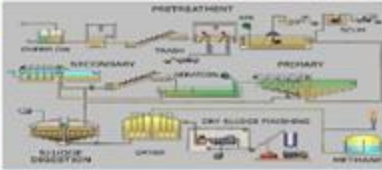




pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Clean Water
Wastewater Technical Assistance Program



▶ **Helping Operators Achieve Excellence**

PADEP Wastewater Technical Assistance Program

**Erick Ammon
PADEP Bureau of Clean Water
Wastewater Operations Group
Wastewater Technical Assistance Program**

eammon@pa.gov

717.772.8911

Erick Ammon – PADEP BCW WWTAP

- Joined PADEP in 2010
 - 2010-2015 - Water Quality Specialist with PADEP Southcentral Regional Office (SCRO) Clean Water Program
 - Technical Field Operations staff in York & Reading District Offices
 - 2015-2023 - Environmental Protection Compliance Specialist with PADEP SCRO Clean Water Program
 - PADEP SCRO
 - * *Acting Water Quality Specialist Supervisor with SCRO Clean Water Program from March 2020 - June 2021 (COVID & Telework...yay!)*
 - March 2023-present - Water Program Specialist with PADEP Bureau of Clean Water, Wastewater Operations Group, Wastewater Technical Assistance Program.
 - PADEP Central Office / Rachel Carson State Office Building
- Pennsylvania Wastewater Operator cert. in 2012 - A,E (1,2,3,4)
- PADEP Environmental Education Grant reviewer
- Member of SAN Pathogens & Point Source Workgroup since 2011.
- Penn State Ext. Master Watershed Steward in Cumberland County
- Cumberland Valley Appalachian Trail Club (Board Member)



PADEP WWTAP

Wastewater Technical Assistance Program (WWTAP)

- On-site Compliance Assistance
- Instrument-based Operational Troubleshooting
- Instrument-based Process Optimization
- Improving Nutrient Removal & Biological Nutrient Removal
- Enhancing Nitrification and Denitrification
- Chemical Dosing Calculations
- Preventative Maintenance Program Development
- Asset Management Program Guidance
- Collections System O&M Evaluations
- Evaluating Influent Organic Loading
- Identifying Sources of Industrial & Non-Domestic Wastewater
- Troubleshooting Operation & Maintenance Impacts on Plant Performance
- Proper Use, Calibration and Maintenance of Meters
- Developing Standard Operating Procedures
- Minimizing Odors at Pump Stations and Treatment Plants
- Developing Process Control Programs
- Assisting with Laboratory Procedures & Laboratory Tutorials
- Worker Safety & Site Security Evaluation
- Digital Record Keeping / eDMR Instruction
- Energy Efficiency Evaluations
- Disaster Response & Resiliency
- PADEP Staff & Certified Operator Training
 - Activated Sludge Refresher
 - Operator Ethics / Clean Water Professionals
 - Optimization & Instrumentation
 - Nutrient Removal & BNR
 - Circuit Rider Training



PADEP WWTAP

- ✓ WWTAP implements a hands-on workplace training approach used for improving operational and maintenance conditions that affect water quality.
- ✓ WWTAP is more about Workers than Workplace
 - Training component
 - Compliance component
 - Aspirational component
- ✓ WWTAP uses a holistic approach to TA that has two parts to address permit non-compliance and to enhance biological nutrient reduction (BNR) and reduce nutrient loading to Waters of the Commonwealth.



PADEP WWTAP

Main resources provided by PA DEP WWTAP:

1. Operator Outreach

Public Service Institute Instructor (PSII) & Wage-Payroll Program
~12 part-time certified wastewater operators across PA
PSII staff focus on attaining / maintaining compliance
Water Program Specialist supervises program

2. Wastewater Treatment Evaluation & Process Optimization

Instrument-based Data Collection

On-site process monitoring laboratory instruction

A six-to-ten-week “look under the hood”

Cradle-to-grave analysis of “where the numbers come from”

Analysis of operations / maintenance

Observations / recommendations on other aspects of operations:

Safety,
NPDES Permit Requirements,
Preventative Maintenance Programs,
Process Monitoring,
Solids Management Planning,
Collections System Evaluations, etc.



▶ Operator Outreach PSII “Wage Payroll” Program

Licensed operators helping licensed operators:

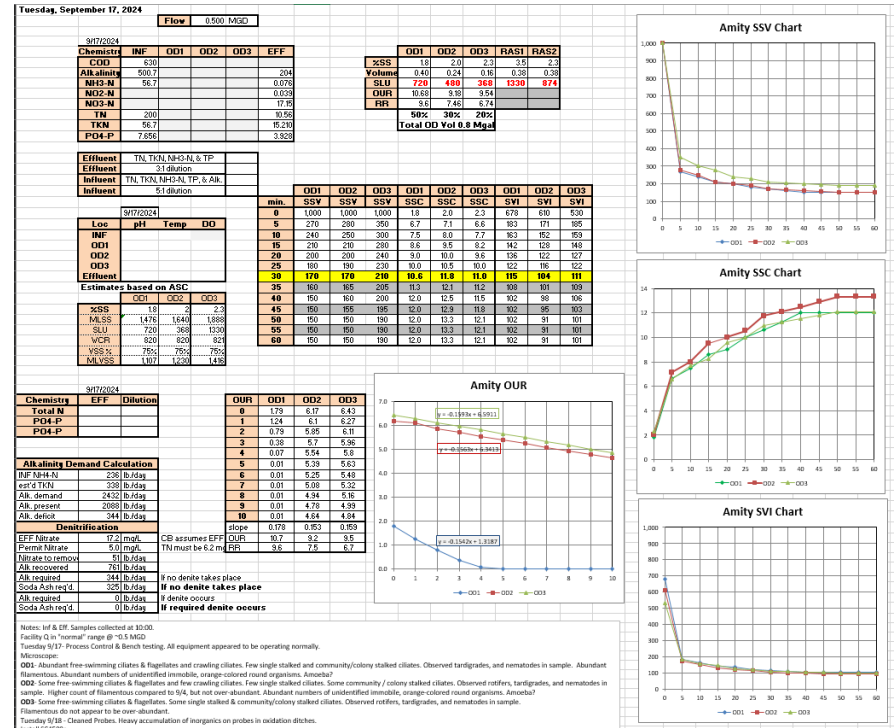
- NPDES & WQM Part II Permit Compliance
- Improved Performance / Effluent Quality
- Laboratory Training & Interpreting Data
- Chemical Use, Dosing, & Safety
- Wastewater Treatment Operations Plan
- Biosolids Management Plan
- Energy Conservation / Pollution Prevention
- Preventative Maintenance
- Collection System Operation
- Asset Management
- Pre-Treatment / Industrial User Management
- Record-keeping and Reporting



Compliance Assistance & Optimization

Adequate Process Monitoring & Control results:

- Increased effluent quality
- Energy optimization / reduction / savings
- Reduced chemical usage
- Predictable operations
- Time and manpower savings
- More budget for better things!

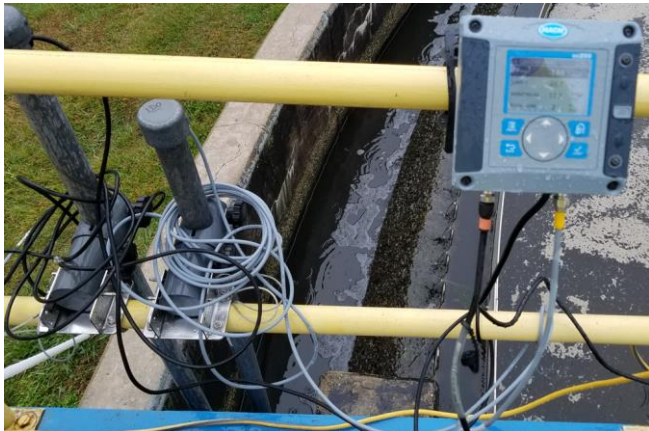


Compliance Assistance & Optimization

Localized Data Collection Pairs

- DO & ORP Probes for in-basin BNR Process,
- DO & pH/Temp Probes for Nitrification,
- Ammonium & Nitrate Probes for effluent monitoring

Used mostly for diagnosing or monitoring single tanks



Compliance Assistance & Optimization

Raven Process Control Kits

- Centrifuge for 15-minute suspended solids tests
- Core-sampler for clarifier blankets
- Settleometers for SSV, SVI, and sludge bulking tests



Compliance Assistance & Optimization

HACH Handheld Meters

- HACH HQ4200 Handheld Meters w/Probes
 - LDO
 - pH
 - ORP
 - Conductivity &
 - LBOD

WWTAP also provides standards for a three-point pH probe calibration (4/7/10), replacement LDO cap & button battery, ORP standard solution (200mV or Zobells 220mV), & Conductivity standard(s).



**WWTAP is currently researching equipment for the purchase of handheld sludge blanket and ammonia probes.*



Compliance Assistance & Optimization

Portable Spectrophotometers

HACH DR1900 Portable Spectrophotometer

WWTAP and/or Facility Procures TNT Tests

- Nitrogen Series
 - » Total Nitrogen
 - » Nitrate-Nitrogen
 - » Nitrite-Nitrogen
 - » Ammonia Nitrogen
 - » TKN
- Total Phosphorous
- Chemical Oxygen Demand (COD)
- Alkalinity
- Quat Ammonium
- Surfactants



Compliance Assistance & Optimization

Composite Samplers for pinpointing collection system hot spots

- Composite or discrete/series (24-bottle) sample collection
- WWTP influent & treatment unit effluent
- Sanitary sewer pump stations
- Designated discharge sampling manholes
- Manholes hanger kit (under cover)



Fluke Power Loggers / Vibration Meters / Ammeters

- Providing energy-use evaluation for conservation efforts
- Determine bearing conditions in power equipment



Enhanced Technical Assistance - Optimization

Enhanced Technical Assistance Evaluations

- On-site Compliance Assistance
- Instrument-based Operational Troubleshooting
- Instrument-based Process Optimization
- Chemical Dosing Calculations
- Energy Efficiency Evaluations
- Pollution Prevention Programs
- Laboratory Tutorials
- Preventative Maintenance Program Development
- Asset Management Program Guidance
- Digital Record Keeping / eDMR Instruction
- Collections System O&M Evaluations
- Worker Safety & Site Security Evaluation

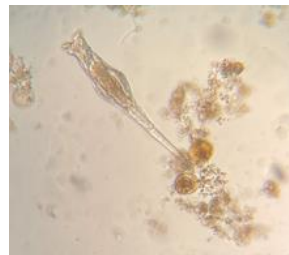
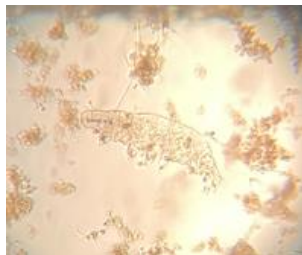


“Enhanced” Technical Assistance - Optimization

Instrument-based Wastewater Treatment Evaluation

- In-situ digital recording probes
- Employs a network of continuous monitoring equipment to monitor processes 24/7 for six-to-ten weeks
 - Influent, Treatment Unit / Process, Effluent monitoring
 - Real-Time Data Logging and Telemetry
- Realtime & Historical Trend Graphs
 - pH/Temp; DO; ORP; TSS; NH₄-N; NO₃-N
 - UVAS (TOC/BOD/COD)
- Portable Environmental Laboratory
 - Microscope | Centrifuge | Settleometers | Colorimetry

Now with
Data!



