pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0027537**
Facility Type	**Industrial**	APS ID	**727032**
Major / Minor	**Minor**	Authorization ID	**1219039**

NPDES PERMIT FACT SHEET
INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

Applicant and Facility Information

Applicant Name	**Hampton Shaler Water Authority**	Facility Name	**Hampton Shaler Water Authority Water Treatment Plant**
Applicant Address	3101 McCully Road P.O. Box 66	Facility Address	1037 East Ohio Street
	Allison Park, PA 15101-1331		Pittsburgh, PA 15223-2018
Applicant Contact	Sam Scarfone	Facility Contact	Sam Scarfone
Applicant Phone	412-486-4867	Facility Phone	412-486-4867
Client ID	71427	Site ID	263795
SIC Code	4941	Municipality	Shaler Township
SIC Description	Trans. & Utilities - Water Supply	County	Allegheny
Date Application Received	March 1, 2018	EPA Waived?	Yes
Date Application Accepted	May 16, 2019	If No, Reason	

Purpose of Application: Renewal of NPDES permit for the discharge of process wastewater from the water treatment plant.

Summary of Review

The Department received an NPDES permit renewal application from Hampton Shaler Water Authority on March 1, 2018 for coverage of the discharge from its Hampton Shaler Water Authority Water Treatment Plant in Shaler Township of Allegheny County. The facility is a municipal water treatment plant with an SIC Code 4941 (Water Supply). The current NPDES permit was renewed on October 9, 2013 and expired on October 31, 2018.

Hampton Shaler Water Authority (HSWA) Water Treatment Plant (WTP) operates as a public drinking water treatment and supply facility providing potable drinking water to over 62,000 people daily in eleven municipalities. The plant has a design capacity of 9.0 MGD. HSWA treats groundwater from 12 wells along the banks of the Allegheny River to produce potable drinking water. The plant draws groundwater through two raw water lines. The water is divided into four raw water lines inside the plant and each line is pre-chlorinated with sodium hypochlorite.

The plant is divided into two main sections described as “old” and “new”, with each receiving two of the four raw water lines. The “new” side of the plant treats approximately 40% of the water. Two (of six total) anthracite greensand filters are used for iron and manganese removal. The “old” side of the plant treats approximately 60% of the water and uses four filters for iron and manganese removal.

Approve	Deny	Signatures	Date
X		Lauren Nolfi, E.I.T. / Environmental Engineering Specialist	March 31, 2020
X		Michael E. Fifth, P.E. / Environmental Engineer Manager	April 17, 2020

Summary of Review

Chemical treatment includes sodium hypochlorite for disinfection of both source water and finished water for 4-log treatment and sodium chloride for zeolite regeneration. A 70,000-gallon capacity Softener Backwash Holding Tank collects initial filter and softener backwash wastewater. The backwash water is diluted and gradually discharged to the ALCOSAN sanitary sewer. Filters are backwashed with finished water from the 103,000-gallon Filter Backwash Holding Tank when head loss reaches 8 ft. or run time reaches 72 hours. The backwash water is retained for solids settling. The tank supernatant is returned to the head of the plant at the raw water line to Filters No. 5 and 6. The Filter Backwash Holding Tank also collects sludge from the reactor clarifier and the sedimentation basin whenever these units are removed from operation and drained for cleaning and inspection. Sludge from both the sedimentation basin and the backwash holding tanks is discharged to an ALCOSAN sewer. Rewash (flushing process water to wash out the brine) water from the filters and softeners and the spent brine from the softener regeneration process is collected in the Rewash Holding Tank and discharged through Outfall 001 to the Allegheny River.

The facility has one outfall, Outfall 001, which discharges to the Allegheny River, designated in 25 PA Code Chapter 93 as a Warm Water Fishery (WWF). Outfall 001 discharges rewash water through a partially open gate valve at the bottom of the Rewash Holding Tank. The partially open gate valve ensures that the outfall maintains a low flow rate. Outfall 001 discharges at an average flow of 0.082 MGD and maximum flow of 0.25 MGD. Several catch basins on the plant property also convey stormwater to Outfall 001. The stormwater is not affiliated with any industrial activities and no materials are stored outdoors. Most of the stormwater infiltrates at the drainage ditch between Route 28 and the railroad tracks, and reportedly does not significantly contribute to the flow at Outfall 001.

