pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NORTHEAST REGIONAL OFFICE
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0026042**
Facility Type	**Municipal**	APS ID	**785283**
Major / Minor	**Major**	Authorization ID	**980088**

Applicant and Facility Information

Applicant Name	**Bethlehem City**	Facility Name	**Bethlehem City WWTP**
Applicant Address	10 East Church Street	Facility Address	144 Shimersville Road
	Bethlehem, PA 18018		Bethlehem, PA 18015
Applicant Contact	Edward J. Boscola, Director of Water & Sewer Resources.	Facility Contact	Jack Lawrence
Applicant Phone	(610) 865-7207	Facility Phone	(610) 865-7168
Client ID	74720	Site ID	443353
Ch 94 Load Status	Not Overloaded	Municipality	Bethlehem City
Connection Status	-	County	Northampton
Date Application Received	May 31, 2013	EPA Waived?	No
Date Application Accepted	June 7, 2013	If No, Reason	Major Facility, Pretreatment
Purpose of Application	Renewal of NPDES Permit for discharge of treated sewage.		

Summary of Review

Renewal: 20.0 MGD Major (with CSOs) Municipal NPDES permit for treated sewage/CSO discharges to the Lehigh River (WWF, stream code# 3335); and CSO/emergency/stormwater discharges to Saucon Creek (CWF, stream code #3345). In 2012, their average daily flow was 9.7 MGD (max 11.9 MGD January flow; 44.97 MGD peak instantaneous).

Application included request to retain CSO Oufall #004 as “emergency-only” discharge point “to prevent severe WWTP property damage” (after CSO discharge authorization ceases per LTCP after replacement CSO #012 starts operating) such as the Hurricane Sandy WWTP power outage (i.e. as a complete plant bypass). The Outfall discharges Northern collection system influent to Saucon Creek. However, the Department does not permit bypasses as approved outfalls in NPDES Permits. Existing permit language (Part A.II and Part B.I.G) addresses bypass requirements.

Special Conditions/language: **New language bolded for convenience below**:

- **Parts A.I.C, A.I.D, and A.I.H: New PA CSO Policy (DEP ID# 385-2000-011) Section III.C (page 6) required footnote was incorporated in all Part A CSO outfall sections.**
- Parts C.I.A, B, & C: Standard sewage conditions (stormwater prohibition as modified in previous permits to refer to “separated sewers only”; necessary property rights; proper management of residuals).
- **Part C.I.D: New chlorine minimization condition per M&C recommendation for all major STPs.**
- Part C.I.E: Existing site-specific Condition (discharge/stream changes).
- Part C.I.F: Existing site-specific condition prohibiting other discharges
- Part C.I.G: Existing site-specific condition for notification prior to CSO Outfall #012 being placed in service
- Part C.I.H: Existing site-specific condition that defined “weekly average”.
- **Part C.II: New Schedule of Compliance for new DO limit (three year time-frame)**
- **Part C.III: New “Maximizing Treatment at the Existing POTW” condition added per CSO Policy Section VI.D (page 12) to authorize approved LTCP/High Flow Management Plant CSO-related bypasses. This condition was requested in 2008 NPDES permit by applicant, but the LTCP had to be updated per 11/10/2008 NPDES**

Approve	Deny	Signatures	Date
X		James D. Berger, P.E. / Environmental Engineer	October 27, 2014
X		Michael J, Brunamonti, P.E. / Environmental Engineer Manager	

Summary of Review

Permit Cover Letter Item 3. The LTCP was subsequently updated & included the High Flow Management Plan (CSO bypassing at 30 MGD).

- Part C.IV: Updated Large CSO/LTCP Standard Conditions including **new** interim time-frames for:
  - **Construction of CSO# 012: March 31, 2015 (2/2015 application estimate)**
  - **WWTP Upgrade to 50 MGD wet weather capacity via effluent Pump upgrade: December 31, 2016 (estimated 2016 per application)**
  - **High Flow Management Plan Update: December 31, 2016 (coinciding with plant upgrade completion allowing 50 MGD peak flow management per application)**
  - **LTCP Update Submittal: December 31, 2017 (CSO Policy Section IV.A (page 6) requires amendments within the permit term & needed to allow for review prior to next NPDES permit renewal circa 2019)**
- Part C.V: Updated Pretreatment Implementation Conditions.
- **Part C.VI: New TRE Condition (for new copper limit)**
- Part C.VII: Updated Whole Effluent Toxicity (WET) standard conditions (no limit)
- Part C.VIII: Updated Stormwater standard conditions