“Enhanced” Technical Assistance - Optimization

Instrument-based Wastewater Treatment Evaluation

- Various data sources:
 - Sneakernet,
 - Local Networks (cables!), and
 - HACH Claros (& WIMS)

The screenshot displays the HACH Claros Mobile Sensor Management web interface. The page title is "Mobile Sensor Management" and the user is "Erick Ammon". The interface shows a list of sensors and their current readings. The sensors are grouped by device ID.

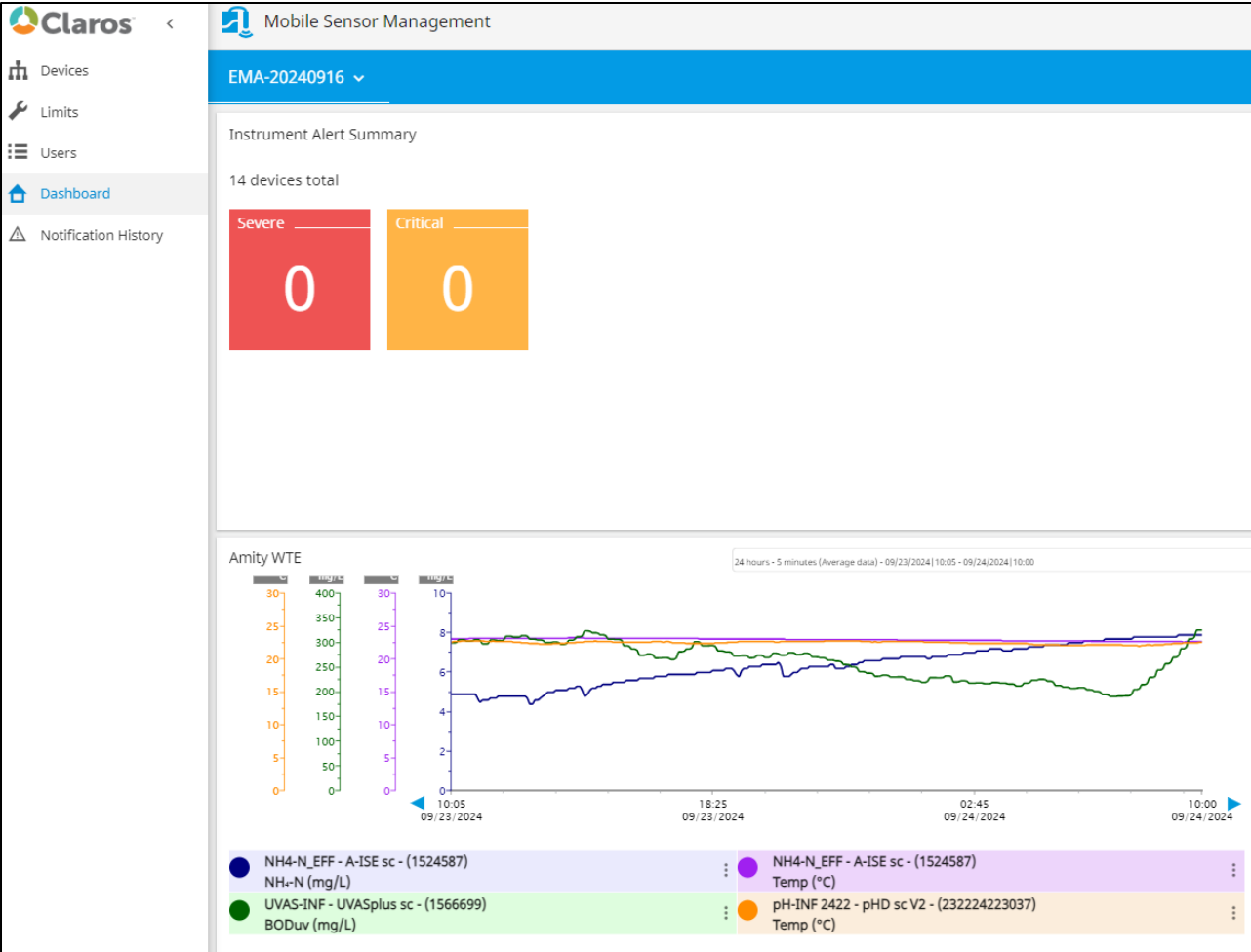
Device ID	Sensor Name	Reading	Unit
2336005 - sc4500	NH4-N_EFF - A-ISE sc - (1524507)	22.7	°C
	NH4-N mg/L	7.9	mg/L
	NO3-N_EFF - NITRATAX plus sc - (1276507)	20.5	mg/L
2341461 - sc4500	pH-INF 2422 - pHD sc V2 - (232224223037)	22.6	°C
	pH pH	6.08	pH
2341461 - sc4500	UVAS-INF - UVASplus sc - (1566699)	326.0	mg/L
	BODuv mg/L	326.0	mg/L
2341461 - sc4500	Sensors	4	
	Output	1	
	Relay	1	



“Enhanced” Technical Assistance - Optimization

Instrument-based Wastewater Treatment Evaluation

- HACH Claros



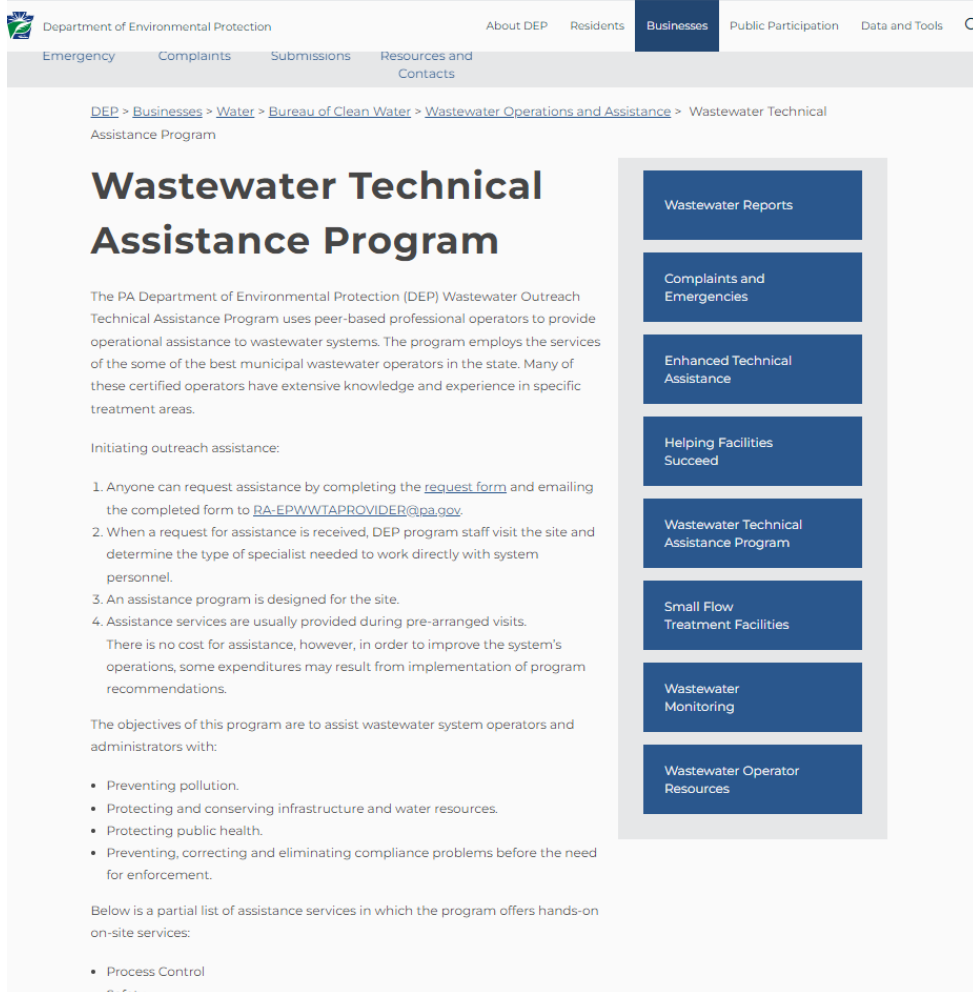
Technical Assistance Referrals

Source of WWTAP Referrals:

- Reported Violations in eDMR and ICIS
- Operator Professional Meetings & Conferences
- EPA Operator Outreach Program (WaterTA)
- Facility and/or Operator Self-Referrals
 - External Referral
- DEP Technical Field Operations Staff
 - Internal Referral
- Cold Calls to Treatment Systems



PADEP Web Pages- PSII / Wage-Payroll



Department of Environmental Protection

About DEP Residents **Businesses** Public Participation Data and Tools

Emergency Complaints Submissions Resources and Contacts

DEP > [Businesses](#) > [Water](#) > [Bureau of Clean Water](#) > [Wastewater Operations and Assistance](#) > Wastewater Technical Assistance Program

Wastewater Technical Assistance Program

The PA Department of Environmental Protection (DEP) Wastewater Outreach Technical Assistance Program uses peer-based professional operators to provide operational assistance to wastewater systems. The program employs the services of some of the best municipal wastewater operators in the state. Many of these certified operators have extensive knowledge and experience in specific treatment areas.

Initiating outreach assistance:

1. Anyone can request assistance by completing the [request form](#) and emailing the completed form to PA-EPWWTAPROVIDER@pa.gov.
2. When a request for assistance is received, DEP program staff visit the site and determine the type of specialist needed to work directly with system personnel.
3. An assistance program is designed for the site.
4. Assistance services are usually provided during pre-arranged visits.

There is no cost for assistance, however, in order to improve the system's operations, some expenditures may result from implementation of program recommendations.

