LCA Main Office:
1053 Spruce Road
Wescosville, PA 18106
610-398-2503

Agendas & Minutes Posted:
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LEHIGH COUNTY AUTHORITY

Published: March 18, 2024

BOARD MEETING AGENDA – March 25, 2024 – 12:00 p.m.

In-Person or Virtual Meeting Attendance Options Available: Meetings of the LCA Board of Directors will be held at LCA's Main Office as well as online using the Zoom Meetings application, which includes a telephone option. Public participation is welcomed both in-person or virtually. Instructions for joining the meeting online or by phone are posted on the LCA website in the morning on the day of the meeting, prior to the start of each meeting. You may also issue comment to LCA via email to LCABoard@lehighcountyauthority.org in advance of any meeting or view the meeting at a later time by visiting the LCA website. Please visit https://www.lehighcountyauthority.org/about/lca-board-meeting-videos/ for specific instructions to join the meeting if you are attending virtually. If attending in-person at LCA's Main Office, please follow all safety and sanitation protocols posted.

1. Call to Order
   - NOTICE OF MEETING RECORDINGS

     Meetings of Lehigh County Authority's Board of Directors that are held at LCA's Main Office at 1053 Spruce Road, Wescosville, PA, may be recorded for viewing online at lehighcountauthority.org. Recordings of LCA meetings are for public convenience and internal use only and are not considered as minutes for the meeting being recorded, nor are they part of public record. Recordings may be retained or destroyed at LCA's discretion.
   - *Public Participation Sign-In Request*
2. Review of Agenda / Executive Sessions
   - Additions to Agenda (vote required if action will be taken)
3. Approval of Minutes
   - *March 11, 2024 Board Meeting minutes*
4. Public Comments
5. Action / Discussion Items:

FINANCE AND ADMINISTRATION

WATER
- *Lehigh River Pump Upgrades (Approval)* ***(ivory)*** *(digital Board packet, pages 6-40)*
- *Lead Service Line Replacement Program Documents & Agreements (Approval)* ***(yellow)*** *(digital Board packet, pages 41-55)*

WASTEWATER
- *Industrial Pretreatment Plant Master Plan (Discussion)*
- *Regional Sewer Capacity & Wet-Weather Planning: Engineering & Program Support (Approval)* ***(green)*** *(digital Board packet, pages 56-65)*
- *Sand Spring WWTP: Treatment Process Modification (Approval)* ***(blue)*** *(digital Board packet, pages 66-69)*
- *Emergency Declaration – Oswald Road Sanitary Replacement (Approval)* ***(salmon)*** *(digital Board packet, pages 70-73)*

6. Monthly Project Updates / Information Items (1st Board meeting per month) (digital Board packet, pages)
7. Monthly Financial Review (2nd Board meeting per month) (digital Board packet pages) **– February 2024 report to be distributed in April**
8. Monthly System Operations Overview (2nd Board meeting per month) (digital Board packet, pages 74-76) **– February 2024 report attached**
9. Staff Comments
10. Solicitor's Comments
11. Public Comments / Other Comments
12. Board Member Comments
13. Executive Sessions
14. Adjournment

UPCOMING BOARD MEETINGS		
April 8, 2024	April 22, 2024	May 13, 2024

PUBLIC PARTICIPATION POLICY

In accordance with Authority policy, members of the public shall record their name, address, and discussion item on the sign-in sheet at the start of each meeting; this information shall also be stated when addressing the meeting. During the Public Comment portions of the meeting, members of the public will be allowed 5 minutes to make comments/ask questions regarding non-agenda items, but time may be extended at the discretion of the Chair; comments/questions regarding agenda items may be addressed after the presentation of the agenda item. Members of the public may not request that specific items or language be included in the meeting minutes.

REGULAR MEETING MINUTES
March 11, 2024

The Regular Meeting of the Lehigh County Authority Board of Directors was called to order at 12:16 p.m. on Monday, March 11, 2024, Chairman Brian Nagle presiding. The meeting was hybrid via in-person and video and audio advanced communication technology ("ACT"), using the Zoom internet application, including telephone option. Each Board member and other attendees of the meeting were able to hear each other attendee and be heard by each other attendee. The public could also participate in the meeting in-person or via ACT, using the Zoom internet application, including telephone option. A Roll Call of Board members present was taken. Brian Nagle, Amir Famili, Ted Lyons, Jeff Morgan, Norma Cusick, Kevin Baker, Linda Rosenfeld, and Sean Ziller were present for Roll Call, and remained for the duration of the meeting.

Attorney Kevin Reid, the Authority's Solicitor, was present along with Authority Staff, Liesel Gross, Ed Klein, Chris Moughan, Andrew Moore, AJ Capuzzi, Phil DePoe, Chuck Volk, Susan Sampson, and Lisa Miller.

Chairman Nagle announced that there was an Executive Session prior to the start of the regular meeting to discuss potential litigation.

Chairman Nagle announced that the Board received their electronic and hard copies of the Board packet in advance. He then asked if anyone did not receive their copy of the packet. A copy of the packet is also available online.

REVIEW OF AGENDA

Liesel Gross announced that there are no changes or corrections to the agenda and no additional Executive Session is planned.

APPROVAL OF MINUTES

February 12, 2024 Meeting Minutes

On a motion by Sean Ziller, seconded by Norma Cusick, the Board approved the minutes from the February 26, 2024 meeting as presented (6-0). Amir Famili and Ted Lyons abstained.

PUBLIC COMMENTS

None.

Authorization for Additional Legal Action Regarding PFAS Litigation

On a motion by Linda Rosenfeld, seconded by Norma Cusick, the Board authorized Grant and Eisenhofer, as special counsel to the Authority, to negotiate a settlement covering unreleased claims with 3M. Contingent upon an acceptable settlement covering unreleased claims being reached, the Authority's Chief Executive Officer and/or Chief Financial Officer are authorized, empowered and directed, following conferring with and receiving agreement from the Authority Solicitor, to take whatever action or steps are deemed necessary by Special Counsel to effectuate any such agreement (7-1).

A roll call vote was taken with the following votes cast:

Brian Nagle – yes
Amir Famili – yes
Ted Lyons – yes

Jeff Morgan – yes
Norma Cusick – yes
Kevin Baker – yes
Linda Rosenfeld – yes
Sean Ziller – no

LCA Strategic Plan – Quarterly Progress Reporting

Liesel Gross provided a 2023 year-end update on strategic initiatives, noting that the report includes updates to 24 specific activities and milestones. She noted two areas within the Employee Engagement initiative that have not been started yet due to employee turnover in the Authority's human resources department and the associated need to shift some of those priorities. All other planned activities have been completed or are ongoing in-progress work.

Due to the growing workload and complexity of some of the Authority's projects, Ms. Gross recommended that reporting on the 2024 strategic initiatives be simplified to focus on seven key goals: KISS Act 537 Plan, Munis Implementation, Lead Program, Asset Management, Employee Safety, Employee Engagement, and Staffing & Building Plan.

The Board suggested that progress reporting on the strategic plan could be conducted semi-annually or annually, and focus quarterly reports only on those areas that require deeper discussion. Liesel Gross agreed and indicated that the nature of the seven key strategic initiatives for 2024 will require regular Board discussion anyway, so less frequent formal reporting is appropriate.

Kline's Island WWTP: Master Plan

Amy Rohrbach provided an overview of the project, which is required by the Allentown Water & Sewer Lease, to perform a comprehensive planning study every five years at the Kline's Island Wastewater Treatment Plant (KIWWTP). The Master Plan will address short-term, mid-term, and long-term capital improvement requirements. Ms. Rohrbach recommended awarding the project to Black & Veatch after describing the selection process and noting that their proposal included a solid team and a well-defined approach.

Amir Famili asked how this project coincides with the Pretreatment Plant Master Plan and the Act 537 Plan. Liesel Gross explained that the Act 537 Plan is being developed to include projects outlined in the 2019 Master Plan. If those projects are modified through this updated Master Plan effort, those modifications can be included in the Act 537 Plan.

On a motion by Linda Rosenfeld, seconded by Norma Cusick, the Board approved the Capital Project Authorization for the KIWWTP Master Plan Development in the amount of $314,602.00 which includes the Professional Services Authorization to Black & Veatch in the amount of $279,602.00 (8-0).

Kline's Island WWTP: Primary Sludge System Upgrades

Amy Rohrbach provided background of the project from the 2019 Master Plan for sludge thickening and digester improvements. This project will improve pumping capabilities and reduce the need for frequent and labor-intensive maintenance of the current sludge lines. Key components of the project include replacing and repairing pipes, installing parallel glass-lined ductile iron sludge force mains, and installing flow meters. The project is highly complex requiring significant pipe installation in paved areas and other areas including complex underground structures. The City of Allentown has reviewed the project and approved it as a Major Capital Improvement.

On a motion by Sean Ziller, seconded by Norma Cusick, the Board approved the Capital Project Authorization for the Detailed Design & Bidding Phase in the amount of $173,800.00 which includes the Professional Services Authorization to D'Huy Engineering Inc. in the amount of $153,800.00 (8-0).

MONTHLY PROJECT UPDATES / INFORMATION ITEMS

Liesel Gross highlighted items for the next meeting in March. An additional project related to the Sand Spring WWTP will be added to the March 25 agenda as well, which was missing from the report. She also provided a brief explanation of the status of the Kline's Island Sewer System Act 537 Plan financial evaluation process, as reported in Part 2 of the report.

STAFF COMMENTS

None.

SOLICITOR'S COMMENTS

None.

PUBLIC COMMENTS / OTHER COMMENTS

None.

BOARD MEMBER COMMENTS

None.

EXECUTIVE SESSION

None.

ADJOURNMENT

There being no further business, the Chairman adjourned the meeting at 12:52 p.m.

Jeffrey J. Morgan
Secretary

MEMORANDUM

Date: March 25, 2024

To: Lehigh County Authority Board of Directors
From: Amy Rohrbach, Project Manager
Subject: Allentown Division – Lehigh River Pump Station Upgrades, Preliminary Design Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Project Authorization – Preliminary Design Phase	$92,000
2	Professional Services Authorization – HDR, Inc. (1), (2)	$77,000

(1) Included in the Capital Project Authorization
(2) Does not include detailed Engineering design, bidding or construction related services

PROJECT BACKGROUND

The purpose of this project is to develop a Basis of Design Report for upgrades to the Lehigh River Pump Station. The scope will include a chemical feed system for taste and odor concerns, improvements to the intake screening, and pump upgrades. Currently, existing pump station is used infrequently due to the taste and odor concerns but in the event of a shutdown of the Little Lehigh Creek intake due to long term maintenance or repairs, the Lehigh River must be made into a reliable back-up. LCA partnered with HDR in 2016 on a chemical feed study for the pump station. HDR plans to advance that evaluation into preliminary design for a chemical feed system along with additional pumping and intake screening improvements. The 2022 Master Plan identified the pump improvements as a near-term project and recommended rehabilitation of pump 2 to allow for a firm pumping capacity of 20 MGD with 1 of the 3 pumps out of service. The intake screens at the pump station must be cleaned manually and it is a difficult and labor-intensive effort. The proposed upgrades will improve water quality, increase pumping efficiency, improve intake screening and reduce maintenance efforts for intake screening.

This project will include conceptual design of the following:

Chemical feed system to address taste & odor
Pump and piping modifications for pump 2, including new VFD
Intake Screening improvements and alternatives analysis

FINANCIAL

This project will be funded by LCA under Allentown Division Water Capital.

CONSULTANT SELECTION PROCESS

Four (4) consulting firms were invited to submit proposals for upgrades to the Lehigh River Pump Station. All firms were provided with the prior 2018 Carbon Feed Study, O&M Manuals, and As-built plans as well as given tours of the existing pump station facility and afforded the opportunity to ask questions. The proposals are summarized below:

CONSULTANT	COST	MAN-HOURS
Black & Veatch Corporation	$159,895	801
Hazen & Sawyer	$174,400	834
HDR Engineering, Inc.	$77,000	368
Verdantas (formerly Borton Lawson)	$89,495	528

THIS APPROVAL – PRELIMINARY DESIGN PHASE SERVICES

HDR Engineering, Inc. (HDR) provided the most responsive proposal at the lowest cost. HDR also performed the prior chemical feed study in 2018 so they have knowledge of the facility and site. HDR has extensive pump station design experience and a proven track record.
Lehigh County Authority intends to retain the services of HDR Engineering, Inc. to provide the preliminary design phase services for the project. The following table summarizes the professional services to be performed under this approval:

Professional Services [(1)]
1. Project Management and Meetings
2. System Evaluations, Code Review, and Condition Assessment
3. Basis of Design Report and Drawings

(1) See HDR, Inc. proposal dated February 2024

PROJECT SCHEDULE

Assuming approval of the Preliminary Design Phase Services at the March 25, 2024 Board meeting, it is anticipated that the work will be completed by mid-July.

FUTURE AUTHORIZATIONS – FINAL ENGINEERING DESIGN & BIDDING

Following Preliminary Desing Phase Services, Capital Project Authorization will be requested from the Board for Detailed Design and Bidding Phase Services.

Lehigh County Authority

Request for Proposal for

Preliminary Design Phase Big Lehigh Pump Station Upgrades

Lehigh County Authority | February 2024

February 21, 2024

Lehigh County Authority
1053 Spruce Road
Allentown, PA 18106

RE: Request for Proposal for Preliminary Design Phase Big Lehigh Pump Station Upgrades

Dear Ms. Amy Rohrbach and Selection Committee,

The Lehigh County Authority (LCA) is currently seeking to improve the reliability of the secondary raw water source for service to the Water Filtration Plant (WFP) and the City of Allentown. The Big Lehigh Intake is located approximately two miles from the WFP and is currently used sparingly and blended with raw water from the Little Lehigh. However, the Little Lehigh Intake needs upgrades and cannot be taken out of service without a reliable secondary raw water source that can be utilized for an extended period of time. This project is intended to upgrade the Big Lehigh Pump Station to provide a redundant and more reliable source of raw water.

