

Application Type Renewal
Facility Type Sewage
Major / Minor Major

**NPDES PERMIT FACT SHEET
ADDENDUM**

Application No. PA0026042
APS ID 785283
Authorization ID 980088

Applicant and Facility Information

Applicant Name	<u>Bethlehem City</u>	Facility Name	<u>Bethlehem WWTP</u>
Applicant Address	<u>10 East Church Street</u> <u>Bethlehem, PA 18018</u>	Facility Address	<u>144 Shimersville Road</u> <u>Bethlehem, PA 18015</u>
Applicant Contact	<u>Edward Boscola</u>	Facility Contact	<u>Jack Lawrence</u>
Applicant Phone	<u>(610) 865-7207</u>	Facility Phone	<u>(610) 865-7168</u>
Client ID	<u>74720</u>	Site ID	<u>443353</u>
SIC Code	<u>4952</u>	Municipality	<u>Bethlehem City</u>
SIC Description	<u>Trans. & Utilities - Sewerage Systems</u>	County	<u>Northampton</u>
Date Published in PA Bulletin	<u>11/22/2014 (Re-draft: TBD)</u> <u>12/22/2014 (extended to</u> <u>1/22/2015 per applicant request).</u>	EPA Waived?	<u>No</u>
Comment Period End Date	<u>(Re-Draft: TBD)</u>	If No, Reason	<u>Major Facility, Pretreatment</u>
Purpose of Application	<u>Application for a renewal of an NPDES permit for discharge of treated Sewage.</u>		

Internal Review and Recommendations

This is a Re-draft NPDES Permit being issued for public comments. This Re-draft NPDES Permit has been updated to reflect current NPDES permit standard permit language/requirements, Chapter 94 Report-identified SSOs and Ammonia-N issues, to revise the Total Residual Chlorine (TRC) limits, to clarify assorted requirements, and to address assorted public comments.

Background:

- This is a 20.0 MGD WWTP with CSOs and an approved 2010 CSO LTCP (Large System) which indicated a historical peak wet weather flow of ~45 MGD. Estimated service area population of 126,000 residents, with ~ 247 miles of CSS/Separated sewers with six LTCP-identified City-operated pump stations. The service area includes an 18 square miles area including the City of Bethlehem, a portion of the City of Allentown, Hanover Township (Lehigh and Northampton counties), Lower Saucon Township, Hellertown, Fountain Hill Borough, Salisbury Township, Palmer Township, Bethlehem Township, and Borough of Freemansburg.
- The NPDES Application noted that the facility had a self-imposed operational limit of 15.5 MGD due to organic loading issues due to higher strength influent BOD5.
- Approved 2010 CSO LTCP Section 9.1 recommended that a detailed hydraulic profile be conducted during the effluent pump station "design phase" to confirm the 50 MGD peak hydraulic capacity throughout the entire WWTP. Other LTCP information:
 - The LTCP Section 9 (WWTP Wet Weather Capacity Summary) describes the existing WWTP as a two-stage secondary treatment process after primary treatment. The first 20 MGD flows through the first stage, with 10 – 15 MGD diverted to Stage 2 during wet weather events.
 - The first stage is an activated sludge process (20 – 25 MGD aeration basin with Intermediate Clarifiers) that allows for nitrification depending upon wastewater temperature and operating mixed

Approve	Return	Deny	Signatures	Date
X			James D. Berger, P.E. / Environmental Engineer	November 2, 2017
X			Amy M. Bellanca, P.E. / Environmental Engineer Manager	
NA			NA – not required for Re-draft NPDES Permit Bharat Patel, P.E. / Environmental Program Manager	-

Internal Review and Recommendations

liquor (MLSS) concentrations per LTCP Section 9.1. Plant experience has shown that aeration limitations, poor sludge settleability, and high clarifier solids loadings can lead to washout of solids from the intermediate clarifiers at flows above 20 – 25 MGD.

