1,2DICHLOROPROPANE	78875	No Criteria	1200.00	---			---	---	---	1200
1,3DICHLOROPROPYLENE	542756	No Criteria	168.00	---			---	---	---	168
ETHYLBENZENE	100414	No Criteria	16800.00	---			---	---	---	16800
BROMOMETHANE (methyl bromide)	74839	No Criteria	12000.00	---			---	---	---	12000

Facility Name: *Westerly WWTF*
RIPDES Permit #: *RI0100064*
Outfall #: *001A*

NOTE: METALS LIMITS ARE TOTAL METALS

Parameter	CAS #	Concentration Limits (ug/L) Based on WQ Criteria		Antideg. Limits (ug/L)	Ave UFP Data (ug/L) 9/13 - 11/20		Ave. DMR Data (ug/L) 9/13-11/20		Potential Permit Limits (ug/L)	
		Daily Max	Monthly Ave	Monthly Ave	Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
CHLOROMETHANE (methyl chloride)	74873	No Criteria	No Criteria	---					---	---
METHYLENE CHLORIDE	75092	No Criteria	47200.00	---					---	47200
1,1,2,2TETRACHLOROETHANE	79345	No Criteria	320.00	---					---	320
TETRACHLOROETHYLENE	127184	No Criteria	264.00	---					---	264
TOLUENE	108883	No Criteria	120000.00	---					---	120000
1,2TRANSDICHLOROETHYLENE	156605	No Criteria	80000.00	---					---	80000
1,1,1TRICHLOROETHANE	71556	No Criteria	No Criteria	---					---	---
1,1,2TRICHLOROETHANE	79005	No Criteria	1280.00	---					---	1280
TRICHLOROETHYLENE	79016	No Criteria	2400.00	---					---	2400
VINYL CHLORIDE	75014	No Criteria	19.20	---					---	19.2
ACID ORGANIC COMPOUNDS										
2CHLOROPHENOL	95578	No Criteria	1200.00	---	---	---	---	---	---	1200
2,4DICHLOROPHENOL	120832	No Criteria	2320.00	---	---	---	---	---	---	2320
2,4DIMETHYLPHENOL	105679	No Criteria	6800.00	---	---	---	---	---	---	6800
4,6DINITRO2METHYL PHENOL	534521	No Criteria	2240.00	---	---	---	---	---	---	2240
2,4DINITROPHENOL	51285	No Criteria	42400.00	---	---	---	---	---	---	42400
4NITROPHENOL	88755	No Criteria	No Criteria	---	---	---	---	---	---	---
PENTACHLOROPHENOL	87865	52.00	52.00	---	---	---	---	---	52	52
PHENOL	108952	No Criteria	13600000.00	---	---	---	---	---	---	13600000
2,4,6TRICHLOROPHENOL	88062	No Criteria	192.00	---	---	---	---	---	---	192
BASE NEUTRAL COMPOUNDS										
ACENAPHTHENE	83329	No Criteria	7920.00	---					---	7920
ANTHRACENE	120127	No Criteria	320000.00	---					---	320000
BENZIDINE	92875	No Criteria	0.02	---					---	0.016
POLYCYCLIC AROMATIC HYDROCARBONS		No Criteria	1.44	---					---	1.44
BIS(2CHLOROETHYL)ETHER	111444	No Criteria	42.40	---					---	42.4
BIS(2CHLOROISOPROPYL)ETHER	108601	No Criteria	520000.00	---					---	520000
BIS(2ETHYLHEXYL)PHTHALATE	117817	No Criteria	176.00	---					---	176
BUTYL BENZYL PHTHALATE	85687	No Criteria	15200.00	---					---	15200
2CHLORONAPHTHALENE	91587	No Criteria	12800.00	---					---	12800
1,2DICHLOROBENZENE	95501	No Criteria	10400.00	---					---	10400
1,3DICHLOROBENZENE	541731	No Criteria	7680.00	---					---	7680
1,4DICHLOROBENZENE	106467	No Criteria	1520.00	---					---	1520
3,3DICHLOROBENZIDENE	91941	No Criteria	2.24	---					---	2.24