Upgrades to the Big Lehigh can be categorized into three major areas: chemical feed; pumping capacity; and intake screens. HDR has prepared a technical proposal to address each of these three components with an associated multi-disciplinary team to prepare the preliminary design of the proposed upgrades. In review of the project documents, including the previously prepared HDR study, and visiting the project site to discuss with the LCA team, the HDR team has identified potential solutions and a technical approach that will address LCA's long-term goals. To work within the available budget for the upgrades, it will be important for the team to work within the needs identified by LCA and operations. Considerations to the building code and fire life safety, FEMA and the flood plain, and operability of the pump station with onsite injection of PAC will be extremely important.

At HDR, we think globally and act locally. The team has been strategically formed to include local personnel who are dedicated to the successes of LCA and who developed the original chemical feed study. The project will be managed by **Mason Beck, PE**, out of our Bethlehem office. Mason has successfully managed and delivered numerous projects in his career, including complex pump stations and multi-disciplinary projects. Mason has also delivered three projects for LCA, the Trexlertown Storage Feasibility Evaluation, the preliminary PAC study at the Big Lehigh, and the New England Avenue Bridge Pipeline Repair. **Rich Atoulikian, PE**, **PMP,** will serve as an active Technical Advisor, continuing his involvement from the original PAC evaluation. His 45+ years of experience, including many pump stations and water treatment plant upgrades. Our proposal provides resumes for key staff we anticipate for this assignment.

HDR appreciates your consideration of our proposal and looks forward to partnering with and serving you on this important project. Should you have any questions, please contact Mason Beck at Mason.Beck@hdrinc.com or 610.807.5114.

Respectfully submitted,
HDR Engineering, Inc.

Mason Beck, PE (#087377)
Project Manager

Herbert C. Higginbotham

Herbert Higginbotham, PE (#024719)
Principal of LCA Client Service

hdrinc.com
1720 Spillman Drive Suite 280 Bethlehem, PA 18015
T 610.807.5100 **F** 610.807.5101

Lehigh County Authority

PRELIMINARY DESIGN PHASE
BIG LEHIGH PUMP STATION UPGRADES

Contents

FOUNDED in 1917, HDR has:

12,000+
Employees Worldwide

200+ Offices Globally

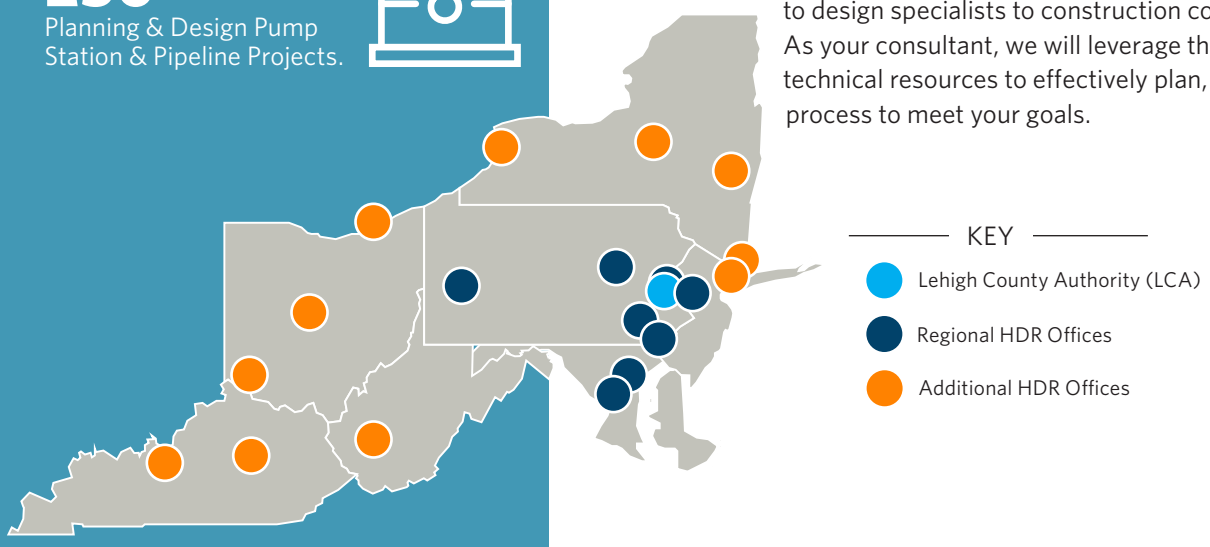
2023 ENR Top 500 Design Firms Rankings

No. 6 Top 20 in Design Firms
No. 5 Top 20 in Water Supply
No. 6 Top 20 in Sewer & Waste
No. 4 Top 20 in WW Treatment

550+
Employees in Pennsylvania, New Jersey, Ohio, New York, & regional states

100+
Regional Staff to support water and wastewater projects (structural, architectural, electrical/controls, & etc.)

250+
Planning & Design Pump Station & Pipeline Projects.



01 Executive Summary

Lehigh County Authority is seeking a qualified firm to provide them with preliminary design services for the Big Lehigh Pump Station Upgrades project. HDR is excited to continue execution of this project that started in 2018. We understand the importance of reliability and redundancy for the raw water supply to the WFP and the future improvements on the Little Lehigh. We look forward to collaboratively working with you on this project.

HDR is an engineering, planning and consulting firm that excels at helping clients manage complex projects and make sound decisions. As an integrated firm, HDR provides a total spectrum of services for our clients. Our staff of professionals represent hundreds of disciplines, and we partner with our clients to provide cost-effective, innovative and practical solutions.

We have partnered with our clients to push the boundaries of what's possible since 1917. Consistently ranked among the nation's Top 10 Design firms, our professionals combine the latest technical innovations with practical solutions. Our water and wastewater consulting services are comprehensive and range from system master planning and regulatory compliance services to infrastructure design, construction administration, commissioning, training, and sustainable operation.

As a global, employee-owned firm, we are driven to help our clients meet today's challenges. With over 12,000+ employees working in 225 locations around the world, we think global and act local.

Our practice is built on a foundation of dedicated, talented, and service-oriented professionals driven to help you identify your best course of action and implement sustainable, cost-effective solutions. To achieve your project's goals, LCA requires a responsive and experienced consultant team with the right technical expertise and a successful track record of delivering projects on time and on schedule.

HDR has selected an experienced team of professionals to successfully deliver for you. We have recognized national resources available to assist local staff to meet your needs. Our team includes experts in a wide range of fields, from regulatory specialists to design specialists to construction cost estimating professionals. As your consultant, we will leverage the knowledge of our in-house technical resources to effectively plan, design and manage the process to meet your goals.

Qualified

HDR has selected our project team from our most capable and qualified experts, whose resumes feature local, directly relevant pump station experience complemented by national experts. The project will be managed by **Mason Beck, PE,** out of our Bethlehem office. Mason has served in a project management role for a wide variety of projects with multi-discipline teams. He has served as project manager for local Southeastern Pennsylvania clients such as Philadelphia Water and DELCORA. Providing QA/QC services for the project will be **Chad Corey, PE, PMP.** Chad has more than 14 years of experience in the water and wastewater treatment field. He began his career at the Pennsylvania Department of Environmental Protection reviewing and issuing permits for water treatment facilities.

In addition, our Technical advisor, **Rich Atoulikian,PE, PMP,** will bring his special expertise to your project through regular interactions with our project team, to deliver a project which meets your budget and schedule expectations.

Proven

HDR's proposed team brings relevant, hands-on problem solving expertise backed by years of experience. In 2018, HDR successfully completed a feasibility study for injection of powdered activated carbon (PAC) for LCA at the Big Lehigh Intake, one of the secondary sources of raw water for the City of Allentown. The study was done to improve LCA's reliability on the facility for raw water with consideration to taste and odor. The study was performed to identify a means which would allow LCA to better rely on the use of the Big Lehigh Intake, and particular address taste and odor issues associated with that raw water source.

Our team has been assembled based on providing LCA with the familiar expertise needed to successfully deliver this project, but it is important to note that key members of our project team have successfully delivered other pump station projects together. We will quickly focus on those areas which can most drastically and cost-effectively achieve your project goals, including considerations to the intake screens and chemical feed. You will benefit from HDR's experience, as a firm you can trust.

Trusted

HDR has consistently delivered stellar consultant services to our clients. We are proud of our reputation of being considered a trusted advisor who offers cost-saving and innovative approaches. HDR showed our responsiveness and commitment to LCA's success during a recent pipeline design to repair a break on a transmission main in Allentown. We will again bring the right resources and experience to improve the future ability of LCA to rely on the Big Lehigh Intake and Pump Station. Our clients trust that we will provide solutions which do not compromise reliability or operations and maintenance.

Prepared

The HDR team has reviewed the information provided in the RFP, visited the site, and discussed the project with LCA staff prior to the release of the RFP. We are ready to start, and have done our homework by reviewing your existing documentation to gain a solid understanding of the issues driving this project, given our historical inherent knowledge of the system based on the previous phase of the proposed improvements.

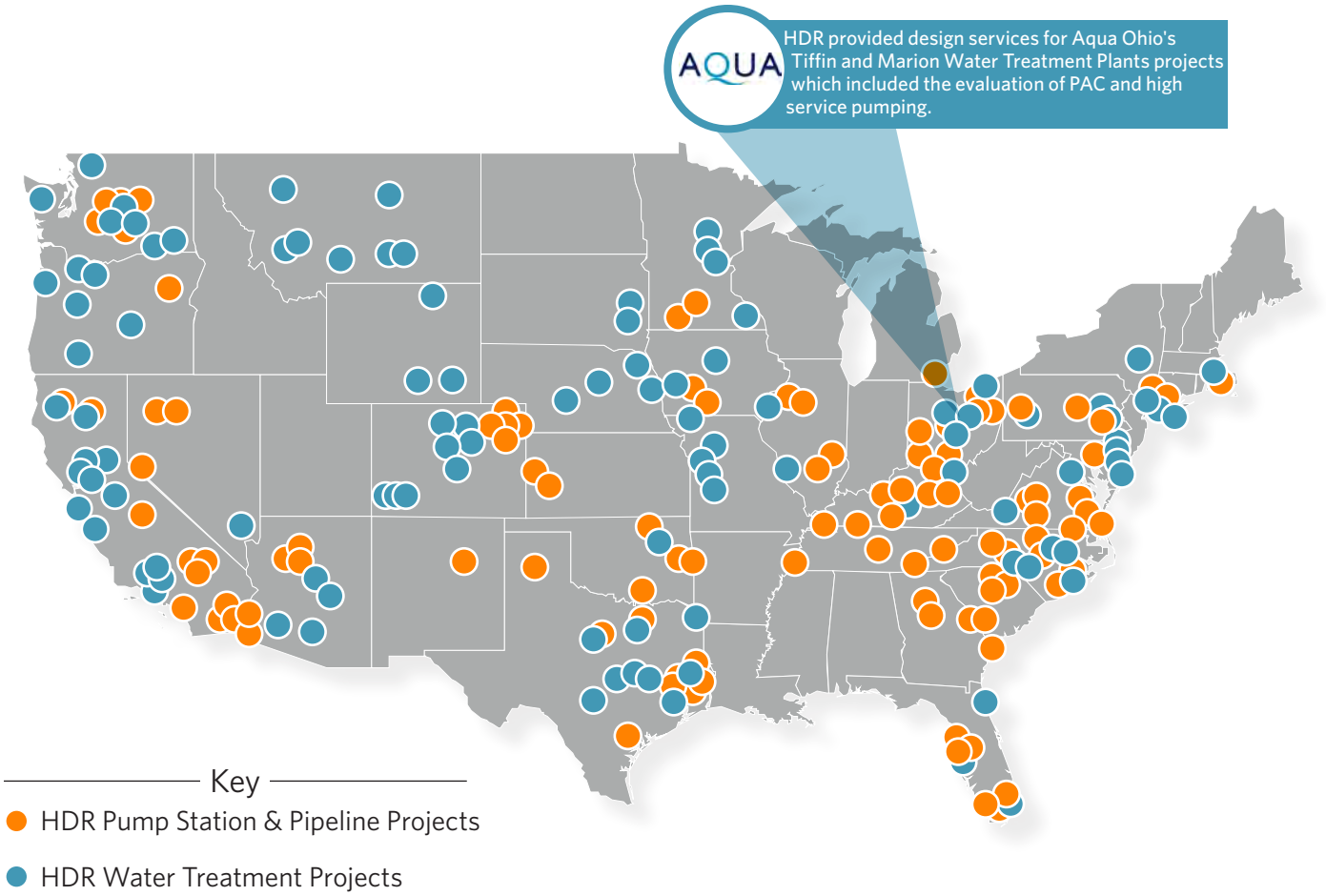
Together, anything is possible.

We believe that our work can add value to the world, that ideas inspire positive change, and that small details yield important results. **Above all, we believe in collaboration with our clients.**

02 Qualifications

LCA is currently seeking to improve the reliability of the secondary raw water source for service to the Water Filtration Plant (WFP) and the City of Allentown. This project is intended to upgrade the Big Lehigh Pump Station to provide a redundant and more reliable source of raw water. We commit a strong local and regional team to your Big Lehigh Pump Station project, with the breadth of expertise to deliver this project successfully.

HDR has successfully evaluated, managed and delivered numerous pump station and a variety of water treatment projects across the United States. A sample of our relevant project experience is shown on the map below. We will leverage the knowledge gained and lessons learned from those projects to define an approach for the Big Lehigh Pump Station Upgrades project.



Experience Counts. Our innovative and forward-thinking project leaders will deliver your project goals.