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001 (Plant Outfall); 012 (CSO Discharge)	Design Flow (MGD)	20.0 (001); 0 (012)
Latitude	40° 37' 12.10" (001) 40° 37' 10.00" (012)	Longitude	75° 20' 11.50" (001) 75° 20' 58.00" (012)
Quad Name	Hellertown	Quad Code	1443
Wastewater Description:	Treated Sewage (#001); CSO Outfall #012		
Receiving Waters	Lehigh River	Stream Code	3335
NHD Com ID	26299633	RMI	9.5400 (001) 9.7800 (012)
Drainage Area	1280.37 square miles (001)	Yield (cfs/mi^2)	0.2898
Q_{7-10} Flow (cfs)	370.944 CFS	Q_{7-10} Basis	USGS Gage #1453000 (Lehigh River at Bethlehem), ~ 2 mile upstream of Outfall 001.
Elevation (ft)	~199	Slope (ft/ft)	-
Watershed No.	2-C	Chapter 93 Class.	WWF, MF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	Siltation, Organic Enrichment/Low D.O., Suspended Solids, PCB		
Source(s) of Impairment	Urban Runoff/Storm Sewers, Municipal Point Source, Combined Sewer Overflow, Source Unknown		
TMDL Status	Pending	Name	

Background/Ambient Data		Data Source
pH (SU)	7.7 – 8.2	9/2/2010 CSO LTCP Table 7-3
Temperature (°F)	87°F (30.5°C)	LTCP Plan Table 7-2 for months of July and August.
Hardness (mg/L)	31 mg/l	Application (STORET WQNO125 near Slatington average from 2002 through 2012)
BOD mg/l	1.5 – 2.4 mg/l	LTCP Table 7-3
Dissolved Oxygen (mg/l)	9.2 – 10.4	LTCP Table 7-3. NOTE: DO levels increase during daylight hours due to photosynthesis in organic enrichment/low DO large streams per DEP Biologists, but then crash at night, so time of measurement affects validity of sampling data.
Fecal Coliform (#/100 ml)	20 – 320	LTCP Table 7-3 (Geo Mea 60 – 160)
TSS (mg/l)	3.2 – 10 mg/l	LTCP Table 7-3
Ammonia-N (mg/l)	<0.28 mg/l	LTCP Table 7-3
Total Nitrogen (mg/l)	1.3 – 3.7 mg/l	LTCP Table 7-3
Total Phosphorus (mg/l)	0.09 – 0.2 mg/l	LTCP Table 7-3

Nearest Downstream Public Water Supply Intake			
			North Penn Water Authority DBA Forest Park Water (ID# 102283-001)
PWS Waters	Delaware River	Flow at Intake (cfs)	-
PWS RMI	-	Distance from Outfall (mi)	~35.5

Changes Since Last Permit Issuance: **Outfall #001 coordinates updated. CSO Outfall 012 (replacing CSO Outfall 004) approved via 12/12/2012 NPDES Permit Amendment & 10/15/2010 DEP LTCP Approval Letter.**

Other Comments:

- **Q7-10 Flow: USGS 2011-1070 "Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania" (1929-2008 data basis) allowed updated LFY of 0.2898 CFS/square miles.**
- **Outfall #012: This CSO outfall will be constructed by March 2015, and will redirect CSO flows from CSO Outfall #004 (Saucon Creek) to the Lehigh River in accordance with the 10/15/2010-approved CSO Long Term Control Plan (LTCP).**
- **Additional LTCP Monitoring: As part of the CSO LTCP, the facility has been monitoring and reporting in-stream conditions on a quarterly basis, upstream and downstream of the permitted Outfall #001 (and will be doing the same for Outfall #012 when it is constructed and in use) in the annual Chapter 94 Report. The application indicates sampling is being done at stream banks for safety reasons.**
    - **Sample Point 001A-R: Upstream of Outfall #001.**
    - **Sample Point 001SCB-R-SC: Downstream of Outfall #001 (and downstream of Saucon Creek confluence with Lehigh River).**
    - **New Sample Point Upstream of Outfall #012: No designation or reported data yet available.**

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	003; 004; 006, 007, 008, 009, 010, and 011	Design Flow (MGD)	0 (003 CSO); 0 (004 CSO); 0 (006 Emergency-only); 0 (007 – 011 Stormwater-only)
Latitude	40° 36' 53.50" (003) 40° 37' 5.30" (004) 40° 37' 6.00" (006) 40° 37' 3.80" (007) 40° 37' 0.40" (008) 40° 36' 56.10" (009) 40° 36' 55.00" (010) 40° 36' 53.70" (011)	Longitude	75° 20' 3.90" (003) 75° 20' 2.30" (004) 75° 20' 1.10" (006) 75° 19' 56.50" (007) 75° 19' 56.60" (008) 75° 19' 56.80" (009) 75° 20' 2.00" (010) 75° 20' 3.10" (011)
Quad Name	Hellertown	Quad Code	1443 (6.22.2)
Wastewater Description:	CSO discharge only (003, 004); Emergency-only treated sewage (006); Stormwater associated with industrial activities (007, 008, 009, 010, and 011).		
Receiving Waters	Saucon Creek	Stream Code	3345
NHD Com ID	26296829	RMI	~ 0.63 (003);~ 0.23 (004); ~0.25 (006); 0.3500 (007); 0.4200 (008);0.5100 (009); 0.5900 (010);0.6200 (011)
Drainage Area	57.88 square miles (Outfall 006)	Yield (cfs/mi^2)	0.476 (Outfall 006 location)
Q_{7-10} Flow (cfs)	27.6 (Outfall 006)	Q_{7-10} Basis	PAStreamstats
Elevation (ft)	-	Slope (ft/ft)	-
Watershed No.	2-C	Chapter 93 Class.	CWF, MF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	Siltation		
Source(s) of Impairment	Urban Runoff/Storm Sewers		
TMDL Status	Pending	Name	

