

Application Type Renewal
Facility Type Municipal
Major / Minor Minor

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No. PA0029432
APS ID 826443
Authorization ID 998970

Applicant and Facility Information

Applicant Name	<u>PA Department of Human Services (DHS) F.K.A. Department of Public Works (DPW)</u>	Facility Name	<u>Clarks Summit State Hospital</u>
Applicant Address	<u>1451 Hillside Drive</u> <u>Clarks Summit, PA 18411-9504</u>	Facility Address	<u>Clarks Summit State Hospital</u> <u>1451 Hillside Drive</u> <u>Clarks Summit, PA 18411</u>
Applicant Contact	<u>Thomas Carachilo</u>	Facility Contact	<u>Thomas Carachilo</u>
Applicant Phone	<u>(570) 587-7246</u>	Facility Phone	<u>(570) 587-7246</u>
Client ID	<u>51700</u>	Site ID	<u>271078</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>Newton Township</u>
Connection Status	<u>No Limitations</u>	County	<u>Lackawanna</u>
Date Application Received	<u>October 15, 2013</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>October 25, 2013</u>	If No, Reason	<u>-</u>
Purpose of Application	<u>Renewal of Individual Sewage NPDES Permit.</u>		

Summary of Review

The applicant is requesting the renewal of their minor sewage NPDES permit to discharge up to 0.395 MGD of treated sewage effluent into the Falls Creek (stream code # 28678; CWF).

The applicant (at the 10/5/2016 Meeting) indicated that previous eDMR flow data is too inaccurate to be trustworthy during high flow events, impacting potential validity of application flow data which indicated:

- In 2011, their average daily flow was estimated at 0.148 MGD.
- In 2012, their average daily flow was estimated at 0.186 MGD with a maximum December flow of 0.218 MGD.
- See Table 3 for summary of October – December flow data & effluent analytical data (after corrective actions with existing flow meters and new onsite composite samplers).

Background:

- **This is a state-owned/operated hospital with its own 0.600 MGD Trickling Filter STP, originally built in the 1950s. Chapter 92a.2 "POTW" definition now defines state-owned facilities as POTWs.**
- They previously reduced their permitted discharge from 0.60 MGD to 0.395 MGD to become a Phase 4 Chesapeake Bay facility. No annual mass caps in the previous NPDES permit.
- This is a 242 bed hospital facility (at present) per PA DHS website (peak of 1450 beds in the 1940s). SIC Code # 8063 applies to hospitals, with 40 CFR 460 ELG applicable to SIC Code #8063 facilities with existing facilities subject to ELGs for BOD5, TSS, and pH.
- See Treatment Plant Section & Compliance Section regarding ongoing site issues.

Part C Special Conditions: **Part A and B updated per latest NPDES Permit template at time of Draft NPDES Permit Issuance for public comment and change to POTW (per Chapter 92a definition). Part C Changes are bolded:**

Approve	Deny	Signatures	Date
X		James D. Berger, P.E. / Environmental Engineer	March 1, 2017
X		Amy M. Bellanca, P.E. / Environmental Engineer Manager	

Summary of Review

- **Part C.I:** Chesapeake Bay Nutrient conditions suffice for Phase 4 CB facilities per Central Office Direction (unless nutrient trading options need to be included due to reduction in permit basis flow).
- **Part C.II:** **New Schedule of Compliance due to ongoing pattern of ammonia-N exceedences (Chapter 92a.51); due to new POTW requirements to achieve 85% minimum monthly average reduction due to reclassification of facility to POTW per Chapter 92a definition, and due to new TRC limits.**
- **Part C.III:** **New Solids Management standard conditions for non-lagoon Treatment Facilities.**
- **Part C.IV:** **New Toxic Reduction Evaluation (TRE) Conditions for copper due to Reasonable Potential Analysis.**
- **Part C.V:** **New Whole Effluent Toxicity (WET) Testing conditions due to stream impairment with multiple known and potential causes for 55:1 effluent-dominated stream.**
- **Parts C.VI.A, B, C:** Standard conditions (stormwater prohibition; necessary property rights; proper management of residuals).
- **Part C.VI.D:** **New Chlorine Minimization condition due to effluent-dominated stream**
- **Part C.VI.E:** **New Dry stream condition due to effluent-dominated receiving stream with little dilution**
- **Part C.VI.F:** **New Notification of Responsible Operator requirement. The permittee has had noncompliance issues (including discovery of unpermitted discharge) and previous eDMR reporting issues.**
- **Part C.VI.G:** **New O&M Plan conditions due to facility operating far below its original 0.600 MGD design capacity, ongoing pattern of violations, and other new permit requirements.**
- **Part C.VI.H:** **New Site-specific Best Management Practices (BMPs) for the storage, distribution and application of salt and deicing chemicals on the hospital's private roads, driveways, parking lots, and walk ways due to known facility contribution to excessive chlorides and salt ions in the receiving stream. This is a narrative effluent limit. The permittee can choose to implement BMPs from any national or state source.**
- **Part C.VI.I:** Existing Site-specific Condition (discharge/stream changes) retained due to effluent-dominated stream.
- **Part C.VI.J:** **New condition to not require annual Chapter 94 Reports unless the Department specifically requests such submittals.**
- **Part C.VII:** **New Chemical Additive conditions due to concerns over boiler wastewater impacts on the impaired receiving stream and potential for chemical additives to negatively impact receiving stream.**
- **Part C.VIII:** **New TRC Effluent Limitations Below Quantitation Limits conditions because new QBELs are below current DEP Target QLs, but DEP Target QLs might become more sensitive over time.**

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	<u>001</u>	Design Flow (MGD)	<u>0.395</u>
Latitude	<u>41° 29' 8.03"</u>	Longitude	<u>75° 44' 53.44"</u>
Quad Name	<u>Scranton</u>	Quad Code	<u>0740 (3.21.4)</u>
Wastewater Description: <u>Treated sewage</u>			
Receiving Waters	<u>Falls Creek</u>	Stream Code	<u>28678</u>
NHD Com ID	<u>66407933</u>	RMI	<u>3.3900</u>
Drainage Area	<u>0.96 square miles</u>	Yield (cfs/mi ²)	<u>0.01238</u>
Q ₇₋₁₀ Flow (cfs)	<u>0.011 CFS</u>	Q ₇₋₁₀ Basis	<u>PAStreamstats-derived LFY</u>
Elevation (ft)	<u>~1160 Feet</u>	Slope (ft/ft)	<u>-</u>
Watershed No.	<u>4-G</u>	Chapter 93 Class.	<u>CWF</u>
Existing Use	<u>-</u>	Existing Use Qualifier	<u>-</u>
Exceptions to Use	<u>-</u>	Exceptions to Criteria	<u>-</u>
Assessment Status	<u>Impaired receiving stream, with facility contributing to greater impairment downstream of Outfall #001 per 12/4/2015 DEP Biologist "Cause/Effect Stream Survey.</u>		
Cause(s) of Impairment	<u>See below</u>		
Source(s) of Impairment	<u>See below</u>		
TMDL Status	<u>-</u>	Name	<u>-</u>
<u>Background/Ambient Data: See Table 2</u>		<u>Data Source: 2/4/2015 DEP Biologist "Cause/Effect Stream Survey included 11/3/2015 Stream sampling immediately upstream of the Outfall #001 discharge (FC01) and ~400 feet Downstream (FC02)</u>	
Nearest Downstream Public Water Supply Intake	<u>Danville</u>		
PWS Waters	<u>Susquehanna River</u>	Flow at Intake (cfs)	<u>-</u>
PWS RMI	<u>-</u>	Distance from Outfall (mi)	<u>76</u>

Changes Since Last Permit Issuance: Permit coordinates updated per application. Illicit discharge (boiler blowdown was previously piped to stream until 2016) was found and ended. Stream now impaired.

Other Comments:

- **Effluent-dominated Stream:** The discharge location is at the Falls Creek headwaters, in an effluent-dominated location, but the facility discharge has historically been a fraction of its permitted discharge capacity. This is a 55:1 effluent dominated stream at NPDES permit basis flows.
- **Chesapeake Bay Monitoring:** This is a Phase 4 Chesapeake Bay facility. The 2009 NPDES Permit required two years of Chesapeake Bay monitoring. No existing cap loads. **NOTE: Inaccurate flow measurement and eDMR reporting issues (see Compliance Section) might impact validity of previously reported TN/TP loadings (affecting overall monthly average flows). Monitoring is being required in this permit term.**
- **Falls Creek Stream Impairment Status:** E-maps indicated that the receiving stream was "attaining" in 1998, but that information is now obsolete. The receiving stream is impaired for aquatic life per DEP Biologist Report (see below).
 - **Change in Stream Status:** 1998 was before the eDMR-documented high I&I flows and year-round ammonia-N exceedences (higher temperatures would result in greater ammonia-N toxicity), and

updated Reasonable Potential Analysis/water quality modeling indicating reasonable potential for impacts at discharge effluent concentrations.

- **Biologist Report:** The 12/4/2015 DEP Biologist “Cause/Effect Stream Survey” determined:
 - The receiving stream was impaired for aquatic life upstream of the facility.
 - The facility has caused changes to the macroinvertebrate community immediately downstream of the discharge (i.e. contributing to ongoing impairment).
 - Upstream sampling indicated elevated specific conductivity, chloride, and TDS from an unknown upstream source. See Table 2.
 - Downstream sampling showed increased specific conductivity, chloride, and TDS due to additional contribution from the WWTP.
- **Known/Potential Causes of Impairment:** The Technical Review has identified a number of known and potential causes for stream impairment for this heavily effluent-dominated stream that might have a synergistic/cumulative impact:
 - **Ongoing Exceedences of the Ammonia-N WQBELs:** Being addressed by Chapter 92a.51 Schedule of Compliance.
 - **Unapproved Boiler Discharge Outfall:** Outfall has been eliminated.
 - **Toxic Pollutants:** The Reasonable Potential Analysis showed that copper had Reasonable Potential to cause exceedances in the receiving stream. TRE conditions have been added to the permit, with new limits effective in three years.
 - **Salts (Chapter 92a.10; 92a.46(1)):** Additional sampling data, submitted January 2017, indicated a high specific conductivity in the site effluent (triple DEP Biologist upstream sample) indicating site effluent is contributing salt ions to the effluent-dominated stream. The DEP Biologist Report and sampling showed that the facility is a contributor to elevated stream TDS, chlorides, and salt ion concentrations (winter salts include: Sodium Chloride; Calcium Chloride; Magnesium Chloride; Potassium Chloride; and other compounds) which can impact stream biology.
 - This permit will require additional monitoring for Specific Conductivity, TDS, Chlorides, Sulfates, and Bromides to gather information on effluent loadings.
 - This permit will require implementation of stormwater Best Management Practices in regard to winter “salting” as a narrative effluent limit to prevent excessive salt residues from impacting the waters of the Commonwealth. There are a variety of nationally recognized sources of salt storage, distribution, and application (parking lots, roads, walkways) Best Management Practices that the facility can choose from. The need for additional stormwater outfalls and stormwater-related practices will be re-evaluated in the next NPDES Permit Renewal cycle.
 - **Therapeutic/Pharmaceutical Products and Breakdown Products:** The State Hospital STP receives sewage containing therapeutic/pharmaceutical products and/or their breakdown products. (The STP also receives flows from the Abington Elementary and Middle schools (unmeasured by STP)). Whole Effluent Toxicity (WET) Testing (Chapter 92a.27(a)(2)) will be required. The WET Testing requirement will be re-evaluated during the next NPDES permit renewal cycle. Factors requiring WET Testing in this permit term include the cumulative and synergistic impacts of:
 - ❖ Known stream impairment for aquatic life
 - ❖ Variability of hospital effluent (due to potential pass-through of therapeutic drugs & pharmaceuticals, etc.),
 - ❖ 55:1 effluent-dominated stream precluding dilution with high flows reported
 - ❖ Presence of high TDS in the site effluent and elevated stream concentration.
 - ❖ Elevated stream concentrations of chlorides and salt ions (sodium, calcium, magnesium, potassium, etc.)
 - ❖ Ongoing pattern of noncompliance (ammonia-N exceedences and apparent unpermitted discharge to the waters of the Commonwealth).
 - **High Flows:** The available (inaccurate flow meter data) eDMR reporting indicates high flows have been occurring (after applicant promises to correct mistyped eDMR data). High flows can impact aquatic life. The new O&M Plan and more accurate flow data will clarify and address peak wet weather flows as needed.