Big Lehigh Carbon Feed Study

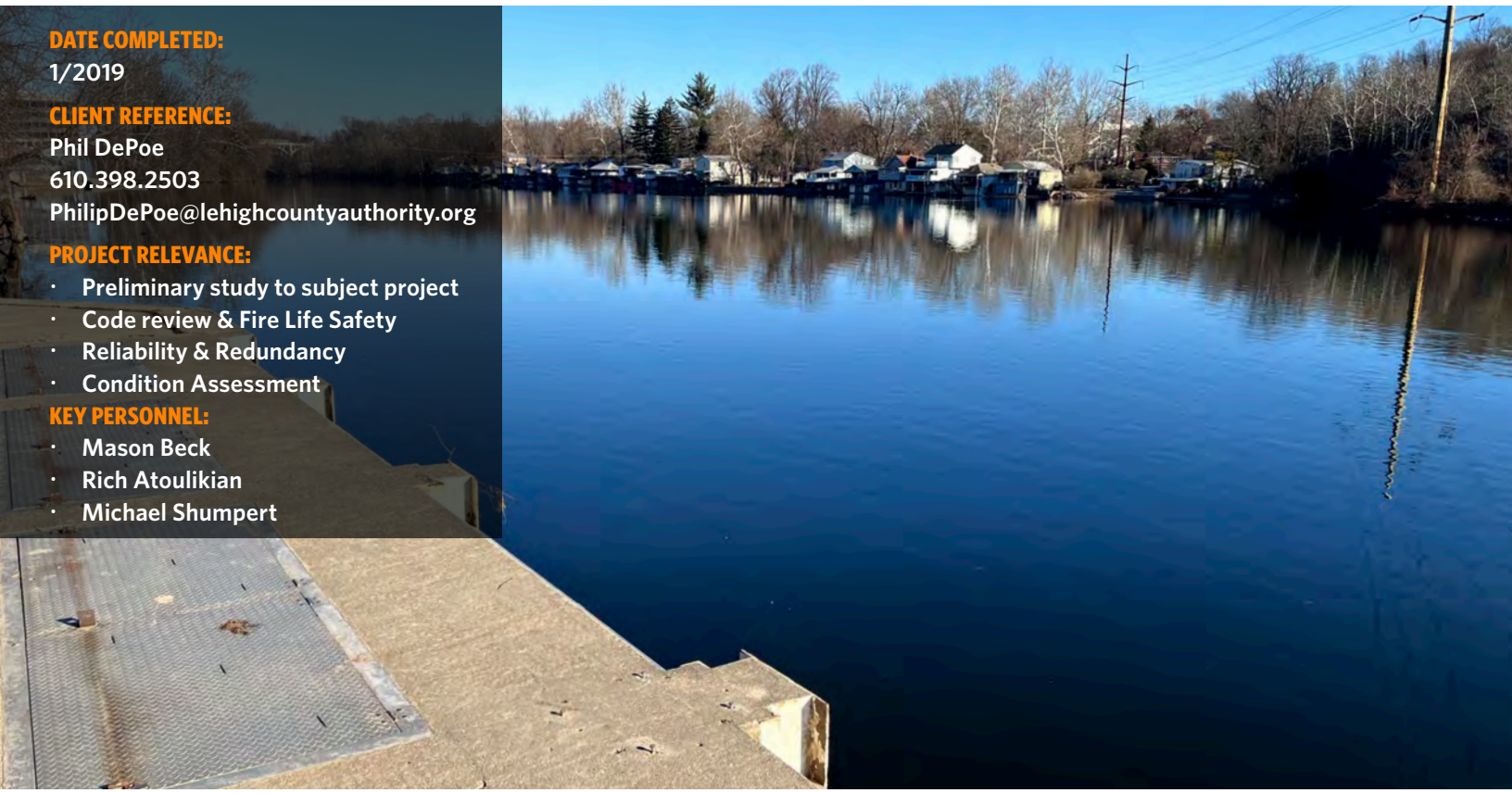
Lehigh County Authority, Allentown, PA

DATE COMPLETED:
1/2019

CLIENT REFERENCE:
Phil DePoe
610.398.2503
PhilipDePoe@lehighcountyauthority.org

PROJECT RELEVANCE:
- Preliminary study to subject project
- Code review & Fire Life Safety
- Reliability & Redundancy
- Condition Assessment

KEY PERSONNEL:
- Mason Beck
- Rich Atoulikian
- Michael Shumpert

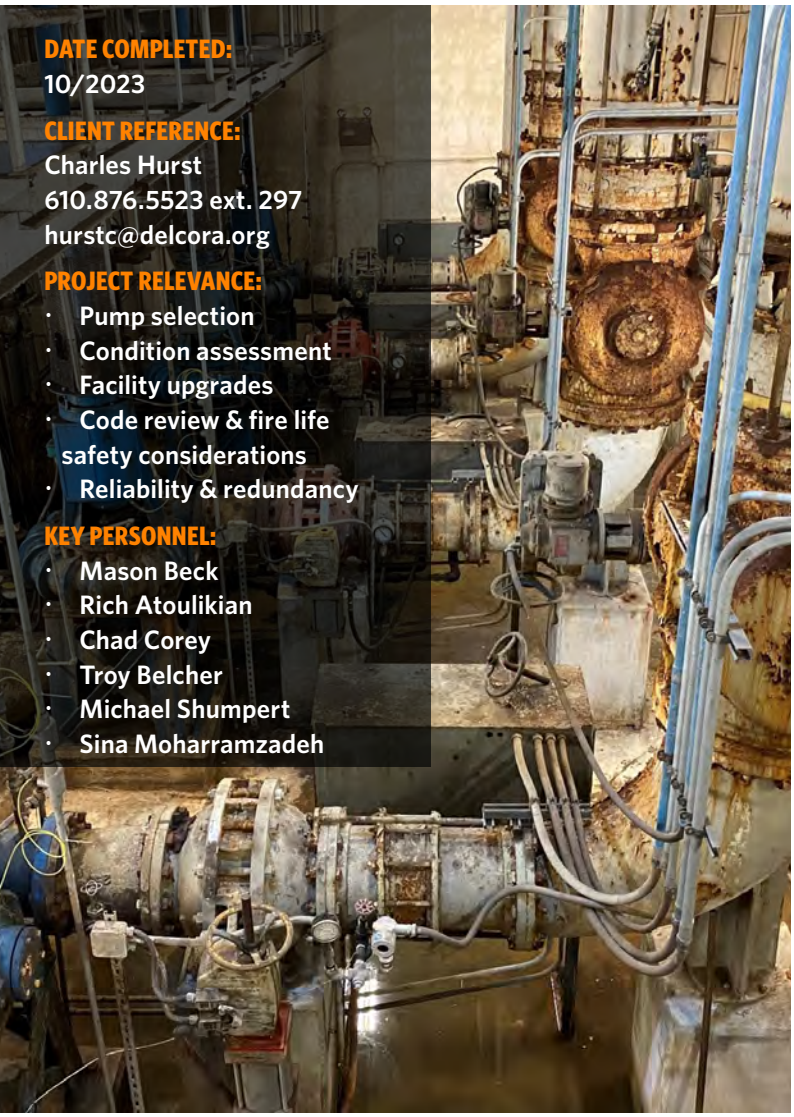


In 2018, HDR completed a feasibility study for injection of powdered activated carbon (PAC) for Lehigh County Authority (LCA) at the Big Lehigh Intake, one of their secondary sources of raw water for the City of Allentown. The study was done to improve LCA's reliability on the facility for raw water with consideration to taste and odor. As the Big Lehigh is only a fraction of the surface water being treated at the City's Water Filtration Plant (WFP), existing infrastructure in place at the WFP doesn't allow for dedicated removal of the taste and odor compounds found in the Lehigh River. The study was completed to evaluate infrastructure needed for LCA's use of the Big Lehigh Intake as the primary source of water which could reduce their reliance on the Little Lehigh during times of drought or challenging treatment conditions.

As part of the study, HDR evaluated four types of PAC feed systems including a bulk bag unloader, silo feed system, bag dump station, and bulk bag delivery with vacuum wand. In addition to a full code review of the existing facility to consider fire life safety for the chemical and limitations triggered by storage quantities, HDR evaluated the systems with consideration to reliability and redundancy, chemical and O&M cost, use of existing building, and construction cost. The introduction of PAC in the existing building would change the occupancy classification due to the hazardous material. Additionally, the Big Lehigh Intake is located in a public park where any additional construction outside of the existing building envelope may be viewed unfavorably by the public. The study recommended use of a bulk bag unloader with future recommendations to coordinate with the City of Allentown for Code considerations and approval related to installation locations inside the existing building or in a new adjacent building.

Eastern Service Area Pump Station Upgrades

Delaware County Regional Water Authority (DELCORA), Delaware County, PA



DATE COMPLETED:
10/2023

CLIENT REFERENCE:
Charles Hurst
610.876.5523 ext. 297
hurstc@delcora.org

PROJECT RELEVANCE:
- Pump selection
- Condition assessment
- Facility upgrades
- Code review & fire life safety considerations
- Reliability & redundancy

KEY PERSONNEL:
- Mason Beck
- Rich Atoulikian
- Chad Corey
- Troy Belcher
- Michael Shumpert
- Sina Moharramzadeh

The Delaware County Regional Water Quality Control Authority (DELCORA) is a municipal authority that owns, operates, and maintains wastewater facilities that serve approximately a half million people in the Greater Philadelphia area, including 42 municipalities in Delaware and Chester Counties. DELCORA collects and conveys an average daily wastewater flow of approximately 50 million gallons per day (mgd) with an instantaneous peak flow of approximately 200 mgd.

DELCORA's service area is divided into two regions; the Western Service Area (WSA) and the Eastern Service Area (ESA). Both dry and wet weather flows collected in the WSA are conveyed to and treated at DELCORA's existing Western Regional Treatment Plant (WRTP). In the far western portion of the ESA, dry weather and a portion of wet weather flows (less than 20 mgd) are also conveyed to and treated at DELCORA'S WRTP. However, wet weather flow above 20 mgd in the western portion of the ESA as well as both dry and wet weather flows collected in the eastern portion of the ESA are conveyed to and treated at the Southwest Water Pollution Control Plant (SWWPCP) owned and operated by the Philadelphia Water Department (PWD).

The initial phase condition assessments were completed associated with the three main pumping stations located in the ESA:

- Darby Creek Pump Station (DCPS)
- Muckinipates Pump Station (MPS)
- Central Delaware Pump Station (CDPS)

Each pump station was assessed and categorized in 5 disciplines: Process-Mechanical, Structural/ Architectural, Electrical, Instrumentation/Controls, and HVAC. Each then assigned criteria on a numerical scale to measure the state of deterioration based on visual observations. Improvements were then documented within a Basis of Design Report followed by final design drawings. As an example, key components at CDPS to be removed included:

- All internal process piping, valves, pumps, and appurtenant equipment (e.g., seal water and PARCO hydraulic systems).
- All pump and pipe support pedestals and brackets.
- All obsolete process control equipment.
- All existing electrical equipment designated for replacement.
- All deteriorating HVAC equipment.
- Catwalks and associated stairs and ladders in the drywell that are currently used to access pump shafts.
- Access hatches currently used for pump removal will be demolished. Sections of the existing floor will also be removed to accommodate larger openings, and increased floor capacity.
- Walkways, ladders, and platforms within the wet well.

Other design tasks included in this project also included:

- Fire Life Safety Code Review.
- Hydraulic analysis and pump selection.
- LiDAR scan of all existing facilities.
- Transient analysis and physical modeling.
- Electrical and I&C improvements.
- Safety feature implementation considering safety in design, pump installation and removal equipment, and access for maintenance.
- Cost estimates.

Queen Lane Raw Water Intake Screening Evaluation

Philadelphia Water Department (PWD), Philadelphia, PA

The Philadelphia Water Department (PWD) owns and operates the Queen Lane Raw Water (QLRW) Intake Structure and Pump Station which has a 120 mgd capacity originally constructed in 1920 with installation of fine screens. The facility was expanded in 1957 to include a trash rake system to collect larger debris off of the river and protect the fine screens from damage. Much of the current infrastructure at the intake structure, including the screening systems, is nearing the end of its service life and needs replacement. Additionally, PWD's goal was to reduce the manual operator interface with the screens, and replacement will help to better automate the system.

To remedy the system, HDR prepared an alternatives analysis and proposed improvements for screenings handling equipment at the intake structure to be a part of the future Intake Facility Upgrades Project. Flood protection, resiliency, and provisions for freezing were included in the analysis. This analysis involved an evaluation of the available screening technology alternatives to replace the existing trash rakes and fine screens, and appurtenances.

When comparing each of the screening systems, the following items were considered:

- Frequency of system maintenance and magnitude of effort.
- Extents of operator interaction during operations.
- Cleaning of screens and any submerged sprockets or mechanical components.
- Structural upgrades required.
- Fine screen system must be constructible within the existing space available.
- Equipment must be able to meet the system capacity of 30 MGD per screen with the existing channel configuration for a total capacity of 120 MGD.
- Impact to the continuity of facility operations during construction.
- System reliability overall.
- Budgetary equipment costs.

This analysis also included a side-by-side comparison of specific design parameters and considerations between the screening alternatives. Available screening options for replacing the mechanical trash rake system include the following:

DATE COMPLETED:
8/2023

CLIENT REFERENCE:
Brian Sparks
215.685.0018
Brian.Sparks@phila.gov

PROJECT RELEVANCE:
- Raw water intake screening
- Pump selection
- Condition assessment
- Reliability

KEY PERSONNEL:
- Mason Beck
- Troy Belcher

- Multi-rake screens (fine and coarse/trash screen) – considered for further evaluation.
- Climber screens (coarse/trash screen) – considered for further evaluation.
- Perforated plate screens (fine screen).
- Drum screens (fine and ultra-fine screen).
- Step screens (fine screen).
- Band-type perforated plate screens (fine and ultra-fine screen).
- Belt filter screens (fine screen).

Baxter Water Treatment Plant Master Plan Improvements

Philadelphia Water Department

Philadelphia, PA

DATE COMPLETED:
12/2023

CLIENT REFERENCE:
Tom Spokas
City of Philadelphia Water Department
thomas.spokas@phila.gov

PROJECT RELEVANCE:
- Reliability & resiliency
- Basis of design planning
- Operational constrains
- Preliminary cost estimates

KEY PERSONNEL:
- Mason Beck
- Rich Atoulikian
- Chad Corey
- Troy Belcher
- Michael Shumpert
- Sina Moharramzadeh

The Baxter Water Treatment Plant is the largest of three water treatment plants owned and operated by the Philadelphia Water Department (PWD). The plant has a full-service capacity of 310 MGD and consists of flocculation, sedimentation, filtration, and disinfection. Currently, the plant uses a chemical disinfection strategy that includes free chlorine and chloramines. Free Chlorine disinfection is achieved by dosing sodium hypochlorite (NaOCl) prior to flocculation and sedimentation basins with additional dosing points midway through the flocculation tank and prior to filtration. Chloramine disinfection is achieved by dosing ammonia (NH3) prior to the finished water basins. PWD's Water Revitalization Plan (WRP) proposed improvements to Baxter's disinfection process in order to ensure continued compliance with current and anticipated water quality regulations. Drivers for these improvements reducing disinfection by-products, and compliance with Long-Term Enhanced Surface Water Treatment Rule (LT2) Bin 2 classification. To comply with the new LT2 Bin 2 classification, the WRP identified and recommended the application of UV disinfection at the Baxter WTP.