- **The second stage of the treatment process is designed to be a nitrification process utilizing the existing Trickling Filters (with ~30 MGD sustained capacity).**
- Section 9.1-Estimated Activated Sludge System peak flow capacity: ~20 – 25 MGD (sustained capacity at 20 MGD).
- Section 9.1-Estimated Trickling filters capacity: ~30 MGD (sustained capacity).
- Section 9.1-Estimated Existing Effluent Pump Station Capacity (to be upgraded to 50 MGD): ~45 MGD.
- **CSO Outfall #012 Replaced CSO Outfall #004 per Approved LTCP:** November 2015 substantial completion and full operation in 2016 per 2015 Chapter 94 Report. CSO Outfall #012 includes a Hydrojet bar screen to remove solids and floatables. LTCP Section 13.3 (Operational Plan) noted that the detailed CSO Outfall #012 operation plan will be finalized after the facilities have been constructed via detailed O&M Plan with its flow gate controlled by WWTP influent meter reading at 45 MGD (prior to plant improvements) and 50 MGD afterward. Phase II (post-CSO Outfall #012 construction), the Lehigh River was to be sampled upstream of the new CSO Outfall #012, and two downstream locations (first upstream of Outfall #001 and second downstream of Outfall #001). Monitoring results to be reported via Chapter 94 Reports (tabulated to compare wet and dry weather events and a summary provided. The evaluation results will be used to determine whether the remaining CSO discharges preclude attainment of the water quality standards in Lehigh River and Saucon Creek. The 2015 Chapter 94 Report noted that the new Lehigh River sampling point “SP7” (upstream of Outfall #012) was added in March 2015, with no 2015 CSO discharges.
- **LTCP Recommended Upgrades and Other Recommendations: The LTCP recommended upgrades to allow the treatment plant to handle 50 MGD without internal bypassing (some completed, some were being installed per Chapter 94 Reports; status/schedule of other upgrades unknown):**
 - Replace Surface Aerators in Existing Aeration Tanks
 - **New Secondary Treatment Train (with new fine bubble aeration blowers/building: 4.5 million gallons of new aeration tank volume paired with existing final clarifiers. The existing Trickling filters would be demolished to provide space. In addition, the treatment train would result in the ability to achieve full nitrification year-round at design average conditions, in excess of the seasonal nitrification requirements of the NPDES permit.**
 - Existing Intermediate Clarifiers: The existing Stage 1 Intermediate Clarifiers would be converted into Final Clarifiers and discharge directly into disinfection system.
 - Existing Final Clarifiers: To be modified with WAS/RAS pumping and piping paired with new aeration tanks.
 - New Effluent Pump Station pump and Repair/Replace Flap Gate: To Increase Pump Capacity from 45 MGD to 50 MGD.
 - Headworks Screening and Degritting: To be rehabilitated to aid in treating peak wet weather flows.
 - Solids Handling Improvements: The increase in wet weather flows to require increased sludge processing and storage capacity:
 - New primary sludge thickener tank: To allow for low clarifier blankets to maximize wet weather treatment without washout of solids.
 - Gravity Thickener Belts changed to rotary thickener
 - Convert Secondary Digesters into Primary Digesters
 - Replacement of Existing Belt filters: Either Centrifuges or new belt filter presses.
 - New Sludge Storage Tank: For temporary storage of solids only to allow for low clarifier blankets.
 - Fifth Primary Digester or Sludge Minimization System if needed
 - Admin/Lab space improvements
 - Primary Sludge Degritting
 - Disinfection Upgrade to Hypochlorite (from gas)
 - Fourth Effluent Pump
- The 2015 Chapter 94 Report indicating 2015 WWTP “Major Capital Projects” as including:
 - CSO Outfall #012 (relocation of CSO Outfall #004): The 12/12/2012 WQM ID# 4812402 authorized relocation of CSO Outfall #004 (discharging to Saucon Creek) to new CSO Outfall #012 (discharging to Lehigh River upstream of Outfall #001). CSO Outfall #012 (15 MGD capacity screened overflow; 45 MGD pumping capacity) included a diversion/screening structure, regulating sluice gate, isolation gates, self-cleaning screen, triplex pump station (each pump sized for 70 HP, 14121 GPM @ 10 Feet TDH), with total pumping capacity estimated at 45 MGD), water level monitors/flow meters, and

Internal Review and Recommendations

outfall (two 36-inch RCP pipes). Expected to reduce SSOs in Freemansburg. The pumps are designed to handle high Lehigh River elevations during flooding conditions.