Treatment Facility Summary				
Treatment Facility Name: Clarks Summit State Hospital				
WQM Permit No.	Issuance Date	Scope		
8530	1954	The 1954 Permit required a complete new STP and outfall be constructed including screen chamber, two "high rate recirculating type" rock filters, final clarifier, sludge digester, glass-enclosed sludge drying beds, control building, chlorination system, etc. with 2500 LF outfall sewer to creek. Plant originally designed for 0.6 MGD annual flow; 1.05 MGD peak flow; and minimum flow of 0.35 MGD per 1954 Final Report and Basis for Design.		
3592402	2/25/1992	STP modification involving the construction of an aerobic digester and dual component chlorine contact tank. The existing chlorination system was to continue in use.		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Trickling Filter With Settling	Hypochlorite (with dechlorination)	0.395000
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.395 MGD (permit) 0.600000 (original design)	610 lb BOD5/day* (original design)	Not Overloaded	Aerated Sludge digester with abandoned sludge drying beds onsite.	disposal

*Original 8/20/1954 "Sewage Collection and Treatment Project Final Report and Basis of Design" assumed that the proposed plant would have the capacity to service 2680 persons (patients and employees) at the original 0.60 MGD design flow. The High Rate Recirculating Rock Filters (i.e. Trickling Filter) Primary Filter had an identified design loading of 450 lb BOD/day (including an allowance for recirculation) and the second filter had an identified design loading of 160 lbs BOD/day (including an allowance for recirculation). i.e. ~610 lb BOD/day design capacity (with allowance for recirculation). The May 2012 Unitech Report assumed the primary biofilter (trickling filter) had 430 lb BOD/day capacity (page 25) and the second filter BOD capacity was not explicitly assumed. The May 2012 Report Appendix E (Basic Design Criteria) assumed an annual average 659 lb BOD/day loading at 200 mg/l BOD concentration for design comparison.

Changes Since Last Permit Issuance:

- **High flow measurement/reporting issues corrected in October 2016. October – December 2016 Flow meter data now indicates actual site flows in the 0.050 – 0.100 MGD range. The applicant consultant noted potential for septic conditions and starved treatment unit biology in this type of flow scenario.**
- **Unapproved discharge for boiler discharge has been terminated. Boiler wastewater going now to STP, with unknown chemical additives. Potential source of salts and other chemicals to the STP and its effluent.**
- The April 22, 2015 PADHS Letter indicated that several minor upgrades have been implemented (Trickling Filter media replacement, installation of VFD driven recirculation pumps, and some SCADA features).
- The January 30, 2015 PADHS Letter noted that the STP had:
 - Upgraded the STP electrical systems.
 - Installed of a Muffin Monster/Grinder pump at head of plant.
 - Installed of new dispensing tanks and chemical feed pumps for the sodium hypochlorite and sodium bisulfite.

Other Comments:

- **Future Site Changes:** The permittee will be exploring options for either Regionalization (connection to the local POTW) or WWTP upgrading in order to come into compliance per meetings with Department.

- Minimum Average Reduction Percentage: Using application influent and effluent data, they might be in compliance with the 85% reduction POTW requirement based upon available data at the time of influent sampling. See table below.

Constituent	Influent	Effluent	% Reduction
BOD5	269 mg/l average	4.2 mg/l CBOD5* average	BOD5 = CBOD5 plus nitrogenous oxygen demand. Using ammonia-N concentration to ball park the reduction results in an ~ 97% reduction.
TSS	209 mg/l average	7.3 mg/l average	96.5% reduction

- NPDES Permit basis flow reduced to from 0.60 MGD to 0.395 MGD (no STP modification) in 2009 NPDES Permit per applicant request (going from Phase 3 to Phase 4 Chesapeake Bay facility). There was no associated WQM Permit for this change.
- **The May 2012 “Wastewater Planning and Feasibility Study” for the Clark Summit State Hospital (prepared by UNI-TEC Consulting Engineers) was intended to address winter ammonia-N exceedences, potential new Chesapeake Bay mass caps (Total Nitrogen & Total Phosphorus), and operations up to Design Year 2035. Assorted WWTP upgrade recommendations were identified that have not been implemented, due to funding issues per the April 22, 2015 PADHS Letter (plus several implemented changed identified above). NOTE: DPW/DHS has indicated that it thinks the report recommendations are too expensive and potentially inadequate (proposed geodesic domes and other improvements might not be enough to achieve/maintain adequate temperatures for biological treatment of Ammonia-N or other constituents) as an interim solution to site issues at 10/5/2016 meeting. Report Upgrade recommendations (summarized as ammonia-N reduction-related upgrade options) included:**
 - Headworks:
 - Remove comminutor and replace with automatic fine screen (with bypass), screenings washer/compactor, and storage/disposal vessel to address “large quantities of rags and other suspended materials characteristic of the raw wastewater influent to plant”.
 - Baffling in flow distribution chamber (downstream of Parshall flume) should be upgraded to minimize influences of variable-rate primary recirculation on hydraulics.
 - Bioremediation in upstream facilities as standard procedures to minimize grease problems in headworks and subsequent operations.
 - Primary Clarifiers: Covering clarifiers (geodesic domes) to preserve heat to optimize Trickling Filter performance & control odors.
 - Trickling Filters:
 - Covering trickling filters (geodesic domes) to preserve heat & optimize biological nitrification (i.e. ammonia-N reduction)
 - Forced ventilation system to provide desired oxygen levels in Trickling Filters (with some temperature benefit per Study).
 - Operational changes to optimize nitrification (first Filter to reduce CBOD5 and second dedicated to removing ammonia-N in series operation). **NOTE: In series operation, the two trickling filters will not have redundancy.**
 - Plant Recirculation System:
 - Modify flow recirculation system to allow recirculation after primary clarification to reduce heat loss & decrease hydraulic/solids loadings on clarifiers
 - SCADA Monitoring & Control system (not just SCADA features) to better handle variable loadings
 - Flow metering on system for all recirculation pumps (unknown if implemented or not)
 - Recirculation piping to provide an option for partial/full recirculation of primary trickling filter flows without going through primary clarifiers
 - Chlorine Contact Tank: Instrumentation to monitor and record chlorine residual and pH in effluent.
 - Others:
 - Chemical feed systems (alum and soda ash) for pH adjustment in the secondary trickling filter to optimize nitrification (located in proposed screening building or elsewhere in control building) and for potential TP treatment.
 - Denitrification Filtration System (sand filtration system for TN reduction with new building, associated accessory equipment).

- Convert decommissioned sludge drying bed/greenhouses into storage building for chemicals, equipment, etc.
- The Study (page 17) noted that the Sludge Aeration Tank “would be a potential means of supplemental treatment” “should the need arise to provide nitrification treatment beyond that afforded by the secondary biofilter” (i.e. secondary trickling filter).

NOTE: The Study also looked at two other options: Alternative B SBR system and Alternative C Multichannel Oxidation Ditch (MOD) System.

- **High Wet Weather Flows Impact:** Cannot be quantified at present. Old flow meter eDMR data was inaccurate at higher flows per the permittee, and there is insufficient data (correlated to rainfall) to quantify potential peak wet weather flows and/or issues at present.
 - **Available eDMR Data:** Inaccurate for higher flows per 10/5/2016 Meeting discussions, but several trends noted:
 - Pattern of worsening peak wet weather flows is consistent with an aging (1950s) STP/sewer system.
 - Year-round ammonia-N violations coinciding with reported increases in wet weather flows per available eDMR data (not updated by permittee).
 - At the 10/5/2016 Meeting, the applicant indicated it expected high peak wet weather flows (after installation of accurate flow meters as of 10/4/2016) and was planning sewer work in conjunction with any STP upgrade/replacement project.
 - **Inspector Comments:** Roof drains were noted as a problem in the 2/1/2012 Inspection Report.
 - **Uni-Tech Report Study:** The May 2012 Uni-Tec Study’s 11/8/2011 Meeting Minutes (no DEP attendees) indicated dry/wet weather flow estimates (40 – 50,000 GPD dry weather flows, and 900,000+ GPD wet weather flows) but the wet weather flow data is now suspect per Permittee statements. The 1/9/2012 – 2/15/2012 School flow monitoring indicated dry weather flows of only 0.0185 MGD, but seasonal conditions limit usefulness of data in terms of gauging I&I during peak precipitation events during rest of year.

Compliance History

DMR Data for Outfall 001 (from April 1, 2014 to March 31, 2015): OLD DATA (pre-updating of eDMR by applicant)

Parameter	Apr 14	May 14	Jun 14	Jul 14	Aug 14	Sep 14	Oct 14	Nov 14	Dec 14	Jan 15	Feb 15	Mar 15
Flow (MGD) Average Monthly	.351	.126	0.6	0.7	.75	0.55	076	.053	.188	.051	.105	.105
Flow (MGD) Daily Maximum	.487	.242	.98	.101	1.58	0.64	420	1.58	.204	.130	.275	.377
pH (S.U.) Maximum	7.3	7.2	7.3	7.3	7.4	7.3	7.3	7.3	7.3	7.3	7.9	7.4
pH (S.U.) Minimum	7.1	7.0	7	7.1	7.0	7.0	7	7.1	7.1	7	7.1	7.1
DO (mg/L) Instantaneous Minimum	10	10	10	10	7.0	12	10	12	12	9	10.0	10.0
TRC (mg/L) Average Monthly	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
TRC (mg/L) IMAX	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
CBOD5 (lbs/day) Average Monthly	4	16	2	80.8	15.3	8.8	24	24	8.6	5.6	7.4	7.8
CBOD5 (lbs/day) Weekly Average	113	39	17	4.9	20.7	10.2	87	54	22.0	15.9	17.0	15.3
CBOD5 (mg/L) Average Monthly	3.5	4	10	6	3	2	24	39	30	8.7	20.7	13.0
CBOD5 (mg/L) Weekly Average	2.7	12	40	13	4.2	2	87	90	91	18.5	41.5	19.6
TSS (lbs/day) Average Monthly	11	36.3	40.0	9.8	43.1	37.8	48	3.0	83.1	8.5	9.3	7.7
TSS (lbs/day) Weekly Average	32	23.5	59.6	175.6	54.1	45.8	27	3.4	5.1	17.2	15.4	12.5
TSS (mg/L) Average Monthly	8	10	8	11	10	.9	7	7	7	14.4	22.5	12.5
TSS (mg/L) Weekly Average	9	28	11	17	11	10	11	11	11	20.	24	18
Fecal Coliform (CFU/100 ml) Geometric Mean	198	44	3	16	2	2	2	4	72	10	2	2
Ammonia (lbs/day) Average Monthly	7	5.8	0.4	0.01	2.0	14.3	7	1.9	1.0	3.4	3.0	5
Ammonia (mg/L) Average Monthly	2.8	1.4	0.4	0.02	.83	3.2	3.2	4.5	2.6	5.4	6.6	7.5