As part of a broader team under PWD's Water Facilities Planning Support Services contract, HDR (as a subconsultant to Gannett Fleming) was responsible for conducting a detailed UV treatment technology alternatives analysis. Five UV vendors with applicable UV technologies were identified and evaluated based on numerous economic and non-economic criteria including:

- Capital / O&M Costs
- Ease of operation
- Safety
- Impact to greenhouse gas footprint
- Hydraulics
- Redundancy, and future expansion
- Site layout and piping
- Resiliency
- Electrical impacts of proposed upgrades
- Low lift pumping requirements
- Maintenance of plant operation, including adaptations to disinfection strategy, during all phases of construction

The findings from this evaluation were used to inform PWD's comprehensive disinfection treatment strategy at the Baxter Plant, as well as the engineering design of the UV treatment system planned for the facility, as the Department navigates an ever-changing regulatory landscape.

The Philadelphia Water Revitalization Plan identified key risks which could potentially impact the ability of the City's water department plant to treat water at their 310 MGD Baxter Water Treatment Plant in Northeast Philadelphia. Icing of the river intake bar racks and secondary screens could jeopardize the PWD ability to maintain plant operation during extreme cold weather. This plant is a critical source of supply for over 50% of the residents of the City of Philadelphia. HDR identified and evaluated alternative measures PWD could implement to mitigate this risk and reduce or eliminate intermittent ice blockages at the Baxter WTP primary Delaware River intake. HDR recommended a multi-phased approach that PWD could implement over time; where each subsequent phase built on the previous phase to combat causes of problematic ice accumulation which was attributed to Float Ice, Frazil Ice, and Bar Screen Supercooling exacerbated by the Delaware River estuary tidal variation. PWD is planning to implement the first phase of our approach in the coming season.

Water Filtration Plant Improvements

Avon Lake Regional Water, Avon Lake, OH

Avon Lake Regional Water (ALRW) is a water and wastewater utility in Northeast Ohio that provides drinking water to over 200,000 residents. Its Water Filtration Plant (WFP), a 50 MGD conventional surface water treatment plant that utilizes Lake Erie as its source, was originally constructed in 1926, with significant expansion in 1978. Today the plant largely consists of what was built in 1978, including all major chemical systems. Due to the age of these systems, they each present a variety of challenges to ALRW's operations staff. Additionally, the 12 original (1926) filters (out of a total of 24) have reached the end of their useful life.

HDR was contracted to design select chemical feed and storage upgrades including alum, powdered activated carbon (PAC), liquid hydrated lime, and chlorine, as well as new dual-media filters to restore the capacity that would be lost when the original filters are decommissioned and add additional capacity beyond 50 MGD to allow for additional redundancy and future growth.

On the chemical systems design, HDR first held a series of workshops with ALRW staff to identify key goals to address their challenges including reducing distance from chemical storage to feed point, providing storage volumes for at least 30 days of storage, and changes to the form of chemical storage for PAC, lime, and chlorine. To accomplish these goals, it was clear that a new chemical storage and feed building would need to be constructed. The PAC system would be changed from a slurry system to a dry PAC silo with an eduction feed system, and lime would be changed from solid hydrated lime to a liquid lime slurry product that does not clog or settle. For chlorine, ALRW decided to replace chlorine gas with a bulk hypo system, for overall risk reduction. Based on the decisions that were made, a new chemical building was designed that will include liquid chemical storage and feed systems for alum and sodium hypochlorite, and mechanical systems for the PAC storage silo that will be adjacent to the building. The new liquid hydrated lime storage and feed system will utilize space occupied by existing systems. The facilities were designed to meet Ten States Standards, including dedicated truck fill stations, chemical containment, emergency shower and eyewash stations, a fire suppression system, SCADA controls including flow pacing of chemical feed, removable skylights for future tank replacement, and monorails for easy pump removal, among other features typical of meeting best practices for facility design. After construction of these new facilities, ALRW will be well-positioned for reliable operation and maintenance of their chemical systems.

DATE COMPLETED:
8/2023

CLIENT REFERENCE:
Rob Munro
Chief Utilities Executive
RMunro@avonlakewater.org

PROJECT RELEVANCE:
- **Chemical feed upgrades**
- **Reliability**
- **Space constraints aesthetics**
- **Operational constraints**

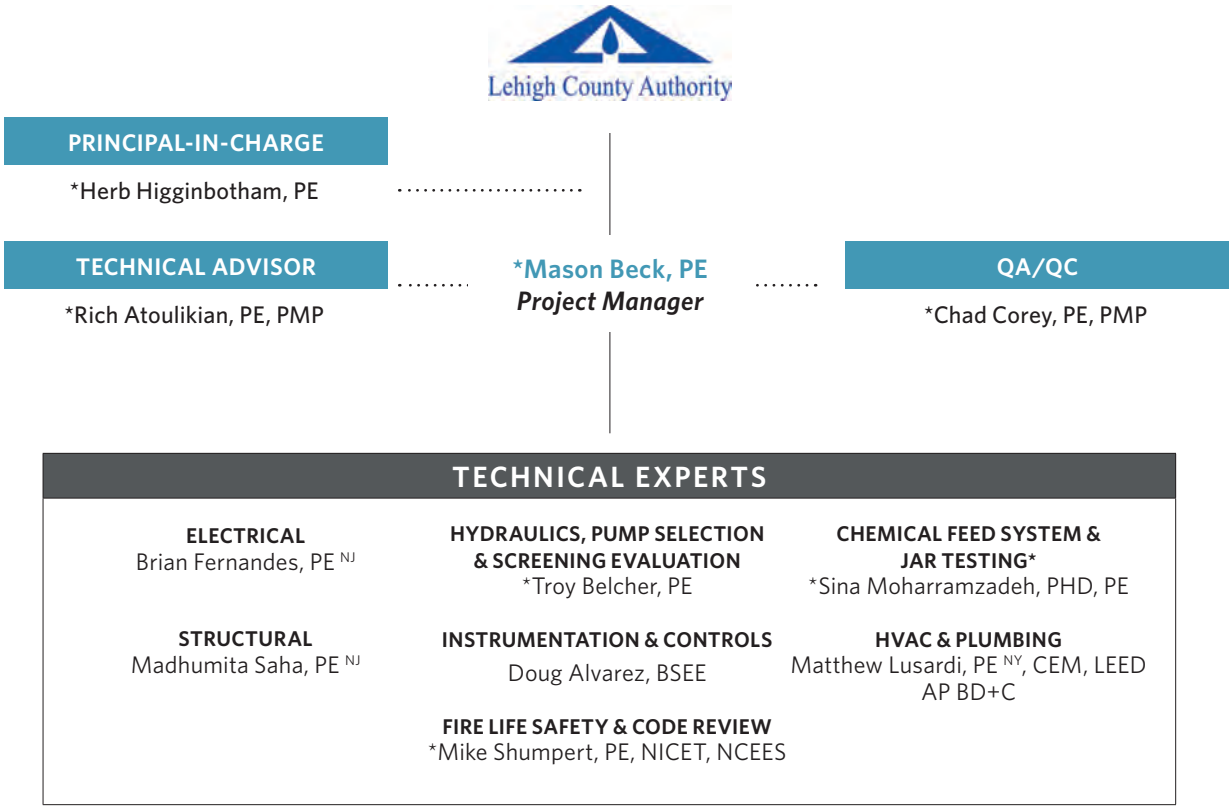
KEY PERSONNEL:
- **Rich Atoulikian**

On the filters design, HDR first developed a plant-wide hydraulic profile, using Visual Hydraulics, to assess the impact of removing the original filters from service and establishing the new filters. The general design philosophy for the new filters was maintaining operational and aesthetic consistency with the existing filters, including a 6 GPM/ft2 loading rate as approved by the Ohio EPA without piloting. The new filters were incorporated as an existing filter building expansion, so HDR's architects performed a thorough building code/fire and life safety review of the entire building to ensure compliance and adequate protection. The design also considered further expansion of the building in the future, including avoiding the installation of new structures and piping within that footprint, providing piping connections to future filters, and considering these future filters as part of the hydraulic design.

03 Team

How a team works together, as well as their collective experience, is essential to the success of any project. HDR's experienced, local team has a history of responsiveness to the diverse and challenging engineering needs that can come with multiple projects.

Below, the HDR team's organization chart identifies our personnel, including key team members, who were carefully selected not only for the tangible benefit which their expertise brings to this services. **This team will be brought together through HDR's Project Manager Mason Beck.** The HDR team organization chart shown below identifies our personnel and key team members, who were carefully selected for the tangible benefit which their expertise brings to the LCA. If needed, subconsultants would be uniquely selected, depending on project-specific needs.



** Key Personnel resumes included on the following pages.*

Mason Beck, PE
Project Manager

Mason has more than 22 years of water and wastewater engineering experience. His experience includes water and wastewater pipelines, pumping stations, storage tanks, and treatment plants at all phases of a project including planning, preliminary design and feasibility studies, final design, bidding, and engineering services during construction. Mason has managed two recent projects for LCA including the Big Lehigh Carbon Feed and the TWSF Feasibility Studies which is related to the WLI capacity and the need for the Western Lehigh Pump Station and Force Main. Mason has been involved in the design of over 50 pump station projects up to 230 MGD including raw water, potable water, and wastewater in submersible, dry pit, and vertical configurations.

YEARS OF EXPERIENCE
Industry: 22

HDR: 18

EDUCATION
MBA, Business Administration

BS, Civil Engineering

PROFESSIONAL REGISTRATIONS
Professional Engineer: PA, NJ, CA, OH, and NY

OFFICE LOCATION
Bethlehem, PA

RELEVANT EXPERIENCE

Lehigh County Authority, LCA-Big Lehigh Carbon Feed Study, *Allentown, PA*
Project Manager. The feasibility study of the addition of a carbon feed system at the Big Lehigh Intake in order to improve LCA's reliability on the facility for potable water supply. The project included the evaluation of the chemical feed rate required based on water quality and capacity, analysis of available equipment alternatives, and consideration to other required improvements of the facility. The primary criteria developed for analysis included reliability and redundancy, chemical and life cycle costs, use of the existing building, and construction cost.

Delaware County Regional Water Authority Eastern Service Area Pump Station Upgrades, *Delaware County, PA*
Project Manager. The Delaware County Regional Water Quality Control Authority (DELCORA) embarked on a program to convey all flows from their Eastern Service Area (ESA) to the Western Regional Treatment Plant. As part of this program, HDR completed condition assessments, hydraulic analysis, preliminary design, and final design for the upgrades of 3 remote wastewater pump stations to improve overall service and resiliency. The condition assessment developed a baseline for improvements and identified components that would be included in the final design packages, items that would be impacted with the proposed improvements such as pump supports and ventilation, and safety concerns that should be prioritized by DELCORA. The hydraulic analysis served to optimize pumping efficiency and reduced flow rates with selection of new dry pit submersible pumps to replace the existing vertical configuration. Final design incorporated code reviews related to fire life safety and NFPA with inclusions of improved ventilation, gas monitors, and egress.

City of Philadelphia Water Department, Queen Lane RWPS, *Philadelphia, PA*
Project Manager. HDR completed a hydraulic analysis and screening evaluation for the Philadelphia Water Department's Queen Lane Raw Water Intake on the Schuylkill River. As the initial step in a future overall facility condition assessment and planned upgrades, the team developed a detailed screening evaluation to reduce maintenance efforts and improve system reliability. The analysis included considerations to both coarse and fine screen systems with automated debris removal improvements. Ranking of alternatives included impacts to the overall structure and facility, aesthetics from the river, extents of operator interaction during operations, cleaning of screens and presence of any submerged mechanical components, any structural upgrades, system reliability, and cost. Initial phases also included replacement of two of the pumps to more reliability meet future design conditions. The pump sizes need to be matched to existing pump flow and head to optimize operation within the pumps POR.

City of Philadelphia Water Department, Baxter WTP Improvements, *Philadelphia, PA*
Project Manager. The Baxter Water Treatment Plant is the largest of three water treatment plants owned and operated by the Philadelphia Water Department (PWD). The plant has a full-service capacity of 310 mgd and consists of flocculation, sedimentation, filtration, and disinfection. Currently, the plant uses a chemical disinfection strategy that includes free chlorine and chloramines. PWD's recently completed Water Master Plan (WMP) proposed improvements to Baxter's disinfection process in order to ensure compliance with current and anticipated water quality regulations. HDR is responsible for leading the identification and evaluation of UV disinfection alternatives. Additionally, the team is evaluating the plant improvements related to site layout and future expansion, redundancy and reliability, electrical impacts of any proposed upgrades, and hydraulics related to low lift pumping requirements.

YEARS OF EXPERIENCE
Industry: 51

HDR: 5

EDUCATION
Graduate Studies: Civil Eng & Public Works Admin, University of Pittsburgh

BSCE, Bucknell University

PROFESSIONAL REGISTRATIONS
Professional Engineer, PA

OFFICE LOCATION
Pittsburgh, PA

Herb Higginbotham, PE

Principal of LCA Client Service

Herb spent over 24 years in the public sector (Allegheny County, PA) in various roles beginning as a junior engineer and culminating with positions as the Director of the Department of Engineering & Construction, and later as Director of Aviation at Pittsburgh International Airport. His extensive public sector experience provides value in understanding the perspective of public officials, elected and appointed, and provides a point of contact to HDR by these individuals as necessary. His career includes a strong emphasis on project/program management, staff development and management, and building relationships.

RELEVANT EXPERIENCE

Lehigh County Authority, Trexlertown Wastewater Storage Facility (TWSF) Feasibility Study, *Allentown, PA*
Project Director. The feasibility evaluation of an in-line gravity storage tank and parallel interceptor in the Trexlertown area to reduce overflows in the collection system. The hydraulic capacity of the system was investigated with development of alternative interceptor sizing. In addition to the hydraulic and alignment routing analysis, the project included evaluation of trenchless crossings, wetland delineation and surveying, coordination with PennDOT, considerations to public impacts, and detailed cost estimates.