Sampling was previously conducted at the outfall pipe and at a lab sink when the outfall pipe is not accessible due to weather conditions. Since stormwater is commingled with the discharge at the outfall pipe outlet, it was recommended at the most recent inspection that sampling be conducted at a point prior to stormwater commingling with the process water discharge. An alternative sampling location at the Rewash Holding Tank is currently used to collect samples.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.082
Latitude	40º 29' 15.00"	Longitude	-79º 57' 17.00"
Quad Name	Pittsburgh East	Quad Code	1506
Wastewater Description:	Rewash water from six filters and six softeners and spent brine from the softener regeneration process.		
Receiving Waters	Allegheny River (WWF)	Stream Code	42122
NHD Com ID	123972952	RMI	4.7526
Drainage Area	11,700 mi^2	Yield (cfs/mi^2)	0.2043
Q_{7-10} Flow (cfs)	2390	Q_{7-10} Basis	U.S. Army Corp of Engineers
Elevation (ft)	704	Slope (ft/ft)	0.0000
Watershed No.	18-A	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired)		
Cause(s) of Impairment	Polychlorinated Biphenyls (PCBs)		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Allegheny River
Nearest Downstream Public Water Supply Intake	West View Water Authority		
PWS Waters	Ohio River	Flow at Intake (cfs)	61.89
PWS RMI	35.38	Distance from Outfall (mi)	9.50

Other Comments:

No changes have been made to Outfall 001 since last permit issuance.

The USGS Stream Stats Data for the drainage area is displayed in Attachment A.

Compliance History

DMR Data for Outfall 001 (from February 1, 2019 to January 31, 2020)

Parameter	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19
Flow (MGD) Average Monthly	0.095	0.089	0.098	0.097	0.101	0.157	0.104	0.102	0.105	0.108	0.116	0.121
Flow (MGD) Daily Maximum	0.148	0.165	0.148	0.160	0.224	0.109	0.168	0.161	0.161	0.181	0.201	0.215
pH (S.U.) Minimum	7.7	7.90	7.80	7.90	8.10	7.50	7.40	7.50	7.60	7.50	7.20	7.90
pH (S.U.) Maximum	7.9	8.10	8.20	7.90	8.20	8.10	7.70	7.90	7.90	7.90	7.90	8.10
TRC (mg/L) Average Monthly	0.19	0.22	0.19	0.095	< 0.10	0.21	0.09	< 0.10	0.135	0.14	0.185	0.14
TRC (mg/L) Instantaneous Maximum	0.22	0.23	0.22	0.14	< 0.10	0.27	0.14	< 0.10	0.22	0.17	0.20	0.21
TSS (mg/L) Average Monthly	16.5	13.25	< 3	7.25	3.75	8.25	4	< 3	< 3	2.25	< 3	< 3
TSS (mg/L) Instantaneous Maximum	23	25	< 3	13	6	15	4	< 3	< 3	3	< 3	< 3
Total Aluminum (mg/L) Average Monthly	< 0.1	< 0.10	< 0.10	0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aluminum (mg/L) Instantaneous Maximum	< 0.1	< 0.10	< 0.10	0.15	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Iron (mg/L) Average Monthly	0.095	0.045	0.05	0.15	0.04	0.025	0.015	< 0.02	0.075	0.045	0.07	0.04
Total Iron (mg/L) Instantaneous Maximum	0.12	0.05	0.05	0.27	0.05	0.04	0.02	< 0.02	0.09	0.05	0.07	0.06

Total Manganese (mg/L) Average Monthly	0.02	0.015	0.02	0.02	< 0.02	0.02	< 0.02	< 0.02	0.015	0.015	0.015	< 0.02
Total Manganese (mg/L) Instantaneous Maximum	0.02	0.02	0.03	0.02	< 0.02	0.03	< 0.02	< 0.02	0.02	0.02	0.02	< 0.02

Summary of Inspections: The last inspection conducted by the Department was on October 30, 2019 by Shawn Bell as a compliance evaluation. No violations were noted.

Other Comments:

Monitoring data from the past three years shows that all discharges have been below effluent limits. No DMR violations have been reported since February 2013.

The client has no open violations.

Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	0.082
Latitude	40º 29' 15.00"	**Longitude**	-79º 57' 17.00"

Wastewater Description: Rewash water from six filters and six softeners, spent brine from the softener regeneration process and stormwater runoff from plant catch basins.