DMR Data for Outfall 001 (from July 1, 2015 to June 30, 2016): OLD DATA (pre-updating of eDMR by applicant)

Parameter	JUN-16	MAY-16	APR-16	MAR-16	FEB-16	JAN-16	DEC-15	NOV-15	OCT-15	SEP-15	AUG-15	JUL-15
Flow (MGD) Average Monthly	0.041	0.062	0.056	0.232	1.088	0.795	0.088	0.077	0.073	0.054	0.056	0.048
Flow (MGD) Daily Maximum	0.113	0.146	0.242	0.989	4.315	1.635	0.182	0.229	0.238	0.282	0.178	0.169
pH (S.U.) Minimum	6.63	7.4	7.5	6.8	7.1	7.0	7.0	7.1	6.8	7	7.2	7
pH (S.U.) Maximum	7.74	8.5	7.9	7.5	7.8	7.9	8.0	7.4	7.4	7	7.3	7.3
DO (mg/L) Instantaneous Minimum	6.69	7.9	7.5	8.4	9.8	9.5	9.5	8.0	6.2	6.5	6.5	6.8
TRC (mg/L) Average Monthly	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	00	0.01	0.01
TRC (mg/L) Instantaneous Maximum	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	00	0.01	0.01
CBOD5 (lbs/day) Average Monthly	1.3	1.6	9.5	26.3	70.8	190.8	2.8	2.8	6	3.3	1.9	1.5
CBOD5 (lbs/day) Weekly Average	1.8	2.3	30.2	74.3	102.0	FF	4.1	3.4	9.6	4.7	3.6	2.3
CBOD5 (mg/L) Average Monthly	4.6	3.7	8.8	9.8	8.0	39.0	3.4	3.3	6	9.3	4.8	4.2
CBOD5 (mg/L) Weekly Average	9.0	4.0	15.0	11.0	10.0	FF	4.0	3.0	13	5	9	6
TSS (lbs/day) Average Monthly	2.2	2.3	12.4	21.3	91.3	60.1	5.6	6.8	17.2	6.5	5.1	5.5
TSS (lbs/day) Weekly Average	3.6	2.9	42.3	45.4	96.9	FF	7.2	12.5	57.7	9.5	5.9	16.7
TSS (mg/L) Average Monthly	8.0	5.3	10.0	12.0	8.0	11.0	6.8	7.0	20	17	12	13
TSS (mg/L) Weekly Average	8.0	6.0	21.0	24.0	11.0	FF	9.5	11.0	48	23	15	29
Fecal Coliform (CFU/100 ml) Geometric Mean	8	< 2	1	16	448	127	4	18	1	95	5	18
Nitrate-Nitrite (mg/L) Average Monthly						3.87	7.79	5.78				
Nitrate-Nitrite (lbs) Total Monthly						FF	FF	5.1				
Total Nitrogen (mg/L) Average Monthly						FF	FF	FF				

Total Nitrogen (lbs) Total Monthly						FF	FF	FF				
Ammonia (lbs/day) Average Monthly	0.01	0.4	2.0	10.1	37.4	59.3	1.0	1.2	1.5	0.7	0.2	0.3
Ammonia (mg/L) Average Monthly	0.48	< 5.3	2.39	3.71	3.77	10.74	1.46	1.41	2.87	1.79	0.47	0.57
Ammonia (lbs) Total Monthly						FF	FF	FF				
TKN (mg/L) Average Monthly						FF	FF	E				
TKN (lbs) Total Monthly						FF	FF	E				
Total Phosphorus (mg/L) Average Monthly						FF	FF	FF				
Total Phosphorus (lbs) Total Monthly						FF	FF	FF				
Nitrate-Nitrite (lbs) Total Monthly						FF	FF	5.1				

DMR Data for Outfall 001 (from February 1, 2016 to January 31, 2017): From 3/1/2017 WMS/eDMR Query.

Parameter	JAN-17	DEC-16	NOV-16	OCT-16	SEP-16	AUG-16	JUL-16	JUN-16	MAY-16	APR-16	MAR-16	FEB-16
Flow (MGD)												
Average Monthly	0.068	0.056	0.038	0.041	0.053	0.056	0.043	0.041	0.062	0.056	0.052	0.109
Flow (MGD)												
Daily Maximum	0.133	0.186	0.132	0.112	0.118	0.159	0.145	0.113	0.146	0.242	0.099	0.432
pH (S.U.)												
Minimum	6.6	7.3	7.2	7.4	6.1	6.9	6.8	6.63	7.4	7.5	6.8	7.1
pH (S.U.)												
Maximum	8.0	8.3	8.1	9.0	8.0	8.6	8.5	7.74	8.5	7.9	7.5	7.8
DO (mg/L)												
Instantaneous												
Minimum	7.1	10.2	8.17	6.2	6.1	6.21	6.16	6.69	7.9	7.5	8.4	9.8
TRC (mg/L)												
Average Monthly	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.00	0.00	0.00	0.01
TRC (mg/L)												
Instantaneous												
Maximum	0.04	0.04	0.04	0.02	0.01	0.01	0.01	0.04	0.00	0.00	0.00	0.01
CBOD5 (lbs/day)												
Average Monthly	13.4	7.4	7.1	12.6	6.9	4.3	3.7	1.3	1.6	9.5	4.9	7.1
CBOD5 (lbs/day)												
Daily Maximum	19.2	4.4	9.4	16.7	19.2						7.4	10.2
CBOD5 (lbs/day)												
Weekly Average						1.30	6.1	1.8	2.3	30.2		
CBOD5 (mg/L)												
Average Monthly	27.8	14.8	25.2	32.7	4.84	6.80	11.8	4.6	3.7	8.8	9.8	8.0
CBOD5 (mg/L)												
Daily Maximum	56.4	17.3	26.3	36.8	9.34						11.0	10.0
CBOD5 (mg/L)												
Weekly Average						10.6	23.0	9.0	4.0	15.0		
TSS (lbs/day)												
Average Monthly	7.3	2.8	2.1	7.8	9.1	5.1	6.0	2.2	2.3	12.4	5.4	9.1
TSS (lbs/day)												
Daily Maximum	14.3	3.2	3.5	10.7	25.8						9.0	16.0
TSS (lbs/day)												
Weekly Average						8.6	6.2	3.6	2.9	42.3		
TSS (mg/L)												
Average Monthly	17.0	7.0	7.33	22.0	18.0	8.90	18.0	8.0	5.3	10.0	12.0	8.0
TSS (mg/L)												
Daily Maximum	42.0	8.0	9.5	34.0	31.0						24.0	11.0
TSS (mg/L)												
Weekly Average						13.0	24.0	8.0	6.0	21.0		

Fecal Coliform (CFU/100 ml) Geometric Mean	1163	19	5.46	44	37	54	15	8	< 2	1	16	448
Ammonia (lbs/day) Average Monthly	1.2	0.6	0.9	1.8	2.5	0.5	0.4	0.01	0.4	2.0	1.9	3.77
Ammonia (mg/L) Average Monthly	2.90	1.5	3.73	5.03	4.84	0.81	1.56	0.48	< 5.3	2.39	3.71	3.77

Compliance History

Effluent Violations for Outfall 001 (from April 1, 2014 to March 31, 2015): OLD DATA (pre-updating of eDMR by applicant)

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Ammonia	04/30/14	Avg Mo	7	lbs/day	4.9	lbs/day
Ammonia	04/30/14	Avg Mo	2.8	mg/L	1.5	mg/L
Ammonia	04/30/14	Avg Mo	7	lbs/day	4.9	lbs/day
Ammonia	04/30/14	Avg Mo	2.8	mg/L	1.5	mg/L
Ammonia	05/31/14	Avg Mo	5.8	lbs/day	1.6	lbs/day
Ammonia	05/31/14	Avg Mo	1.4	mg/L	0.5	mg/L
TSS	07/31/14	Wkly Avg	175.6	lbs/day	148.2	lbs/day
Ammonia	08/31/14	Avg Mo	2.0	lbs/day	1.6	lbs/day
Ammonia	08/31/14	Avg Mo	.83	mg/L	0.5	mg/L
Ammonia	09/30/14	Avg Mo	14.3	lbs/day	1.6	lbs/day
Ammonia	09/30/14	Avg Mo	3.2	mg/L	0.5	mg/L
CBOD5	10/31/14	Wkly Avg	87	mg/L	40.0	mg/L
Ammonia	10/31/14	Avg Mo	7	lbs/day	1.6	lbs/day
Ammonia	10/31/14	Avg Mo	3.2	mg/L	0.5	mg/L
CBOD5	11/30/14	Avg Mo	86	mg/L	25.0	mg/L
CBOD5	11/30/14	Wkly Avg	218	mg/L	40.0	mg/L
Ammonia	11/30/14	Avg Mo	4.5	mg/L	1.5	mg/L
CBOD5	11/30/14	Avg Mo	39	mg/L	25.0	mg/L
CBOD5	11/30/14	Wkly Avg	90	mg/L	40.0	mg/L
Ammonia	11/30/14	Avg Mo	4.5	mg/L	1.5	mg/L
CBOD5	11/30/14	Avg Mo	39	mg/L	25.0	mg/L
CBOD5	11/30/14	Wkly Avg	90	mg/L	40.0	mg/L
Ammonia	11/30/14	Avg Mo	4.5	mg/L	1.5	mg/L
CBOD5	12/31/14	Avg Mo	30	mg/L	25.0	mg/L
CBOD5	12/31/14	Wkly Avg	91	mg/L	40.0	mg/L
Ammonia	12/31/14	Avg Mo	2.6	mg/L	1.5	mg/L
Ammonia	01/31/15	Avg Mo	5.4	mg/L	1.5	mg/L
CBOD5	02/28/15	Wkly Avg	41.5	mg/L	40.0	mg/L
Ammonia	02/28/15	Avg Mo	6.6	mg/L	1.5	mg/L
CBOD5	02/28/15	Wkly Avg	41.5	mg/L	40.0	mg/L
Ammonia	02/28/15	Avg Mo	6.6	mg/L	1.5	mg/L
Ammonia	03/31/15	Avg Mo	5	lbs/day	4.9	lbs/day
Ammonia	03/31/15	Avg Mo	7.5	mg/L	1.5	mg/L

Effluent Violations for Outfall 001, from: August 1, 2015 To: June 30, 2016: OLD DATA (pre-updating of eDMR by applicant)

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
CBOD5	01/31/16	Avg Mo	190.8	lbs/day	82.4	lbs/day
CBOD5	01/31/16	Avg Mo	39.0	mg/L	25.0	mg/L
TSS	10/31/15	Wkly Avg	48	mg/L	45.0	mg/L
Ammonia	03/31/16	Avg Mo	10.1	lbs/day	4.9	lbs/day
Ammonia	02/29/16	Avg Mo	37.4	lbs/day	4.9	lbs/day
Ammonia	01/31/16	Avg Mo	59.3	lbs/day	4.9	lbs/day
Ammonia	02/29/16	Avg Mo	3.77	mg/L	1.5	mg/L
Ammonia	10/31/15	Avg Mo	2.87	mg/L	0.5	mg/L
Ammonia	09/30/15	Avg Mo	1.79	mg/L	0.5	mg/L
Ammonia	01/31/16	Avg Mo	10.74	mg/L	1.5	mg/L
Ammonia	03/31/16	Avg Mo	3.71	mg/L	1.5	mg/L
Ammonia	04/30/16	Avg Mo	2.39	mg/L	1.5	mg/L
Ammonia	05/31/16	Avg Mo	< 5.3	mg/L	0.5	mg/L