ALCOSAN, North End Facilities - New Outfall, Disinfection Facility, and New Secondary Clarifiers, *Pittsburgh, PA*
Project Director. ALCOSAN's consent decree specifies a schedule for expansion of the plant capacity for increased wet weather flow. A key part of that expansion is to increase secondary capacity to 295 MGD. The Basis of Design documents call for adding two final settling tanks, an RAS pump station, a final disinfection system, and a new outfall. A river wall will be constructed to provide additional area for the new facilities. HDR's role is to finalize design and provide services during construction.

ALCOSAN, RAS Pipe and RAS Pump Replacement, *Pittsburgh, PA*
Project Director. Project includes the preparation of Contract Documents for the design, procurement and construction of RAS pipe and fittings, new RAS pumps, improvements to the four RAS pumping systems, and to the Aeration Tank splitter boxes. HDR is also to provide engineering services during construction, and start up start-up assistance.

ALCOSAN, Regionalization Implementation – Wet Weather Planning, *Pittsburgh, PA*
Project Director and Principal-in-Charge. This $8M program managed preparation for the transfer of over 200 miles of sewers and numerous wet weather control facilities from their current municipal owners to ALCOSAN. The program will develop a Capital Improvement Program (CIP) and an Annual Operating Plan (AOP) which will provide ALCOSAN with the detailed work items, schedules, and budgets required for implementation. Herb's responsibilities included coordination with nearly 85 customer municipalities and other stakeholders, and oversight of the technical assessment of infrastructure identified for transfer, and the development of the CIP and AOP.

YEARS OF EXPERIENCE
Industry: 47

HDR: 12

EDUCATION
MS, Civil Engineering

BS, Civil Engineering

REGISTRATIONS
Professional Engineer:
PA, MI, NJ, NY, OH, WV

OFFICE LOCATION
Cleveland, OH

Rich Atoulikian, PE, BCEE, PMP

Technical Advisor | Hydraulics and Pump Selection QA/QC

Rich has successfully delivered wastewater and water pump stations and treatment projects utilities across the U.S. over his 47-year career. He is a recognized expert in pump station analyses and design. Over his career he has leadership roles on a number of different projects. Rich has a full understanding of the processes and techniques which lead to a successful project within the triple constraint of schedule, budget, and quality. Rich frequently as a technical advisor on projects, leveraging his vast experience to provide reliable, cost-effective solutions to our clients.

RELEVANT EXPERIENCE

Lehigh County Authority, LCA-Big Lehigh Carbon Feed Study, *Allentown, PA*
Technical Advisor. The feasibility study of the addition of a carbon feed system at the Big Lehigh Intake in order to improve LCA's reliability on the facility for potable water supply. The project included the evaluation of the chemical feed rate required based on water quality and capacity, analysis of available equipment alternatives, and consideration to other required improvements of the facility. The primary criteria developed for analysis included reliability and redundancy, chemical and life cycle costs, use of the existing building, and construction cost.

Delaware County Regional Water Authority Eastern Service Area Pump Station Upgrades, *Delaware County, PA*
Technical Advisor. DELCORA embarked on a program to convey all flows from their Eastern Service Area (ESA) to the Western Regional Treatment Plant. As part of this program, HDR completed condition assessments, hydraulic analyses, and designed upgrades of 3 remote wastewater pump stations to improve overall service and resiliency. The condition assessment provided a baseline by identifying components to be included in the design across all disciplines, and identified potential safety concerns. The hydraulic analysis allowed optimizing pumping efficiency, and improving reliability through selection of new, robust pumping equipment..

City of Philadelphia Water Department, Baxter WTP Improvements, *Philadelphia, PA*
Technical Advisor. The The Baxter Water Treatment Plant is the largest water treatment plant owned and operated by the Philadelphia Water Department (PWD). The plant has a full-service capacity of 310 mgd and consists of flocculation, sedimentation, filtration, and disinfection. PWD's recently completed Water Master Plan (WMP) proposed improvements to Baxter's disinfection process to ensure compliance with current and anticipated water quality regulations. HDR led the evaluation of UV disinfection to replace chlorine. HDR is also evaluating plant improvements related to site layout and future expansion, redundancy and reliability, electrical impacts of any proposed upgrades, and hydraulics related to low lift pumping requirements.

Avon Lake Regional Water, Water Filtration Plant Improvements, *Cleveland, OH*
QA/QC. HDR was contracted to design chemical and storage upgrades for alum, powered activated carbon (PAC), liquid hydrated lime, and chlorine, as well as dual-media improvements. HDR held a series of operator-focused workshops to solicit their input on the new facilities. Specifically, operator preference was to convert the existing PAC system from a slurry to a dry feed system, with a silo with an induction system. While the new silo will be located outdoors, the remainder of the chemical systems were incorporated into a new building.

Lehigh County Authority, Trexlertown Wastewater Storage Facility (TWSF) Feasibility Study, *Allentown, PA*
QA/QC. The feasibility evaluation of an in-line gravity storage tank and parallel interceptor in the Trexlertown area to reduce overflows in the collection system. The hydraulic capacity of the system was investigated with development of alternative interceptor sizing. In addition to the hydraulic and alignment routing analysis, the project included evaluation of trenchless crossings, wetland delineation and surveying, coordination with PennDOT, considerations to public impacts, and detailed cost estimates.

YEARS OF EXPERIENCE
Industry: 14

HDR: 3

EDUCATION

BS, Civil Engineering

PROFESSIONAL REGISTRATIONS
Professional Engineer: PA

Project Management Professional

Water System Operator, PA

OFFICE LOCATION
Plymouth Meeting, PA

Chad Corey, PE, PMP
QA/QC

Chad has over a decade of experience in the water and wastewater treatment field with a background in regulatory, public and private sectors. He began his career at the Pennsylvania Department of Environmental Protection reviewing and issuing permits for water treatment facilities. Later, he became the superintendent of treatment and quality control for a water utility serving over 1 million people in the greater Philadelphia area where he was responsible for day-to-day operations of 55 remote groundwater pumping stations, as well as distribution system water quality in over 50 potable water storage tanks and approximately 5,000 miles of water distribution system piping. In addition to his treatment responsibilities, Chad was closely involved with maintenance and capital improvements to the many water treatment, storage, pumping and distribution assets owned by the utility.

RELEVANT EXPERIENCE

Delaware County Regional Water Authority, DELCORA Pump Station Design, *Chester, PA*
Project Engineer. The Delaware County Regional Water Quality Control Authority (DELCORA) embarked on a program to convey all flows from their Eastern Service Area (ESA) to the Western Regional Treatment Plant. As part of this program, HDR completed condition assessments, hydraulic analysis, preliminary design, and final design for the upgrades of 3 remote wastewater pump stations to improve overall service and resiliency. The condition assessment developed a baseline for improvements and identified components that would be included in the final design packages, items that would be impacted with the proposed improvements such as pump supports and ventilation, and safety concerns that should be prioritized by DELCORA. The hydraulic analysis served to optimize pumping efficiency and reduced flow rates with selection of new dry pit submersible pumps to replace the existing vertical configuration. Final design incorporated code reviews related to fire life safety and NFPA with inclusions of improved ventilation, gas monitors, and egress.

Philadelphia Water Department, Water Facilities Planning Support Services, Baxter WTP Master Plan Improvements, *Philadelphia, PA*
Project Manager. The Baxter Water Treatment Plant is the largest of three water treatment plants owned and operated by the Philadelphia Water Department (PWD). The plant has a full-service capacity of 310 mgd and consists of flocculation, sedimentation, filtration, and disinfection. Currently, the plant uses a chemical disinfection strategy that includes free chlorine and chloramines. PWD's recently completed Water Master Plan (WMP) proposed improvements to Baxter's disinfection process in order to ensure compliance with current and anticipated water quality regulations.

Philadelphia Water Department, Applied Research Planning for Water and Wastewater Processing, *Philadelphia, PA*
Project Manager. Chad has managed PWD's Applied Water Research Contract since 2021. During that time Chad has assisted PWD's applied research group in several key research program initiatives related to Water and Wastewater Treatment such as: PFAS compliance planning and pilot testing, Nutrient reduction treatment technology research, Wastewater pilot testing for ammonia removal, Data management systems evaluations, and Academic engagement, as well as the development of a research Portfolio Management Plan, which provided guidelines for prioritizing specific research initiatives over others based on the needs and mission of the Department. Under this task, Chad interviewed key stakeholders at all levels of Philadelphia Water Department, including operations personnel, junior and senior management and the Commissioner. The Applied Research group acts as an internal consultant to PWD, insights gained from these interviews were compiled and evaluated to better understand how other divisions of PWD interact with the Applied Research group within the Planning and Research unit.

YEARS OF EXPERIENCE
Industry: 13

HDR: 3

EDUCATION
BS, Civil Engineering

PROFESSIONAL REGISTRATIONS
Professional Engineer: PA

OFFICE LOCATION
Philadelphia, PA

Troy Belcher, PE

Hydraulics, Pump Selection & Screening Evaluation

Troy has over 10 years of experience in potable, stormwater, and wastewater design, construction management, and condition assessment experience for pipeline, large and small pump stations, site piping, site civil, reservoir, and deep well projects. His experience includes field inspections, water quality testing, pipeline pressure testing, facility startups, shop drawing review, answering RFIs, contractor bid reviews, payment application reviews, equipment procurement, and permitting services for municipal and other clients.

RELEVANT EXPERIENCE

Delaware County Regional Water Authority, DELCORA Pump Station Design, *Chester, PA*
Project Engineer; Lead Process-Mechanical Designer and Pump Selection. The Delaware County Regional Water Quality Control Authority (DELCORA) embarked on a program to convey all flows from their Eastern Service Area (ESA) to the Western Regional Treatment Plant. As part of this program, HDR completed condition assessments, hydraulic analysis, preliminary design, and final design for the upgrades of 3 remote wastewater pump stations to improve overall service and resiliency. The condition assessment developed a baseline for improvements and identified components that would be included in the final design packages, items that would be impacted with the proposed improvements such as pump supports and ventilation, and safety concerns that should be prioritized by DELCORA. The hydraulic analysis served to optimize pumping efficiency and reduced flow rates with selection of new dry pit submersible pumps to replace the existing vertical configuration. Final design incorporated code reviews related to fire life safety and NFPA with inclusions of improved ventilation, gas monitors, and egress.

City of Philadelphia Water Department, Queen Lane RWPS, *Philadelphia, PA*
Senior Project Engineer. As HDR completed a hydraulic analysis and screening evaluation for the Philadelphia Water Department's Queen Lane Raw Water Intake on the Schuylkill River. As the initial step in a future overall facility condition assessment and planned upgrades, the team developed a detailed screening evaluation to reduce maintenance efforts and improve system reliability. The analysis included considerations to both coarse and fine screen systems with automated debris removal improvements. Ranking of alternatives included impacts to the overall structure and facility, aesthetics from the river, extents of operator interaction during operations, cleaning of screens and presence of any submerged mechanical components, any structural upgrades, system reliability, and cost. Initial phases also included replacement of two of the pumps to more reliability meet future design conditions. The pump sizes need to be matched to existing pump flow and head to optimize operation within the pumps POR.

City of Philadelphia Water Department, Baxter WTP Improvements, *Philadelphia, PA*
Senior Project Engineer. The Baxter Water Treatment Plant is the largest of three water treatment plants owned and operated by the Philadelphia Water Department (PWD). The plant has a full-service capacity of 310 mgd and consists of flocculation, sedimentation, filtration, and disinfection. Currently, the plant uses a chemical disinfection strategy that includes free chlorine and chloramines. PWD's recently completed Water Master Plan (WMP) proposed improvements to Baxter's disinfection process in order to ensure compliance with current and anticipated water quality regulations. HDR is responsible for leading the identification and evaluation of UV disinfection alternatives. Additionally, the team is evaluating the plant improvements related to site layout and future expansion, redundancy and reliability, electrical impacts of any proposed upgrades, and hydraulics related to low lift pumping requirements.

Michael Shumpert, PE, NICET, NCEES

Fire Life Safety & Code Review

Michael is a registered Fire Protection Engineer and also has a NICET Level IV certification in Fire Alarm Systems. His experience includes the specification, design, and review of fire protection systems in commercial, health care, educational, telecommunication, computer server, water treatment, power generation, chemical and fuel storage, rail transportation, and various other industrial facilities. His background in fire protection engineering includes code consulting, life safety, fire suppression, and fire alarm systems design.

YEARS OF EXPERIENCE

Industry: 22

HDR: 9

EDUCATION

Certificate, Fire Protection Engineering Applications, Graduate Certificate (Postbaccalaureate), California Polytechnic State University, San Luis Obispo (Cal Poly), 2015

BS, Electrical Engineering, University of Nebraska, 2001

PROFESSIONAL REGISTRATIONS

Professional Engineer: NH, OR, AL, OK, NE, AR, IN, IL, MT, KS, CO, MO

PROFESSIONAL CERTIFICATIONS

National Council of Examiners for Engineering and Surveying (NCEES)

NICET - Fire Alarm Systems - Level IV

National Institute for Certification in Engineering Technologies — Fire Alarm Systems Level IV, Special Hazards Suppression Systems Level I

OFFICE LOCATION

Lincoln, NE

RELEVANT EXPERIENCE

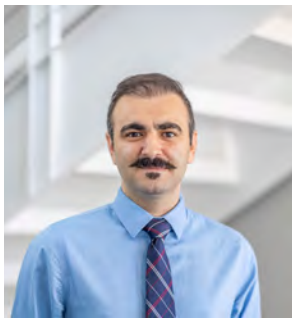
Delaware County Regional Water Authority, DELCORA Pump Station Design, *Chester, PA*
FLS Code Review Lead. The Delaware County Regional Water Quality Control Authority (DELCORA) embarked on a program to convey all flows from their Eastern Service Area (ESA) to the Western Regional Treatment Plant. As part of this program, HDR completed condition assessments, hydraulic analysis, preliminary design, and final design for the upgrades of 3 remote wastewater pump stations to improve overall service and resiliency. The condition assessment developed a baseline for improvements and identified components that would be included in the final design packages, items that would be impacted with the proposed improvements such as pump supports and ventilation, and safety concerns that should be prioritized by DELCORA. The hydraulic analysis served to optimize pumping efficiency and reduced flow rates with selection of new dry pit submersible pumps to replace the existing vertical configuration. Final design incorporated code reviews related to fire life safety and NFPA with inclusions of improved ventilation, gas monitors, and egress.