Background/Ambient Data:		Data Source:
pH (SU)	7.5 – 8.2	9/2/2010 CSO LTCP Report (approved 10/15/2010) Table 7-3 (WQ Data (dry sampling)) – 5 samples in May 2009.
Temperature (°F)	66	LTCP Table 7-2 for July/August
BOD (mg/l):	1.7 – 2.2	LTCP Table
DO (mg/l)	9.3 – 10.5	LTCP Table (see note for Lehigh River data)
Fecal Coliform (#/100/ml)	60 – 340 #/100 ml	LTCP Table (Geo Mean 113 – 180)
TSS (mg/l)	3.2 - 20	LTCP Table
Ammonia-N (mg/l)	<0.28	LTCP Table
Total N (mg/l)	2.2 – 4.6	LTCP Table
Total P (mg/l)	0.08- 0.2	LTCP Table

Changes Since Last Permit Issuance: **Permit coordinates updated per 1/14/2010 Bethlehem Letter.**

Other Comments:

- **General: Saucon Creek confluence with the Lehigh River is directly downstream of Outfall #001 and future CSO Outfall #012 on the Lehigh River. Therefore, approximately same distances to public water supply.**
- **Outfall #004: CSO Outfall #004 is being replaced by CSO Outfall #012 (on Lehigh River), which is expected to improve Saucon Creek water quality. The permittee indicates that this outfall would be retained in place and might be used as an emergency bypass in extreme wet weather events (such as Hurricane Sandy which caused a WWTP power failure) to prevent severe property damage at WWTP. After CSO Outfall #012 starts discharging, Outfall #004 CSO discharges will be prohibited by permit and LTCP, therefore any such discharge would be treated as an emergency bypass event. The Department would use enforcement discretion as appropriate.**
- **Additional LTCP Monitoring: As part of the CSO LTCP, the facility has been monitoring and reporting in-stream conditions on a quarterly basis, upstream and downstream of the permitted outfalls (CSO Outfall #003 and stormwater outfalls) in the Chapter 94 Reports. The application indicates sampling is being done at stream banks for safety reasons.**
    - **Sample Point 003A-SC: Upstream of CSO Outfall #003 (to be discontinued after CSO 004 replacement by CSO 012)**
    - **Sample Point 003B-SC: Downstream of CSO Outfall #003 (to be discontinued after CSO 004 replacement by CSO 012)**
    - **Sample Point 004A-SC: Upstream of CSO Outfall #004 (to be discontinued after CSO 004 replacement by CSO 012)**
    - **Sample Point 004B-SC: Downstream of CSO Outfall #004 location.**

Treatment Facility Summary

Treatment Facility Name: Bethlehem City WWTP

WQM Permit No.	Issuance Date	Scope
4813402	5/7/2013	Two new sludge dewatering centrifuges and two new emergency effluent pumps.
4812402	12/12/2012	Relocation of CSO Outfall #004 discharge to new Outfall #012.
4811401	4/14/2011	Two new gravity filter belts, new WAS pumps
489403	11/19/1998	CSO Outfall #004 screening device
487405	5/10/1985	Transfer of STP Permit.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Activated sludge process with trickling filters at present. See below for details.	Gas Chlorine	20.0

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
20.0*	39,365**	Not Overloaded	Anaerobic digestion and dewatering.	Landfilled or offsite beneficial use in mine reclamation as soil conditioner.

*8/1/2012 Act 537 Plan Update Letter approved WWTP upgrades "to restore the existing plant design capacity of 20 MGD to accommodate the existing and future wastewater needs of the city and its contributing municipalities."
**Application-identified limit, with application indicating that the facility has self-imposed a 15.5 MGD cap flow due to higher BOD levels than originally estimated (310 mg/l influent), in order to avoid organic overloads.