Effluent Violations for Outfall 001, from: March 1, 2016 To: January 31, 2017: From 3/1/2017 WMS/eDMR Query:

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
CBOD5	10/31/16	Avg Mo	32.7	mg/L	25.0	mg/L
CBOD5	11/30/16	Avg Mo	25.2	mg/L	25.0	mg/L
CBOD5	01/31/17	Avg Mo	27.8	mg/L	25.0	mg/L
CBOD5	01/31/17	Daily Max	56.4	mg/L	40.0	mg/L
Ammonia	09/30/16	Avg Mo	2.5	lbs/day	1.6	lbs/day
Ammonia	09/30/16	Avg Mo	2.5	lbs/day	1.6	lbs/day
Ammonia	03/31/16	Avg Mo	10.1	lbs/day	4.9	lbs/day
Ammonia	10/31/16	Avg Mo	1.8	lbs/day	1.6	lbs/day
Ammonia	03/31/16	Avg Mo	10.1	lbs/day	4.9	lbs/day
Ammonia	11/30/16	Avg Mo	3.73	mg/L	1.5	mg/L
Ammonia	10/31/16	Avg Mo	5.03	mg/L	0.5	mg/L
Ammonia	01/31/17	Avg Mo	2.90	mg/L	1.5	mg/L
Ammonia	04/30/16	Avg Mo	2.39	mg/L	1.5	mg/L
Ammonia	03/31/16	Avg Mo	3.71	mg/L	1.5	mg/L
Ammonia	05/31/16	Avg Mo	< 5.3	mg/L	0.5	mg/L
Ammonia	08/31/16	Avg Mo	0.81	mg/L	0.5	mg/L
Ammonia	09/30/16	Avg Mo	4.84	mg/L	0.5	mg/L
Ammonia	07/31/16	Avg Mo	1.56	mg/L	0.5	mg/L

Summary of Inspections: 10/13/2015, 12/21/2015, and 01/04/2017 Inspections noted violations.

Other Comments:

- **Inaccurate eDMR data:** Original eDMR/compliance output given above to show pattern of noncompliance, and due to nature of problems (data entry errors can be corrected if they retained original records but inaccurate flow measurements at higher flows cannot be easily corrected (with flow meter issues only addressed circa October 2016)). In addition:
 - Bad flow data (obviously missing decimal places in assorted entries) remained in eDMR as of 1/7/2017.
 - See Communications Log for 10/5/2016 Meeting Highlights, including DPW/DHS-provided information about inaccurate flow data.
 - eDMR assumed that the existing daily max CBOD5/TSS limits were weekly average limits (unlike paper DMRs).
 - Not sure if new WMS/eDMR data format problem due to data updating or otherwise.
- **Administrative Extension:** A 1/5/2015 Administrative Letter Extension was issued. Renewal application was not timely.
- **Open Violations:** 3/1/2017 WMS Query (Open violation for client by permit number) indicated that there are eight open violations. Three open violations for this facility (exceedances and discharge from unpermitted outfall/boiler since terminated). Two open air violations for an inactive Philadelphia facility and two open Safe Drinking Water violations for a Selinsgrove facility. **This Draft NPDES Permit is being issued to help the permittee to understand and address ongoing compliance issues.**
- **Pattern of Exceedances:** Ammonia-N exceedances have spread from winter-only violations to year-round. Pattern of existing CBOD5 and TSS exceedances (except to extent that inaccurate high flow measurement/reporting might have impacted calculated mass loadings on the receiving stream).
- **Application Sampling Data:** The Application-reported effluent data indicated exceedences or potential exceedences:
 - 22 mg/l max Ammonia-N is an exceedence, and the average 1.5 mg/l concentration would be a summer exceedence.
 - 20,000/100 ml max Fecal coliform maximum concentration and the average concentration of 596/100 ml. Chapter 92a.47 (Secondary Treatment) IMAX limit (being added this permit cycle) was exceeded.
 - 2.50 mg/l max TRC concentrations and 0.95 mg/l minimum TRC concentration are above existing limits and above reported eDMR data.
 - 68 mg/l CBOD5 max concentration.
- **Significant I&I Issues:** The overall eDMR pattern/trend of increasing peak wet weather flows is consistent with an old, aging STP & collection system, even given inaccurate higher flow data.
 - See Treatment Section for background information.
 - The application-reported annual average daily flows were 0.186 MGD (2012) and 0.148 MGD (2011, year of record precipitation in Northeastern PA). Per eDMR data (pre-updating), daily max flows reached 1.03 MGD in 2011 (6.9 peaking factor) and only 0.42 MGD in 2012 (2.25 peaking factor).
 - The I&I problem has increased significantly within the last few years which indicates an apparent trend:
 - From March 2009 through 2012, all monthly average flows were below the permit basis flow (0.395 MGD), and reported daily max flow volumes were substantially below figures reported for 2013 and 2014.
 - In 2013, the daily max flows reached 3.73 MGD, with five (5) months straight where monthly flows exceeded the permit basis flow of 0.395 MGD (with one month at 1.01 MGD monthly average flow) during the June – October time-frame (including summers when the school sources would not be generating significant sewage flows). The 3.73 MGD flow was a factor of 9.4 above the permit basis flow and a factor of 6.2 above the 0.60 MGD STP hydraulic capacity.
 - In 2014, June – October was a similar period where each monthly flow exceeded the permit basis flow.
 - High flows can lead to operational problems including Ammonia-N, TSS and CBOD5 effluent exceedences (such as reported).

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Development of Effluent Limitations

Outfall No. <u>001</u>	Design Flow (MGD) <u>0.395</u>
Latitude <u>41° 29' 8.03"</u>	Longitude <u>75° 44' 53.44"</u>
Wastewater Description: <u>Treated sewage</u>	

Permit limits and/or monitoring:

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
BOD5	23.00 Lbs/d 32.07 Lbs/d 30.0 45.0 60.0 85%	Monthly Average Daily Max Monthly Average Weekly Average IMAX Minimum Monthly Removal	New ELG limits being imposed per 40 CFR 260, superseding previous CBOD5 limits. For convenience to the applicant, the existing CBOD5 concentration limits have been replaced by the equivalent BOD5 Chapter 92a.47/EPA Secondary Treatment limits for operator convenience and cost-savings plus antibacksliding considerations. As a POTW, the 85% minimum reduction requirements applied. See below for details.
CBOD5	82.4 Lbs/d 131.8 Lbs/d 25.0 40.0 50.0	Monthly Average Daily Max Monthly Average Daily Max -IMAX	Previous Secondary Treatment limits (Chapter 92a.47) superseded by more stringent BOD5 limits (CBOD5 is a portion of the BOD5) and for consistency with Federal ELG.
TSS	21.32 Lbs/d 36.22 Lbs/d 30.0 45.0 60.0 85%	Monthly Average Daily Max Monthly Average Weekly Average IMAX Minimum Monthly Removal	New ELG limits being imposed per 40 CFR 260, superseding previous TSS mass limits (98.9 lbs/d Monthly average; 148.2 lbs/day Daily Max). See below for details. Existing concentration Technology limit (Chapter 92a.47) retained due antibacksliding considerations. Daily Max was in previous permit, converted to weekly average for POTW (Chapter 92a.47 secondary treatment limit). As a POTW, the 85% minimum reduction requirements applied. See below for further details.
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 Chapter 92a.47.
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 Chapter 92a.47.
Total Residual Chlorine (TRC) – Interim limit for 57 months.	0.02 0.04	Average Monthly IMAX	Interim existing limits. The facility has dechlorination facilities per May 2012 Study.
Total Residual Chlorine (TRC) – Final limits for 58 th month.	0.011 0.037	Average Monthly IMAX	Revised WQBEL from TRC Spreadsheet, effective in 57 months with old limits retained. The facility has dechlorination facilities per May 2012 Study. New limits below DEP Target QL, therefore the Part

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			C.VIII (TRC limits below Quantitation Limits) conditions will apply.
Ammonia-Nitrogen (May 1 - Oct 31)	Report (lbs) 1.6 (lbs/d) 0.5 Report 1.0	Total Annual Monthly Average Monthly Average Daily Max IMAX	Existing WQBEL supported by updated water quality modeling and retained due to antibacksliding considerations, and effluent-dominated stream. Daily Max reporting added. Chesapeake Bay monitoring added.
Ammonia-Nitrogen (Nov 1 - Apr 30)	Report (lbs) 4.9 (lbs/d) 1.5 Report 3.0	Total Annual Monthly Average Monthly Average Daily Max IMAX	See above. Winter multiplier used.
Dissolved Oxygen (DO)	6.0	Minimum	Existing WQBEL supported by Water Quality Modeling
Total Phosphorus	Report (lbs) Report (lbs) Report (lbs/day) Report Report	Total Annual (Net) Total Annual Monthly Average Monthly Average Daily Max	Monitoring updated per current Chesapeake Bay monitoring requirements for a Phase 4 Significant Chesapeake Bay discharger. Net loadings added in event that they want to trade nutrients.
Total Nitrogen (TKN + Nitrate-Nitrite-N measured in same sample)	Report (lbs) Report (lbs) Report (lbs/day) Report Report	Total Annual (Net) Total Annual Monthly Average Monthly Average Daily Max	See above
TDS, Chlorides, Sulfates, and Bromide	Report (lbs/day) Report	Monthly Average Monthly Average	TDS concentration triggers monitoring requirements per Reasonable Potential analysis and due to stream impairment with site contributing to elevated stream TDS, Chlorides, and sulfates concentrations.
Copper (Interim – 57 months)	Report (lbs/d) Report Report	Monthly Average Monthly Average Daily Max	New monitoring requirement for interim time-frame with TRE conditions and 57-month compliance schedule due to new WQBEL per Reasonable Potential Analysis.
Copper (Final – month 58)	Report (lbs/d) 0.016 0.025 0.032	Monthly Average Monthly Average Daily Max IMAX	See above. IMAX derived from multiplier.
Specific Conductivity	Report (umhos)	Daily Max	Due to high effluent concentrations measured in 2016, addition of boiler wastewater to STP, with salts being a known cause of stream impairment.
Raw Sewage Influent BOD5 and TSS	Report (lbs/day) Report (lbs/day) Report Report	Monthly Average Daily Max Monthly Average Daily Max	As a POTW, the facility must monitor incoming BOD5 and TSS influent loadings to determine if it is meeting the 85% treatment requirements. If more than 1 sample per month, the monthly average will differ from daily max value.

Comments:

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New POTW Requirements: Chapter 92a.2 POTW definition includes state-owned facilities. Permit is being updated to address POTW-specific requirements: influent CBOD5/TSS monitoring and reporting; weekly average limits; 85% minimum average monthly reduction in Part A.I Additional Requirements) will be incorporated into the Draft NPDES Permit.

Composite Sampling: 24-hour composite sampling required for toxics (metals). All composite sampling changed to 24-hour composite sampling for consistency. Facility has purchased a 24-hour composite sampler per 10/5/2016 Meeting discussions.