Stormwater Drainage Overview

Several catch basins on the plant property convey stormwater to Outfall 001. The stormwater is not affiliated with any industrial activities and no materials are stored outdoors. Most of the stormwater infiltrates at the drainage ditch between Route 28 and the railroad tracks, and reportedly does not significantly contribute to the flow at Outfall 001. Since stormwater is commingled with the discharge at the outfall pipe outlet, it was recommended at the most recent inspection that sampling be conducted at a point prior to stormwater commingling with the process water discharge. An alternative sampling location at the Rewash Holding Tank is currently used to collect samples.

Technology-Based Limitations (TBELs)

HSWA WTP is not subject to Federal Effluent Limitation Guidelines (ELGs) as the SIC code is not listed under 40 CFR parts 405 through 471.

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1) as indicated in Table 1.

Effluent standards for pH pursuant to 25 Pa. Code §§ 95.2(1), as indicated in Table 1, are also imposed on all industrial wastes.

Pennsylvania regulations at 25 Pa. Code § 92a.48(b) require the imposition of technology-based TRC limits, as indicated in Table 1, for facilities that use chlorination and that are not already subject to TRC limits based on applicable federal ELGs or a facility-specific BPJ evaluation.

Table 1: Regulatory Effluent Standards

Parameter	Monthly Average	Daily Maximum	IMAX
Flow (MGD)	Monitor	Monitor	----
pH (S.U.)	Not less than 6.0 nor greater than 9.0 at all times		----
TRC	0.5 mg/l	1.0 mg/l	1.6 mg/l

Best Practicable Control Technology Currently Achievable (BPT)

BPT for wastewater from treatment of water treatment plant (WTP) sludges and filter backwash is found in DEPs Technology-Based Control Requirements for Water Treatment Plant Wastes Document which recommends effluent limitations be imposed under Best Professional Judgement in accordance with 40 CFR § 125.3, and detailed in Table 2.

Table 2: BPT Limits for WTP sludge and filter backwash wastewater		
Parameter	**Monthly Average (mg/L)**	**Daily Maximum (mg/L)**
Total Suspended solids	30.0	60.0
Total Iron	2.0	4.0
Total Aluminum	4.0	8.0
Total Manganese	1.0	2.0
Flow (MGD)	Monitor and Report	
pH (S.U.)	Not less than 6.0 nor greater than 9.0 at all times	
Total Residual Chlorine	0.5	1.0

Water Quality-Based Effluent Limitations (WQBELs)

Toxics Screening Analysis – Procedures for Evaluating Reasonable Potential and Developing WQBELs

DEP's procedures for evaluating reasonable potential are as follows:

1. For IW discharges, the design flow to use in modeling is the average flow during production or operation, and may be taken from the permit application.

2. Perform a Toxics Screening Analysis to identify toxic pollutants of concern. All toxic pollutants whose maximum concentrations, as reported in the permit application or on past DMRs, that are greater than the most stringent applicable water quality criterion are evaluated as pollutants of concern. [This includes pollutants reported as "Not Detectable" or as "<MDL" where the method detection limit for the analytical method used by the applicant is greater than the most stringent water quality criterion]. List all toxic pollutants of concern in a Toxics Screening Analysis section of the Fact Sheet (see Attachment C).

3. For any outfall with an applicable design flow, perform PENTOXSD modeling for all pollutants of concern. Use the maximum reported value from the application form or from DMRs as the input concentration for the PENTOXSD model run.

4. Compare the actual WQBEL from PENTOXSD with the maximum concentration reported on DMRs or the permit application. Use WQN data or another source to establish the existing or background concentration for naturally occurring pollutants, but generally assume zero background concentration for non-naturally occurring pollutants.

    - Establish limits in the draft permit where the maximum reported concentration equals or exceeds 50% of the WQBEL. Use the average monthly and maximum daily limits for the permit as recommended by PENTOXSD. Establish an IMAX limit at 2.5 times the average monthly limit.

    - For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.

    - For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10% - 50% of the WQBEL.

The information described above including the maximum reported discharge concentrations, the most stringent water quality criteria, the pollutant-of-concern (reasonable potential) determinations, the calculated WQBELs, and the WQBEL/monitoring recommendations are collected on a spreadsheet titled "Toxics Screening Analysis." (Attachment C).

Total Maximum Daily Load (TMDL)

Wastewater discharges from Hampton Shaler Water Authority are located in the Allegheny River Watershed, for which the Department has developed a TMDL. A TMDL establishes the amount of a pollutant that a water body can assimilate without exceeding the water quality criteria for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and non-point sources in order to restore and maintain the quality of the state's water resources (USEPA 1991a). The TMDL was finalized on April 9, 2001 and addresses contamination of fish tissue, in the Allegheny River from Lock and Dam 3 (River Mile 14.5) to the mouth (River Mile 0.0), by PCB and chlordane. Water quality criteria for the TMDL watershed do not apply to the wastewater discharges from HSWA.