Changes Since Last Permit Issuance:

- **2012/2013 Chapter 94 Reports:**
  - **Aeration Basin Upgrade Project (10 new aerators with VFDs) was completed in 2011;**
  - **A secondary digester was converted to a primary digester, plus two new gravity belt thickeners for WAS thickening in progress in 2013;**
  - **Primary Digester-3 (conversion of South Secondary Digester) plus two new sludge primary pump vaults with new boiler plus SCADA monitoring system being implemented (to be completed by July 2014).**
- **Application: New CSO Outfall #012 construction to be completed in February 2015 and operating in March.**

Other Comments:

- **Existing WWTP Description: The NPDES Renewal Application describes the existing WWTP as including first stage activated sludge process plus second stage trickling filters for nitrification:**
  - **Four mechanical bar screens**
  - **Two grit removal tanks**
  - **Two primary sedimentation tanks**
  - **Three aeration tanks (operating in plug flow)**
  - **Two intermediate sedimentation tanks (primary clarifiers)**
  - **Four trickling filters,**
  - **Two final sedimentation tanks (final clarifiers)**

- **Three chlorine contact tanks (chlorine gas)**
- **Sludge is sent to gravity thickener, gravity belt thickener, four anaerobic digester tanks, and dewatering by two belt filter presses and one centrifuge.**
- **Outfall #001 to Lehigh River(gravity flow, unless high river level requires pumping)**
- **Outfall #006 to Saucon Creek (emergency outfall when Outfall #001 is not usable)**

- **Future Construction Planned Per Application: 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.**
  - **Next Five (5) Years Per Application:**
    - **Construct CSO Outfall #012 (substantial completion Feb 2015)**
    - **Replacement of mixing equipment in two existing primary digesters (completion 2015)**
    - **Short-term dewatering improvements - 1st and 2nd centrifuges (2016)**
    - **Headworks Improvements - screening and grit rehabilitation (to be permitted 2016)**
    - **Fourth Effluent Pump Installation to handle 50 MGD wet weather flow (2016).**
    - **Admin building (to be permitted 2016)**
  - **Unscheduled Construction (after next 5 years) per 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**
    - **Third Centrifuge**
    - **5th Primary digester or sludge minimization systems if necessary**
    - **Primary Sludge degritting**
    - **Disinfection upgrade to Hypochlorite**

- **High Flow Management & Internal WWTP Bypasses due to Wet Weather Flows:**
  - **2013 Bypasses: 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.**
  - **Current High Flow Management Plan: The application indicates that all flows up to 45 MGD goes through the Final Clarifiers and Chlorination prior to discharge to either Outfall #001 or emergency-only Outfall #006:**
    - **20 MGD flows: Effluent flows up to 20.0 MGD receive full treatment.**
    - **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) are 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).**
    - **>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 to 50 MGD eliminating the need for wet weather-related internal plant bypasses, and further reducing the volume and duration of CSO events."**
  - **High Flow Management Plan Update: They plan to update their High Flow Management Plan after the wet weather flow capacity is increased to 50 MGD (by WWTP pump upgrade).**
- **85% Treatment Requirements (CBOD5 and TSS): The 2013 Chapter 94 Report confirmed >85% removal of both CBOD5 and TSS.**

Compliance History

eDMR Data for Outfall 001 (from August 1, 2013 to July 31, 2014):

Parameter	Aug 13	Sep 13	Oct 13	Nov 13	Dec 13	Jan 14	Feb 14	Mar 14	Apr 14	May 14	Jun 14	Jul 14
Flow (MGD) Average Monthly	9.296	8.187	8.127	8.016	8.168	8.824	9.045	9.703	10.207	11.876	9.799	9.19
Flow (MGD) Daily Maximum	14.223	11.919	10.869	12.966	12.604	14.834	11.862	15.696	23.748	29.836	17.916	13.253
pH (S.U.) Maximum	7.5	7.2	7.2	7.2	7.2	7.1	7.6	7.5	7.2	7.2	7.4	7.3
pH (S.U.) Minimum	6.5	6.4	6.3	6.4	6.4	6.4	6.6	6.5	6.3	6.5	6.3	6.2
TRC (mg/L) Average Monthly	0.36	0.33	0.30	0.33	0.40	0.35	0.39	0.39	0.36	0.38	0.40	0.44
TRC (mg/L) IMAX	0.71	0.55	0.54	0.64	0.93	0.66	0.55	0.57	0.58	0.69	0.67	0.68
CBOD5 (lbs/day) Average Monthly	426.1	289.4	505.3	345.7	355.2	517.5	383.5	496.4	529.1	877.7	483.8	524.3
CBOD5 (lbs/day) Weekly Average	749.4	341.9	647.3	356	725	877.5	452.2	723.6	2359.8	1091.9	720.8	658.6
CBOD5 (mg/L) Average Monthly	5.1	4.3	7.4	5.1	5.2	6.6	5.1	6.1	5.6	6.6	6.0	6.8
CBOD5 (mg/L) Weekly Average	8.4	5.3	8.6	5.4	9.0	9.4	5.7	6.9	13.5	7.8	10.1	9.0
TSS (lbs/day) Average Monthly	619.5	448.07	800.8	566.2	453.5	628.7	617.4	654.3	750.5	677.28	592.5	632.2
TSS (lbs/day) Weekly Average	969.8	613.85	958.4	566.8	776.84	963.6	649.3	1086.5	1693.6	972.43	1251.2	1179.3
TSS (mg/L) Average Monthly	7.6	6.7	11.9	8.4	6.6	8.3	8.3	8.1	8.1	5.7	7.3	8.3
TSS (mg/L) Weekly Average	11.5	9.6	15.0	8.8	9.7	10.7	9.5	9.7	10.5	7.5	17.5	16.2
Fecal Coliform (CFU/100 ml) Geometric Mean	12	8	10	4	5	6	2	5	3	4	14	6
Ammonia (lbs/day) Average Monthly	257.09	258.876	447.44	252.6	218.6	264.6	1079.32	991	387.15	293.9	357.31	219.81
Ammonia (mg/L) Average Monthly	3.0	3.9	6.6	3.6	3.1	3.6	14.0	12.6	4.3	2.7	4.2	2.9