- Chlorination system improvements: Unidentified
- New Dewatering Facility (scheduled for completion in 2016): The 5/7/2013 WQM Permit ID# 4813402 authorized installation of two new sludge dewatering centrifuges (1.23 MGD hydraulic design & 51,300 lb BOD5/day total treatment unit capacity, sized for 29.2 tons/hour wet sludge at 2.8% solids loading with polymer addition) to replace the existing belt filters and addition of two emergency Effluent Pumps (@ 13,889 GPM @ 28 Foot TDH each) for a total of four with a 50 MGD peak instantaneous flow capacity). New building with two new centrifuges and polymer handling.
- Digester/WAS Thickening Upgrade (begun in 2012): The 4/14/2011 WQM ID# 4811401 authorized conversion of one secondary digester into a primary digester, with the second digester preserved for a future conversion (based on a 11.9 MGD maximum monthly average flow). All primary digesters (1.23 MGD hydraulic design, 51,300 lbs BOD5/day Organic Design Total Treatment Unit) were to receive new heating/mixing systems. A new boiler system was to be installed. The digester control building was to be expanded. Two new gravity belt thickener units (0.472 MGD hydraulic design, 42,300 lbs BOD5/day Organic Design Total Treatment Unit, 10 tons/hour wet sludge capacity). New WAS pumps, spray water pump skid, polymer feed system and control system.
- Completed Changes (overlapping some of the above):
 - ❖ 2013 conversion of South Secondary Digester to Primary Digester No. 3 (with new heating/mixing system and "Dystor"),
 - ❖ Two new Gravity Belt Thickeners (GBT) were installed for WAS thickening
 - ❖ Two new primary sludge pump vaults and one new boiler were installed
 - ❖ New SCADA monitoring and control system has been implemented
 - ❖ In 2014, the South Primary Digester (Primary Digester No. 1) was upgraded with new heating/mixing system. The PD-1 roof was repaired, coated, and painted to prevent gas escape.
 - ❖ The North Primary Digester (Primary Digester No. 2) was emptied and cleaned. However, the roof could not be repaired and needs replacement. New roof and new heating/mixing system scheduled to be installed in 2016. This Digester was out-of-service.
- Future Construction Planned: The 8/1/2012 Act 537 Plan Update Revision indicated that the WWTP would be converted to a "single-stage activated sludge process" by various upgrades. The 2014 NPDES permit application indicated that they had completed Act 537 Improvements including WAS Thickening Improvements, Conversion of first existing secondary digester to primary digester, etc. via the WQM ID# 4813402.
- Unscheduled Construction (after next 5 years) per 2014 NPDES Application:
 - New aeration basins and blower building
 - Aeration tank improvements (anoxic zone, internal recycle)
 - Primary Sludge Thickener Improvements
 - Conversion of 2nd Existing Digester to primary digester & new sludge storage tank
- **Current High Flow Management Plan**: The NPDES application indicates that all flows up to 45 MGD go through the Final Clarifiers and Chlorination prior to discharge to either Outfall #001 or emergency-only Outfall #006 (when river levels prevent pumping to the Lehigh River):
 - **20 MGD flows**: Effluent flows up to 20.0 MGD receive full two-stage secondary treatment (second stage trickling filters are designed for nitrification).
 - **20 – 30 MGD flows**: Up to 10 MGD flow is directed around aeration tanks/intermediate clarifiers to trickling filters (demonstrated process capacity of 30 MGD per LTCP Section 9.1) to avoid washouts.
 - **30 – 45 MGD flows**: Primary effluent flows > 30 MGD are sent directly to final clarifiers for flows up to 45 MGD. The LTCP Section 9.1.1 indicates that the WWTP influent gates (West Gate G-1 and East Gate G-2) were currently adjusted as necessary to control plant influent flow to approximately 40 – 45 MGD currently. Flows will be controlled from North Interceptor to maintain 45 MGD (50 MGD) plant flows in future. After the new effluent pumps installation, 50 MGD will be the new peak flow.
 - **>45 MGD flows**: LTCP Figure 9-2 shows >45 MGD flows go through a bar screen prior to discharge (without treatment) i.e. CSO discharges via Outfalls #003 and #004 or #012.
 - **After All LTCP-required Upgrades**: Per LTCP Section 9.3, once the new aeration train and associated facilities are in service, "wet weather treatment capacity will then be increased up

Internal Review and Recommendations

to 50 MGD eliminating the need for wet weather-related internal plant bypasses, and further reducing the volume and duration of CSO events.”

Compliance History: See attachments for details. No open violation per 10/27/2017 WMS query for client:

"Permit: 785283
Client ID: 74720
Client: All

Open Violations: 0"

No data was found using the criteria entered. Please revise your choices and try again.

Public Comments: Responses bolded.