Facility Name: *Westerly WWTF*
RIPDES Permit #: *RI0100064*
Outfall #: *001A*

NOTE: METALS LIMITS ARE TOTAL METALS

Parameter	CAS #	Concentration Limits (ug/L) Based on WQ Criteria		Antideg. Limits (ug/L)	Ave UFP Data (ug/L) 9/13 - 11/20		Ave. DMR Data (ug/L) 9/13-11/20		Potential Permit Limits (ug/L)	
		Daily Max	Monthly Ave	Monthly Ave	Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
DIETHYL PHTHALATE	84662	No Criteria	352000.00	---			---	---	---	352000
DIMETHYL PHTHALATE	131113	No Criteria	8800000.00	---			---	---	---	8800000
DInBUTYL PHTHALATE	84742	No Criteria	36000.00	---			---	---	---	36000
2,4DINITROTOLUENE	121142	No Criteria	272.00	---			---	---	---	272
1,2DIPHENYLHYDRAZINE	122667	No Criteria	16.00	---			---	---	---	16
FLUORANTHENE	206440	No Criteria	1120.00	---			---	---	---	1120
FLUORENE	86737	No Criteria	42400.00	---			---	---	---	42400
HEXACHLOROBENZENE	118741	No Criteria	0.02	---			---	---	---	0.0232
HEXACHLOROBUTADIENE	87683	No Criteria	1440.00	---			---	---	---	1440
HEXACHLOROCYCLOPENTADIENE	77474	No Criteria	8800.00	---			---	---	---	8800
HEXACHLOROETHANE	67721	No Criteria	264.00	---			---	---	---	264
ISOPHORONE	78591	No Criteria	76800.00	---			---	---	---	76800
NAPHTHALENE	91203	No Criteria	No Criteria	---			---	---	---	---
NITROBENZENE	98953	No Criteria	5520.00	---			---	---	---	5520
NNITROSODIMETHYLAMINE	62759	No Criteria	240.00	---			---	---	---	240
NNITROSODINPROPYLAMINE	621647	No Criteria	40.80	---			---	---	---	40.8
NNITROSODIPHENYLAMINE	86306	No Criteria	480.00	---			---	---	---	480
PYRENE	129000	No Criteria	32000.00	---			---	---	---	32000
1,2,4trichlorobenzene	120821	No Criteria	560.00	---			---	---	---	560
PESTICIDES/PCBs										
ALDRIN	309002	5.20	0.00	---			---	---	5.2	0.004
Alpha BHC	319846	No Criteria	0.39	---			---	---	---	0.392
Beta BHC	319857	No Criteria	1.36	---			---	---	---	1.36
Gamma BHC (Lindane)	58899	0.64	0.64	---			---	---	0.64	0.64
CHLORDANE	57749	0.36	0.03	---			---	---	0.36	0.032
4,4DDT	50293	0.52	0.01	---			---	---	0.52	0.008
4,4DDE	72559	No Criteria	0.02	---			---	---	---	0.0176
4,4DDD	72548	No Criteria	0.02	---			---	---	---	0.0248
DIELDRIN	60571	2.84	0.00	---			---	---	2.84	0.00432
ENDOSULFAN (alpha)	959988	0.14	0.07	---			---	---	0.136	0.0696
ENDOSULFAN (beta)	33213659	0.14	0.07	---			---	---	0.136	0.0696
ENDOSULFAN (sulfate)	1031078	No Criteria	712.00	---			---	---	---	712
ENDRIN	72208	0.15	0.02	---			---	---	0.148	0.0184
ENDRIN ALDEHYDE	7421934	No Criteria	2.40	---			---	---	---	2.4