The objectives of this program are to assist wastewater system operators and administrators with:

- Preventing pollution.
- Protecting and conserving infrastructure and water resources.
- Protecting public health.
- Preventing, correcting and eliminating compliance problems before the need for enforcement.

Below is a partial list of assistance services in which the program offers hands-on on-site services:

- Process Control
- Safety

Wastewater Reports

Complaints and Emergencies

Enhanced Technical Assistance

Helping Facilities Succeed

Wastewater Technical Assistance Program

Small Flow Treatment Facilities

Wastewater Monitoring

Wastewater Operator Resources

DEP > (www.dep.pa.gov)

Businesses >

Water >

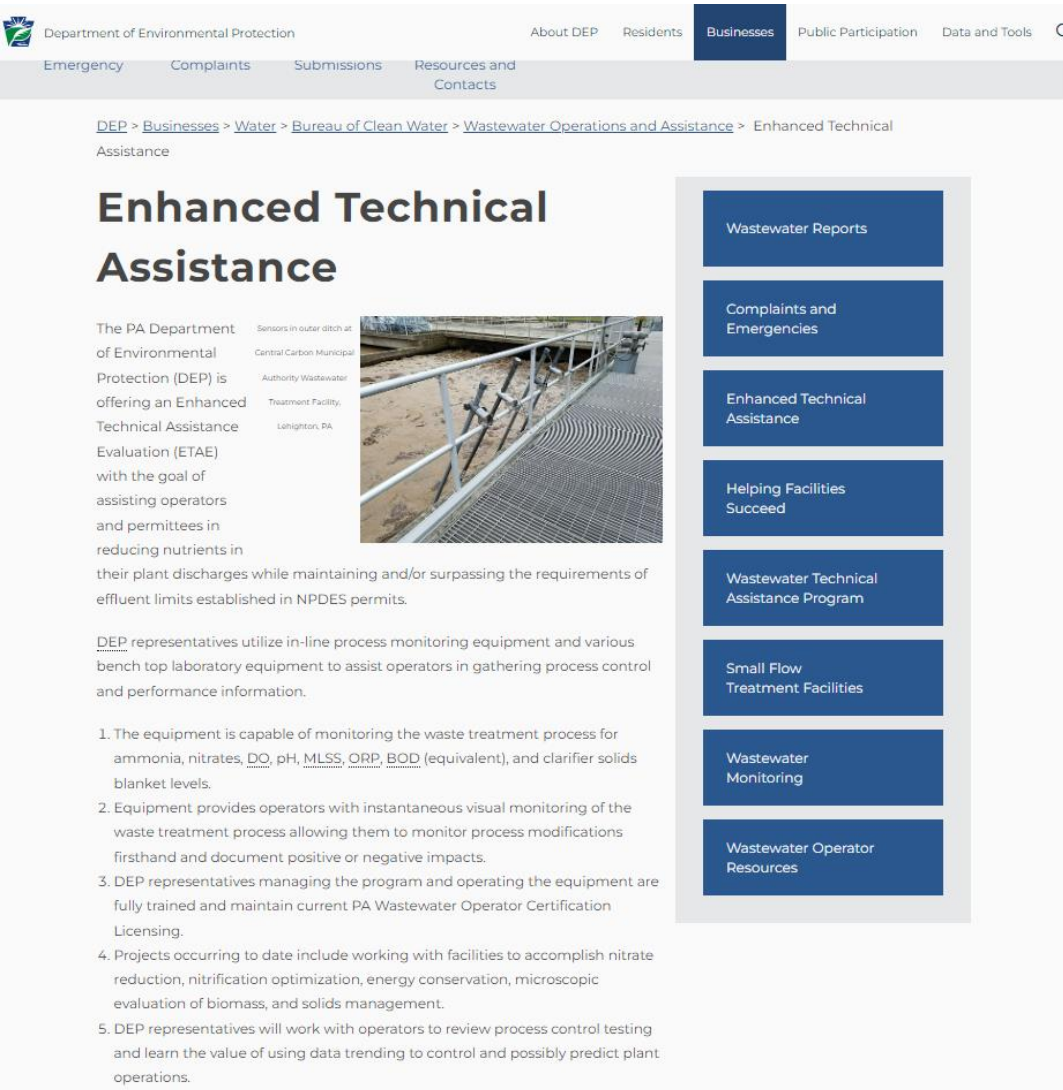
Bureau of Clean Water >

Wastewater Operations & Assistance >

Wastewater Technical Assistance Program



PADEP Web Pages- Enhanced TA Evaluations



The screenshot shows the PADEP website navigation menu with 'Businesses' selected. The breadcrumb trail is: DEP > Businesses > Water > Bureau of Clean Water > Wastewater Operations and Assistance > Enhanced Technical Assistance. The main heading is 'Enhanced Technical Assistance'. The text describes the program's goal of assisting operators and permittees in reducing nutrients. A list of five numbered points details the program's capabilities and projects. A sidebar on the right contains eight menu items: Wastewater Reports, Complaints and Emergencies, Enhanced Technical Assistance, Helping Facilities Succeed, Wastewater Technical Assistance Program, Small Flow Treatment Facilities, Wastewater Monitoring, and Wastewater Operator Resources. An image of a wastewater treatment facility is also present.

Department of Environmental Protection

About DEP Residents **Businesses** Public Participation Data and Tools

Emergency Complaints Submissions Resources and Contacts

DEP > [Businesses](#) > [Water](#) > [Bureau of Clean Water](#) > [Wastewater Operations and Assistance](#) > Enhanced Technical Assistance

Enhanced Technical Assistance

The PA Department of Environmental Protection (DEP) is offering an Enhanced Technical Assistance Evaluation (ETA) with the goal of assisting operators and permittees in reducing nutrients in their plant discharges while maintaining and/or surpassing the requirements of effluent limits established in NPDES permits.

DEP representatives utilize in-line process monitoring equipment and various bench top laboratory equipment to assist operators in gathering process control and performance information.

1. The equipment is capable of monitoring the waste treatment process for ammonia, nitrates, DO, pH, MLSS, ORP, BOD (equivalent), and clarifier solids blanket levels.
2. Equipment provides operators with instantaneous visual monitoring of the waste treatment process allowing them to monitor process modifications firsthand and document positive or negative impacts.
3. DEP representatives managing the program and operating the equipment are fully trained and maintain current PA Wastewater Operator Certification Licensing.
4. Projects occurring to date include working with facilities to accomplish nitrate reduction, nitrification optimization, energy conservation, microscopic evaluation of biomass, and solids management.
5. DEP representatives will work with operators to review process control testing and learn the value of using data trending to control and possibly predict plant operations.

Sensors in outer ditch at Central Carbon Municipal Authority Wastewater Treatment Facility, Lehighton, PA

- Wastewater Reports
- Complaints and Emergencies
- Enhanced Technical Assistance
- Helping Facilities Succeed
- Wastewater Technical Assistance Program
- Small Flow Treatment Facilities
- Wastewater Monitoring
- Wastewater Operator Resources

DEP > (www.dep.pa.gov)

Businesses >

Water >

Bureau of Clean Water >

Wastewater Operations and Assistance >

Enhanced Technical Assistance



PADEP Web Pages- Operator Resources

The screenshot shows the PADEP website's navigation structure. At the top, there is a header with the Department of Environmental Protection logo and navigation links: About DEP, Residents, **Businesses**, Public Participation, and Data and Tools. Below this is a secondary navigation bar with links: Emergency, Complaints, Submissions, and Resources and. The main content area is titled "Wastewater Operator Resources" and includes a breadcrumb trail: DEP > Businesses > Water > Bureau of Clean Water > Wastewater Operations and Assistance > Wastewater Operator Resources. The page features a large heading "Wastewater Operator Resources" and a paragraph encouraging operators to visit the Operator Certification Information Center. A list of publications is provided, including Best Practices for Water and Wastewater Operators, Discharge Monitoring Reports, and various fact sheets. On the right side, there is a vertical menu of blue buttons: Wastewater Reports, Complaints and Emergencies, Enhanced Technical Assistance, Helping Facilities Succeed, Wastewater Technical Assistance Program, Small Flow Treatment Facilities, Wastewater Monitoring, and Wastewater Operator Resources.

Department of Environmental Protection

About DEP Residents **Businesses** Public Participation Data and Tools

Emergency Complaints Submissions Resources and

DEP > [Businesses](#) > [Water](#) > [Bureau of Clean Water](#) > [Wastewater Operations and Assistance](#) > Wastewater Operator Resources

Wastewater Operator Resources

Wastewater operators are encouraged to visit the [Operator Certification Information Center](#) for information concerning operator licensing, exams, and related information. Additional resources are available below.

- [DEP Publications](#)
- [Spreadsheets](#)
- [Energy Efficiency](#)
- [Asset Management](#)
- [Training Materials](#)
- [Wastewater Instructional Videos](#)

DEP Publications

- [Best Practices for Water and Wastewater Operators](#) (PDF) (3900-FS-DEP4518)
- [Discharge Monitoring Reports: A Guide to Electronic and Paper DMR Reporting](#) (PDF) (3800-BK-DEP3047)
- [Fact Sheet – Management of "Non-Detect" Results for Discharge Monitoring Reports](#) (PDF) (3800-FS-DEP4262)
- [Fact Sheet – Management of Cleaning Wastewater](#) (PDF) (3800-FS-DEP1944)
- [Fact Sheet – Management of Swimming Pool, Hot Tub, and Spa Water Discharges](#) (PDF) (3800-FS-DEP4251)
- [Use of Chlorine Tablets for Wastewater Disinfection](#) (PDF) (3800-FS-DEP4406)
- [Fact Sheet – Planned and Unplanned Discharges of Chlorinated Water to Surface Waters](#) (PDF) (3830-FS-DEP4861)
- [Chlorinated Water Discharge – Incident Report Form](#) (3800-FM-BCW0530)
- [Chapter 94 Wasteload Management – Overview and Summary](#) (PDF) (3850-BK-DEP4450)

Wastewater Reports

Complaints and Emergencies

Enhanced Technical Assistance

Helping Facilities Succeed

Wastewater Technical Assistance Program

Small Flow Treatment Facilities

Wastewater Monitoring

Wastewater Operator Resources

DEP > (www.dep.pa.gov)

Businesses >

Water >

Bureau of Clean Water >

Wastewater Operations & Assistance >

Wastewater Operator Resources



Complaints & Emergencies

DEP > (www.dep.pa.gov)