Internal Comments:

Pattern of Ammonia-N Exceedances: The 2015/2016 Chapter 94 Annual Reports show that the facility is still having ammonia-N exceedances blamed on multiple causes (including conversion of WWTP treatment process per general DEP Technical Assistance guidance but also including cold weather impacts/operational issues). The Chapter 94 Reports do not identify any proactive measures to address this problem except for a potential side-stream treatment process for high strength centrate from the new onsite centrifuges. See Compliance History attachment for recent Ammonia-N exceedance. **Therefore, the Re-draft NPDES Permit includes a Schedule of Compliance to address and fully resolve ammonia-N exceedances. Adding daily max reporting (no additional sampling required).**

Pattern of Dry/Wet Weather SSO Events in Collection/Conveyance System: The 2015/2016 Chapter 94 Annual Reports indicated an ongoing pattern of ongoing prohibited SSOs (see Table 1). Blockages have apparently been recurring in the collection system, which indicates a more proactive SSO prevention program is required for compliance with the general SSO prohibition. The City does corrective action “after the fact”, and the 2016 Chapter 94 Report indicates the City is developing an “Oil & Grease Program” (no details). The Chapter 94 Reports do not include any evaluation whether the SSOs are recurring in specific areas requiring more intensive O&M. It is possible that sewage collection/conveyance system has hydraulic restrictions or insufficient scouring velocities that might require WQM permitting. **Therefore, the Re-Draft NPDES Permit includes a Schedule of Compliance to resolve this pattern of prohibited SSOs in the Collection/Conveyance System. Onsite overflows are subject to NPDES bypassing conditions and PPC Plan requirements applicable to any spill, leak or other release.**

Internal Comment Regarding WWTP Internal Bypassing: On 12/1/2016, DEP M&C estimated that the facility is now having internal bypasses at a rate of 15-25 per year, and requested that they be addressed.

- **Bypassing is allowed by the CSO LTCP at specific flows (see above), with all other bypasses subject to standard NPDES bypassing requirements. Review of Chapter 94 Reports indicated a lesser number of listed bypasses (a.k.a. “overflows” per Table 1 below) but that appears to be partly due to Chapter 94 Report omissions of bypasses due to out-of-service units (due to repairs, ongoing facility modifications, non-functional equipment, cold weather impacts, etc.).**
 - **NPDES Application Information pertaining to bypasses:** The (revised) 8/8/2014 NPDES Application Topographic and Discharge Information Section Attachment 2 only identified 4 SSO events in the collection system, 8 dry weather overflows at the STP (contained and blamed on problems other than >20 MGD flows), and an emergency plant bypass during Hurricane Sandy.
 - **2013 Chapter 94 Report:** The 2013 Chapter 94 Report indicated nine (9) plant bypasses occurred in 2013; none resulted in releases outside secondary containment per application. All bypasses were chlorinated prior to discharge.
 - **2015 Chapter 94 Report:** Only 6 in-plant bypasses were reported (zero CSO wet weather discharges), with a 9.3 MGD ADF flow and 10.7 MGD Max 3-month flow, with the Chapter 94 Table indicating peak flows of >24.6 MGD.

Internal Review and Recommendations

- **2016 Chapter 94 Report:** Only 7 bypasses reported. All City bypass-related correspondence noted the facility had approval to install the additional 4.5 MG aeration tank system, but did not identify any schedule.
- **High Flow Management Plant (HFMP):** The Re-Draft NPDES Permit will require an updated High Flow Management Plan (HFMP) meeting all bypassing requirements, a new O&M Plan requirement, and CSO LTCP Update requirement within one year of Permit Effective Date to ensure bypasses are prevented/minimized as required. The Stormwater Conditions (including PPC Plan requirements) pertain to any onsite spill, leak or release.

Additional Minor NPDES Permit Changes:

- Part A, B, and C Standard Conditions updated to current 2016 NPDES Standard Template language.
- Fecal Coliform units updated to “No./100 ml” per current DEP permitting practices.
- Influent BOD5 and TSS monitoring increased to 1/day due to known stream impairment causes including organic enrichment/low DO and Suspended Solids; self-imposed BOD influent limits; 36 SIUs identified in 2016 Chapter 94 Report; ongoing WWTP O&M problems; and Chapter 92a.61.
- Total Dissolved Solids (TDS): The Department has added IMAX limits.
- Grab sampling reporting converted to IMIN and IMAX per current eDMR rules.
- CSO Outfalls clarification for CBOD5, TSS, and Ammonia-N: Changed to “hourly when discharging” sampling, and “grab-composite” consistent with CSO LTCP (eliminating need for explanatory Part A footnotes), plus reporting of daily max value (no additional sampling requirement) in Redraft Permit.
- Adding daily maximum reporting for Emergency Outfall #006 (no additional sampling needed).
- Adding daily maximum reporting for Influent BOD5 and TSS (no additional sampling needed)
- Adding Oil & Grease to stormwater sampling requirement per DEP M&C general recommendation for STP stormwater discharges.