City of Philadelphia Water Department, PWD Baxter and Belmont WTP Lab Renovation Conceptual Design
FLS Code Review Lead. HDR is currently in the Conceptual Phase for renovation of two of PWD's WTPs. This project is engaging BLS managers, WTP managers, laboratory supervisors and PWD Design in a series of four workshops for each of the labs. Through survey and user input, code review, investigation of structural and system impacts, and user feedback HDR is developing low, medium, and high impact concept designs for each of the plants' labs. The planned features will improve workflow via changes to the physical layout, incorporation of industry space standards for equipment, conformance to ADA aisle width regulations, and safety upgrades to meet present day lab safety standards. Concepts will be selected as best preparing the labs to meet the challenges of the next 30 years, to meet industry standard space requirements for the amount and variety of equipment used to meet regulatory and process control needs; to meet modern-day lab safety standards, such as improved chemical storage and isolating office space from operational lab space; and to meet the requirements associated with anticipated future regulations (flexibility to add equipment / analyses) .

Lehigh County Authority, LCA-Big Lehigh Carbon Feed Study, *Allentown, PA*
FLS Code Review Lead. The feasibility study of the addition of a carbon feed system at the Big Lehigh Intake in order to improve LCA's reliability on the facility for potable water supply. The project included the evaluation of the chemical feed rate required based on water quality and capacity, analysis of available equipment alternatives, and consideration to other required improvements of the facility. The primary criteria developed for analysis included reliability and redundancy, chemical and life cycle costs, use of the existing building, and construction cost.

Howard County, MD Little Patuxent Water Reclamation Plant Biosolids Processing Facilities Improvements,
Fire Protection Engineer. Develop a Biosolids Master Plan that provides a framework for reliable cost-effective and socially responsible treatment and beneficial use of LPWRP biosolids in a changing and unpredictable regulatory environment.

USACE - Kansas City District, LCAAP Water Treatment Plant
Fire Protection Engineer. HDR was contracted by USACE Kansas City District to complete final engineering design of a new water treatment plant to supply 0 grain and 5 grain hardness production, process, potable, and fire water to LCAAP and demolition of existing deteriorated facilities.



YEARS OF EXPERIENCE
Industry: 3

HDR: 2

EDUCATION
PhD, Civil Engineering

PROFESSIONAL REGISTRATIONS
Professional Engineer: PA

OFFICE LOCATION
Plymouth Meeting, PA

Sina Moharramzadeh, PHD, PE

Chemical Feed System & Jar Testing

Sina Moharramzadeh is a Water/Wastewater Designer at HDR. Currently, he is involved with several projects with utilities such as PWD, Des Moines WRA, and Des Moines Water Works, working on designing water/wastewater treatment processes and developing preliminary engineering reports. He received his Ph.D. in Civil Engineering from Iowa State University. During his Ph.D., he worked on physical-chemical processes such as freeze separation for RO brine management and urine nutrient recovery. He has a solid background in water chemistry, physical-chemical processes, and RO-membrane process.

RELEVANT EXPERIENCE

Delaware County Regional Water Authority, DELCORA Pump Station Design, *Chester, PA*
Project Engineer. The Delaware County Regional Water Quality Control Authority (DELCORA) embarked on a program to convey all flows from their Eastern Service Area (ESA) to the Western Regional Treatment Plant. As part of this program, HDR completed condition assessments, hydraulic analysis, preliminary design, and final design for the upgrades of 3 remote wastewater pump stations to improve overall service and resiliency. The condition assessment developed a baseline for improvements and identified components that would be included in the final design packages, items that would be impacted with the proposed improvements such as pump supports and ventilation, and safety concerns that should be prioritized by DELCORA. The hydraulic analysis served to optimize pumping efficiency and reduced flow rates with selection of new dry pit submersible pumps to replace the existing vertical configuration. Final design incorporated code reviews related to fire life safety and NFPA with inclusions of improved ventilation, gas monitors, and egress.

City of Philadelphia Water Department, Baxter WTP Improvements, Philadelphia, PA
Project Engineer. The Baxter Water Treatment Plant is the largest of three water treatment plants owned and operated by the Philadelphia Water Department (PWD). The plant has a full-service capacity of 310 mgd and consists of flocculation, sedimentation, filtration, and disinfection. Currently, the plant uses a chemical disinfection strategy that includes free chlorine and chloramines. PWD's recently completed Water Master Plan (WMP) proposed improvements to Baxter's disinfection process in order to ensure compliance with current and anticipated water quality regulations. HDR is responsible for leading the identification and evaluation of UV disinfection alternatives. Additionally, the team is evaluating the plant improvements related to site layout and future expansion, redundancy and reliability, electrical impacts of any proposed upgrades, and hydraulics related to low lift pumping requirements.

Lehigh County Authority, Trexlertown Wastewater Storage Facility (TWSF) Feasibility Study, *Allentown, PA*
Project Engineer. The feasibility evaluation of an in-line gravity storage tank and parallel interceptor in the Trexlertown area to reduce overflows in the collection system. The hydraulic capacity of the system was investigated with development of alternative interceptor sizing. In addition to the hydraulic and alignment routing analysis, the project included evaluation of trenchless crossings, wetland delineation and surveying, coordination with PennDOT, considerations to public impacts, and detailed cost estimates.

Philadelphia Water Department, Georges Hill Pump Station, *Philadelphia, PA*
Project Engineer. HDR is currently completing a new 15 MGD Georges Hill Booster pump station facility design that will act as a redundant source to the existing Belmont High Booster Station. The new pump station will be designed to meet PWD's Green Stormwater Infrastructure design standards, allowing it to blend into the environment and limit disturbance to the community during and after construction. Additionally, the project includes designs for new water and sewer piping, a stormwater runoff system, permitting, architectural, HVAC, electrical, controls, structural, Fire Protection, and security for complete integration within the existing land and infrastructure.

04 Technical Approach

HDR has consistently delivered stellar consultant services to our clients. We are proud of our reputation of being considered a trusted advisor who offers cost-saving and innovative approaches. Our clients trust that we will provide solutions which do not compromise reliability or operations and maintenance.

HDR understands the existing conditions of the Big Lehigh Intake and the relatively infrequent use. While it is used sparingly, it is a critical feature of the LCA infrastructure and important for reliable water supply to the City of Allentown. While the final deliverable of this phase is a Preliminary Design Report (PDR) and associated drawings, HDR has found value in development of brief Technical Memorandums for consensus prior to development of a PDR. This will allow the PDR to be more concise of a document where decisions have already been made and the report is used to define design criteria to be utilized in the next phase. Our goal is to communicate efficiently and frequently with LCA staff and operations to identify key drivers in the critical components of this upgrade.

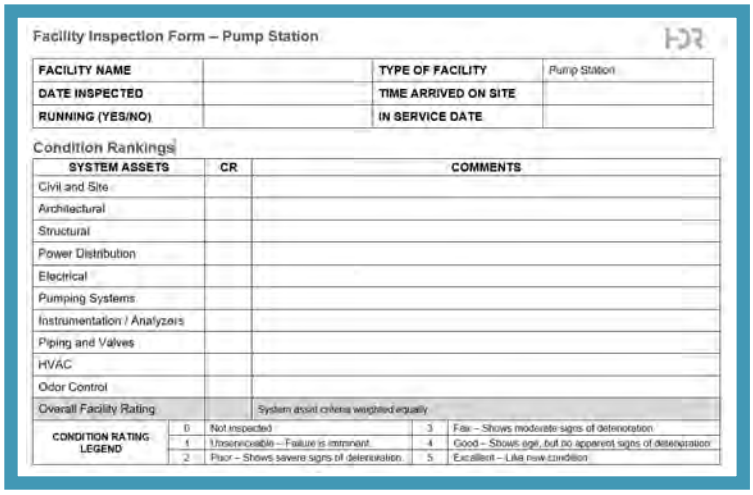
- Screening
- Pumping
- Chemical Feed

Other disciplinary components including electrical, instrumentation, HVAC, plumbing, and structural will fall into the evaluation of each. With LCA input, HDR will provide a condensed PDR documenting the decisions made. Preliminary alternatives evaluations will be appendixes for records but will have already been collaboratively agreed upon with LCA for continuation into final design. The PDR will serve more as an executive summary documenting the direction of the project.

Facility Condition Assessment

HDR has found significant value to a full facility condition assessment at project initiation. While some members of the HDR team visited the site during the 2018 chemical feed evaluation, a lot can change in 6 years. HDR's strategy includes placing recommended improvements or identified deficiencies into two buckets. The first are items that are necessary to accommodate improvements to pumping and screening, or implementation of a chemical feed system. The second are items that are necessary for reliable operation or safety, which may not be directly related to the key system improvements. For example, our condition assessment of a remote pumping facility for DELCORA identified direct access openings to the wetwell which were not adequately secured or structural sound. These items were prioritized for immediate repair by DELCORA. Similar items may be identified as part of a detailed condition assessment that can be integrated into final design or accelerated for remedy by LCA.

Components are given a Condition Rating (CR) from 1 to 5 noting their overall description and Percent of Original Life. A CR of 1 is in New or Excellent Condition and 100% remaining while a CR of 5 is categorized as Failing – Virtually Unserviceable and <5%.



Facility Inspection Form – Pump Station

FACILITY NAME		TYPE OF FACILITY	Pump Station
DATE INSPECTED		TIME ARRIVED ON SITE	
RUNNING (YES/NO)		IN SERVICE DATE	

Condition Rankings

SYSTEM ASSETS	CR	COMMENTS
Civil and Site		
Architectural		
Structural		
Power Distribution		
Electrical		
Pumping Systems		
Instrumentation / Analyzers		
Piping and Valves		
HVAC		
Odor Control		
Overall Facility Rating		System asset criteria weighted equally

CONDITION RATING LEGEND				
	0	Not inspected	3	Fair – Shows moderate signs of deterioration
	1	Unserviceable – Failure is imminent	4	Good – Shows age, but no apparent signs of deterioration
	2	Poor – Shows severe signs of deterioration	5	Excellent – Like new condition

Items identified in the condition assessment will then be subject to a secondary evaluation, considering detrimental impacts to facility reliability, space constraints, aesthetics, operational constraints, overall cost, and regulatory requirements. Some "low hanging fruit" may be easily rectified to improve operations; others may not negatively impact operations nor have any bearing on the proposed improvements to the facility. Still others may need improvement which can be deferred to a later date where necessary budget can be allocated. It's important for the multi-disciplinary reviewers to grasp the criticality of the facility, goals of the project and future operations, and placement within Bucky Boyle Park.

Figure 1. While the facility appears to be in a good and well-kept condition, a multi-disciplinary assessment is a valuable tool to baseline the project and identify "domino" type impacts for implementation of improvements.

Space and Aesthetics

Any improvements to the facility will need to minimize impacts to the adjacent Bucky Boyle Park. It's possible that the chemical feed system and pump replacement can be accommodated inside of the building, pending Code analysis and approvals from the City of Allentown AHJ (Authority Having Jurisdiction). However, any modifications to the screen operation will be visible to the public. HDR's analysis will include consideration to both aesthetics and noise, with goal of minimizing impacts. If building expansion is required to accommodate the chemical feed system, HDR's in-house architects can provide building renderings for LCA and City review during final design. Locations can be explored to the north of the building which would be more visible to the public and the park. Alternatively, the south side of the building adjacent to the electrical equipment may be a more ideal location for a building expansion as it's more hidden from public view.

It will also be important to consider noise from HVAC improvements required for building ventilation and operations activities at the facility. Frequency of vehicle trips to maintain screens, dispose of debris, deliver or load chemicals will have impacts to the public at the park. As the facility is not currently manned on a regular basis, it will be important to maintain this operational strategy.

Preliminary System Evaluations

HDR understands the criteria presented to consider reliability, space constraints, aesthetics, operational constraints, cost, and permitting. While the dedicated study of each system will consider each, HDR also will consider the impact to operator and public safety. HDR's internal Drive to Zero Program is focused on the understanding that we all play an important role in driving cultures of quality and safety. This is the goal of our proposed condition assessment and evaluation of the Big Lehigh Intake. HDR is committed to providing proposed upgrades that will convey service reliability and safety improvements to LCA and the City of Allentown.

As part of our evaluation, we'll consult with LCA to determine if any weighting is applicable to certain criteria. Relative comparisons of two criteria aren't always equivalent; for example, it's assumed that reliability plays a more important role in the analysis and ranking of alternatives than space constraints. The associated difference or weighting factor is what will be collaboratively determined. And while not overly apparent, it's possible that the evaluation of appurtenances of each of the components could have associated impacts on the other. It's important that the selection of pump improvements not impact decisions made on the chemical feed system or screens. Similarly, improvements to the screening may impact the suction head of the pumps and associated efficiency of the new pump. Each of the studies noted below will be developed in concert with LCA and resultant recommendations will be documented in the BODR.