WQ Modeling Assumptions: Upstream hardness of 127 mg/l. Discharge hardness of 189 mg/l. WQM Model 7.0 validity is impacted by effluent-dominated stream scenarios, but superseded by existing limits subject to antibacksliding considerations.

Point	Drainage Area	Elevation	Modeling Reach-assumed RMI
1 (Outfall #001)	0.96 square mile	~1160 Feet	3.39
2	1.57 square miles	~1100 Feet	2.21
3	5.61 square miles	~946 Feet	0.001

ELG Requirements: This hospital is subject to the Federal ELG (40 CFR 460) as an existing source subject to 40 CFR 460.12 (Best Practicable control technology currently available, regulation promulgated circa 1976). The Federal ELG expresses limits in terms of the “functional operations of the hospital”, i.e. occupied beds (40 CFR 460.10 through 460.12) for existing facilities except as 40 CFR 125.30 (Fundamentally different factors), 125.31 (Criteria), and 125.32 (Method of application) apply. The Federal ELG does not appear to have been addressed by previous NPDES Permitting per available DEP files. Being existing ELG limits, the Department cannot delay imposition of these limits.

For permitting purposes, the revised Federal ELG loadings @ 242 hospital beds (with allowances for school district flows) have been incorporated into this permit’s mass loading limits, with Chapter 92a.47 secondary treatment concentration limits due to antibacksliding considerations. (Secondary BOD5 and CBOD5 limits are equivalent except that the BOD5 limits incorporated an allowance for nitrogenous oxygen demand).

- **Historic Loadings:** The facility actual occupancy rates dropped from a high of 1450 beds in the 1940s, to a present 242 occupied beds per the PA DHS website. The original July 28, 1954 Sewage Permit documents indicate a potential for 2500 patients onsite. Original NPDES permitting documents noted the potential for up to 2500 occupied beds onsite (with 1420 occupied beds) design basis flow (2680 persons allowing for work shifts) with an original 0.600 MGD average hospital design flow.
- **Original CBOD5/BOD Design Loadings Loading:** Using the 120% BOD5/CBOD5 limit conversion factor (Metcalf & Eddy, also seen in the EPA BOD5/DEP CBOD5 secondary treatment limits), the existing 82.4 lbs/day CBOD5 monthly average loading limits would equate up to 98.88 lbs/day BOD5 effluent loading, and would allow up to 1093 occupied beds at the Hospital using the ELG factors. **NOTE:** They have had exceedances of their existing CBOD5 daily max load limit (218 lbs/day).
- **TSS Loading:** The existing TSS load limits (98.8 lbs/day monthly average limit) would equate to ~807 occupied beds using the ELG factors. **NOTE:** They have had exceedances of their existing TSS load limits (175.6 lbs/day per Compliance Section above).
- **ELG contribution to pollutant loadings (242 occupied hospital beds):**

Constituent	Daily Max for 1000 beds	Allowable loading (Daily Max)	Monthly Average for 1000 beds	Allowable Loading (Monthly Average)
BOD5	90.4 lbs	21.87 lbs/day @242	74.0 lbs	17.90 lbs/day @ 242

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		(present CBOD5 limit of 131.8 lbs/day)		(present CBOD5 limit of 82.4 lbs/day)
TSS	122.4 lbs	29.62 lbs/day @242 (present TSS limit of 148.2 lbs/day)	74.5 lbs	18.02 lbs/day @242 (present TSS limit of 98.8 lbs/day)
pH	6.0 – 9.0 SU	-	6.0 – 9.0 SU	-

- **School contributions:** This STP also receives flows from several schools, but does not measure influent. The May 2012 Uni-Tech Report (CSSH Wastewater Planning and Feasibility Study), prepared by the applicant’s technical consultant, noted that the Abington Heights School District (Newton Ransom Elementary and Abington Middle School, directed flows to this STP. The loadings were estimated at 7% of the estimated CSSH total flow (using possibly inaccurate CSSH flow meters that resulted in an estimated 0.234 MGD CSSH flow). The Uni-Tech Report Appendix C (Flow Monitoring & Wastewater Sampling Report) included a 45-day flow monitoring period that estimated an average 0.0185 MGD (18,500 GPD) school flow during the flow monitoring period (January 6 – February 19), measured at a manhole. The report calculated that the school was adding 34 lbs/day BOD5 and 22 lbs/day TSS loading to the influent flow. Calculating school-related effluent allowances, and assuming 85% removal efficiency:
 - Monthly Average BOD5 Effluent Load is capped at: 5.1 lbs/day
 - Monthly Average TSS Effluent Load is capped at: 3.3 lbs/day
 - Daily Max BOD5 loading (2.0 multiplier): 10.2 lbs/day
 - Daily Max TSS loading (2.0 multiplier): 6.6 lbs/day
- **New BOD5/TSS Mass Limits:**
 - Total monthly average BOD5 Loading: 23.00 lb/day BOD5
 - Daily Max BOD5 loading: 32.07 lb/day BOD5
 - Total monthly average TSS Loading: 21.32 lb/day TSS
 - Daily Max TSS loading: 36.22 lbs/day TSS

Chesapeake Bay Requirements: This is a “non-significant” Phase 4 Chesapeake Bay Facility (>0.2 MGD; <0.4 MGD capacity), which chose to reduce their permit basis capacity from 0.60 MGD to 0.395 MGD in the 2009 NPDES Permit. They conducted the required two years of monitoring. Minimum monthly monitoring is required for Phase 4 facilities. Additional monitoring would be required if they chose to engage in nutrient trading.

Reasonable Potential Analysis: Reasonable Potential Analysis and Water Quality Modeling used 24-hour composite sampling results (12/1/2016; 12/8/2016; and 12/16/2016 sampling via new onsite 24-hour composite sampler) for metals (max of 0.0428 mg/l copper; 0.001 mg/l lead; and 0.0338 mg/l Zinc).

- **Copper:** The Toxic Screening Spreadsheet recommended copper limits. Copper limits and TRE conditions have been added to the permit. The max copper effluent concentration exceeded the copper WQBEL.
- **Lead and Zinc:** Neither required monitoring per Toxic Screening Spreadsheet. Zinc WQBEL was lower than WQS criteria, so WQS criteria used in Toxic Screening Spreadsheet.
- **TDS, Sulfates, Chlorides and Bromides, plus Specific Conductivity:** The Toxic Screening Spreadsheet recommended monitoring of TDS, Sulfates, Chlorides and Bromides. Per the 11/3/2015 DEP Biologist sampling, the facility is contributing detectable levels of these constituents to the impaired stream. Such constituents might be a sign of stormwater runoff issues such as excessive winter salting, etc.) in addition to potential effluent issues.
 - Unapproved Discharge (Boiler blowdown per Site Personnel Identification to DEP Inspector): DEP Inspector identified apparent outfall that was indicated to be for boiler blowdown per site personnel. No such outfall is authorized by the existing NPDES permit, nor requested in the NPDES permit application. Any non-stormwater outfall is an unauthorized discharge that must cease under current permit and regulations. They have the option of either redirecting such flow to the STP or collecting it for shipment for offsite disposal.
 - Specific Conductivity & Salts (Sodium Chloride; Calcium Chloride; Magnesium Chloride; Potassium Chloride): January 2017 e-mailed data indicated specific conductivity a factor of 3 of the DEP Biologist upstream sample, with boiler wastewater being a potential source of salt ions to the waters of the Commonwealth. Specific conductivity monitoring is being required to monitor

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salt ions (sodium, calcium, magnesium, potassium, etc.). Specific conductivity is a measure of ions (cations and anions) in the water. These conductive ions come from dissolved salts and inorganic materials such as alkalis, chlorides, sulfides and carbonate compounds. Salts dissolve in water to produce an anion and a cation. Dissolved salts from outdoor usage in winter is an obvious source (sodium chloride, calcium chlorides, magnesium chlorides, and potassium chlorides are in wide usage, with other chemicals often added to the mix such as: Sodium acetate and calcium magnesium acetate and calcium hydroxide). See above for DEP Biologist sample results. Options:

- **Salt-related BMPs added to Permit:** Due to apparent salt contribution to the stream, a requirement for salt-related Best Management Practices (BMPs) has been added to the permit per Pollution Prevention considerations (Chapter 92a.10; Chapter 92a.46(1); BMPs defined in Chapter 92a.2): There are internet-available BMPs for salt management, specifically addressing application to parking lots, private roads, etc. that could be incorporated into the NPDES permit.

Ammonia-N: Due to an ongoing and worsening pattern of ammonia-N exceedences (now year-round exceedences), a 57-month Compliance Schedule is being incorporated into this permit per Chapter 92a.51 (to address potential additional time requirements and funding outside of the permittee’s control). Chapter 92a.51 requires coming into compliance with the existing final enforceable limits as soon as practicable. Related information:

- Per Table 1, ammonia-N problems have been an on-again/off-again concern for this STP since 1985.
- Information indicates a worsening pattern of exceedences.
 - **Receiving Stream:**
 - In 1998, the receiving stream was determined to be an attaining stream.
 - In 2015, the receiving stream was determined to be impaired for aquatic life.
 - **Effluent Data:**
 - In the 2009 – 2011 time-frames, Winter ammonia-N exceedences occurred.
 - In 2012, the ammonia-N exceedences spread to Fall months (before I&I problems substantially worsened). Ammonia-N’s toxicity increases with temperature.
 - In 2013 and 2014, ammonia-N exceedences spread to summer months, coinciding with months of substantial I&I flows. Ammonia-N’s toxicity increases with temperature.
 - See eDMR violations reported above.
- The application did not request any relief from existing ammonia-N limits.

Chemical Additives (Boiler Usage): The Department has determined that one site-used boiler chemical additive (Formula 2340F) is not on the DEP List of approved chemical additives. The Department has determined that the other identified chemical additive (Greentech PT2700F) might be potentially subject to a daily maximum concentration effluent permit limit, depending upon actual effluent concentrations. A chemical notification form or request form would be required to determine if a new effluent limit might have to be imposed.

- Previous unpermitted boiler discharge outfall might have been a source of the ongoing stream impairment.
- The facility uses boiler chemical additives in Boilers 4 & 5. See table below for available chemical additive information.
- See Tables 4 & 5 below for a summarization of CSSH-provided boiler spreadsheet information.

Chemical Additive	Max Daily Volume (both boiler max reported usage)	AQUATIC LIFE EFFECT LEVEL ACUTE (mg/L)	AQUATIC LIFE EFFECT LEVEL CHRONIC (mg/L)	HUMAN HEALTH SAFE USAGE CONCENTRATION (mg/L)
Greentech PT2700F a.k.a. Condor Technologies Inc. Boiler Water Treatment Chemical	1.5 gallons (~12.5 lb/day at density of water)	11.87	1.32	NA

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Formula 2340F is not found on current DEP Chemical Additive list	0.25 gallons (~4.167 lbs/day at density of water)	Unknown	Unknown	Unknown
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NPDES Permit Fact Sheet

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Clarks Summit State Hospital

Whole Effluent Toxicity (WET) Testing Requirements (new NPDES Permit Term)

Due to ongoing Stream Impairment with various known/potential causes (both cumulative and synergistic) discussed above, WET Testing will be required for the new NPDES Permit Term, there was no previous NPDES permit requirement for WET Testing, and consequently no previous WET Test data for evaluation.