eDMR Data for Outfall 003, 006, 007, 008, 009, 010, 011 & 012 (from August 1, 2013 to July 31, 2014): No eDMR data available from CSO Outfalls/Stormwater Outfalls for this period (no CSO discharge via Outfall #003; no emergency discharge via Outfall #006; stormwater sampling not required in previous NPDES Permit).

eDMR Data for Outfall 004 (CSO Discharge):

Parameter	Apr 14	May 14
Flow (MGD) Average Monthly	5.645	3.339583
Flow (MGD) Daily Maximum	5.645	3.339583
pH (S.U.) Maximum	6.7	6.7
pH (S.U.) Minimum	6.7	6.7
CBOD5 (mg/L) Average Monthly	111	84
TSS (mg/L) Average Monthly	142	68
Fecal Coliform (CFU/100 ml) Geometric Mean	FF	3000000

Compliance History

Effluent Violations for Outfall 001 (from February 1, 2013 to January 31, 2014):

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Ammonia	10/31/13	Avg Mo	6.6	mg/L	5.0	mg/L

Summary of Inspections: **No violations per last inspection (3/10/2014) per NMS Query on inspection history per permit number.**

Other Comments: **No open violations per 9/16/2014 NMS Query (Open violations for client by permit number).**

Effluent Violations for Outfall 003, 004, 006, 007, 008, 009, 010, 011 & 012 (from February 1, 2013 to January 31, 2014):

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
No violations to report						

Summary of Inspections: **No violations per NMS Query on inspection history per permit number.**

Other Comments:

- **WQM Permit Condition Schedule: 12/12/2012 WQM Permit ID#4812402 Special Condition A had a substantial completion of construction date of 9/30/2014 for CSO Outfall #012, now scheduled for substantial completion in February 2015, and operation in March 2015 per application.**
- **LTCP Compliance: They met their LTCP presumptive performance goals (>85% reduction; no 2012 or 2013 CSO events). 2011 Hurricane Sandy event caused CSOs, when they diverted all influent to CSO Outfalls #003 and #004 due to WWTP power outage. Potential compliance issues:**
  - **Construction Schedule: The 10/15/2010 DEP Approval Letter (LTCP) included an implementation schedule with work to be completed by 12/1/2013 for CSO Outfall #012 (new diversion structure with flow control gate and overflow regulator weir; new outfall piping, check valve, and structure; and new screen for CSO discharge) & upgrade to 50 MGD wet weather flow capacity via WWTP pumping upgrade. Application-identified schedule:**
    - **2/2015 CSO Outfall #012 substantial completion, with 3/2015 for operation.**
    - **2016 WWTP pump upgrades allowing the handling of 50 MGD wet weather flows**
  - **LTCP Sections 9.2.1, 9.2.3 & 9.3 & 13.1: The LTCP recommended use of existing wet weather strategy (involving plant bypasses) until all 2008 Act 537-approved upgrades were in place (including new treatment train & removal of trickling filters) to eliminate need for bypasses. The schedule for these additional upgrades was to be determined during post-construction monitoring (Section 13.1). No schedule identified per Treatment Section above.**
  - **LTCP Section 14.1 (Post-construction Monitoring Plan):**
    - **The LTCP required ammonia-N monitoring at the CSO Outfalls (no data reported), but ammonia-N reporting not part of previous DMRs.**
    - **The 2013 Chapter 94 Report Table 2-4 in-stream monitoring/reporting (LTCP Section 14.2.3) appeared to be missing sampling point data for 5 sampling events per month during the May through September time-frame (swimming season) for in-stream sampling points.**
    - **BOD5 was sampled instead of CBOD5.**

Development of Effluent Limitations

Outfall No.	001, 006	**Design Flow (MGD)**	20.0 (001) 0 (006-emergency only)
Latitude	40° 37' 7.46" (001) 40° 37' 6.00" (006)	**Longitude**	75° 19' 59.83" (001) 75° 20' 2.00" (006)

Wastewater Description: Treated Sewage Discharge (001); Treatment Plant Emergency Outfall (006)