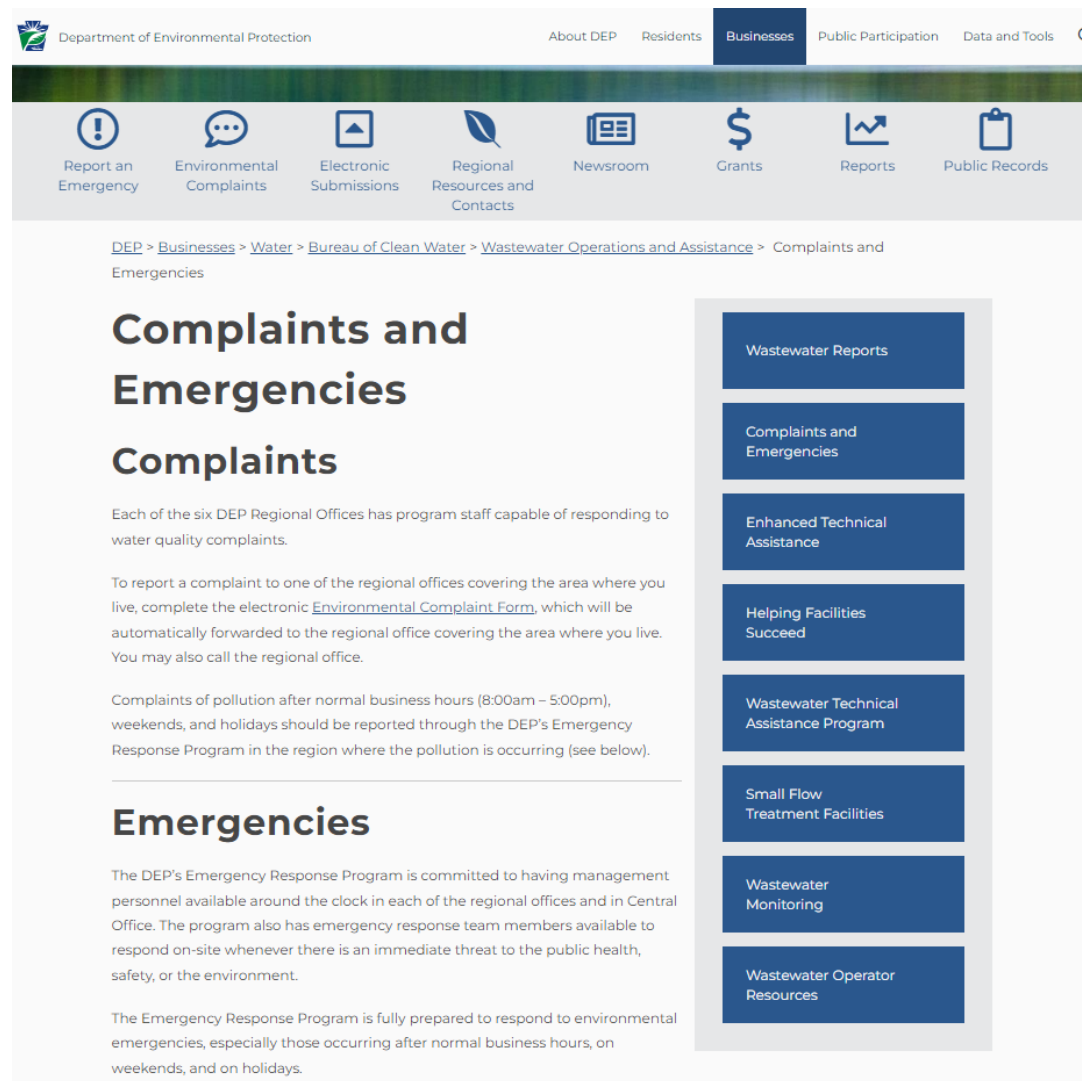
Businesses >

Water >

Bureau of Clean Water >

Wastewater Operations and Assistance >

Complaints and Emergencies



Department of Environmental Protection

About DEP Residents **Businesses** Public Participation Data and Tools

Report an Emergency Environmental Complaints Electronic Submissions Regional Resources and Contacts Newsroom Grants Reports Public Records

[DEP](#) > [Businesses](#) > [Water](#) > [Bureau of Clean Water](#) > [Wastewater Operations and Assistance](#) > Complaints and Emergencies

Complaints and Emergencies

Complaints

Each of the six DEP Regional Offices has program staff capable of responding to water quality complaints.

To report a complaint to one of the regional offices covering the area where you live, complete the electronic [Environmental Complaint Form](#), which will be automatically forwarded to the regional office covering the area where you live. You may also call the regional office.

Complaints of pollution after normal business hours (8:00am – 5:00pm), weekends, and holidays should be reported through the DEP's Emergency Response Program in the region where the pollution is occurring (see below).

Emergencies

The DEP's Emergency Response Program is committed to having management personnel available around the clock in each of the regional offices and in Central Office. The program also has emergency response team members available to respond on-site whenever there is an immediate threat to the public health, safety, or the environment.

The Emergency Response Program is fully prepared to respond to environmental emergencies, especially those occurring after normal business hours, on weekends, and on holidays.

- Wastewater Reports
- Complaints and Emergencies
- Enhanced Technical Assistance
- Helping Facilities Succeed
- Wastewater Technical Assistance Program
- Small Flow Treatment Facilities
- Wastewater Monitoring
- Wastewater Operator Resources



Complaints & Emergencies

Emergency Response Hotline

DEP maintains a 24-hour emergency response hotline with Duty Officers on call in each DEP Regional Office for dispatching response personnel to emergency and incidents within DEP purview.

To report an environmental emergency, please call:

1-800-541-2050

To submit an environmental complaint, please fill out our online [Environmental Complaint Form](#).

Regional Offices

Erin Wells, Regional Director Staci Gustafson, Asst. Regional Director Northwest (Meadville) Regional Office 230 Chestnut St. Meadville, PA 16335-3481 Telephone: 814.332.6945	Jared Cressler, Regional Director Daniel Therford, Asst. Regional Director Northcentral (Williamsport) Regional Office 208 W. 3 rd St., Suite 101 Williamsport, PA 17701-8448 Telephone: 570.327.3636	Joseph Buczynski, P.E. Regional Director Dean Ritter, Asst. Regional Director Northeast (Wilkes-Barre) Regional Office 2 Public Square Wilkes-Barre, PA 18701-1915 Telephone: 570.826.2511
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James E. Miller, Regional Director Kevin Halloran, Asst. Regional Director Southwest (Pittsburgh) Regional Office 400 Waterfront Drive Pittsburgh, PA 15222-4745 Telephone: 412.442.4000	Robert DiGianno, Regional Director Andrea Blosser, Asst. Regional Director Southcentral (Harrisburg) Regional Office 909 Elmerton Avenue Harrisburg, PA 17110-8200 Telephone: 717.705.4700	Patrick Patterson, Regional Director Sachin Shankar, Asst. Regional Director Southeast (Norristown) Regional Office 2 East Main Street Norristown, PA 19401 Telephone: 484.250.5900
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- [Southwest Regional Office](#): 412-442-4000
- [Northwest Regional Office](#): 814-332-6945
- [North-central Regional Office](#): 570-327-3636
- [South-central Regional Office](#): 717-705-4700
- [Southeast Regional Office](#): 484-250-5900
- [Northeast Regional Office](#): 570-826-2511
- [Regional Permit Coordination Office](#): 717-772-5987



▶ WWTAP Observations From The Field:

No. 1 Operator Error:

- Not enough sludge wasting!

Others:

- Inattention to Detail
- Time Management
- Inadequate Training / Underconfidence
- Reactive Maintenance (Not Proactive)
- Always Fight the Last Battle
- Jack-of-all-Trades / Master of None



Wastewater Treatment (Mis-)Management

Observations of Wastewater Treatment Operations:

- Not enough Process Monitoring
 - Failure to relate lab results back to operations
- Not enough manpower dedicated to operations
 - Hiring trainable and motivated staff
- Lack of Funding
 - Maintenance and Contingency Funds
- Lack of Planning
 - No asset management program or capital improvement plan
- Too many “Convenient Rationalizations”
 - E.G., “That’s the way we’ve always done it.”
- Politics of Local Oversight
 - Bosses need training, too.



Field Installations



Field Installations

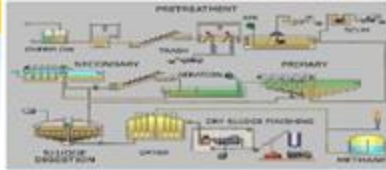


Field Installations





pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

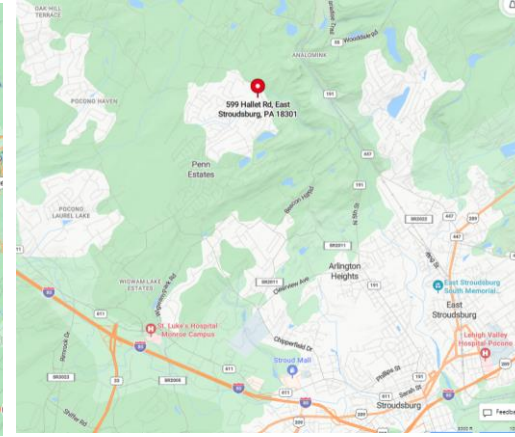
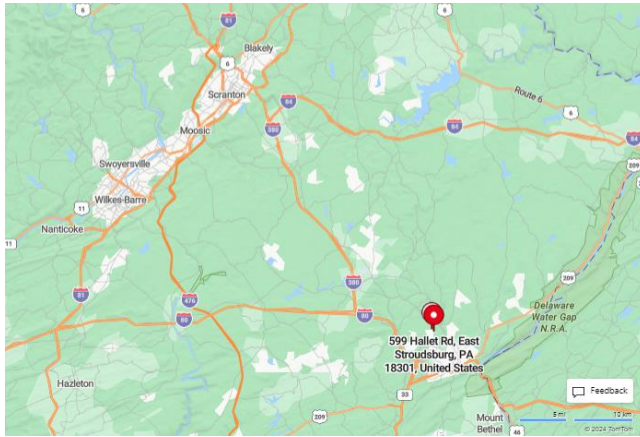


Bureau of Clean Water
Wastewater Technical Assistance Program

Technical Assistance Case Study

How PADEP WWTAP has helped WWTP Operators

Case Study: Penn Estates STP



Case Study: Penn Estates WWTP

Community Utilities Of PA, Inc. - Penn Estates WWTP Stroud Township, Monroe County, PA NPDES # PA0060283

Prior to WTE, CUPA planned to build more nitrate filters (\$\$\$).

After consultation, PA DEP WWTAP staff suggested using “intermittent aeration” with mixing in secondary units to denitrify nitrate in secondary processes, allowing natural BNR to reduce NOx.