PENTOXSD Water Quality Modeling Program

PENTOXSD Version 2.0 for Windows is a single discharge, mass-balance water quality modeling program that includes consideration for mixing, first-order decay and other factors to determine recommended WQBELs for toxic substances and several non-toxic substances. Required input data including stream code, river mile index, elevation, drainage area, discharge name, NPDES permit number and discharge flow rate are entered into PENTOXSD to establish site-specific discharge conditions. Other data such as low flow yield, reach dimensions and partial mix factors may also be entered to further characterize the conditions of the discharge and receiving water. Pollutants are then selected for analysis based on those present or likely to be present in a discharge at levels that may cause, have the reasonable potential to cause, or contribute to excursions above state water quality standards (i.e., a reasonable potential analysis). Discharge concentrations for the selected pollutants are chosen to represent the "worst case" quality of the discharge (i.e., maximum reported discharge concentrations). PENTOXSD then evaluates each pollutant by computing a Waste Load Allocation for each applicable criterion, determining a recommended maximum WQBEL and comparing that recommended WQBEL with the input discharge concentration to determine which is more stringent. Based on this evaluation, PENTOXSD recommends average monthly and maximum daily WQBELs.

Reasonable Potential Analysis and WQBEL Development for Outfall 001

Discharges from Outfall 001 are evaluated based on concentrations reported on the application and on DMRs; data from those sources are used for toxics screening as described above. The PENTOXSD model is run with the discharge and receiving stream characteristics shown in Table 4. Since the nearest downstream public water supply intake is 9.50 miles downstream of Outfall 001, the intake flow was not included in the PENTOXSD model run.

The pollutants selected for analysis include those identified as candidates for modeling by the Toxics Screening Analysis spreadsheet (in accordance with Step 2 of the Toxics Screening Analysis procedure discussed above). Pollutants for which water quality standards have not been promulgated (e.g., TSS, oil and grease) are excluded from the analysis.

Based on the recommendations of the Toxics Screening Analysis, shown in Attachment C, Total Dissolved Solids, Chloride, Cadmium, Copper, Lead, Mercury, Phenols and Silver were candidates for PENTOXSD modeling. The maximum reported values for Cadmium, Lead, Mercury, Phenols and Silver were each reported as “non-detect” using a quantitation limit (QL) that exceeds the Department’s Target QL.

Table 4: PENTOXSD Inputs

Parameter	**Value**
River Mile Index	4.7526
Discharge Flow (MGD)	0.082
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	11,700
Q_{7-10} (cfs)	2390
Low-flow yield (cfs/mi^2)	0.2043
Elevation (ft)	704
Slope	0.0004

The WQBELs calculated using PENTOXSD are compared to the maximum reported effluent concentrations as described in the Toxics Screening Analysis section above to evaluate the need to impose WQBELs or monitoring requirements in the permit. Output from the PENTOXSD model runs is included in Attachment D.

Based on PENTOXSD modeling and the Toxics Screening Analysis, monitoring is to be imposed for the parameters Total Dissolved Solids, Chloride, Bromide and Sulfate, as shown below in Table 5. Total Dissolved Solids and Chloride are discussed further below.

Total Dissolved Solids (TDS)

Per *Policy and Procedure for NPDES Permitting of Discharges of Total Dissolved Solids (TDS) – 25 Pa. Code §95.10 (DEP-ID: 385-2100-002)*, a monitoring requirement for TDS for any discharge that exceeds 2,000 mg/L TDS should be applied at minimum. The maximum reported TDS concentration at Outfall 001 is 1750 mg/L. Since the TDS discharge concentration is below 2,000 mg/L, no effluent limits will be applied for TDS or its constituent parameters.

Chloride

The maximum Chloride concentration at Outfall 001 is 1260 mg/L. The Toxics Screening Analysis spreadsheet recommended Chloride as a candidate for PENTOXSD modeling. In accordance with 25 Pa. Code §96.3(d) and since the nearest downstream Public Water Supply Intake is 9.50 miles downstream of the discharge, impacts on potable water supply withdrawals are not expected. No effluent limits will be applied for Chloride.