Facility Name: *Westerly WWTF*
RIPDES Permit #: *RI0100064*
Outfall #: *001A*

NOTE: METALS LIMITS ARE TOTAL METALS

Parameter	CAS #	Concentration Limits (ug/L) Based on WQ Criteria		Antideg. Limits (ug/L)	Ave UFP Data (ug/L) 9/13 - 11/20		Ave. DMR Data (ug/L) 9/13-11/20		Potential Permit Limits (ug/L)	
		Daily Max	Monthly Ave	Monthly Ave	Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
HEPTACHLOR	76448	0.21	0.01	---	---	---	---	---	0.212	0.00632
HEPTACHLOR EPOXIDE	1024573	0.21	0.00	---	---	---	---	---	0.212	0.00312
POLYCHLORINATED BIPHENYLS3	1336363	No Criteria	0.01	---	---	---	---	---	---	0.00512
2,3,7,8TCDD (Dioxin)	1746016	No Criteria	0.00	---	---	---	---	---	---	0.000000408
TOXAPHENE	8001352	0.84	0.00	---	---	---	---	---	0.84	0.0016
TRIBUTYLTIN		1.68	0.06						1.68	0.0592
NON PRIORITY POLLUTANTS:										
OTHER SUBSTANCES										
ALUMINUM (limits are total recoverable)	7429905	No Criteria	No Criteria	---	---	---	24.36	24.36	---	---
AMMONIA (winter)	7664417	19728.00	5918.40	30900	---	---	10776.19	8579.05	19728	5918.4
AMMONIA (summer)		15124.80	4537.44	5500	---	---	5156.82	2081.59	15124.8	4537.44
4BROMOPHENYL PHENYL ETHER	16887006	No Criteria	No Criteria	---	---	---			---	---
CHLORIDE	7782505	No Criteria	No Criteria						---	---
CHLORINE		65.00	65.00	65	---	---	40.43	37.41	65	65
4CHLORO2METHYLPHENOL		No Criteria	No Criteria	---	---	---			---	---
1CHLORONAPHTHALENE	106489	No Criteria	No Criteria	---	---	---			---	---
4CHLOROPHENOL		No Criteria	No Criteria	---	---	---			---	---
2,4DICHLORO6METHYLPHENOL		No Criteria	No Criteria	---	---	---			---	---
1,1DICHLOROPROPANE	142289	No Criteria	No Criteria	---	---	---			---	---
1,3DICHLOROPROPANE		No Criteria	No Criteria	---	---	---			---	---
2,3DINITROTOLUENE		No Criteria	No Criteria	---	---	---			---	---
2,4DINITRO6METHYL PHENOL	7439896	No Criteria	No Criteria	---	---	---			---	---
IRON	608935	No Criteria	No Criteria						---	---
pentachlorobenzene		No Criteria	No Criteria	---	---	---			---	---
PENTACHLOROETHANE		No Criteria	No Criteria	---	---	---			---	---
1,2,3,5tetrachlorobenzene	630206	No Criteria	No Criteria	---	---	---			---	---
1,1,1,2TETRACHLOROETHANE	58902	No Criteria	No Criteria	---	---	---			---	---
2,3,4,6TETRACHLOROPHENOL		No Criteria	No Criteria	---	---	---			---	---
2,3,5,6TETRACHLOROPHENOL	95954	No Criteria	No Criteria	---	---	---			---	---
2,4,5TRICHLOROPHENOL	88062	No Criteria	No Criteria	---	---	---			---	---
2,4,6TRINITROPHENOL	1330207	No Criteria	No Criteria	---	---	---			---	---
XYLENE		No Criteria	No Criteria						---	---

ATTACHMENT F

Total Ammonia (November – April) Antidegradation Analysis

Facility : Westerly WWTF
Parameter : AMMONIA

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

Chronic Metals Translator	:	N/A	
Previous monthly average limit (Total)	:	30900	ug/L
Historical discharge concentration (Total)	:	10200	ug/L
/aterbody background concentration (Dissolved)	:	0	ug/L
Facility chronic dilution factor	:	10	x
Chronic criteria (Dissolved)	:	20000	ug/L
Remaining Assimilative Capacity to be Allocated	:	0	%

Note: 0% of the remaining assimilative capacity was allocated because Westerly has historically discharged ammonia at levels well below the permit limit.