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

Acute Partial Mix Factor (PMFa): 1

Chronic Partial Mix Factor (PMFc): 1

1. Determine IWC – Acute (IWCa):

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

$$[(0.395 \text{ MGD} \times 1.547) / ((0.011 \text{ cfs} \times 1) + (0.395 \text{ MGD} \times 1.547))] \times 100 = \text{IWCa}\% = 98.23\%$$

Is IWCa < 1%?: X **NO (chronic tests required)**

If the discharge is to the tidal portion of the Delaware River, indicate how the type of test was determined: **NA**

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

2a. Determine Target IWCa (If Acute Tests Required): **NA**

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

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

$$[(0.395 \text{ MGD} \times 1.547) / ((0.011 \text{ cfs} \times 1.0) + (0.395 \text{ MGD} \times 1.547))] \times 100 = \text{TIWCC}\% = 98.23\%$$

3. Determine Dilution Series

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCC, whichever applies).

Dilution Series = 100%, 98%, 73%, 49%, and 25%.

WET Limits

Has reasonable potential been determined? **X YES**

Will WET limits be established in the permit? **X NO**

If WET limits will be established, identify the species and the limit values for the permit (TU). **NA**

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits:

There is reasonable potential due to DEP Biologist memo indicating ongoing stream impairment for aquatic life (not present during 1998 sampling apparently for a 55:1 effluent-dominated stream), with the facility being a known source of ongoing ammonia-N exceedences of the WQBELs; effluent concentrations exceeding WQBELs for toxics (copper and lead, with reasonable potential for zinc to cause exceedences); high flows (intermittent high flows can impact aquatic life); high elevations of salts ions and chlorides that can impact aquatic life; potential for unusual pass-through therapeutic chemicals from the hospital and overall cumulative and/or synergistic impacts. The WET Testing during the permit term will allow for the facility to address known impacts

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and determine if reasonable potential exists for the next NPDES Permit Renewal (where potential limits would be determined).

Attachments

Toxic Screening Spreadsheet
WQM Model 7.0 Output
PENTOXSD Output
TRC Spreadsheet
Table 1 (Ammonia-N limits)
Table 2 (Available Stream Sampling & Related Information)
Table 3 (September – December 2016 CSSH STP Operating Data)
Table 4 (Boiler 4 Chemical Usage from CSSH Spreadsheets)
Table 5 (Boiler 5 Chemical Usage from CSSH Spreadsheets)
Communications Log

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.3

Facility: Clarks Summit State Hospital
Analysis Hardness (mg/L): 189

NPDES Permit No.: PA0029432
Discharge Flow (MGD): 0.396

Outfall: 001
Analysis pH (SU): 7

Parameter	Maximum Concentration in Application or DMRs (µg/L)	Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Total Dissolved Solids	1460000	500000	Yes		Monitor
Chloride	984000	250000	Yes		Monitor
Bromide		N/A			Monitor
Sulfate		250000			Monitor
1,4-Dioxane		N/A			
Total Copper	42.8	16.07	Yes	16.297	Establish Limits
Total Lead	1	7.15	No	7.236	
Total Zinc	58.3	205.5	No	205.5	

WQM 7.0 Effluent Limits

<u>SWP Basin</u>		<u>Stream Code</u>		<u>Stream Name</u>			
04G		28678		FALLS CREEK			
RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
3.390	DHS CSSH	PA0029432	0.395	CBOD5	25		
				NH3-N	0.5	1	
				Dissolved Oxygen			6

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin: 04G Stream Code: 28678 Stream Name: FALLS CREEK

RMI	Name	Permit Number	Disc Flow (mgd)
3.39	DHS CSSH	PA0029432	0.3950

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent	
				WQBEL (µg/L)	WQBEL Criterion
COPPER	16.297	CFC	25.426	16.297	CFC
Greentech PT2700F	1.346	CFC	2.099	1.346	CFC
LEAD	1	INPUT	1.56	7.236	CFC
ZINC	33.8	INPUT	52.733	133.551	AFC

TRC_CALC

1A	B	C	D	E	F	G
2	TRC EVALUATION					
3	Input appropriate values in B4:B8 and E4:E7 Clark Summit Hospital STP					
4	0.011	= Q stream (cfs)		0.5	= CV Daily	
5	0.395	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	1.2	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)			=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations	Reference	CFC Calculations	
11	TRC	1.3.2.iii	WLA_afc = 0.025	1.3.2.iii	WLA_cfc = 0.017	
12	PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373	5.1c	LTAMULT_cfc = 0.581	
13	PENTOXSD TRG	5.1b	LTA_afc = 0.009	5.1d	LTA_cfc = 0.010	
14						
15	Source	Effluent Limit Calculations				
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.011	AFC		
18			INST MAX LIMIT (mg/l) = 0.037			

Table 1 (Ammonia-N Limits)

Permit Source	30-day avg. (mg/l)	30-day avg. (lb/d)	IMAX (mg/l)	Related Information
2013 NPDES Application	-	-	-	Effluent Ammonia-N was identified at 0.05 mg/l minimum and 22 mg/l maximum, with a 1.5 mg/l average (unidentified number of samples). Annual Average Flows were: <u>2011</u> : 0.148 MGD (record year of precipitation in NE PA) <u>2012</u> : 0.186 MGD Highest monthly 2012 flow: 0.218 MGD in December. See Compliance Section Tables for summarized eDMR data
2/3/2009 NPDES Permit & Application	0.5 S 1.5 W	1.6 S 4.9 W	1.0 S 3.0 W	Effluent Ammonia-N was identified at max 1.20 mg/l, and average of 0.8 mg/l from ten samples. 2008 Application also indicated previous year annual average flow was 0.102196 MGD and highest monthly flow was 0.131515 MGD.
12/18/2003 NPDES Permit & Application	0.5 S 1.5 W	2.5 S 7.5 W	1.0 S 3.0 W	2002 average daily flow at 0.097 MGD and highest monthly flow at 0.133 MGD, and no recent problems in DMRs per 12/18/2003 IRR.
8/2/1993 NPDES Permit	0.5 S 1.5 W	2.5 S 7.5 W	1.0 S 3.0 W	-
Draft 2/15/1985 NPDES Permit	0.5 S 1.5 W	2.5 S 7.5 W	1.0 S 3.0 W	8/15/1985 IRR noted that the NH3-N limitations were rarely met, even with the facility receiving 1/3 of permit basis flows. The IRR cited a 5/30/1985 Department of Public Welfare Letter which indicated that the facility might not meet permit limits for ammonia-N, with a course of action including submitting ammonia-N data for one year, reduction of permit basis flow to actual flow rate, and the DPW was to “initiate action for additional changes to the existing plant if lab analysis indicate NH3-N values must be reduced”.
10/30/1984 WPC Report	0.5 S 1.5 W	- -	- -	Modeling assumptions: 0.60 MGD permit basis flow, based on old modeling program that also estimated BOD5 limits, LFY of ~0.0115 CFS/square mile, 0.9 square mile drainage area, minimum DO of 6.0 mg/l & background NH3-N of 0.06 mg/l, somewhat more conservative assumptions
1/31/1980 NPDES Permit	- -	- -	1.5 S 4.5 W	7.5 lbs/d S Daily Max 22.5 lbs/d W Daily Max
Sewage Permit No. 8530 Department Certification to EPA (undated)	0.5 S 1.5 W	- -	- -	-

Table 2 (Available Stream Sampling & Related Information)

Constituent	Upstream Sample (FC01)	Downstream Sample (FC02)	Application Effluent Data	DMR data range (7/1/2015 to 6/30/2016)	Limits
Flow (MGD)	-	-		0.041 – 1.088 (30-day) 0.113 – 4.315 (daily max)	0.395 (ADF permit basis)
pH (SU)	7.13	7.34	6.5 (min) 8.3 (max)	6.63 – 7.5	6.0 – 9.0
Temperature	8 °C (~46.4 °F)	8.3 °C (~46.9 °F)	-	-	-
Hardness (mg/L)	127	138	-	-	-
Spec. Conductivity (umhos/cm)	902.00	1039.0	-	-	-
Ammonia-N (mg/L)	<0.02	0.35	0.05 (min) 22.0 (max)	0.48 – 10.74 (30-day)	0.5S/1.5W (30-day) 1.0S/3.0W (IMAX)
Total N (mg/L)	0.70	2.84	1.5 (min) 11.7 (max)		-
Total P (mg/L)	0.028	0.451	2.4 (min) 4.6 (max)		-
Nitrate (mg/L)	0.39	1.54	-	-	-
Nitrite (mg/L)	<0.20	<0.44	-	-	-
Nitrite-Nitrate (mg/l)	<0.59 (calculated)	<1.98 (calculated)	4.2 (min) 32.1 (max)	3.87 – 7.79	-
TDS (mg/L)	526	626	1730 (1 sample)	-	-
TSS (mg/L)	<5	10	-	5.3 – 20 (30-day)	30.0 (30-day) 45.0 (Daily Max)
Chlorides (mg/l)	232.00	259.00	-	-	-
Sulfate (mg/l)	19.09	21.56	-	-	-
Salt Ions:	-	-	-	-	-
Calcium (mg/l)	42.990	47.300	-	-	-
Potassium (mg/l)	2.360	3.533	-	-	-
Magnesium (mg/l)	4.645	4.898	-	-	-
Sodium (mg/l)	124.700	126.00	-	-	-
Constituents of Interest:	-	-	-	-	-
Copper (ug/l)	<4	10.400	20.8 (1 sample)	-	9.33 (30-day)*
Lead (ug/l)	<1.0	<1.0	27.7 (1 sample)	-	3.255 (30-day)*
Zinc (ug/l)	<5.0	6.570	58.3 (1 sample)	-	119.8 (30-day)*
Fe (ug/l)	353.00	382.000	-	-	-
Al (ug/l)	23.17	81.16	-	-	-
Mn (ug/l)	441.000	359.00	-	-	-
Total Residual Chlorine (TRC) (mg/l)	-	-	0.092 (min) 2.50 (max)	0 – 0.2 (30-day) 0 – 0.4 (IMAX)	0.01 (30-day)* 0.03 (IMAX)*
Fecal Coliform (#/100 ml)	-	-	1 (min) 20,000 (max)	1 – 448 (30-day)	200S/2000W (30-day) 1000S/10000W (IMAX)*

*New or Revised Permit Limit in this Permit Cycle.