New Total Residual Chlorine (TRC) Limits: The Department has updated the TRC water quality modeling with site-specific “mix” factors scientifically calculated by the PENTOXSD water quality modeling. The modeling showed that more stringent TRC permit limits are required. Therefore, the Department has modified the Part A.I permit limits and three-year Part C.II (Schedule of Compliance) to include the new TRC limits.

85% CBOD5 minimum monthly average removal: Reporting has been added because of DRBC Docket requirements, receiving stream’s impairment due to organic enrichment/low DO, and Chapter 92a.61. (CBOD meaning “Carbonaceous Biochemical Oxygen Demand” & DO means “Dissolved Oxygen”). This requirement already existed in the permit’s Part A.I Additional Requirements Section. Because Outfall #006 is for emergency use only (high Lehigh River levels prohibiting use of Outfall #001, etc.), it has not been included in the Outfall #006 reporting.

85% TSS minimum monthly average removal: Reporting has been added due to TSS exceedances and receiving stream’s impairment due to suspended solids and Chapter 92a.61. This requirement already existed in the permit’s Part A.I Additional Requirements Section. Because Outfall #006 is for emergency use only (high Lehigh River levels prohibiting use of Outfall #001, etc.), it has not been included in the Outfall #006 reporting.

EPA Public Comments (12/4/2014 & 12/8/2014 E-mails): The US EPA provided a limited review, focusing on the Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP) requirements (especially in regard to implementation of the Nine Minimum Controls (NMCs)). Specifically, the US EPA requested that the Department “clarify, justify, and document in the fact sheet whether these controls below have been used to develop the CSO requirements” (i.e. Part C CSO requirements and assorted CSO LTCP/Nine Minimum Controls-related recommendations). “If not please consider these recommendations and make revisions to the draft permit accordingly.” **The Department reviewed the EPA comments and concluded that they will be better addressed by the Part C.V.G (Combined Sewer Overflow Compliance Schedule, pages 35-36) requirement for submittal of a revised LTCP by December 31, 2017 (i.e. prior to the next NPDES Permit Renewal) to allow for a focused technical review without delaying permit action. This schedule will allow for further evaluation of in-stream conditions due to completion of replacement CSO Outfall #012 and cessation of use of CSO Outfall #004; updating the NMCs to account for site construction/operational changes; evaluation of impact of WWTP effluent pump upgrades; an updated High Flow Management Plan; etc. Additionally:**

Internal Review and Recommendations

- The EPA CSO LTCP-related comments will be forwarded with the Final NPDES Permit to the permittee, in order to be addressed in the required LTCP Update, due within one year of PED.
- The facility was determined to be in compliance with the (approved 10/15/2010) CSO LTCP's Presumptive Goal set forth in Part C.V.C.5 (>85% capture/elimination; no 2015 or 2016 CSO events) during the NPDES Permit Renewal process. The next LTCP Update (due within 1 year of LTCP) will require further evaluation of compliance with LTCP goals and include evaluation of stream conditions and resultant implications. The Department retains broad authority to update the NPDES Permit if necessary to reflect an updated CSO LTCP's chosen demonstrative and/or presumptive goals.
- The Part C.V.B requires compliance with the NMCs (i.e. the technology limits) which were listed therein. The next LTCP Update (due within 1 year of LTCP) will require further evaluation of compliance with NMCs. Compliance with the NMC for maximizing flow to the WWTP will be evaluated in context of completed/proposed site construction, Facility operational changes (updated WWTP HFMP, O&M Plan) and offsite requirements (collection system overflows; pretreatment NMC updating to address Oil & Grease Program, Indirect Dischargers, etc.) that might allow for increase in secondary treatment, new CSO conditions, etc.
- The NPDES Permit includes several changes to clarify the existing approved LTCP and general CSO-related requirements (as explained in the original Fact Sheet) including new Part A.I.I language and the Part C.V compliance schedule.