Table 5: Outfall 001 Water Quality Based Effluent Limits

Parameter	Mass Units (lbs/yr)	Concentrations (mg/L)	
	Total Annual	Monthly Average	Daily Maximum
Total Dissolved Solids	XXX	Report	Report
Chloride	XXX	Report	Report
Bromide	XXX	Report	Report
Sulfate	XXX	Report	Report

Total Residual Chlorine (TRC)

To determine if WQBELs are required for discharges containing total residual chlorine, a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 mg/l from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit. The results of the modeling, included in Attachment E, indicate that no WQBELs will be imposed for TRC.

Anti-Backsliding

The effluent limitations and monitoring requirements in Table 6 below are from the current permit, issued on October 9, 2013. The draft permit does not propose any effluent limits that are less stringent than those imposed in the previous permit.

Table 6: Current Permit Effluent Limitations – Outfall 001

Parameter	Average Monthly	Maximum Daily	Units
Flow	Monitor & Report		MGD
Total Residual Chlorine	0.5	1.0	$^{mg}/_{L}$
Total Suspended Solids	30	60	$^{mg}/_{L}$
Aluminum, total	4.0	8.0	$^{mg}/_{L}$
Iron, total	2.0	4.0	$^{mg}/_{L}$
Manganese, total	1.0	2.0	$^{mg}/_{L}$
pH	Not less than 6.0 nor greater than 9.0		S.U.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below in Table 7 are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Monitoring frequencies will remain twice per month for all parameters.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Table 7: Proposed Effluent Limits – Outfall 001

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Daily Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	2/month	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	60.0	XXX	2/month	Grab
Total Dissolved Solids	XXX	XXX	XXX	Report	Report	XXX	2/month	Grab
Total Aluminum	XXX	XXX	XXX	4.0	8.0	XXX	2/month	Grab
Total Iron	XXX	XXX	XXX	2.0	4.0	XXX	2/month	Grab
Total Manganese	XXX	XXX	XXX	1.0	2.0	XXX	2/month	Grab
Sulfate	XXX	XXX	XXX	Report	Report	XXX	2/month	Grab
Chloride	XXX	XXX	XXX	Report	Report	XXX	2/month	Grab
Bromide	XXX	XXX	XXX	Report	Report	XXX	2/month	Grab

Compliance Sampling Location: Outfall 001, Prior to commingling with stormwater runoff.

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☒	PENTOXSD for Windows Model (see Attachment **C**)
☒	TRC Model Spreadsheet (see Attachment **D**)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Toxics Screening Analysis Spreadsheet (see Attachment **B**)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☒	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