Information:

- Private community wastewater treatment system in Poconos
- Community Utilities of PA (CUPA) purchased facility in 2017
- Successive facilities added over time
- Current configuration dates from 2008
- 0.500 MGD AADF
- 917 lb./day Avg. Organic Load
- ~2,000 connections to sewer
- Four staff at plant, including Operator

Issues & Concerns:

- Piecemeal design with treatment units installed over time.
- Many older steel tanks re-used in facility
- Secondary tanks & clarifiers above-ground
- Insufficient freeboard due to gravity redesign
- **Five** nitrate filters added to achieve TN limits
- Hydraulic overload due to SSOs
- Consent Order with regional Clean Water Program to identify and eliminate Inflow/Infiltration and hydraulic surging during wet weather
- Operators care for collection system, pumping stations, and facility, but
 - All trade work is contracted out.

Case Study: Penn Estates STP



Case Study: Penn Estates WWTP

CUPA PENN ESTATES STP
PROBE & PUMP PLACEMENT MAP

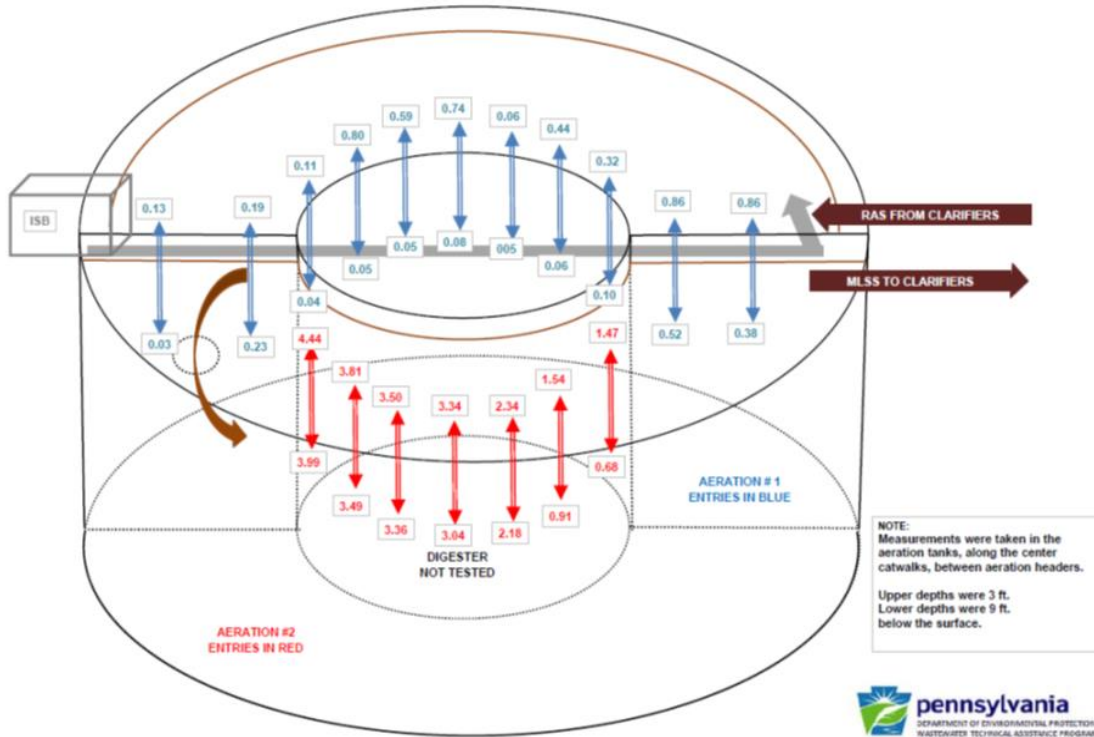


Case Study: Penn Estates WWTP



Case Study: Penn Estates WWTP

DISSOLVED OXYGEN PROFILE FOR AERATION TANKS 1 AND 2
PENN ESTATES STP, STROUD TOWNSHIP, MONROE COUNTY, PENNSYLVANIA



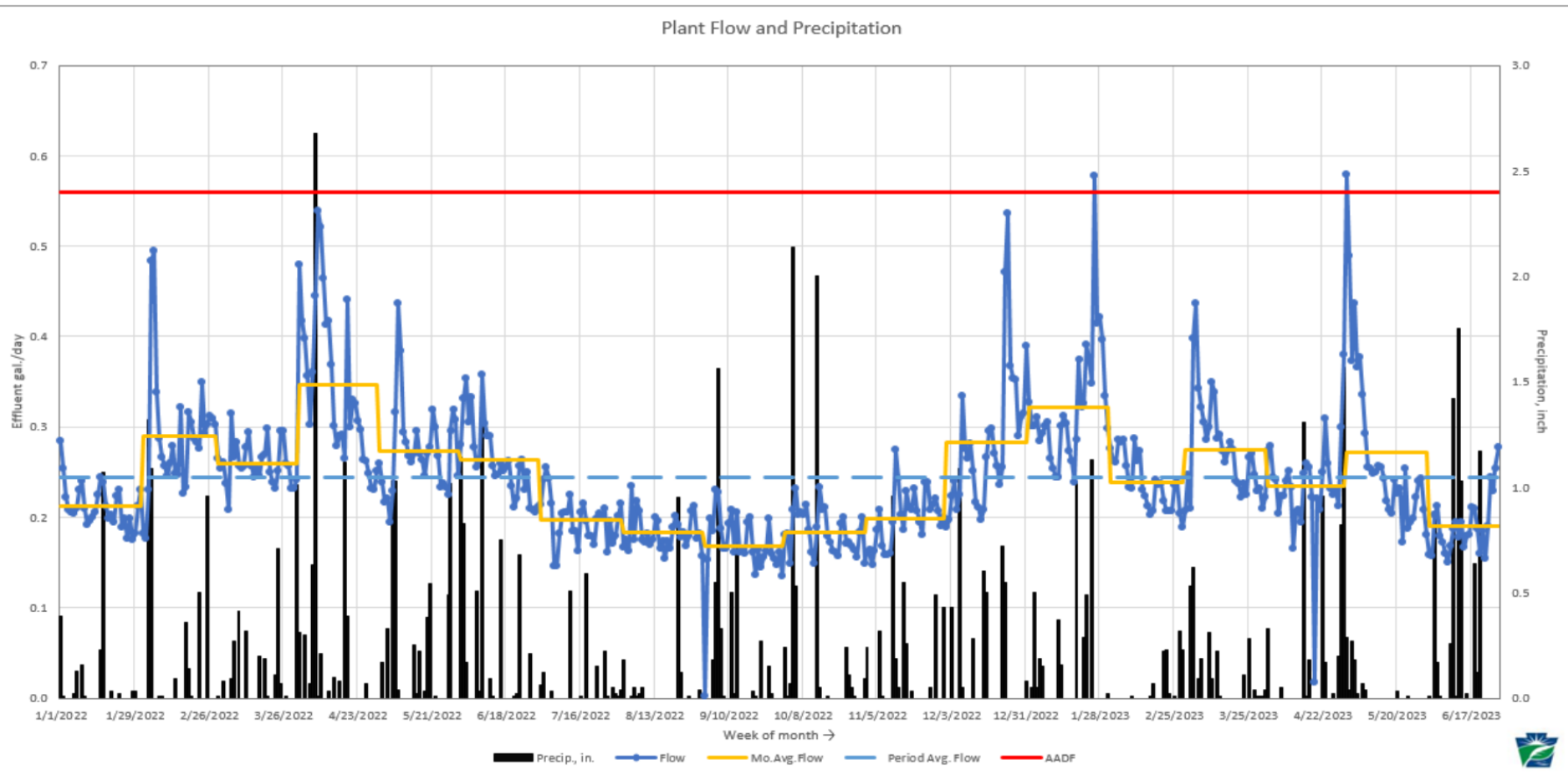
Focus on Intermittent Aeration of above-ground activated sludge aeration tank to achieve in-tank biological denitrification:

- Accumulated detritus was a significant problem
- Coarse-bubble aerators questionable or inoperable.
- Hydraulic overloads in wet weather causing SSO's.

Installed timers on aeration blowers, chopper/grinder pumps in tank for anoxic mixing, and blowers to maintain clarifier RAS (airlift).