Table 3 (September – December 2016 CSSH STP Operating Data)

	September	October (WWTP meter work done)	November	December
Reservoir Water Meter Reading (GPD)	28,721 average 52,780 max 861,620 gallon total	25,764 average 36,050 max 798,670 gallons total	25,936 average 41,730 max 778,090 gallons total	32,252 average 44,220 max 967,550 gallons total
Influent Flow (average GPD)	87,755	35,874	46,208	55,001
Influent Flow (daily max GPD)	141,000	64,830	58,690	83,770
Influent Flow (gallons total)	2,632,660	1,076,230	1,386,240	1,705,030
Effluent Flow (average GPD)	53,055 (0.052 MGD per eDMR)	41,299 (0.041 MGD per eDMR)	38,143 (0.038 MGD per eDMR)	56,196
Effluent Flow (daily max GPD)	117,828 (0.118 MGD per eDMR)	112,421 (0.112 MGD per eDMR)	132,062 (0.132 MGD per eDMR)	83,770
Effluent Flow (gallons total)	1,591,647	1,280,272	1,144,285	1,742,071
Ammonia-N Effluent (eDMR mg/l)	4.84 (monthly avg.) <u>Limit Summer:</u> 0.5 mg/l monthly 1.0 mg/l IMAX	5.03 (monthly avg.) <u>Limit Summer:</u> 0.5 mg/l monthly 1.0 mg/l IMAX	3.73 (monthly avg.) <u>Limit Winter:</u> 1.5 mg/l monthly 3.0 mg/l IMAX	No eDMR data but CSSH indicated: 12/1: 2.19 12/8: 3.60 12/16: 1.28
CBOD5 Effluent (eDMR mg/l)	4.84 (monthly avg.) 9.34 (daily max)	32.7 (monthly avg.) 36.8 (daily max)	3.73 (monthly avg.) 6.94 (daily max)	No eDMR data but CSSH indicated BOD : 12/1: 15.2 12/8: 15.6 12/16: 12.1
TSS Effluent (eDMR mg/l)	18.0 (monthly avg.) 31.0 (daily max)	22.0 (monthly avg.) 34.0 (daily max)	7.33 (monthly avg.) 9.4 (daily max)	No eDMR data but CSSH indicated: 12/1: 9.4 12/8: 7.2 12/16: 7.2
Specific Conductivity (umhos)	-	-	-	No eDMR data but CSSH indicated: 12/1: 1704 12/8: 2810 12/16: 2150
Fecal Coliform (#/100 ml) (200S/2000W)	-	-	-	No eDMR data but CSSH indicated: 12/1: >2419.6 12/8: >2419.6 12/16: >2419.6

Table 4 (Boiler 4 Chemical Usage from CSSH Spreadsheets)

Month	Boiler Water Tests	Lab test?	Tannin 2700 (pt)	2340 (pt)	Amine	Blowdowns Main Count	Condensate Return Test
Report-identified range	2500 – 3500 (micro-mhs)	Not identified	-	-	-	-	0 – 10 (micro-mhs)
May 2016 (5 days reported)	1501 – 2721	Filter: 109 – 140 Unfiltered: 116 – 155	1 - 4	2	-	-	21 - 68
June 2016 (28 days reported)	3078 – 11788	Filter: 150 – 308 Unfiltered: 141 – 296	-	1 - 2	-	-	8 – 104
July 2016 (25 days reported)	11324 – 15960	Filter: 274 – 395 Unfiltered: 250 – 294	-	1 – 2	-	13 days blowdown (1/day)	9 – 102
August 2016 (28 days reported)	14211 – 115710 (typo?) or 17000	Filter: 232 - 301 Unfiltered: 248 - 322	-	1 – 2	-	15 days blowdown (1/day)	21 - 100
September 2016 (22 days reported)	9361 – 16770	Filter: 96 – 254 Unfiltered: 116 – 271	1 – 4	1	-	16 days blowdown (1/day)	22 – 300
October 2016 (10 days reported)	6024 – 9112	Filter: 50 - 305 Unfiltered: 66 – 323	4 – 8	1	-	1 days blowdown (1/day)	17 - 102

Table 5 (Boiler 5 Chemical Usage from CSSH Spreadsheets)

Month	Boiler Water Tests	Lab Results?	Tannin 2700* (pt)	2340 (Pt)	Amine	Blowdowns Main Count	Condensate Return Test
Report-identified range	2500 – 3500 (micro-mhs)	Not identified	Not identified	-	-	-	0 – 10 (micro-mhs)
January 2016 (30 days reported)	6207 – 13220	Filter: 71 - 212 Unfiltered: 110 - 231	1 – 2	1	-	-	10 - 91
February 2016 (23 days reported)	8723 - 18327	Filter: 40 - 253 Unfiltered: 87 - 323	1 – 2 qt	-	1 pt – 1 qt	1 days	6 - 452
March 2016 (23 days reported)	3900 - 24495	Filter: 38 - 192 Unfiltered: 58 - 272	1 – 8	-	1 pt	3 days	8 – 116
April 2016 (27 days reported)	10125 - 16745	Filter: 98 - 198 Unfiltered: 109-301	1 – 4? (wrong column)	1	-	4 days	10 - 131
May 2016 (24 days reported)	11169 - 16877	Filter: 111-3131 Unfiltered: 143-275	1	1	-	6 days	9 – 66
September 2016	2931 – 7357	Filter: 150 - 295	1	1	-	-	55 - 115

(4 days reported)		Unfiltered: 158 - 325					
October 2016 (15 days reported)	6760 - 10273	Filter: 116 - 234 Unfiltered: 200-291	1	1	-	4 days	26 - 179
November 2016 (26 days reported)	5242 -9901	Filter: 135-219 Unfiltered: 146-260	-	2	1 pt	1	21-138
December 2016 (28 days reported)	7469-10184	Filter: 150 - 231 Unfiltered: 150 - 248	1-2	1-2	-	-	26-85

*GreenTech PT2700-F includes tannin as a component (45 – 50%) and >5% sodium hydroxide.

**Formula 2340-F includes diethylaminoethanol (34-44%) and is shipped under “amines”.

Communication Log (not addressing separate DEP M&C or Compliance Assistance communications):

10/13/2013: NPDES Permit Renewal Application received (due 9/1/2013)
10/15/2013: DPW E-mail copy of Application with forwarded e-mail about invoice
10/16/2013: DEP (Mary Hastings) E-mail to DEP Business office about electronic transfer of application fee circa July.
10/21/2013: DEP Completeness Telephone call to DPW
10/24/2013: Supplement Application information received.
10/25/2013: Application deemed complete
1/5/2014: Administrative extension letter issued. NPDES Permit would otherwise have expired 2/28/2014.
1/6/2015: DEP Deficiency Letter issued, with response due within thirty business days (6 weeks) - ~2/19/2015.
1/30/2015: Applicant Letter asking for 90 day extension for response to Deficiency letter with reference to eDMR issues. Letter also referenced that they requested a \$4.9 million capital project to replace the existing biofilters (trickling filters). Inspector was aware of their plan to hire consultant to “verify the accuracy” of the eDMR reporting.
2/20/2015: DPW E-mail follow-up request for extension.
2/20/2015: DEP letter formally granting requested extension.
4/30/2015: CSSH response to 1/6/2015 DEP Letter.
10/15/2015: DPW e-mail asking for application status.
12/4/2015: DEP Biologist memo (Cause/Effect Stream Survey; CSSH)

10/5/2016 Meeting Notes: The Department met with DPW/DHS and its advisory technical consultant (Penn State) about the CSSH facility.

- **Next Meeting Scheduling:** Next meeting will be scheduled in January 2017 to allow for gathering, submittal, and review of new weekly (or more frequent) 24-hour composite sampling results from influent/effluent sampling (TN/TP/other constituents of interest. meeting DEP Target QLs), and new (accurate/calibrated flow meters) flow data to update application information. DPW/DHS will be investigating regionalization options (connection to local POTW) versus STP replacement/upgrade options versus potential sale of STP (as is) to new operator, in part using new data that will become available over next few months. The DPW/DHS is also looking at repairing old sewer system problems with any STP upgrade/connection to local POTW.
- **DHS/DPW Contacts:**
 - DHS engineering staff (Michael Kapil, Miland Desai) are now taking lead on resolving CSSH issues.
 - Penn State Facilities Engineering Institute (Bob Bruce) helps out with operating DHS and other State Agency facilities (STPs, boiler system, etc.) but would not be the design engineer on any application.
 - The CSSH licensed lead operator (Chris Meredeck?) is still out on extended medical leave.
 - CSSH was trying to get another operator onsite to assist the licensed assistant Operator (“David Bisky”?). They might have someone this week.
 - DEP Technical Assistance (Marc Neville) has been helping CSSH out.
 - DPW/DHS has had ongoing problems in finding qualified operators for its STP facilities (and boiler facilities, etc.).
- **Illicit Discharge:** They have permanently stopped the illicit discharge of boiler blowdown (unpermitted discharge) by piping flow to STP. They will send in a letter with figure/schematic showing that the boiler blowdown is going into the STP “flash tank” and then into the treatment process, plus date of redirection. The piping has no valve or other way to discharge to the environment. Boiler blowdown chemical is organic-based. They did not think the chemicals would impact the STP operation. If it was a problem, then the boiler blowdown could be redirected to offsite disposal.
- **Violations:** Are flagged for their attention. They know that they will not meet the ammonia-N limits in winter. They asked for DEP feedback about summer ammonia-N exceedances (see below).
- **New Influent Flow Meter and Effluent Flow Meter:** Previous eDMR reported flow data is inaccurate. New and accurate influent meter (ultrasonic meter at Parshall Flume) and effluent flow meter were both installed as of the day before (10/4/2016), i.e. eDMR will be reporting valid numbers for October onward.
 - CSSH indicated previous eDMR data was based on inaccurate metering or an electronic spreadsheet (that was impacted by a multiplier in some reporting periods). January – March flows were estimated to be off by a factor of 10.
 - Previous reported flows were rendered inaccurate by recycling flows, affected by flow variations at old sensor location/elevation (higher flows being measured inaccurately), use of an electronic spreadsheet

that used a multiplier when it should not have, etc. They noted a 67% influent flow rate error that carried through to effluent flows due to the electronic spreadsheet.

- They will be looking at both influent and effluent flow meter results over winter to see if winter “foaming” impacts meter accuracy.
- They believe the sewer system needs work, and expect higher wet weather flows to show up in new flow monitoring. **NOTE: The “inaccurate” DMR reporting does show a pattern of worsening peak wet weather flows and increasing inability to meet Ammonia-N limits during warm weather seasons (in addition to older pattern of winter ammonia-N exceedances) consistent with an older STP/sewer collection system requiring major rehabilitation/upgrading or replacement, and change in stream status from attaining (1998) to documented stream impairment (2015 DEP Biologist Memo).**
- New 24-hour Composite Sampler: They have a new site composite sampler which will be installed this week. They will be taking flow-proportioned (every 10,000 gallons or such frequency) composite samples of influent flow (especially useful for STP design or regionalization options) as well as effluent samples. They might also take composite samples of indirect dischargers (two schools) at an upstream manhole, etc. to see what they are receiving. DEP Technical Assistance had previously loaned them a less accurate sampler.
- Trickling Filters Problems:
 - They are aware of the pattern of ongoing ammonia-N violations, CBOD5 violations, high flows, etc. They know ammonia-N violations now include warm weather months. They indicated that the facility will not meet the ammonia-N limits in winter.
 - They know that TFs are old technology not designed to meet current requirements.
 - The TF units have freezing problems in winter (arm frozen), and biological treatment has apparently stopped during cold weather. The 2012 Uni-Tech report option of geodesic domes appears too expensive for an interim solution and might not achieve/maintain adequate temperatures for winter ammonia-N biological treatment.
 - The replacement TF media is apparently not dense enough (has not generated/retained enough “bugs” for biological treatment), but DHS/DPW is not sure why. Old media seemed to work better. The Penn State consultant noted that similar media had worked out at other facilities.
 - DHS/DPW is looking at options including building a second STP next to current STP, to ensure continuity of operation until new STP is built.
 - The CSSH water source uses water softeners (potential salts in wastewater)
- School Agreements: DPW/DHS will be relooking at their agreements with the local schools to take in their sewage. Abington School District flows were estimated in the 2012 Uni-Tech study at about 17,000 GPD and up to >50,000 GPD based on winter flow monitoring by consultant. **NOTE:** The Department mentioned that there are STP requirements about problems due to interference and pass-through from indirect dischargers. Ultimately, if the STP problems are not resolved, the schools might no longer be able to direct their sewage to CSSH (needing new connection/agreement with local POTW).
- Future:
 - DPW/DHS indicated the 2012 Uni-Tech report recommendations are considered too expensive and potentially inadequate (proposed geodesic domes and other improvements might not be enough to achieve/maintain adequate temperatures for biological treatment of Ammonia-N or other constituents in winter for the old trickling filter treatment system) as an interim solution to site issues.
 - DPW/DHS noted CSSH-related work funding required legislative approval. They asked for funding previously, but none was authorized.
 - They are gathering preliminary information on options, but will require a feasibility analysis of their options (upgrading STP options, connection to local POTW, etc. plus any needed sewer works) as part of process.
 - They would have to select an option and hire a design engineer to do the actual design.
 - They would have to obtain all needed permits (including stream crossings for sewer work, etc.).
 - They envision a Governor’s Office/Department-to-Department meeting sometime in future to get authorization/prioritization. Without prioritization, any work might be a 5-year project. **NOTE:** The DEP noted that the DEP Regional Director meets with other Departments quarterly and might bring up CSSH.