Attachments

Attachment A: StreamStats Report for Outfall 001

Attachment B: Toxics Screening Analysis Results for Outfall 001

Attachment C: PENTOXSD Modeling Results for Outfall 001

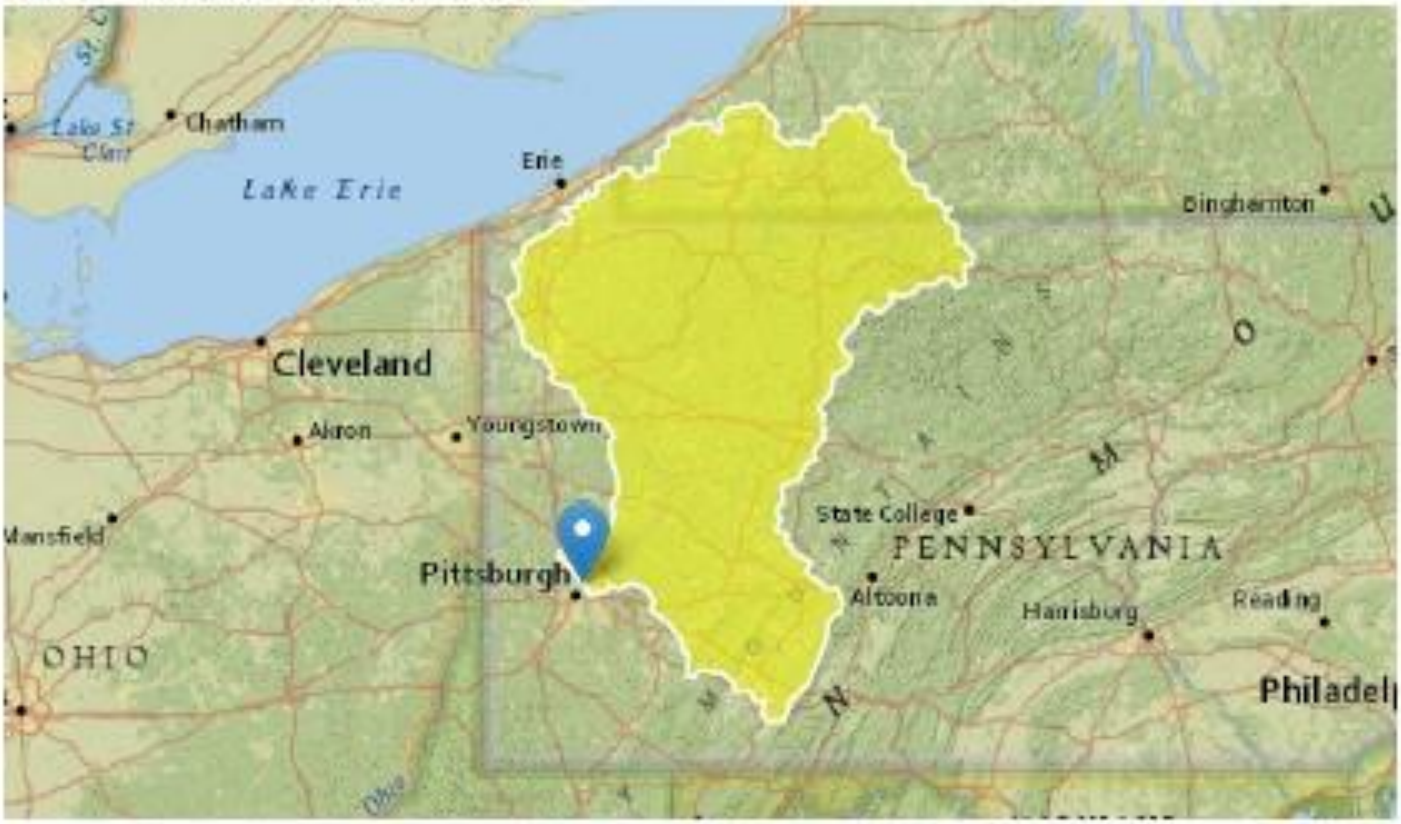
Attachment D: TRC Modeling Results for Outfall 001

ATTACHMENT A:

StreamStats Report for Outfall 001

StreamStats Report

Region ID: PA
Workspace ID: PA20200318142400223000
Clicked Point (Latitude, Longitude): 40.48655, -79.95363
Time: 2020-03-18 10:24:26 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	11700	square miles
ELEV	Mean Basin Elevation	1590.7	feet
PRECIP	Mean Annual Precipitation	43.8	inches

Low-Flow Statistics Parameters[96 Percent (11200 square miles) Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	11700	square miles	2.33	1720
ELEV	Mean Basin Elevation	1590.7	feet	898	2700
PRECIP	Mean Annual Precipitation	43.8	inches	38.7	47.9

Low-Flow Statistics Parameters[4 Percent (486 square miles) Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	11700	square miles	2.26	1400
ELEV	Mean Basin Elevation	1590.7	feet	1050	2580

Low-Flow Statistics Disclaimers[96 Percent (11200 square miles) Low Flow Region 3]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report[96 Percent (11200 square miles) Low Flow Region 3]

Statistic	Value	Unit
7 Day 2 Year Low Flow	1510	ft^3/s
30 Day 2 Year Low Flow	1910	ft^3/s
7 Day 10 Year Low Flow	1000	ft^3/s
30 Day 10 Year Low Flow	1200	ft^3/s
90 Day 10 Year Low Flow	1620	ft^3/s

Low-Flow Statistics Disclaimers[4 Percent (486 square miles) Low Flow Region 4]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report[A Percent (488 square miles) Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	1530	ft^3/s
30 Day 2 Year Low Flow	1940	ft^3/s
7 Day 10 Year Low Flow	1000	ft^3/s
30 Day 10 Year Low Flow	1090	ft^3/s
90 Day 10 Year Low Flow	1500	ft^3/s

Low-Flow Statistics Flow Report[Area-Averaged]

Statistic	Value	Unit
7 Day 2 Year Low Flow	1510	ft^3/s
30 Day 2 Year Low Flow	1910	ft^3/s
7 Day 10 Year Low Flow	1000	ft^3/s
30 Day 10 Year Low Flow	1190	ft^3/s
90 Day 10 Year Low Flow	1610	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

ATTACHMENT B:

Toxics Screening Analysis Results for Outfall 001

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

CLEAR FORM

Facility: **Hampton Shaler Water Authority** NPDES Permit No.: **PA0027537** Outfall: **001**
Analysis Hardness (mg/L): **86.3** Discharge Flow (MGD): **0.25** Analysis pH (SU): **7.57**
Stream Flow, Q_{7-10} (cfs): **2390**

	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
Group 1	Total Dissolved Solids		1750000	500000	Yes		Monitor
	Chloride		1260000	250000	Yes		Monitor
	Bromide	<	100	N/A	No		Monitor
	Sulfate		87700	250000	No		Monitor
	Fluoride	<	260	2000	No		
Group 2	Total Aluminum	<	100	750	No		
	Total Antimony	<	5	5.6	No		
	Total Arsenic		8	10	No		
	Total Barium		410	2400	No		
	Total Beryllium	<	2	N/A	No		
	Total Boron		110	1600	No		
	Total Cadmium	<	2	0.271	Yes	1170.901	No Limits/Monitoring
	Total Chromium	<	20	N/A	No		
	Hexavalent Chromium	<	5	10.4	No		
	Total Cobalt	<	5	19	No		
	Total Copper		100	9.3	Yes	38822.46	No Limits/Monitoring
	Total Cyanide	<	10	N/A	No		
	Total Iron		370	1500	No		
	Dissolved Iron	<	20	300	No (Value < QL)		
	Total Lead	<	5	3.2	Yes	13765.53	No Limits/Monitoring
	Total Manganese	<	20	1000	No		
	Total Mercury	<	1	0.05	Yes	19.739	No Limits/Monitoring
	Total Molybdenum	<	5	N/A	No		
	Total Nickel	<	20	52.2	No		
	Total Phenols (Phenolics)	<	10	5	Yes	4100000	No Limits/Monitoring
	Total Selenium	<	5	5.0	No (Value < QL)		
	Total Silver	<	5	3.8	Yes	10494.76	No Limits/Monitoring
	Total Thallium	<	2	0.24	No (Value < QL)		
	Total Zinc	<	20	119.8	No		

ATTACHMENT C:

PENTOXSD Modeling Results for Outfall 001

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
42122	4.75	704.00	11700.00	0.00000	0.00	☑

Stream Data

	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Rch Velocity (fps)	Rch Trav Time (days)	Tributary Hard (mg/L)	Tributary pH	Stream Hard (mg/L)	Stream pH	Analysis Hard (mg/L)	Analysis pH
Q7-10	0.2043	0	2390	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard (mg/L)	Disc pH
HSWA 001	PA0027537	0.25	0	0	0	0.7	0.7	0	0	86.3	7.57

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
CADMIUM	2000	0	0.5	0.5	0	0	0	0	1	0
CHLORIDE (PWS)	1260000	0	0.5	0.5	0	0	0	0	1	0
COPPER	100000	0	0.5	0.5	0	0	0	0	1	0
LEAD	50000	0	0.5	0.5	0	0	0	0	1	0
MERCURY	1000	0	0.5	0.5	0	0	0	0	1	0
PHENOL	1E+07	0	0.5	0.5	0	0	0	0	1	0
SILVER	50000	0	0.5	0.5	0	0	0	0	1	0
TOTAL DISSOLVED SOLIDS (PWS)	1750000	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
42122	4.25	703.00	11700.50	0.00000	0.00	☑

Stream Data

	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Rch Velocity (fps)	Rch Trav Time (days)	Tributary Hard (mg/L)	Tributary pH	Stream Hard (mg/L)	Stream pH	Analysis Hard (mg/L)	Analysis pH
Q7-10	0.2043	0	2390.5	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard (mg/L)	Disc pH
		0	0	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
CADMIUM	0	0	0.5	0.5	0	0	0	0	1	0
CHLORIDE (PWS)	0	0	0.5	0.5	0	0	0	0	1	0
COPPER	0	0	0.5	0.5	0	0	0	0	1	0
LEAD	0	0	0.5	0.5	0	0	0	0	1	0
MERCURY	0	0	0.5	0.5	0	0	0	0	1	0
PHENOL	0	0	0.5	0.5	0	0	0	0	1	0
SILVER	0	0	0.5	0.5	0	0	0	0	1	0
TOTAL DISSOLVED SOLIDS (PWS)	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
18A	42122	ALLEGHENY RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
4.753	2390	0	2390	0.38675	0.0004	0.8524	1407.9	1651.7	1.9918	0.0153	1000+
4.253	2390.5	0	2390.5	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
4.753	6663.6	0	6663.6	0.38675	0.0004	1.3383	1407.9	1052.0	3.5366	0.0086	1000+
4.253	6664.8	0	6664.8	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
4.75	**HSWA 001**	**PA0027537**