Permit Limits & Monitoring: **Changes bolded for convenience.**

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
CBOD5	4,170 lbs/d 6,672 lbs/d 25.0 40.0 50.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing Technology limit (Chapter 92a.47) supported by water quality modeling.
TSS	5,004 lbs/d 7,506 lbs/d 30.0 45.0 60.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing Technology limit (Chapter 92a.47)
pH	6.0 – 9.0 SU	Min - IMAX	Existing Technology limit (Chapter 92a.47)
Fecal Coliform (5/1 – 9/30)	200/100 ml **1,000/100 ml**	Geo Mean **IMAX**	Existing Technology limit (Chapter 92a.47) **with IMAX added per reg**.
Fecal Coliform (10/1 – 4/30)	2,000/100 ml **10,000 ml/100 ml**	Geo Mean **IMAX**	Existing Technology limit (Chapter 92a.47) **with IMAX added per reg**.
Total Residual Chlorine	0.50 1.20	Average Monthly IMAX	Existing Technology limit (92a.48) supported by water quality modeling
Ammonia-Nitrogen (May 1 - Oct 31)	834 lbs/d 5.0 10.0	Monthly Average Monthly Average IMAX	Existing water quality-based effluent limit supported by updated modeling
Ammonia-Nitrogen (Nov 1 - Apr 30)	2,502 lbs/d 15.0 30.0	Monthly Average Monthly Average IMAX	See above.
Dissolved Oxygen (DO)	**4.0**	**Minimum**	**New limit (with 3 year Schedule of Compliance) due to receiving WWF stream as recommended per Sewage Effluent SOP (Chapter 92a.61) and due to stream impairment (organic enrichment/low DO among causes). WQM modeling otherwise required a 3 mg/l limit. No effluent data available.**
Total Phosphorus	**Report lbs/d Report**	**Monthly Average Monthly Average**	**Monitoring required by 12/5/2012 DRBC docket# D-1971-078 CP-3 (incorporated per Chapter 92a.12), Individual Sewage Effluent SOP recommendation, and known stream impairment.**
Total Nitrogen	**Report lbs/d Report**	**Monthly Average Monthly Average**	**See above.**
Nitrate-N	**Report lbs/d Report**	**Monthly Average Monthly Average**	**See above.**
TKN	**Report lbs/d Report**	**Monthly Average Monthly Average**	**Required for TN monitoring.**
Nitrite-N	**Report lbs/d**	**Monthly Average**	**Required for TN monitoring.**

	Report	**Monthly Average**	
TDS	**Report lbs/d** **1000** **2000**	**Monthly Average** **Monthly Average** **IMAX**	**New limit per 12/5/2012 DRBC docket# D-1971-078 CP-3 limit (incorporated per Chapter 92a.12), with 2.0 sewage multiplier for IMAX, and DEP Toxic Screening Spreadsheet recommendation.**
Bromides, Chlorides, Sulfates	**Report lbs/d** **Report**	**Monthly Average** **Monthly Average**	**New monitoring requirement per Toxic Screening Spreadsheet recommendation.**
BOD5 Influent	**Report**	**Monthly Average**	**New monitoring requirement for POTWs.**
TSS Influent	**Report**	**Monthly Average**	**See above**
Copper	**Report lbs/d** **0.009** **Report** **0.018**	**Monthly Average** **Monthly Average** **Daily Max** **IMAX**	**New limits per updated PENTOXSD WQBEL (AFC) with IMAX (via 2.0 sewage multiplier). TRE with three year time-frame for compliance added to permit. See Reasonable Potential section below.**
Other Toxics	Not Needed	-	Per Reasonable Potential analysis below.
Duration of Discharge (Outfall #006 only)	**Report**	**Total Monthly**	**Outfall #006 is for emergency usage only. Therefore, duration of discharge will be reported for informational purposes.**

Comments:

- **Outfall Details: See Table 1 (below)**
- **Water Quality Modeling (Outfall 001 to Lehigh River) Input Assumptions: See Attachment A for WQM Model 7.0 Output & TRC spreadsheet modeling.**
    - **Stream Temperature: 25 °C due to WWF receiving stream (30.5 °C measured summer temperatures LTCP input did not impact results).**
    - **Stream pH 8 per LTCP data (pH 7 did not impact limits).**
    - **Discharge hardness (90.3 mg/l LTA from application)**
    - **Stream hardness (31 mg/l from application).**
- **"Treatment plant emergency outfall" #006: The previous NPDES permit identified Outfall #006 as a "Treatment plant emergency outfall" (for when Outfall #001 could not be used due to Lehigh River backpressure, etc.).**
    - **Emergency discharge receives same level of treatment as Outfall #001 discharges (per High Flow Management Plan). Therefore, the permit limits/monitoring requirements are the same except for the following:**
        - **Duration of discharge reporting per above.**
        - **Daily grab sampling for pH, DO, TRC, CBOD5, TSS, Fecal Coliform, & Ammonia-N.**
        - **Weekly grab sampling (TDS, TN (TKN. Nitrate-N, Nitrite-N), TP and copper) in case emergency lasts longer than a week and to gather information (for future Saucon Creek TMDL and actual plant discharges during emergency conditions such as high flow conditions).**
        - **Per previous NPDES Permit, CBOD5, TSS and Ammonia-N are sampled hourly and composited daily to generate DMR reported data.**
        - **No monitoring requirement for BOD5 Influent, TSS Influent, and effluent bromide, sulfates, and chlorides because emergencies would mean non-representative results in terms of both plant operation and potential impacts on downstream drinking water plants.**
    - **Non-emergency discharges (i.e. scheduled maintenance) would require a major permit amendment and new WQ modeling/limits due to discharge to Saucon Creek.**