DEP/DHS Discussion & Feedback:

- Future DMR reporting: CSSH asked which flow meter results should be used in eDMR reporting. They think that the influent flow meter will be more accurate.
 - The DEP noted that they should compare the influent/effluent flow meter results over the next year to see how the results compared. The DEP recommended including daily checks (or more frequent during peak

wet weather) of meters to note and report any unusual conditions for reference when the compare the new flow results. They should be able to determine which meter is the most accurate and suitable for eDMR reporting purposes.

- The DEP mentioned that any future Part II WQM Permit application will have to justify flow assumptions and explain about past data problems.
- Need to Collect New Data:
 - Any STP engineering design/planning will require accurate flow and influent sampling/analysis data. For example, if actual flow is much less than 0.395 MGD, one could end up with an oversized plant with consequent operating problems. If flows are really 1/3 of NPDES permit flow, then a reduced NPDES permit basis flow might allow for less stringent permit limits than a 0.395 MGD discharge to a 55:1 effluent-dominated stream per updated DEP modeling.
 - Sometimes 24-hour composite sampling (flow proportioned) numbers are better than manual 8-hour composite sampling results in terms of meeting permit limits. NOTE: More representative sampling eliminates potential biases due to sampling during peak concentration periods.
 - Updated NPDES application sampling, with 24-hour flow-proportioned composite sampling and meeting DEP Target QLs, might change preliminary modeled WQBELs. They can also look at older submitted information and inform the Department of any reason to doubt accuracy (non-detect levels above Target QLs, etc.).
 - Stream is impaired due to TDS, chlorides, salt ions, among other constituents of concern.
- Any STP/TF upgrade option should look at future permit limits:
 - DEP noted that Chesapeake Bay Phase 4 facilities will likely receive Chesapeake Bay mass limits sometime in the future. Previously the caps were based on 6 mg/l TN and 0.8 mg/l TP in the mass cap calculations.
 - DEP will send a sample draft Part A table of potential future permit limits/monitoring requirements to DPW/DHS.
 - Updated 24-hour composite sampling (1 influent sample and 3 effluent samples) for all Minor Sewage Facilities Form/Instructions plus other constituents of interest would be helpful.
- TF Feedback: DPW/DHS asked for any feedback on how to come back into compliance in winter, and future options.
 - Violations: There are penalties for noncompliance.
 - Ammonia-N options:
 - One option for TF has been to go to a 1:1 recirculation mixing to help resolve ammonia-N problems, even if that meant buying/installing a new pump.
 - More representative 24-hour composite sampling (more representative than 8-hour composite) has sometimes resulted in lower reported effluent concentrations.
 - School effluent flows have high ammonia-N concentrations (and peaking flow times during the day). Hospital flows might be somewhat more consistent over 24-hour period.
 - Future Denitrification options: It is possible to treat Total Nitrogen in a TF with a final denitrification stage unit, but it needs close Operator attention, a lot more process sensors, and a carbon (BOD) feed source for the denitrification stage due to process using up carbon before then. It is easy to end up with operational problems such as effluent problems (high BOD/TSS in effluent, etc.).
 - Ammonium Quaternary Compounds ("Quats"): Schools and other institutions use disinfectants with these disinfectant compounds. The disinfectant chemicals have then traveled to the downstream STPs and killed the STP microorganisms. They might need the institutions to switch to other cleaning/disinfectant chemicals.
 - Formaldehydes: Urinal blocks can be a source. DPW indicated that it talked to the schools about this problem.
 - Sulfides: The school sewers might not be a source of sulfides, but sulfides have impacted TF facilities.
 - Boiler Blowdown: Boiler chemicals often have disinfectants that can kill STP micro-organisms. They need to pay attention how the new boiler blowdown addition impacts the STP operation.
- WET Testing: Whole Effluent Toxicity (WET) Testing is not required currently for the site. It might be required in the future.
- Future DEP Permitting: The DEP supplied copies of the Individual Sewage NPDES Permitting SOP, Determining Effluent Limits for Sewage facilities, and the SOP for WQM STP permitting, plus various current WQM Permit Application forms for informational purposes. The Department noted that they should check e-library for current forms prior to submitting anything. File reviews of local POTW Chapter 94 Reports/Plans can be scheduled via DEP.
- DEP Contacts: BR is contact for Department-to-Department issues (and Planning). Pat M. is contact for operational issues. Amy is contact for permitting issues.

- Other issues: When STP problems are not resolved, EPA or third party suits interventions can happen.

10/6/2016 DEP E-mail sent to CSSH: Including draft NPDES Part A conditions (not issued for public comment and subsequently revised), DEP Biologist sampling results for stream. DEP (BR Patel) separately provided general information about the Abington (FKA Clark Summit) POTW as a potential regionalization option (does look like it has capacity).

1/4/2017: CSSH E-mail with new September – December composite sampling data

1/5/2017: CSSH E-mail with September – December flow data

1/6/2017 CSSH Letter: Boiler discharge disconnection documentation;

1/10/2017: CSSH Consultant (Environmental Engineering & Management) Letter regarding facility. Included estimated cost for a 0.400 MGD activated sludge treatment plant with UV disinfection (~\$2.2 million) and noted potential for septic conditions/cessation of biological treatment due to actual flows/organic loadings at CSSH.

January 18, 2017 Meeting Notes:

Limits:

- Existing Ammonia-N limits remain.
- Possible tighter TRC limits per modeling: **NOTE: Their new consultant recommended UV disinfection due to interferences at permit limit in CSSH-supplied letter.**
- New 85% CBOD5/BOD5 & TSS reduction as POTW requirement (Chapter 92a.2 POTW definition applies).
- New Copper limit – probably remains.
- New Zinc limit – might remain (elevated downstream concentration and need for modeling update), Monitoring might be required even if no limit.
- New Lead limit – probably gone
- Boiler biocides: TBD with probable specific conductivity monitoring & reporting & chemical additive conditions if not disposed offsite. They will send in MS-DS and daily max usage rate info. DEP will get back to them if problem. They might ship offsite to disposal if problem. Noted potential switch to other chemical option and possible chemical additive condition option.
- New Fecal Coliform IMAX limits (Chapter 92a.47 – 1000S/10000W) – **Need for sufficiently sensitive test.**
- Flow data: They have daily max flow influent data (including school flows). They estimated average effluent flow around 45,000 GPD, tracking closely to water meter readings. Do not have means for estimating peak flows (hourly/instantaneous) at present. Would be useful if influent data with major rainfall allowed for ball-parking of peak flows. Information will be needed in event of WQM permit plus question whether a HFMP is needed now. CSSH noted original facility sized for 0.600 MGD based on 3000 patients. Operational problems can result in operating far below original design capacity (noted in CSSH consultant letter).
- Sampling Data Entry: Looked like duplicate numbers. DMR/eDMR certification language requires a system of ensuring correct information is entered. Person certifying document is responsible, and DEP, AG, Feds are going after false data reporting. Someone might get into trouble if problem recurs. They noted spreadsheet included lab sheets so actual data can be checked.
- Several new IMAX values: Will be in permit (fecal coliform) and additional monitoring. CSSH should read the future Draft NPDES Permit carefully to see what has changed.
- Operator: CSSH still looking for new operator. Operator would be needed even for sewer connection scenario (not constantly, but checking pumps, etc.) unless sewer facilities transferred to third party (who would operate it).
- Regionalization Option (connecting to Abington/Clark Summit POTW ~ 4 miles distant for direct connection and shorter for tie-in to existing sewer lines NOT owned by the receiving WWTP): Tentative choice and basis for next permitting (year added for regionalization, after-meeting discussion for 6 months of funding – would need major NPDES Permit amendment to change interim steps if change to alternate option like STP upgrade. They are also looking at modular treatment units, which should be looked at to see if they can come into compliance as soon as practicable per Chapter 92a.51. Route involves tying into existing sewer line (gravity line) about a mile away, with pump station and sewer line to be permitted and built by CSSH. They will have to go through Planning, and might have a future option to transfer new sewer line/pump station to Municipality/Authority (with themselves as customer). Schedule of Compliance will have deadlines, but they should not wait if they can proceed per Chapter 92a.51 to coming into compliance. CSSH assured the Department that funding money is given priority for coming into compliance. CSSH consultant indicated a preliminary 8-inch conceptual pipeline with 100,000 GPD capacity to handle a peak flow of 500,000 GPD.

- BR noted DEP Planning section can sit in at meetings with receiving WWTP and municipalities & authorities for Regionalization. PennVEST allows for low interest loans, with some grant potential. The DEP would not order a municipality/authority to take CSSH wastewater. Planning must be done. BR noted that the facility should look at 20 year costs in its planning and funding proposals.
- Will issue draft NPDES Permit at 0.395 MGD flow unless they ask for different in week. Draft NPDES Permit will be issued in about a month (after receipt of boiler chemical MS-DS and max daily usage).
- They can explore other options in their feasibility stage/final plan stage. They looked at option for activated sludge process upgrade, but prefer Regionalization option at present. They previously sent in copy of CSSH Consultant letter with preliminary cost estimate which also noted potential need for UV disinfection due to TRC sampling/analysis interference.
- It was noted that the Uni-tec Report relied on old information in regard to flows and wastewater constituents in their 2012 Report.
- CSSH can look at derating with feasibility study, but current ammonia-N numbers appear to show that it is not the solution by itself (factor of 10 difference between limits and Fall monthly average limits, and IMAX limits will be in permit).
- Derating option to allow less stringent limits via antibacksliding exemption: to less than 0.395 MGD with technical antibacksliding exemption rationale/documentation in writing would be needed. CB Phase 4 implication. Site discussion about reduction in effluent volume per Inspector, but would need written CSSH request to derate facility to less than 0.395 MGD, and antibacksliding considerations apply. They would have to make a demonstration that any backsliding exemption applied (with EPA and other third parties interested in any such proposal). WQM modeling at 0.395 MGD is 1.4 mg/l/2.8 mg/l Summer limits even if backsliding was possible. **Need written request for dry weather permit basis flow, information showing flow is reasonable (including peaking flows), and will require technical rational for antibacksliding exemption for ammonia-N or other existing limits. Told them to request it within the week if they are proposing it now, so new NPDES Permit can account for new limits. Major NPDES Permit mod if done in the future.**
- **Modular Units:** They are going to look at those options. They should consider if modular units might allow them to come into compliance with the interim limits.

1/20/2017: CSSH E-mail with boiler chemical additive & boiler water information.

1/20/2017: DEP E-mail with sample of apparent eDMR data entry error, supplied per CSSH request.