City of Bethlehem Public Comments (1/21/2015 Letter): Summarized below (with the "no comment" and "informational-only" comments omitted for brevity):

Copper Limit & TRE: The City requested deletion of the new copper limit and TRE condition, based upon "1980s and 1990s" documentation that was not provided ("BCM Engineers Lehigh River Model Study" & "Tetrtech Water Effects Ratio Study for the Lehigh River"), which was said to include a 5.4 WER and a Lehigh River hardness of 125 mg/l. The City also noted that there had been no "material change in the City's industrial discharger contribution or treatment since 2003". **The request could not be granted.**

- The City is proposing site-specific water quality criteria without meeting the minimum regulatory requirements. Chapter 93.8a(i) and 93.8d places the burden of proof on the applicant to justify any proposed site-specific water quality criteria (WER-based or other), and requires DEP pre-approval of the Study Plan (Chapter 93.8d(d)) plus EPA approval of the methodology (Chapter 93.8d(c)). Site-specific criteria can be pursued as part of the TRE Phase I. Please note the US EPA no longer accepts copper WER studies, but is recommending the Biotic Ligand Model (BLM) methodology, after addressing all other options (including source reduction, etc.) upfront.
- The copper requirements were developed per standard DEP policies and procedures based upon current statutory/regulatory requirements and scientifically-based methodologies plus NPDES Application information. See the DEP NPDES and Standard Operating Procedures webpages for the DEP permitting and effluent limitation determination procedures.
- The City-referenced information is too obsolete for consideration and could not be further evaluated in the absence of City-provided documentation. Please note even valid Water-Effect Ratios must be periodically re-evaluated and do not apply outside the original WER Study-defined site (which the City did not define). The City-referenced Study in-stream hardness also conflicted with application stream data, further demonstrating that the obsolete WER cannot be relied upon.

Dissolved Oxygen (DO) and Part C.II (Schedule of Compliance for DO): The City requested deletion of the new DO minimum (4.0 mg/l) and deletion of the Schedule of Compliance for meeting the new limit and do monitoring instead to determine if DO is a "pollutant of concern". **The Department could not grant this request:**

- DO is already a site-specific environmental concern. The receiving Lehigh River segment is already known to be impaired with organic enrichment/low DO among the known causes.
- The Lehigh River is a WWF (warm water fishery) where temperature restricts the availability of oxygen in the receiving stream, which will be affected by sewage effluent's oxygen demand.

Bromide, Chlorides, and Sulfates Monitoring: The City requested deletion of these monitoring requirements on the basis that other STPs do not have these monitoring requirements, that bromide was non-detect, and that these constituents are typically part of TDS monitoring separately required by the DRBC. **The Department could not grant this request:**

Internal Review and Recommendations

- This is a new statewide monitoring requirement due to statewide concerns about these constituents' potential impact on potable water supplies. The City's effluent met the statewide trigger levels for such monitoring as documented by the original Fact Sheet's Toxic Screening Analysis Spreadsheet.
- No technical reason was provided for why the statewide requirement should not apply to this NPDES permit renewal action. The City retains its rights to publicly comment on any other facility's NPDES application if it comments within the applicable public comment period.

Fecal Coliform IMAX Limits: The City is concerned that it cannot meet the regulatory Fecal Coliform IMAX limits due to CSO flows; that its grab sampling (daily) is only representative of a small portion of the wastewater discharged during the day; and that its multiple grab samples cannot be averaged to meet the new limits. **The Public comment did not explicitly request deletion of the limit. The Department cannot omit the Chapter 92a.47 regulatory requirement. In addition:**

- The new Chapter 92a.47 regulatory limit is an Instantaneous Maximum limit (#fecal coliform per 100 ml in the grab sample), and is not subject to any form of averaging. The City is free to provide any regulatory argument that its Outfalls Nos. 001 and 006 do not have to meet regulatory requirements during CSO events, but the burden of making such a case falls on the City.
- The CSO Outfalls Nos. 003 and 012 only require fecal coliform monitoring per the current LTCP. The updated LTCP (due within one year of Permit Effective Date) should explicitly address whether CSO outfall limits are required to protect the waters of the Commonwealth.

CSO Outfall #004 usage as an Emergency Bypass (after CSO Outfall #012 is operating): The City desired to retain Outfall #004 (currently an authorized CSO Outfall whose authorization will cease when replaced by CSO Outfall #012 construction per the CSO LTCP) "for emergency usage where a treatment plant bypass would be necessary to prevent severe property damage at the WWTP and/or in upstream communities (i.e. Freemansburg). The City would report such discharges in accordance with the NPDES permit." **No explicit request to modify the Draft NPDES Permit (which had retained the not-yet-replaced Outfall #004). The Department could not grant this request:**

- To restate the Department's position as outlined in the 10/29/2014 Draft NPDES Permit Cover Letter: The Department does not permit plant "bypasses" as approved NPDES outfalls:
 - Per the approved CSO LTCP, authorized usage of CSO Outfall #004 ceased after the replacement CSO Outfall #012 was available. CSO Outfall #012 is constructed and operational. Therefore, no CSO or other discharges are authorized.
 - The CSO LTCP requires further treatment plant upgrades to handle wet weather flows, which may eliminate any need for CSO outfalls or other wet weather bypasses. In the interim, the facility may retain the Outfall #004 structure for emergency usage during extreme wet weather events (such as Hurricane Sandy) where only a complete treatment plant bypass can prevent severe property damage at the treatment plant. Any such bypass would be reported and treated as such (see Permit Part A.II; B.I.G; Part C.I.F.). The Department will use its enforcement discretion as appropriate during extreme wet weather events.