Hydraulic Analysis and Pump Selection

When selecting pumps, HDR will evaluate the impact resulting from variable system operating conditions. Variations to the suction side hydraulic conditions will impact the pumps' discharge pressure. As the intake is on the Lehigh River, the suction hydraulics will be impacted

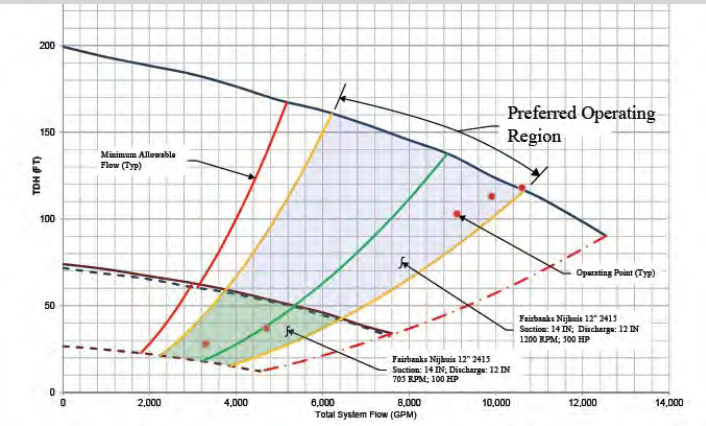
Figure 2. Existing PARCO Operated Valve and Air Release Valve on Pump #3 Discharge

by the water level in the river along with the head losses through the screening system. As will be discussed, the screening system selection and the operational strategy will impact pump performance. We will work with an Excel based hydraulic model and as-built conditions to evaluate the variability of the system and provide a new smaller pump that fits in with operation of the existing pumps and reliably meets your hydraulic objectives. The 10,000 gpm pumps are too large for the required firm capacity of 20 mgd. As currently installed, the firm capacity is approximately 36.2 mgd. Removal of a 10,000 gpm pump would meet a firm capacity of 21.9 mgd. However, operations would like to have the flexibility in the station to rotate between pumps, and essentially have two standby pumps or ease of future maintenance. Replacement of Pump #2 with a third 7,600 gpm pump would provide the minimum capacity requirements with two standby pumps for ease of a 2+1+1 configuration. Matching pump sizes typically make operations easier and provides more flexibility for future maintenance. The maximum typical turndown of a VFD for an extended period of time is approximately 50% speed, resulting in a flow of approximately 3 MGD, depending on static head conditions according to the facility O&M manual. Alternatively, a smaller pump (less than 7,600 gpm) could

HDR has a proven approach for selecting pumps focused on operating within the Preferred Operating Region (POR). Operating a pump within its POR, close to the best efficiency point, is ideal for long-term pump operation. In this region, loads on the impeller are balanced for long-term operational reliability. HDR will utilize our proven approach to proper pump selection, as defined by the Hydraulic Institute standards. Our approach is summarized below.

1. Establish pump selection alternatives based on rated capacity.
2. Analyze flow and pressure ranges to determine occurrence frequencies.
3. Determine the number of pumps operating, pumping efficiency, and corresponding total motor horsepower.
4. Perform a net present worth analysis and life cycle cost analysis to compare pump alternatives.
5. Select the appropriate pump and motor sizes.
6. Confirm NPSH Required versus NPSH Available meets appropriate safety factors. .
7. Incorporate anticipated operation into the process control description to require pump operation in the POR during normal operation.

We have successfully implemented this approach for numerous other clients. The pump curve shown in the figure below is from a recent HDR project.



Example illustrating Preliminary Pump Curves and the concept of Preferred and Allowable Operating Regions (POR and AOR).

be installed that would operate more efficiently at lower flow conditions. HDR will evaluate a series of options that can be evaluated collaboratively with LCA operations with pros and cons to both meet normal low flow conditions with the Big Lehigh as a secondary source along with maximum flow conditions for the facility to be used as a primary source during an outage of the Little Lehigh.

While not included in your scope for this preliminary design, HDR proposes that LCA consider, as a supplemental service, having a transient analysis performed during startup and shutdown of the pumps, as

well due to loss of primary power, to enable transients to be managed to within acceptable limits. It's understood that the existing PARCO system causes operational issues and is not overly functional. Plus, the existing system occupies valuable square footage inside of the building. There is limited lay length between the pump discharge and elbow, so options are reduced without replacement of the long-radius discharge elbow. Options may include an electro-hydraulic actuated valve or electrically actuated valve. Removal of the elbow and reconfiguration of the discharge piping may provide additional options including a Cla-Val style system. For all installations, it's important that the air release valve remain in place or be replaced in kind.

With a full transient analysis during design, additional mitigation measures may be implemented as part of the raw water intake upgrades or under the future planned pipeline improvements between the intake at the WFP. It would also serve to optimize the start up cycle time with opening of the valve.

Once design parameters are set, proper pump selection is critical for reliable long-term performance. HDR will work closely with LCA engineering and operations to be determine the range of operating conditions and estimate a frequency of occurrence so that proper pump selection can be made. Once operational parameters are identified, acceptable manufacturers will be contacted. It's possible that operating conditions may be too broad and the new pump may need to operate within its Allowable Operating Region (AOR) at times. While not ideal, this can be tolerated for short periods of time. Operating outside of the AOR can lead to cavitation issues, and rotating assembly damage.

Chemical Feed System

HDR will build upon our evaluation completed in 2018 to further evaluate any alternative chemical options. The use of PAC for taste and odor control is a very common practice in water treatment and it comes with added benefits beyond the removal of taste and odor compounds. Under the right conditions, application of PAC has been shown to be an effective mechanism for reducing a variety of undesirable compounds such as synthetic organic compounds (SOC), as well as natural organic matter (NOM) precursors which would otherwise lead the formation of disinfection byproducts such as trihalomethanes later in the plant. PAC feed systems can utilize dry carbon or utilize a slurry, there are advantages and disadvantages to each which would be considered during the preliminary design phase.

There are numerous chemical treatment processes for taste and odor removal; as part of this preliminary design, HDR will assess these treatment options for you. We recommend evaluations of adsorptive processes (PAC, GAC) as well as processes which rely on oxidation including Ozone, Chlorine, Chlorine dioxide, Potassium Permanganate, and UV/AOP. Each type of treatment will bring advantages and disadvantages based on source water chemistry and targeted T&O compounds. These alternatives can be vetted at a high level, or in detail if desired. Based on our understanding of this facility and the information presented in the request for proposal it is assumed that PAC will be the selected alternative. However, alternative options will be presented for your consideration. Once a treatment method is selected, HDR will evaluate the need for jar testing.

HDR has done recent jar testing at PWD's Baxter WTP for use of Chlorine Dioxide as a pre-oxidant to reduce formation of disinfection byproducts. The results of the analysis and jar testing, if needed, will further define the size of the chemical storage and feed system required in the building. Jar testing should be conducted under both warm and cold water (seasonal) conditions in order to capture variations in pH and NOM, and ideally should occur during periods of known T&O events (e.g. late summer algae blooms or periods with high leaf tannins). Information gathered from these tests can inform design and help define anticipated chemical feed rates. PAC feed can get problematic at high doses (above 20mg/L) due to carry over into downstream plant processes. Understanding anticipated dosage, through jar testing, would aid in identifying if carry over were likely to occur and to what extent it must be addressed at the WFP. High PAC dosage necessitate optimization of the plant sedimentation process to ensure PAC is not carried through filtration; we can explore options if jar testing indicates feed rates will be this high. We understand there is familiarity with PAC, as LCA already feeds PAC at the WFP for raw water from the Little Lehigh.

HDR will also further refine the installation location and loading methods. Installation will consider the following:

- Amount of chemical to be stored inside the building will be limited by the AHJ and Code. Inclusion of the system in the building may also trigger additional HVAC requirements and fire sprinklers.
- If not used consistently, dry PAC (before slurried) can become cakey and clog up in the equipment.

- PAC is a messy material that can get into and cause issues with other equipment, such as pumps. Proper SOPs and operating strategies will need to be implemented if installed inside of the existing pump room.
- Method of delivery (truck, super-sacks, or 50 lb bags) will impact amount of operational interaction. As LCA currently has only 5 operators on-staff to maintain this remote facility, reducing this operations interface is important. Amount of chemical stored onsite will need to be balanced with other considerations to storage duration previously discussed.

Based on HDR's experience with the facility and similar installations, HDR recommends that the PAC feed system be in a separate room than the main pumping equipment. This will better facilitate approvals with the AHJ and keep a cleaner working environment for operations. HDR will look at placement of the additional structure and associated storage quantities during the preliminary design phase.

Flow Pacing for Dosage of PAC

As the current PAC is paced using the flow meter at the WFP it will be important for the chemical to be accurately dosed at the intake. Typically flow pacing is used to monitor dosage rate based on the overall flow. However, accurate flow pacing will not be achievable with the WFP 2 miles from the pump station. Ideally, the injection location is in close proximity to the flow meter. As the discharge forcemain on the lower floor is in a tight location, it will be difficult to install a standard magnetic style flow meter. However, strap-on or insertion type flow meters could be utilized to monitor flow leaving the site. VFD speed could also be utilized, although it would not be as accurate. If there are concerns about accuracy, an SOP can be developed and data collected between the WFP flow meter, intake flow meter, and pump speed to optimize the dosage rates. Determining the best means of flow pacing the PAC will be discussed in a Workshop with LCA staff.

Screening Evaluation

This analysis will involve an evaluation of the available screening technology alternatives to replace the existing screens and appurtenances. When comparing each of the screening systems, the following items will be considered:

- Frequency of system maintenance and magnitude of effort.

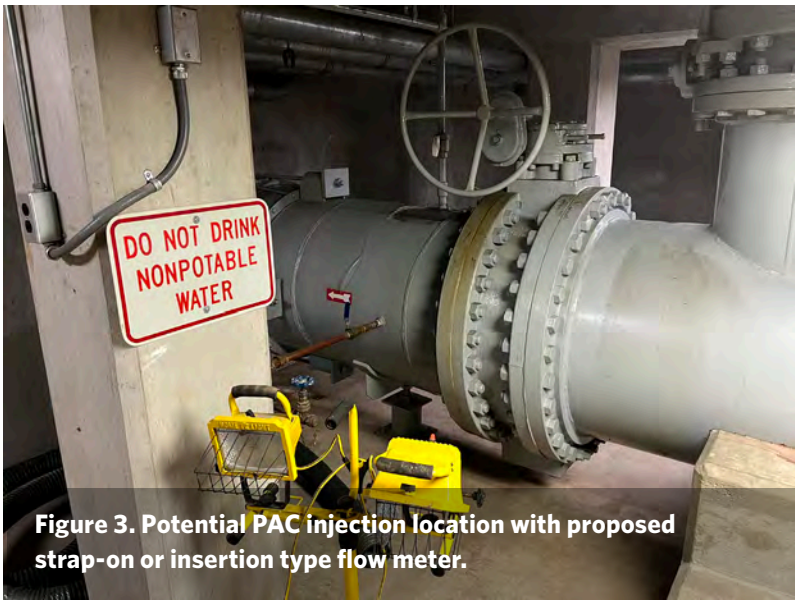


Figure 3. Potential PAC injection location with proposed strap-on or insertion type flow meter.

- Extent of operator interaction during operations.
- Cleaning of screens and any submerged sprockets or mechanical components.
- Structural upgrades required.
- Equipment must be able to meet the system capacity with the existing structural configuration.
- Impact to the continuity of facility operations during construction.
- System reliability overall.
- Budgetary equipment costs.
- Consideration to FEMA guidelines as the intake structure is within the regulatory floodway.
- Consideration to debris disposal in location adjacent to the pump building.
- Aesthetic impacts to the river with addition of equipment.
- Current screen cleaning operation and frequency.

Available screening options typically include multi-rake screens and climber screens which are more common for coarse screening systems applicable for a raw water intake with the goal of debris disposal. Fine screening options including perforated plate screens or drum screens could be considered, but are not likely to be suitable for the installation. HDR's evaluation of the screens for the Queen Lane Raw Water Intake for PWD included both coarse and fine screens for replacement.

As was observed and discussed in the field, it will be important to consider overall project budget, frequency of current screen cleaning, and impacts to the existing structure. Electrical infrastructure may also be required

to be routed to the intake. Implementation of automatic screen cleaning systems will be costly and potentially require major structural improvements. Given that the intake structure is cleaned via a vacuum truck once every 5 years (based on recent conditions), screen cleaning improvements could be reasonably deferred at the discretion of LCA. HDR will work with you to increase the future reliability of the system without sacrificing the allocated budget that may be reserved for other planned improvements.

Discussions with operations during a visit of the site highlighted that the screening structure is cleaned at an interval of approximately every 5 years using a vac truck. It was noted that the bar racks do not frequently clog with large debris, but occasionally are needed to be cleared manually with rakes. Given the location in the FEMA floodway and elevation difference from the pump station, the difficulty and associated cost of debris removal to a location above the floodway was evident. Alternatively, a debris removal system and container could be located adjacent to the structure at the base of the driveway, if permitted by FEMA. Any equipment located at the top of the structure would need to be properly rated for submergence and moving parts could be a source of maintenance. Instead of improvements to the screens with inclusion of a debris removal system, HDR can explore options to keep debris off of the primary screens utilizing a floating boom. For cleaning of the fine screen chambers, alternatives can be explored to keep sediment moving through the system or back to the river

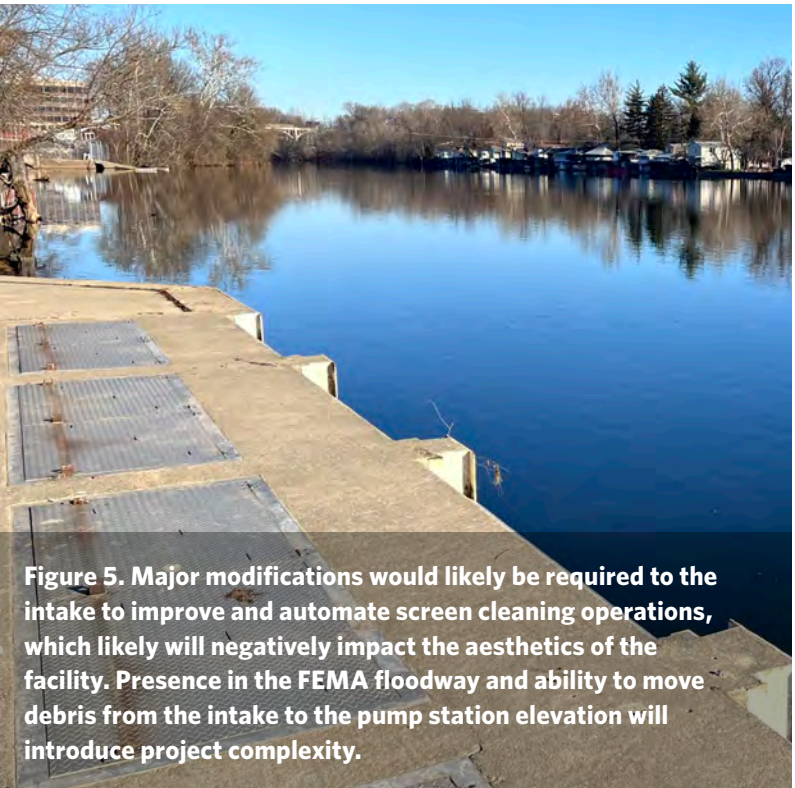


Figure 5. Major modifications would likely be required to the intake to improve and automate screen cleaning operations, which likely will negatively impact the aesthetics of the facility. Presence in the FEMA floodway and ability to move debris from the intake to the pump station elevation will introduce project complexity.