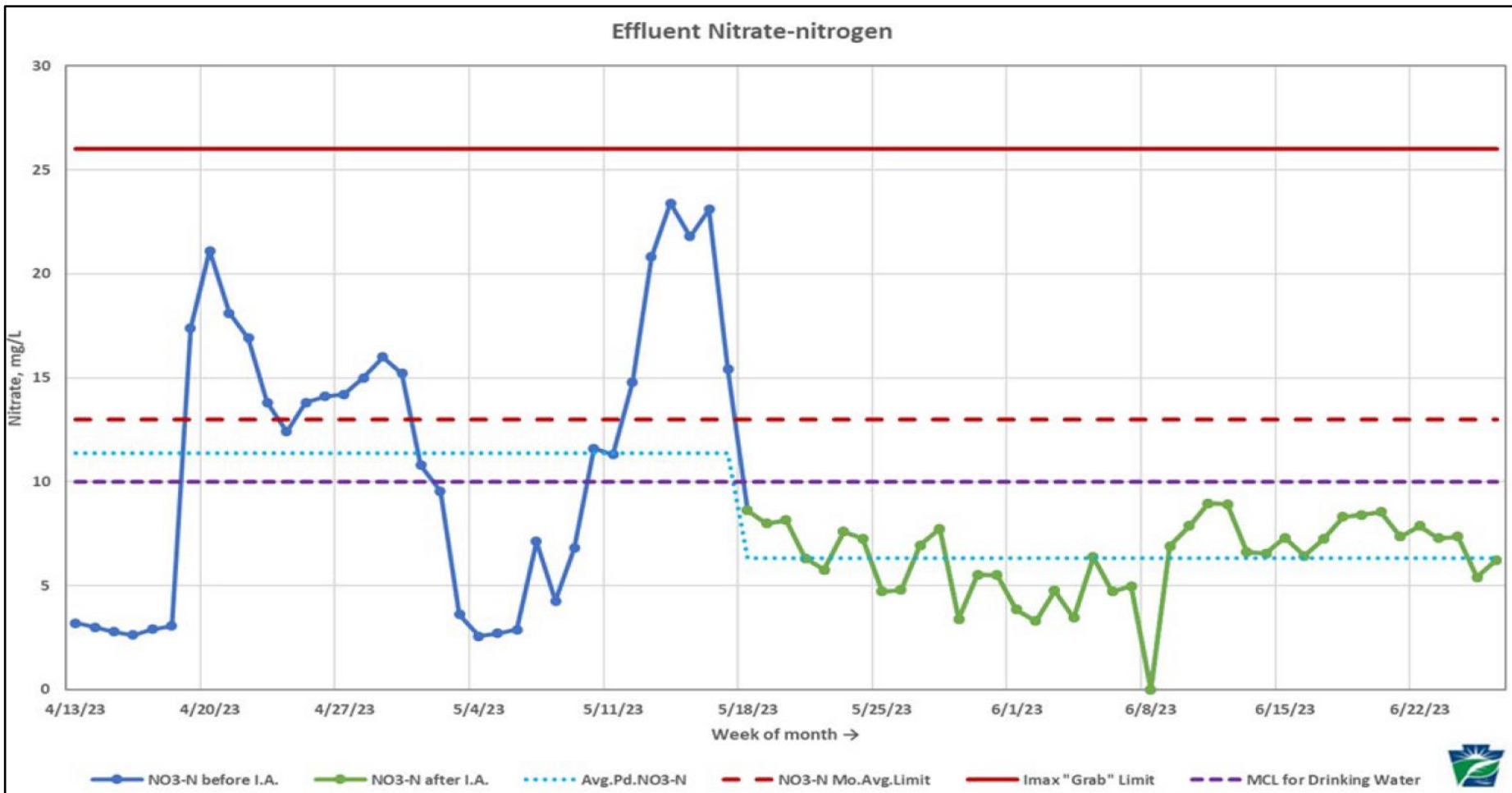
Case Study: Penn Estates WWTP

Facility has significant Inflow & Infiltration issues in collection system.



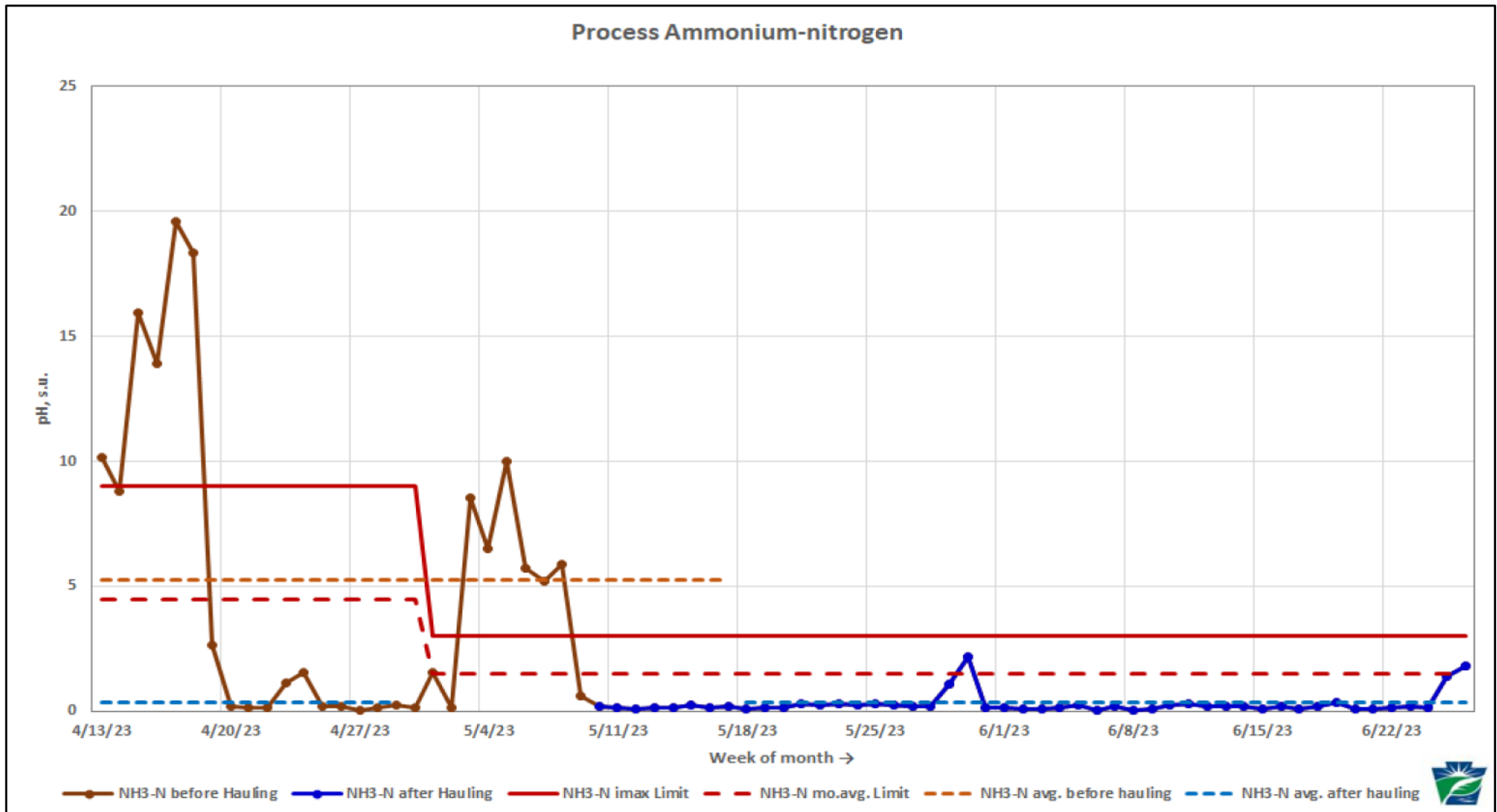
Case Study: Penn Estates WWTP

Achieved reductions in effluent $\text{NO}_3\text{-N}$ to below 10 mg/L. (DRBC MCL)



Case Study: Penn Estates WWTP

Achieved reductions in effluent $\text{NH}_4\text{-N}$ to near-non-detectable concentrations.



Penn Estates WTE Report

**COMMUNITY UTILITIES OF PA, INC.
PENN ESTATES WASTEWATER TREATMENT FACILITY
STROUD TOWNSHIP, MONROE COUNTY, PENNSYLVANIA**

NPDES # PA0060283



DENITRIFICATION STUDY

Prepared by
Marc Neville, Water Program Specialist
Jeremy Miller, Wastewater Operations Advisor
Bureau of Clean Water
Rachel Carson State Office Building
PO Box 8774
400 Market Street
Harrisburg, PA 17105-8774

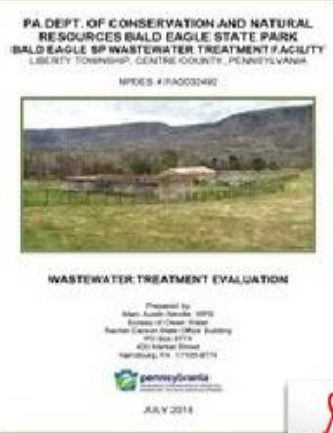


July 2023



Wastewater Treatment Evaluation Reports

WWTAP WTE Reports are available on-line at “Helping Facilities Succeed” page on PADEP website



DEP > (www.dep.pa.gov)

Businesses >

Water >

Bureau of Clean Water >

Wastewater Operations & Assistance >

Wastewater Operator Resources



How To Contact WWTAP

Requests for assistance can be made through your regional DEP office Clean Water Program staff, or by using the online request form!

Access PADEP website and search “wastewater technical assistance request form”.

DEP (www.dep.pa.gov) >

Businesses >

Water >

Bureau of Clean Water >

Wastewater Operations and Assistance >

Wastewater Technical Assistance Program

Email the completed form to RA-EPWWTAPROVIDER@pa.gov



https://files.dep.state.pa.us/Water/BNPNSM/WastewaterOperations_Assistance/OperatorOutreachProgram/Technical_Assistance_Request_Form.docx

CONTACT ME (eammon@pa.gov - 717.772.8911)



How To Contact WWTAP



FREE WASTEWATER TECHNICAL ASSISTANCE Throughout the State of Pennsylvania

The Department of Environmental Protection's Wastewater Technical Assistance Program (WWTAP) is available to offer free on-site Technical Assistance to Wastewater Treatment Plants throughout the state of Pennsylvania. Many of the friendly instructors are experienced in troubleshooting and operating Wastewater Treatment Plants and have years of experience with the Activated Sludge Process.

How can WWTAP help?

- Troubleshooting O&M (operation and maintenance) Problems Affecting Plant Performance
- Treatment Plant Optimization
- Developing Process Control Programs for Wastewater Treatment Plants
- Nutrient Removal and BNR (Biological Nutrient Removal) Processes
- Assistance developing SOPs (Standard Operating Procedures)
- Nitrification and Denitrification
- Minimizing Odor Problems with Pumpstations and Treatment Plants
- Assistance with Proper Use, Calibration and Maintenance of Meters
- Assistance with Laboratory Procedures

Request Assistance

Fill in the Wastewater Technical Assistance Form below and email it to:

RA-EPWWTAPROVIDER@pa.gov

Or mail to:

Pennsylvania DEP
Bureau of Clean Water – WWTAP Program
Rachel Carson State Office Building
P.O. Box 8774
Harrisburg, PA 17105-877

Email this completed TA Request Form and all associated documentation to:
RA-EPWWTAPROVIDER@pa.gov



WASTEWATER TECHNICAL ASSISTANCE REQUEST FORM

Facility Name Facility Name		Date of Request mm/dd/yyyy	
Facility Address Facility Address			
City City		State PA	Zip Code 5 digit Zip Code
County County		Municipality Municipality	
Responsible Official or Contact Name First and Last Name		Contact Title Title	
Contact Email Address Email		Contact Phone Number XXX.XXX.XXXX	
NPDES # Permit #		Technical Assistance Need Choose an item.	

Regional Office Contact with Phone Number:

(Complete if Known)

DEP Inspector or Contact Name First and Last Name	Phone Number XXX.XXX.XXXX	Region Click to Select
--	------------------------------	---------------------------

Technical Assistance Needed/Problem:

(Please be as specific and concise as possible. Provide any background information on the issue for which technical assistance is being requested.)

|

Email this completed TA Request Form and all associated documentation to:
RA-EPWWTAPROVIDER@pa.gov



Goals and Outcomes:

(Describe what you would like to achieve as a result of technical assistance.)

Other Relevant Information:

(Scan and attach any relevant documents or photos)

How did you hear about the free technical assistance offered by the PA DEP Wastewater Technical Assistance Program?