Permit Part A.I.G (Stormwater Outfalls): The City has requested that Stormwater Outfalls #007 (material handling areas) and #011 (near aeration tanks) be representatively sampled for Outfalls #008 (driveway and grassy area between Trickling filters and final clarifiers), #009 (grassy area between intermediate clarifier and trickling units), #010 (grassy area between existing aeration tanks and intermediate clarifiers). The City also requested the sampling point be identified as the "first storm inlet/boxes located on the site, upstream of the Outfalls for safety purposes (with outfalls often submerged by Saucon Creek). **The Department can grant these requests in part:**

- **Permit Sampling Locations:** Have been clarified in the Part A section of the Permit per request.
- **Representative Sampling:** Outfalls #008, #009, and #010 can be represented by the other outfalls if there is no known spill, leak or other release within their drainage area(s).

Permit Parts A.I.A, A.I.B, A.I.E, A.I.F and C.I.D (Chlorine Minimization), page 31: The City has requested that (Outfall #001 and #006) TRC sampling frequency be reduced to 1/day, as opposed to 1/shift, noting that other facilities are sampling at 1/day. **The Department cannot grant this request for Outfall #001. The current 1/shift monitoring frequency is the standard frequency for this size of sewage facility (per the DEP New and Reissuance Sewage Individual NPDES Permit Applications SOP). The new TRC limits & Schedule of Compliance/Chlorine Minimization condition will require frequent measurements. The City Public comments about potential inability to meet the fecal coliform IMAX limits indicates a need to closely monitor TRC levels during wet weather periods. Outfall #006 (emergency discharge) has been changed to "daily when discharging" due to eDMR rules for intermittent discharges.**

Internal Review and Recommendations

Permit Part C.III (Maximizing Treatment at Existing POTW), page 32: The City asked either use of a lower (20 MGD) flow figure instead of the condition's 30 MGD figure in terms of "CSO-related bypass of the secondary treatment portion of the POTW treatment plant" or clarification. The City noted that it currently starts in-plant bypasses around the existing aeration tanks/intermediate clarifiers for flows in excess of 20 MGD per its WWTP Operating Procedures. At influent flows above 30 MGD – 45 MGD, excess flows are diverted around the trickling filters. After planned WWTP pump improvements, the WWTP capacity will increase to 50 MGD wet weather flow, but in-plant bypasses will continue at 20 MGD until upgrades to construct additional aeration tanks are completed in the future. **The Department cannot grant this request because the Trickling filters units (bypassed by ≥ 30 MGD flows, not >20 MGD flows) are the basis for meeting secondary treatment technology limits for the existing Outfall #001 and (emergency-only) Outfall #006. This condition does not impact the CSO LTCP-approved plan for bypassing of hydraulically limited aeration basins to direct >20.0 MGD flow to the Trickling Filters (within the overall secondary treatment process).**

Permit Part C.IV (Combined Sewer Overflows – compliance schedule): The City requested that the "date of substantial completion" for the new CSO Outfall #012 be changed from March 31, 2015 to May 1, 2015, based on their most recent project schedule. **The Department deleted this condition due to previous CSO Outfall No. 012 construction.**

Permit Part C.VIII (Stormwater Conditions): The City indicated that it would update its PPC Plan/Emergency Response Plan (ERP) to address the Part C.VII.B (PPC Plan) requirements in 2015, and commented on specific requirements, and noted a separate update submittal would be forthcoming: **The Department noted the provided information but the revised PPC Plan was not submitted for Department review. Existing NPDES Permit requirements must be met, and updated PPC Plan/stormwater requirements must be met upon the final NPDES Permit Effective Date.**

TKN and Nitrite-N Monitoring Requirements: The City requested deletion of these monitoring requirements as being separate from the DRBC monitoring requirements for Total Nitrogen and Nitrate-N (not being disputed). **The Department could not grant this request. Total Nitrogen is calculated by the sum of Total Kjeldahl Nitrogen (TKN) + Nitrite-N + Nitrate-N measured in the same sample. Unless the City can identify an acceptable test method to measure TN directly, the additional constituents must be monitored.**