Reasonable Potential: See Attachment A for Toxic Screening Spreadsheet & PENTOXSD Modeling Output

- **Toxic Screening Spreadsheet (attached): Only copper required a limit (with TRE conditions).**
- **Other Copper Data: The 2013 Chapter 94 Report included copper data. Using TOXCONC, the Long Term Average Monthly Copper concentration was calculated to be 0.0208083 mg/l (above WQBEL) with a COE of 0.3692792 (lognormal distribution). Additionally, the Chapter 94 Report calculated the arithmetic average of the copper North influent (0.084 mg/l) and copper South Influent (0.082 mg/l).**
- **Application-identified Other Constituents: In addition to the Pollutant Group constituents, the analysis found "suspected" presence of several chemicals. Lacking other information (and passing WET tests). Monitoring will not be required at this time for:**

- **Hexamethylcyclotrisiloxane (CAS# 541-05-9): Tentatively identified in one of six samples (not quantifiable). Internet search found 3/18/2003 MS-DS sheet lacking toxicology data, indicated not on carcinogen lists (ACGIH, IARC, or NTP). No aquatic toxicity data found.**
- **Octamethyl Cyclotetrasiloxane (CAS# 556-67-2): Tentatively identified in one of six samples (not quantifiable). Internet search found rodent toxicological data but nothing on aquatic toxicity. Used in antifoam products per another MS-DS, but the DEP chemical additives policy does not apply to STPs.**

- **SIUs: The application indicated no known problem with SIU flows. The facility has a pretreatment program (with monitoring to be done at DEP Target QLs in the future).**
- **WET Testing: No reasonable potential per WET section below.**

Development of Effluent Limitations

	003;		0 (CSO)
	004;		0 (CSO)
Outfall No.	012	**Design Flow (MGD)**	0 (CSO)
	40° 37’ 7.46” (003)		75° 19’ 59.83” (003)
	40° 37’ 5.00” (004)		75° 20’ 4.00” (004)
Latitude	40° 37’ 10.00” (012)	**Longitude**	75° 20’ 58.00” (012)

Wastewater Description: CSO discharges during wet weather only

Permit Limits/Monitoring: Changes are bolded.

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
$CBOD_5$	Report	Monthly Average	Existing monitoring per the Approved LTCP Post Construction Monitoring Plan Section 14.1.
TSS	Report	Monthly Average	See above
pH	Report SU	Min - IMAX	See above
Fecal Coliform	Report	Monthly Average	See above.
Ammonia-Nitrogen	**Report**	**Monthly Average**	**New requirement per the Approved LTCP Post Construction Monitoring Plan Section 14.1, being incorporated into this permit cycle.**

Comments:

- **Outfall Details: See Table 1.**
- **Sampling Method: Per previous NPDES Permits, CBOD5 and TSS are sampled hourly and composited daily to generate DMR reported data.**

Development of Effluent Limitations

Outfall No.	007, 008, 009, 010, 011	**Design Flow (MGD)**	0 (stormwater only)
	40° 37' 14.00" (007)		75° 20' 2.00" (007)
	40° 37' 22.00" (008)		75° 20' 2.00" (008)
	40° 37' 30.00" (009)		75° 20' 2.00" (009)
	40° 36' 38.00" (010)		75° 20' 2.00" (010)
Latitude	40° 36' 46.00" (011)	**Longitude**	75° 20' 2.00" (011)

Wastewater Description: Stormwater associated with industrial activities only

Permit Constituent	**Permit Basis**
TSS	Existing Tech monitoring requirement per DEP Statewide PAG-03 BPJ for this industry.
TKN	See above
Total Iron	See above.
pH	Existing Tech monitoring requirement retained per BPJ due to stream impairment.
$CBOD_5$, Chemical Oxygen Demand (COD), Oil & Grease, TP, and Dissolved Iron	No longer required. Not part of DEP Statewide PAG-03 BPJ for this industry. Implemented BMPs and PPC Plan should prevent contamination of stormwater run-off, with monitored parameters acting as indicators for potential problems.