[Click to choose a selection](#)

Email this completed TA Request Form and all associated documentation to:
RA-EPWWTAPROVIDER@pa.gov

https://files.dep.state.pa.us/Water/BPNPSM/WastewaterOperations_Assistance/OperatorOutreachProgram/Technical_Assistance_Request_Form.docx



**Funding &
Technical Assistance
Resources for Water &
Wastewater Utilities**



Funding & Technical Assistance Resources

PENNVEST

Drinking Water

- Storage Tanks
- Lead Removal
- Treatment
- Distribution
- Dams
- Capital Contributions
- Public Wells
- Acquisitions



WWW.PENNVEST.PA.GOV
(877) 787-8137

Wastewater

- Treatment Plants
- Collection Lines
 - Inflow/Infiltration
 - Sewer Separation
- Pump Stations
- Capital Contributions
- Acquisitions



WWW.PENNVEST.PA.GOV
(877) 787-8137



Funding & Technical Assistance Resources

PENNVEST

www.pennvest.pa.gov

Regional contact lists for DEP and PENNVEST staff

Funding program explanations

Application system access

News and updates

Office Information

Pennsylvania Infrastructure Investment Authority

333 Market Street, 18th Floor

Harrisburg, PA 17101-2210

1-877-787-8137 (Toll free)

717-787-8137 (Local main line & directory)

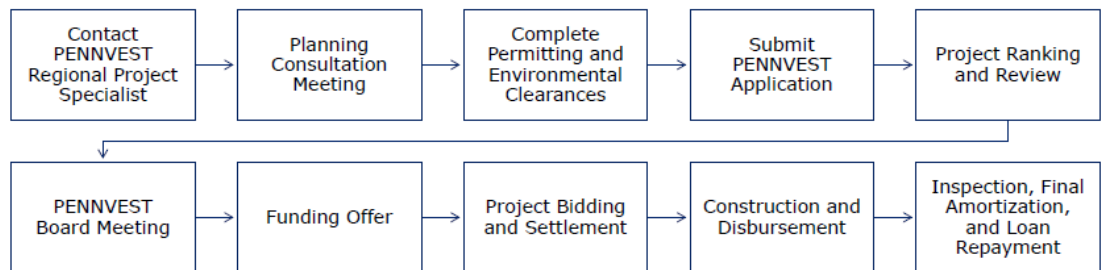
717-787-0804 (Fax)

Business Hours:

M-F 8:00 am to 4:00 pm

*except state closures and holidays

Application and Project Workflow



Funding & Technical Assistance Resources

PA Department of Community and Economic Development (DCED)

- PA Small Water & Sewer Program
 - Assist with the construction, improvement, expansion, or rehabilitation or repair of a water supply system, sanitary sewer system, storm sewer system, or flood control projects.
- H2O PA
 - Water Supply, Sanitary Sewer and Storm Water Projects
- Appalachian Regional Commission (ARC)
 - Construction and infrastructure development, including site preparation, water, sewer, broadband, or other needed improvements.
- Sewage Facilities Program
 - Costs associated with the planning work required under Act 537.
- Community Development Block Grant (CDBG)
 - Infrastructure improvement
- Local Share Accounts (by county)

DCED Contact for water & wastewater:

Stephen Schelander

Economic Development Analyst

sschelande@pa.gov or 717-720-7331

Various Programs have different guidance, however there is one application process for DCED:

[Single Application for Assistance \(state.pa.us\)](https://state.pa.us)



Funding & Technical Assistance Resources

United States Department of Agriculture (USDA)

Rural Utilities Service

Water & Environmental Programs (WEP)

www.rd.usda.gov/programs-services/water-environmental-programs

Various Funding & Technical Assistance Programs for Water & Wastewater

Revolving Funds for Financing Water and Wastewater Projects

Water & Waste Disposal Predevelopment Planning Grants

Circuit Rider Program - Technical Assistance for Rural Water Systems

Pennsylvania Rural Development State Office

359 East Park Drive, Suite 4

Harrisburg, PA 17111

(717) 237-2299

Water and Environmental Programs (WEP)

General Program Inquiries: (717) 237-2188

Linda M. Thomas

Water and Environmental Program Director

linda.Thomas@usda.gov or (814) 547-5941



Funding & Technical Assistance Resources

Bipartisan Infrastructure Law / Infrastructure Investment & Jobs Act

The Bipartisan Infrastructure Law (BIL) allocates 2% of PA Clean Water State Revolving Fund (CWSRF) monies to wastewater technical assistance programs.

BIL wastewater technical assistance program(s) will:

- Enhance or build programs that proactively identify, reach out to, and provide assistance to rural, small, and publicly owned treatment works and drinking water systems, particularly in disadvantaged communities.
- Be designed to help disadvantaged communities identify needs, develop projects, apply for funding, design and implement projects, build capacity, and create training and career pathways.
- Provide flexible forms of technical assistance that may include, but not be limited to, community outreach, technical evaluation of wastewater solutions, preparation of applications, preliminary engineering reports, and financial documents necessary for receiving SRF assistance.

Small, rural, publicly-owned, & financially disadvantaged facilities within EJ Areas and/or within 0.5 miles of an Area of Concern.

- POTW that treat up to 1 million gallons per day (MGD) of wastewater, or
- Serve a population of less than 10,000 persons, or
- Environmental Justice area



Funding & Technical Assistance Resources

Bipartisan Infrastructure Law / Infrastructure Investment & Jobs Act

The Infrastructure Investment & Jobs Act (IIJA) Reauthorizes existing programs and establishes new programs that support water infrastructure, including programs designed to:

- assist publicly owned treatment works (i.e., sewage and wastewater treatment plants commonly known as POTWs) convert waste in water to energy;
- plan and construct POTWs to address municipal combined sewer overflows, sanitary sewer overflows, or stormwater;
- increase the resilience of POTWs to natural hazards or cybersecurity vulnerabilities;
- assist small and medium POTWs;
- construct, repair, or replace decentralized wastewater systems for households with low or moderate incomes;
- assist qualified households with low or moderate incomes connect to POTWs;
- provide alternative sources of water to meet critical water supply needs; or
- develop and construct public water systems and wastewater systems for rural and Native villages in Alaska.



Funding & Technical Assistance Resources

Bipartisan Infrastructure Law / Infrastructure Investment & Jobs Act

EPA selected Environmental Finance Centers to assist communities to access federal funding for BIL projects that improve public health and environmental protection.

Environmental Finance Center Network - efcnetwork.org

EFCN MEMBERS

New England EFC at the University of Southern Maine | neefc.org

Syracuse University EFC | efc.syr.edu

EFC at the University of Maryland | efc.umd.edu

Jennifer Cotting – Director or Medessa Burian - Assistant Director
jcotting@umd.edu msburian@umd.edu

EFC at the University of North Carolina at Chapel Hill | efc.sog.unc.edu

Great Lakes Environmental Infrastructure Center | gleic.org

Southwest EFC at the University of New Mexico | swefc.unm.edu

EFC at Wichita State University | wichita.edu/efc

EFC West at Earth Island Institute | efcwest.net

EFC at Sacramento State | efc.csus.edu

Moonshot Missions

Nick Meurer – Utility Advisor

Nick@moonshotmissions.org

Sarah Niederer, MPH – Senior Utility Advisor

Sarah@moonshotmissions.org

EPA R3



Funding & Technical Assistance Resources

Larson Design Group

Contracted engineering firm to develop projects for BIL/IIJA Wastewater Technical Assistance Program implementation in Pennsylvania.

Quay Schappell
 Program Manager – Water/Wastewater
 Larson Design Group
 1000 Commerce Park Drive, Suite 201
 Williamsport, PA 17701
 (570) 244-3374
qschappell@larsondesigngroup.com

SUMMARY OF CWSRF ASSISTANCE ACTIVITY
 Larson Design Group Technical Assistance

Prepared By:		Date of Assistance:	
Wastewater System Name:		DEP Region:	
Facility Name:		NPDES No.:	
Wastewater System Primary Contact:		Phone #:	
System's future PENNVEST Project Summary:			
Activity:	<input type="checkbox"/> Virtual <input type="checkbox"/> In-Person; Specific Location:		
Primary Purpose of this activity*:			

*Activity is a site visit, training, Teams meeting, substantial assistance via phone, etc.

Participants	Title	Phone# (Optional)	Email: (Optional)

Short Summary of Primary Discussion:

Obstacles Identified:

Solutions Discussed:

Upcoming Action Items for Wastewater System: Summarize here in chronological order, include estimated completion date

Upcoming Action Items for Larson Design Group: Summarize here in chronological order, include estimated completion date.

Future Site Visit Planned: Date and Purpose and Names of Water System Personnel Meeting With

Prioritized DEP Follow Up or Action Items.



Funding & Technical Assistance Resources

The PA DEP's Energy Programs Office (EPO)

- Water (WTP) & Wastewater Treatment Plant (WWTP) Operators Energy Outreach
- Municipal Opportunities for Retrofits and Energy Efficiency (MORE) Program
- Improving Critical Facility Energy Resilience with Onsite Generation and Storage (Microgrids!)
- The PADEP EPO participates in the US DOE's Sustainable Wastewater Infrastructure of the Future (SWIFt) accelerator. (Phase 2)

[Sustainable Wastewater Infrastructure Accelerator - Completed | Better Buildings Initiative \(energy.gov\)](#)

If you are interested in resources and funding for energy projects, please contact DEP at RA-EPENERGYEPL@pa.gov or 717-783-8411.



Funding & Technical Assistance Resources

USDOE Sustainable Wastewater Infrastructure of the Future (SWIFt) accelerator.

[Sustainable Wastewater Infrastructure Accelerator - Completed | Better Buildings Initiative \(energy.gov\)](#)

Better Buildings Accelerators

ACTIVE ACCELERATORS COMPLETED ACCELERATORS

SUSTAINABLE WASTEWATER INFRASTRUCTURE ACCELERATOR - COMPLETED

The Sustainable Wastewater of the Future (SWIFt) Accelerator worked with water resource recovery facilities to accelerate a pathway toward sustainable infrastructure. SWIFt aimed to catalyze the adoption of innovative and best-practice approaches in data management, advanced technologies, and financing for infrastructure improvement. Partners sought to improve the energy efficiency of their participating water resource recovery facilities by at least 25% and integrate at least one resource recovery measure.

SWIFt Phase 2: Energy Recovery

DOE continued SWIFt's efforts in the wastewater sector focused on energy recovery and recently completed phase 2 of this accelerator. Learn more about the more than 130 million kWh energy saved.

[Learn More](#)

Customized Toolkit Training

DOE is offering customized training on the use and implementation of the Wastewater Energy Management (SWIFt) Toolkit to help more facilities set and achieve their energy efficiency goals. Get access to resources, networking, technical support, and recognition.