Determine existing water quality:

$$Cp = \frac{(DF - 1)*Cb + 1*(Cd*MT)}{DF} = 3090 \text{ ug/L}$$

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

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

Calculation of the new chronic permit limit:

Crac = Ccriteria - Cp = 16910 ug/L

Proposed Limit = (Cp + %*Crac)*DF - (DF-1)*Cb = 30900 ug/L Dissolved

Proposed Limit = (Proposed Dissolved Limit/MT) = 30900 ug/L Total

Traditional Limit = XXX ug/L

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

Chronic limit = 30900 ug/L

Calculation of the new acute permit limit:

Acute Limit = XXX ug/L

Final Limits:

MONTHLY AVERAGE PERMIT LIMIT : 30900 ug/L

ATTACHMENT G

INDUSTRIAL PRETREATMENT PROGRAM ANNUAL REPORT REQUIREMENTS

The permittee shall provide to the DEM with an annual report that briefly describes the POTW's pretreatment program activities, including activities of all participating agencies, if more than one jurisdiction is involved in the local program. The report required by this section shall be submitted electronically by March 15 annually as a NetDMR attachment or by an alternative electronic reporting system as it becomes available. The report must include, at a minimum, the applicable required data in appendix A to 40 CFR Part 127. The report required by this section must also include a summary of changes to the POTW's pretreatment program that have not been previously reported to the DEM and any other relevant information requested by the DEM. 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 permittee shall submit to the DEM a report that contains the following information:

1. 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 (CIUs), Significant Industrial Users (SIUs), Non-Significant Categorical Industrial Users (NSCIUs), and any other categories of users established by the permittee;
    a. Names and addresses, or a list of deletions and additions keyed to a previously submitted list. The POTW shall provide a brief explanation of each deletion. This list shall identify which Industrial Users (IUs) are subject to categorical Pretreatment Standards and specify which Standards are applicable to each Industrial User. The list shall indicate which Industrial Users are subject to local standards that are more stringent than the categorical Pretreatment Standards. The POTW shall also list the Industrial Users subject to categorical Pretreatment Standards that are subject to reduced reporting requirements under paragraph (e)(3), and identify which Industrial Users are Non-Significant Categorical Industrial Users.
    b. Permit status. Whether each SIU has an unexpired control mechanism and an explanation as to why any SIUs are operating without a current, unexpired control mechanism (e.g. permit);
    c. Baseline monitoring reporting requirements for newly promulgated industries
    d. In addition, a brief description of the industry and general activities.
2. 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;
3. A summary of compliance and enforcement activities of each Industrial User 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. This includes, but is not limited to:
    a. The number of SIUs inspected by the POTW (including inspection dates for each industrial user)
    b. SIUs sampled by the POTW for each industrial user; (including sampling dates for each industrial user)**.**
    c. Compliance schedules issued (include list of subject users)
    d. Written notices of violations issues (include list of subject users)
    e. Administrative orders issued (include list of subject users)
    f. Criminal or civil suits filed (include list of subject users) and,
    g. Penalties obtained (include list of subject users and penalty amounts)
    h. Other enforcement actions conducted in accordance with the approved Enforcement response Plan.
4. 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;

5. 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;
6. A list including the report/notification type, due date, and receipt date for each report/notification required by 40 CFR 403.12.
7. 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;
8. 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;

9. 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);
10. 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;

11. 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 a completed Annual Pretreatment Report Summary Sheet (See below).

Annual Pretreatment Report Summary Sheet

POTW Name:

RIPDES Permit #:

Pretreatment Report Period Start Date:

Pretreatment Report Period End Date:

# of Significant Industrial Users (SIUs):

# of SIUs Without Control Mechanisms:

# of SIUs not Inspected

# of SIUs not Sampled:

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

# of SIUs in SNC with Reporting Requirements:

# of SIUs in SNC with Pretreatment Compliance Schedule:

# of SIUs in SNC Published in Newspaper:

# of SIUs with Compliance Schedules:

# of Violation Notices Issued to SIUs:

# of Administrative Orders Issued to SIUs:

# of Civil Suits Filed Against SIUs:

# of Criminal Suits Filed Against SIUs:

# of Categorical Industrial Users (CIUs):

# of CIUs in SNC:

<u>Penalties</u>

Total Dollar Amount of Penalties Collected ($):

# of IUs from which Penalties have been collected:

<u>Local Limits</u>

Date of Most Recent Technical Evaluation of Local Limits:

Date of Most Recent Adoption of Technically Based Local Limits:

Pollutant	Limit (mg/l)	MAHL (lb/day)