Comments:

- **Outfall Details: See Table 1.**
- **Analytical Data: No stormwater analytical information available (not previously required). Monitoring will be required in this permit cycle.**
- **Application-Identified Stormwater BMPs: It is the plant's policy to store all chemicals, grit and sludge containers in covered areas. Stormwater channels, inlets, and Pump House No. 5 wet well are cleaned at least once per year. Stormwater inlet covers are used in appropriate areas. The plant driveways are cleaned manually with a street sweeping vehicle. Vehicle and equipment washing is done inside where floor drains are piped to plant processes.**

Whole Effluent Toxicity (WET)

For Outfall 001, **Chronic** WET Testing was completed:

X For the permit renewal application (4 tests).

The dilution series used for the tests was: 100%, 60% 19.5%, 10%, 5%, and 0%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: **19.5%**

Summary of Four Most Recent Test Results

NOEC/LC50 Data Analysis

	***Ceriodaphnia* Results (% Effluent)**			***Pimephales* Results (% Effluent)**			
Test Date	**NOEC Survival**	**NOEC Reproduction**	**LC50**	**NOEC Survival**	**NOEC Growth**	**LC50**	**Pass? ***
5/8/2012	100%	100%	>100%	100%	100%	>100%	Pass
8/14/2012	19.5%	19.5%	>100%	100%	100%	>100%	Pass
11/13/2012	100%	100%	>100%	100%	100%	>100%	Pass
2/12/2013	100%	60%	>100%	100%	100%	>100%	Pass

***** *A "passing" result is that which is greater than or equal to the TIWC value.*

X No Reasonable potential.

Comments: Original Dilution series could not be determined, but 19.5% is nearly identical to recalculated TIWc.

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa): **0.048 (PENTOSXD)** Chronic Partial Mix Factor (PMFc): **0.337 (PENTOSXD)**

1. Determine IWC – Acute (IWCa):

$(Q_d \times 1.547) / ((Q_{7\text{-}10} \times PMFa) + (Q_d \times 1.547))$

[(20.0 MGD x 1.547) / ((370.944 cfs x 0.048) + (20.0 MGD x 1.547))] x 100 = **IWCa% = 63.47%**

Is IWCa < 1%? **X NO (Chronic tests required only)**

Type of Test for Permit Renewal: **Chronic**

2b. Determine Target IWCc (If Chronic Tests Required)

$(Q_d \times 1.547) / (Q_{7\text{-}10} \times PMFc) + (Q_d \times 1.547)$

[(20.0 MGD x 1.547) / ((377.944 cfs x 0.337) + (20.0 MGD x 1.547))] x 100 = **TIWCc% = 19.83% (rounded to 20%)**

3. Determine Dilution Series

TIWc Dilution Series = 100%, 60%, 20%, 10%, and 5%.

WET Limits

Has reasonable potential been determined? **X No.**

Will WET limits be established in the permit? **X No.**

Table 1 (Outfall Description)

Outfall #	Flow	Receiving Stream	Description
001	20.0 MGD treated sewage	Lehigh River	48-inch pipeline for pumped flow to Lehigh River, upstream of Saucon Creek confluence.
002	None	-	Abandoned old trickling filter treatment bypass – 30-inch pipe.
003	CSO Discharge	Saucon Creek	36-inch South Interceptor overflow @ Manhole 6A at the WWTP with flap gate.
004	CSO Discharge	Saucon Creek	48-inch North Interceptor CSO Outfall (with bar screen) being replaced by Outfall #012.
005	None	-	Abandoned Florence Junction CSO Overflow 36-inch pipe.
006	Treatment Plant Emergency Outfall for treated sewage	Saucon Creek	36-inch pipe used when Outfall #001 cannot be used (due to river levels/backpressure or other emergency).
007	Stormwater	Saucon Creek	24-inch CMP drains 60,000 square foot area where grit/sludge containers are stored, handled, and transported, and where plant's primary material delivery and storage area is located.
008	Stormwater	Saucon Creek	18-inch Cast Iron pipe drains 70,000 square foot grassy area and portion of plant drive way between trickling filters and final clarifiers..
009	Stormwater	Saucon Creek	16-inch Cast Iron pipe drains 120,000 square foot area including ingle catch basin in grassy area between intermediate clarifier and trickling filters.
010	Stormwater	Saucon Creek	48-inch CMP drains 11,000 square foot area containing single catch basin in grassy area between existing aeration tanks and intermediate clarifiers.
011	Stormwater	Saucon Creek	24-inch CMP drains 12,000 square foot area containing three catch basins in walkway area near existing aeration tanks.
012	CSO Discharge	Lehigh River	New Dual 36-inch RCP North Interceptor overflow to Lehigh River (east of Minsi Trail Bridge) upstream of Outfall 001 per LTCP. Overflow has screening, sampling, metering and pumping per 2012 NPDES Permit Amendment application. The screened overflow has the capacity to "pass 15 MGD with the pumping capacity of 45 MGD".