[Get Started](#)

Join Upcoming Webinars

Dedicated to bringing you the latest actionable insights on today's energy efficiency landscape, the Better Buildings Webinar Series is a chance to explore the topics and trends that affect your organization with industry experts and your peers.

[Register Today](#)

FEATURED SOLUTIONS



Wastewater Energy Management Toolkit Toolkits

This toolkit helps water resource recovery facilities establish and implement energy management and planning by collecting best practices and innovative approaches used by wastewater facilities who partnered with DOE's Sustainable Wastewater Infrastructure of the Future (SWIFt) Accelerator.

[View Related Solutions](#)



SWIFt Accelerator Results Fact Sheet Fact Sheet

This fact sheet summarizes the key accomplishments and results from the Sustainable Wastewater Infrastructure of the Future (SWIFt) Accelerator. The Accelerator produced many tools and resources supporting energy data management for wastewater operations, as well as planning, implementation, and financing for comprehensive energy efficiency and resource recovery projects.

[View Related Solutions](#)

OTHER RESOURCES

FACT SHEET	+
GUIDANCE	-
<p>Energy Data Management Manual for the Wastewater Treatment Sector <small>Guidance</small></p> <p>The purpose of this document is to describe the benefits of energy data management, explain how it can help drive savings when linked to a strong energy management program, and provide clear, step-by-step guidance to wastewater treatment plants on how to appropriately track energy performance.</p>	

PARTNERS

A-Z	+
Location	+

[Better Buildings Sustainable Wastewater Infrastructure of the Future Accelerator](#)



Bureau of Clean Water – Wastewater Ops

Bureau of Clean Water - Wastewater Operations Group

Develop SOPs & Guidance Documentation

eInspection App

Compliance Monitoring Strategy

Annual Inspection Goals

Nutrient Trading

Training for Technical Field Operations Staff

i.e.: Water Quality Specialists

OpCert Board Inquiries

Cybersecurity Liaison

Other Duties as Assigned

*Catch-All. Almost *anything* wastewater related.



Water & Wastewater Cybersecurity

Cybersecurity & Emergency Planning for Water & Wastewater Utilities

- Cybersecurity - the state of being protected against the criminal or unauthorized use of electronic data, or the measures taken to achieve this.



Water & Wastewater Cybersecurity

- Water and Wastewater systems are considered critical infrastructure
- Cyber-attacks can have dire effects on a system and its customers
- Improving cybersecurity preparedness for the sector is a top priority for the Federal and State governments
- **Adopting cybersecurity best practices is essential and *should be considered an on-going priority moving forward***



PADEP Bureau of Clean Water Cybersecurity Roles

- The PADEP Bureau of Clean Water currently serves as the liaison between the Wastewater Utilities we regulate and the Agencies who provide guidance pertaining to Cybersecurity such as Environmental Protection Agency (EPA), Cybersecurity and Infrastructure Security Agency (CISA), and the Federal Bureau of Investigation (FBI).
- DEP strongly encourages wastewater facility owners and operators to provide notification to DEP when a suspected cyber-attack occurs at their facility. In these cases, DEP may assist in notifying federal agencies (CISA, EPA and FBI) of the incident.



U.S. Cybersecurity and Infrastructure Security Agency (CISA)

- DEP must be notified of instances where a cyber-attack occurs and the incident causes or threatens pollution in accordance
 - 25 Pa. Code § 91.33. Incidents causing or threatening pollution and
 - Part A. Section III of the facilities NPDES Permit where applicable.
- If pollution has resulted from a cyber-attack, it is imperative that the Department is immediately notified so we can respond quickly and determine the appropriate measures required to mitigate the contamination.



U.S. Cybersecurity and Infrastructure Security Agency (CISA)

- To address cyber threats to Publicly Owned Treatment Works (POTW)s, CISA has been working with industry and interagency partners to develop a set of voluntary Cross-Sector Cybersecurity Performance Goals (CPGs).
- These goals were first introduced in December 2022 and updated in March 2023. The goals include a combination of recommended practices for Information Technology (IT) and Operations Technology (OT) owners, including a prioritized set of security practices.



What to do if an attack occurs

- Check other internal systems to look for breaches
- Do ***NOT*** reach out to the media or post on social media!



Incident Action Checklist – Cybersecurity

For on-the-go convenience, the actions in this checklist are divided up into three “rip & run” sections and provide a list of activities that water and wastewater utilities can take to prepare for, respond to and recover from a cyber incident. You can also populate the “My Contacts” section with critical information that your utility may need during an incident.



EPA Cybersecurity Incident Checklist



Cyber Incidents and Water Utilities

Cyberspace and its underlying infrastructure are vulnerable to a wide range of hazards from both physical attacks as well as cyberthreats. Sophisticated cyber actors and nation-states exploit vulnerabilities to steal information and money and are developing capabilities to disrupt, destroy or threaten the delivery of essential services such as drinking water and wastewater.

As with any critical enterprise or corporation, drinking water and wastewater utilities must evaluate and mitigate their vulnerability to a cyber incident and minimize impacts in the event of a successful attack. Impacts to a utility may include, but are not limited to:

- Interruption of treatment, distribution or conveyance processes from opening and closing valves, overriding alarms or disabling pumps or other equipment
- Theft of customers' personal data such as credit card information and social security numbers stored in on-line billing systems
- Defacement of the utility's website or compromise of the email system
- Damage to system components
- Loss of use of industrial control systems (e.g., SCADA system) for remote monitoring of automated treatment and distribution processes



Cyber incidents can compromise the ability of water and wastewater utilities to provide clean and safe water to customers, erode customer confidence and result in financial and legal liabilities. The following sections outline actions drinking water and wastewater utilities can take to prepare for, respond to and recover from cyber incidents.

What to do if an attack occurs



- Reporting (cont'd)
 - Local/State police (Call 911)
 - PA Criminal Intelligence Center / All-Hazards Fusion Center: [Report Suspicious Activity \(pa.gov\)](https://www.pa.gov)

Report Suspicious Activity

Always call 911 to report a crime in progress.

The Pennsylvania Criminal Intelligence Center (PaCIC) is the primary All-Hazards Fusion Center for the Commonwealth of Pennsylvania. PaCIC coordinates the intake, processing and dissemination of intelligence and analysis concerning all threats and hazards to the commonwealth.

There are three ways to report suspicious activity to PaCIC.

- Phone: 1-888-292-1919
- Email: tips@pa.gov
- Use the **See Something Send Something** smartphone app for [android](#)  or [iPhone](#) 



What to do if an attack occurs



CYBER INCIDENT REPORTING PROCESS

WHY IS IT IMPORTANT TO REPORT CYBER INCIDENTS?

A cyber incident could jeopardize drinking water and waste water utilities by allowing access to private customer/employee information, changing chemical levels in water treatment processes, or denying access to critical systems. Cyber incidents resulting in disruptions of operational processes are of particular concern to the Federal Government. The attacker is a criminal, and reporting an incident allows individuals to look out for suspicious activity and enables them to take steps to protect themselves.

WHERE TO REPORT:

REPORT TO THE FBI FOR THREAT RESPONSE

Submit an internet crime complaint form to the FBI at www.ic3.gov or contact your local field office at www.fbi.gov/contact-us/field. The FBI will conduct the investigation.

OR

REPORT TO CISA FOR ASSET RESPONSE

Submit a computer security incident form to the Cybersecurity and Infrastructure Security Agency (CISA) Incident Reporting System at www.us-cert.cisa.gov/forms/report. CISA can be contacted by phone at 888-282-0870 and by email at Central@cisa.gov. CISA will provide technical assets and assistance to mitigate vulnerabilities and reduce the impact of the incident.

OR

CONTACT EPA FOR CENTRALIZED RESPONSE

Please reach out to the U.S. Environmental Protection Agency (EPA) Water Infrastructure and Cyber Resilience Division (WICRD) at WICRD-outreach@epa.gov. EPA's WICRD will act as a centralized federal point of contact between the affected parties/stakeholders and all appropriate federal agencies incorporated in the incident response.

WHEN TO REPORT TO THE FEDERAL GOVERNMENT

Utilities are encouraged to report all cyber incidents when there is any:

- Loss of data, system availability, or control of systems;
- Impact to any number of victims;
- Detection of unauthorized access to, or malicious software present on, critical information technology systems;
- Affected critical infrastructure or core government functions; or
- Impact to national security, economic security, or public health and safety.

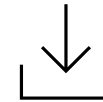
WHAT TO REPORT TO THE FEDERAL GOVERNMENT

A cyber incident may be reported at various stages, even when complete information may not be available. Helpful information could include:

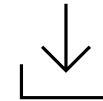
- Who you are,
- Who experienced the incident,
- What sort of incident occurred,
- Details of incident impact,
- How and when the incident was initially detected,
- What response actions have already been taken, and
- Who has been notified.

If you experience a cyberattack...

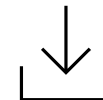
EPA Cyber Incident Reporting



Cyber Incident Reporting Factsheet - US EPA



Is Your Utility Cyber Aware? | US EPA



Cybersecurity Assessment and Technical Assistance - US EPA



How Can You Protect Your Cyber Infrastructure?

Water & Wastewater utilities can achieve some peace of mind by implementing four actions that CISA has prioritized to provide organizations with a basic level of cybersecurity.

These four actions, all of which are part of the CPG goal framework, are:

- **Change default passwords**
- **Implement phishing-resistant multifactor authentication (MFA) for log-ins.**
- **Have separate user and privileged accounts**
- **Create, maintain, and exercise Incident Response Plans**



Federal Cybersecurity Funding

CISA & FEMA's State and Local Cybersecurity Grant Program

(SLCGP): <https://www.cisa.gov/cybergrants/slcgp>

Clean Water State Revolving Fund (CWSRF)

<https://www.epa.gov/waterresilience/cybersecurity-funding>



Cybersecurity Resources

Additional information regarding cybersecurity can be found at the following websites:

<https://www.fbi.gov/investigate/cyber>

<https://www.cisa.gov/>

<https://www.epa.gov/waterresilience/epa-cybersecurity-water-sector>

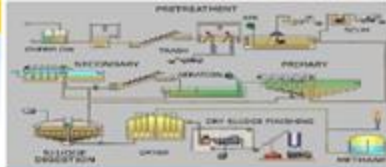
<https://www.epa.gov/waterresilience/cybersecurity-response>





pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Clean Water
Wastewater Technical Assistance Program



▶ **THANK YOU!**

Erick Ammon
Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
Bureau of Clean Water, Operations Section
400 Market Street, 11th Floor
Harrisburg, PA 17101

717-772-8911
eammon@pa.gov