Part A Outfall Sampling Frequency and Compositing Footnotes:

Outfall #003 (CSO); Outfall #004 (CSO authorization terminating upon Outfall #012 completion); and Outfall #012 (new CSO outfall): The City noted that the ammonia-N monitoring requirement (from CSO LTCP) omitted the existing Part A CBOD5/TSS note language ("*One Grab Sample shall be taken during each hour of discharge, composited daily and analyzed for the parameters listed above.") **The Department has clarified the sampling requirements (grab-composite hourly sampling) in the Part A.**

Outfall #006 (WWTP emergency outfall when Outfall #001 cannot be used): In addition to the footnote language, the City asked for clarification on the meaning of the term "weekly when discharging".

- **The Outfall #006 is used as an emergency discharge of WWTP effluent when Outfall #001 cannot be used due to high river levels of other emergencies. It is not a CSO Discharge with the former Outfall #003/012 footnote language. The only differences from Outfall #001 requirements were changes to sampling frequencies & sampling type due to intermittent emergency nature of the discharge. The previous CSO footnote language was not applicable. See NPDES Part A.II 24-hour composite sampling definition.**
- **The weekly when discharging sampling requirement was added due to potential for more than one short-term emergency discharge period per month (such as a too high river level fluctuating due to subsequent rain events) for the Outfall #001 monthly monitoring requirements. Emergency situations should not last more than one week in general.**

Outfall #012 Receiving Stream: The City noted that the Outfall #012 receiving stream number was incorrect (Part A.I.H). **The typo has been corrected.**

CSO Outfall Latitude & Longitude (Part A): The City noted that the coordinates were given in terms of negative longitude, noting that this was one longitude convention for locations west of the Prime Meridian. **The permit form is inherently ambiguous, but all longitudes have been converted to positive values for consistency in regard to locations west of the Prime Meridian.**

Internal Review and Recommendations

Permit Part A Additional Requirements Section 1.b (page 16): The City requested deletion of the Part A standard template condition's numeric oil & grease limits because they are not an industrial discharger. **The Department could not grant this request because Chapter 92a.47a)(7) explicitly incorporates these Chapter 95.2(2) requirements into secondary treatment requirements for sewage treatment plants, and the limits are part of the standard template condition.**

Table 1 (SSOs per Chapter 94 Reports)

Chapter 94 Report Year	Wet Weather SSOs	Dry Weather SSOs or bypass (City lumping WWTP spills/releases into SSOs)
2007	13 (10 in Freemansburg; 3 in Lower Saucon) in two >4-inch rain events*)	Zero
2012	Zero (with Hurricane Sandy causing two CSOs to discharge)	12 (8 at the WWTP involving the Intermediate Clarifiers, WAS System, digester, primary clarifiers), 1 main break due to sinkhole); and 3 blockages in Bethlehem**
2013	1 in Bethlehem	2 (1 blockage in Bethlehem; 1 digester spill at WWTP)
2014	4 (in Freemansburg Northeast Trunk Line)	4 (2 blockages in Bethlehem; 2 WWTP spills due to RAS pipe rusting or frozen Final Clarifier pipe)
2015	2 (1 with blockage in Bethlehem, 1 with submerged manhole in Freemansburg Northeast Trunkline)***	5 (4 from blockages, 1 from Pump transfer switch problem) in Bethlehem
2016	1 blamed on blockage	7 (1 blamed on blockage/partially collapsed pipe, 4 on blockages, and 1 on bypass pump failure during sewer main repair.

*The 2012 Chapter 94 Report indicated the City believed that previous surcharging manholes in Freemansburg were attributed to the height of the CSO Weir at Diversion Manhole No. 1 and Saucon Creek, not hydraulic capacity of the Northeast Trunk Line. The CSO Outfall #004 relocation/replacement by CSO Outfall #012 was expected to help alleviate SSOs on the Northeast Trunk Line.

**The 2012 Chapter 94 Report noted that the City took actions including increased monitoring and remedial actions including rodding/flushing in the affected areas, plus contacts made with users in frequent excessive grease buildup areas. The City also noted that it was developing an Oil & Grease Program with requirements on fats, oil and grease disposal.

***CSO Outfall #012 was substantially constructed on 11/20/2015 and became fully operational on 4/21/2016. Chapter 94 Reports noted this should eliminate recurrences of NE Trunk Line wet weather overflows.