AFC

Q7-10: **CCT (min)** 15 **PMF** 0.699 **Analysis pH** 7 **Analysis Hardness** 99.996

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
TOTAL DISSOLVED SOLIDS (PWS)	0	0	0	0	NA	NA	NA
CHLORIDE (PWS)	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	2.014	2.133	9229.549
	Dissolved WQC. Chemical translator of 0.944 applied.						
COPPER	0	0	0	0	13.439	13.999	60569.28
	Dissolved WQC. Chemical translator of 0.96 applied.						
LEAD	0	0	0	0	64.579	81.642	353247.1
	Dissolved WQC. Chemical translator of 0.791 applied.						
MERCURY	0	0	0	0	1.4	1.647	7126.48
	Dissolved WQC. Chemical translator of 0.85 applied.						
PHENOL	0	0	0	0	NA	NA	NA
SILVER	0	0	0	0	3.217	3.784	16373.51
	Dissolved WQC. Chemical translator of 0.85 applied.						

CFC

Q7-10: **CCT (min)** 720 **PMF** 0.699 **Analysis pH** 7 **Analysis Hardness** 99.996

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
TOTAL DISSOLVED SOLIDS (PWS)	0	0	0	0	NA	NA	NA
CHLORIDE (PWS)	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	0.246	0.271	1170.901
	Dissolved WQC. Chemical translator of 0.909 applied.						
COPPER	0	0	0	0	8.956	9.329	40363.14
	Dissolved WQC. Chemical translator of 0.96 applied.						
LEAD	0	0	0	0	2.517	3.181	13765.53
	Dissolved WQC. Chemical translator of 0.791 applied.						
MERCURY	0	0	0	0	0.77	0.906	3919.564
	Dissolved WQC. Chemical translator of 0.85 applied.						
PHENOL	0	0	0	0	NA	NA	NA
SILVER	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
4.75	**HSWA 001**	**PA0027537**

THH

Q7-10: **CCT (min)** 720 **PMF** 0.063 **Analysis pH** NA **Analysis Hardness** NA

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
TOTAL DISSOLVED SOLIDS (PWS)	0	0	0	0	500000	500000	NA
CHLORIDE (PWS)	0	0	0	0	250000	250000	NA
CADMIUM	0	0	0	0	NA	NA	NA
COPPER	0	0	0	0	NA	NA	NA
LEAD	0	0	0	0	NA	NA	NA
MERCURY	0	0	0	0	0.05	0.05	19.739
PHENOL	0	0	0	0	10400	10400	4100000
SILVER	0	0	0	0	NA	NA	NA

CRL

Qh: **CCT (min)** 720 **PMF** 0.089

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
TOTAL DISSOLVED SOLIDS (PWS)	0	0	0	0	NA	NA	NA
CHLORIDE (PWS)	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	NA	NA	NA
COPPER	0	0	0	0	NA	NA	NA
LEAD	0	0	0	0	NA	NA	NA
MERCURY	0	0	0	0	NA	NA	NA
PHENOL	0	0	0	0	NA	NA	NA
SILVER	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
18A	42122	ALLEGHENY RIVER

RMI	Name	Permit Number	Disc Flow (mgd)
4.75	HSWA 001	PA0027537	0.2500

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
CADMIUM	1170.901	CFC	1826.794	1170.901	CFC
CHLORIDE (PWS)	1260000	INPUT	1960000	NA	NA
COPPER	38822.46	AFC	60569.29	38822.46	AFC
LEAD	13765.53	CFC	21476.44	13765.53	CFC
MERCURY	19.739	THH	30.795	19.739	THH
PHENOL	4100000	THH	6400000	4100000	THH
SILVER	10494.76	AFC	16373.51	10494.76	AFC
TOTAL DISSOLVED SOLIDS (PWS	1750000	INPUT	2730000	NA	NA

ATTACHMENT D:

TRC Modeling Results for Outfall 001

TRC EVALUATION

2390	= Q stream (cfs)	0.5	= CV Daily
0.25	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.7	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	0.7	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	0	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	0	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	1379.947	1.3.2.iii	WLA cfc =	1345.332
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	514.201	5.1d	LTA_cfc =	782.113

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.720	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) =	1.170	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...**
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...**
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**