Figure 4. Troy Belcher inspecting the Queen Lane Raw Water Intake Coarse Screening Equipment as part of the intake upgrades and screening evaluation. HDR will use lessons learned from from intake facilities and operations for consideration on the Big Lehigh Intake.

with air burst or jet mixing inside of the structure, similar to the air burst style system in Section 4 of the pump station O&M manual. It is also possible that the current sediment deposition inside of the structure is due to the infrequent use and relatively low flows. With more frequent operation and consistently higher flows, it's possible that the sediment loading inside the structure may be reduced. However, it will be important to confirm that sediment loading does not then increase inside of the pump station structure.

Prior to implementing more invasive and costly infrastructure, HDR will work with you to evaluate potential options and associated impacts. It will be important to consider ability of the WFP to remove the sediment from the raw water or associated permits and approvals for conveying materials back into the river.

3D and BIM Design

As the project moves from preliminary design to final design, HDR proposes to utilize a LiDAR scan of the facility to develop a BIM Model. The LiDAR scan, while not included in this base scope of work, could be an added service completed by HDR that would expedite the final design process with building of the BIM model, either during preliminary design or early in the final design phase.

05 Scope of Work

Task 1 – Project Management and QA/QC

A. HDR will lead Project Management, responsible for all aspects of the Contract and project management, including the scope, schedules, and budget. The HDR Project Manager will maintain liaison with LCA and their Project Manager, who will direct and oversee work on the Contract for LCA.

B. Project Control Plan

- Project Schedule
  - At the onset of the Project, HDR shall propose a schedule for deliverables and meetings/ workshops.
  - HDR will maintain a schedule coordinated in cooperation with LCA.

C. HDR will prepare a Project Guide identifying the project's team, lines of communication, scope of services, budgets, task assignments, quality control (QC) plan, health & safety, project administration, and project closeout procedures. HDR will conduct a Project Approach and Resource Review (PARR) internally at approximately 10% progress. The PARR is a technical review intended to: compare the technical approach and scope of work with LCA's needs and expectations, identify and plan for project risks, evaluate project staffing and Quality Control team, and evaluate project tools and resources to be used. Recommendations from the PARR will be incorporated into the Quality Control Program and updated in the Project Guide. HDR will perform QC reviews of work products at various stages in the project as identified in the scope of work.

D. Kickoff Meeting and Workshops

- HDR will facilitate a hybrid kickoff meeting to be held at the main LCA office and over a virtual platform agreeable to LCA. Two (2) representatives from HDR will attend in-person. Up to (2) additional representatives from HDR will be available to attend online.
- Workshop: A workshop will be held after submittal of all TMs to discuss LCA comments and path forward. Final TMs will be updated according to comments provided by LCA. The hybrid workshop will be held at the main LCA office and over a virtual platform agreeable to LCA. Two (2) representatives from HDR will attend in-person. Up to (2) additional representatives from HDR will be available to attend online.
- Workshop: A workshop will be held after submittal of the Draft BODR to discuss LCA comments prior to issuance of the Final BODR. The hybrid workshop will be held at the main LCA office and over a virtual platform agreeable to LCA. Two (2) representatives from HDR will attend in-person. Up to (2) additional representatives from HDR will be available to attend online.

Task 2 – System Evaluations, Code Review, and Condition Assessment

As part of Task 2 HDR will provide a series of Technical Memorandum (TM) for LCA review. The goal will be to facilitate LCA review and input early in the process and achieve consensus from engineering and operations. Recommendations made in each of the TMs will be documented for final design in the Basis of Design Report completed under Task 3.

- **Data Collection and Review**
  - Collect and review applicable data, criteria, standards, regulations and other information pertinent to the Project described herein. Such data shall include, but not be limited to:
    - Relevant site plans.
    - Topographic maps.
    - Record and as-built drawings.
    - Information on the existing Pumps/ Pumping System
    - Standard Operating and Maintenance Procedures (SOP/SMP) and/or Operation and Maintenance Plans.
    - Existing utilities.
    - Water quality data.

  - » Other known pertinent data, reports, and information provided by LCA.

Additionally, HDR will conduct interviews with LCA operations made available during the condition assessment site visit.

- **Hydraulic Evaluation and Pump Selection.**

  The HDR team will complete the following:

  - Hydraulic analysis of the Big Lehigh Pump Station considering range of flows as both a primary and secondary source.
  - Identify typical ranges of operation anticipated.
  - Identify alternatives for new operating conditions with the replacement of Pump #2 (10,000 gpm pump) with a smaller pump on a VFD.
  - Provide pump recommendations for the replacement pump.
  - Recommendations for any piping replacement or improvements to accommodate the pump selection.

  Deliverable: Draft Hydraulic Evaluation and Pump Selection TM. The Final TM will be included in the BODR as an appendix.

- **Screening Evaluation**

  As part of the basis of design analysis, HDR will complete an alternatives analysis on the intake screening equipment. It's anticipated the following will be evaluated:

  - Intake bar screens/trash rack on frontage of Lehigh River with provisions for automated screen cleaner and debris conveyor.
  - Interior automated screens and debris removal.
  - Debris handling.
  - Options for enhanced screen cleaning utilizing air burst or pressurized water systems.
  - High level review of impacts to fish and in-river aquatic species.
  - Consideration to freezing and reliability during cold weather events.

  Deliverable: Draft Screening Evaluation TM. The Final TM will be included in the BODR as an appendix.

- **Chemical Feed Evaluation.**

  HDR will complete the chemical feed evaluation considering of:

  - Evaluation of chemical options.
  - Consideration to jar testing for recommended chemical feed system. If elected to proceed, jar testing will be addressed via an amendment. As results may vary based on water quality, jar testing over an extended period of time may be explored to capture seasonal variability and effectiveness.
  - Preliminary layout of the chemical feed system.
  - Approach to address residual chemical at the WFP.

  A building and fire life safety code review will be completed as a separate TM.

  For reasons documented in our technical approach, HDR's scope and level of effort is based on the findings of the preliminary 2018 TM utilizing Powdered Activated Carbon (PAC) in a bulk-bag unloader. This system optimizes facility reliability, reduces operational constraints, is a known product to regulatory agencies, and is the least impactful to park aesthetics. Based on experience with code reviews, safety, and operability of other equipment in the presence of PAC, installation in a separate room/addition to the existing structure is assumed. The TM will document potential chemical alternatives and associated pros and cons for installation at the Big Lehigh.

  Deliverable: Draft Chemical Feed Evaluation TM. The Final TM will be included in the BODR as an appendix.

- **Building Code and Fire Life Safety Review**

  A code compliance determination will be completed for the alternatives and associated recommendations will be based on the code. Code compliance review will include evaluation of applicable Building Codes for ingress/egress requirements, evaluation of NFPA 820 for hazardous area classifications, as well as other applicable requirements.

- **Site Visit and Condition Assessment**

  HDR will visit the facility to conduct a multi-disciplinary condition assessment. It's anticipated that the following disciplines will be represented: process-

mechanical, electrical, instrumentation and controls, structural, HVAC, and plumbing. The assessment will serve to identify facility improvements required to accommodate the proposed design scope of work. Additionally, the HDR team will seek to identify any facility deficiencies that may be remedied as part of or prior to construction of the improvements.

To better target the improvements required as part of the 3 major system upgrades (pump, screens, and chemical feed systems), the condition assessment will be conducted after some preliminary evaluations have been completed. Better understanding the system and potential improvements will make the condition assessment more efficient. Items to be evaluated in the field include, but are not limited to:

- Review of existing structure to consider any necessary structural modifications to accommodate the new chemical feed equipment, screens, or pump.
- Review of existing electrical and instrumentation infrastructure to determine available capacity and presence of spares for new electrical loads. As a large pump is proposed to be replaced with a smaller pump, additional service capacity to the facility is not anticipated.
- Review of HVAC and Plumbing infrastructure to identify improvements needed to accommodate the new chemical feed equipment, screens, or pump. Additional exhaust and plumbing connections are likely to be required for any chemical system improvements inside the building or within a new adjacent building.

Deliverable: Condition Assessment Field Notes and Draft Recommendations TM. The notes and final TM will be included in the BODR as an appendix.

Task 3 – Basis of Design Report and Drawings

- Preliminary Basis of Design Report

  HDR will provide a Preliminary Basis of Design Report (BODR) for LCA review. For simplicity, the BODR will serve as executive summary and design criteria document, summarizing the initial TMs completed and being a condensed resource to be utilized during final design. Alternatives evaluations and additional information will be included as appendices.

- Concept Drawings

  HDR will prepare preliminary design plans limited to the following drawings:

  - Pump and Piping Modifications
  - Screening Improvements
  - Chemical System P&ID
  - Electrical Single Line Diagram

  The drawings will be conceptual and schematic in nature, utilizing existing as-builts PDF drawings to convey layouts representing the proposed 30% design. Major equipment selections will be identified on the drawings and within the BODR. The chemical system P&ID and Electrical Single Line Diagram will be completed in AutoCAD. Full Revit/BIM drawings will be developed in future phases based on a LiDAR scan that can be completed as added scope part of this initial basis of design development or deferred to final design.

- Construction Cost Estimate

  An Opinion of Probable Construction Cost (OPCC) will be provided with the BODR according to the Association for the Advancement of Cost Engineering. The estimate will be prepared to a Class 4 level and consider a multi-prime contract.

  Deliverables: Draft and Final BODR with cost estimate and TM appendices.

06 Schedule

HDR has familiarity with the site, proposed improvements, and has structured the project schedule accordingly. Instead of an initial site visit aligned with the kickoff, HDR will initiate the preliminary design activities to better define alternatives and potential recommendations. Delaying the condition assessment will better support our multi-disciplinary team in targeting more specific improvements related to the pumps, chemical feed, and screens while in the field.

TASK	MONTH															
	March				April				May				June			
Notice to Proceed and Kickoff Meeting			■													
Review of Background Data			■	■												
Hydraulic Analysis and Pump Selection				■	■	■	■	■								
Chemical Feed System Evaluation				■	■	■	■	■								
*Jar Testing (*if required)*						■										
Screening Analysis				■	■	■	■	■								
Code Review						■	■									
Condition Assessment					■	■										
TM Submittals and LCA Review								■	■							
Workshop										■						
Draft Basis of Design Report											■	■	■			
LCA Review and Workshop														■		
Final Basis of Design Report															■	■

07 Fee Proposal

HDR has prepared a streamlined approach to the preliminary design phase of the Big Lehigh PS upgrades with a reflected cost that will prepare the team for the final design. For efficiency in development of the project, we have not proposed any subconsultants but will engage as necessary for final design. We welcome discussions with LCA on our technical approach, scope, and associated fee.

Task No.	Task Description	Principal-in-Charge	Technical Advisor	QA/QC	Senior PM	Process-Mechanical		Structural Engineer	HVAC & Plumbing Engineer	Electrical and I&C		Fire Life Safety	Project Controller	Total HDR	Total HDR	Expenses	Total Cost ($)
						Senior Engineer	Engineer			Electrical	I&C			Labor Hours	Labor ($)		
1	Project Management and Meetings	2	3	0	16	6	0	4	3	4	3	0	6	47	$11,200	-	$11,200
2	System Evaluations, Code Review, and Condition Assessment	0	1	7	14	82	72	22	8	16	17	24	0	263	$52,700	$500	$53,200
3	Basis of Design Report and Drawings	0	1	4	5	6	10	8	4	4	14	2	0	58	$12,600	-	$12,600
TOTALS		2	5	11	35	94	82	34	15	24	34	26	6	368	$76,500	$500	$77,000

1720 Spillman Drive, Suite 280
Bethlehem, PA 18015
610.807.5100
hdrinc.com

We practice increased use of sustainable materials and reduction of material use.

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CAPITAL PROJECT AUTHORIZATION

PROJECT NO.: AD-W-23 **BUDGET FUND:** Allentown Div\W\Capital

PROJECT TITLE: Allentown Division – Lehigh River Pump Station Upgrades Preliminary Design Phase

PROJECT TYPE:

- ☐ Construction
- ☒ Engineering Design
- ☐ Equipment Purchase
- ☐ Amendment No. 1

THIS AUTHORIZATION: **$92,000**
TO DATE (W/ ABOVE) **$92,000**

DESCRIPTION AND BENEFITS:

The purpose of this project is to develop a Basis of Design Report for upgrades to the Lehigh River Pump Station. The scope will include a chemical feed system for taste and odor concerns, improvements to the intake screening, and pump upgrades. The existing pump station is used infrequently due to the taste and odor concerns but in the event of a shutdown of the Little Lehigh Creek intake due to long term maintenance or repairs, the Lehigh River must be made into a reliable back-up. LCA partnered with HDR in 2016 on a chemical feed study for the pump station. HDR plans to advance that evaluation into preliminary design for a chemical feed system along with additional pumping and intake screening improvements.

AUTHORIZATION STATUS:

Prior Authorizations	
None	
Requested This Authorization – Preliminary Design Phase	
Preliminary Design Phase: HDR, Inc.	**$77,000**
Staff	**$10,000**
Contingencies	**$5,000**
Total This Authorization	**$92,000**

Future Authorizations	
Detailed Design & Bidding Phase	
Construction Phase	

Review and Approvals:

Project Manager	Date	Chief Executive Officer	Date
Chief Capital Works Officer	Date	Chairman	Date

\\lca-dc\users\miller_lj\Minutes\2024\March 25 meeting\CPA Lehigh River Pump Station Upgrades Design.docx

Lehigh County Authority

1053 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2503 * FAX (610)398-8413 * Email: service@lehighcountyauthority.org

PROFESSIONAL SERVICES AUTHORIZATION

Professional: HDR, INC.
1720 Spillman Dr, Suite 280
Bethlehem, PA 18015

Date: March 25, 2024
Requested By: Amy Rohrbach

Approvals
Department Head: _____
Chief Executive Officer: _____

Allentown Division – Lehigh River Pump Station Upgrades – Preliminary Design Phase Services

The purpose of this project is to develop a Basis of Design Report for upgrades to the Lehigh River Pump Station. The scope will include a chemical feed system for taste and odor concerns, improvements to the intake screening, and pump upgrades. Currently, existing pump station is used infrequently due to the taste and odor concerns but in the event of a shutdown of the Little Lehigh Creek intake due to long term maintenance or repairs, the Lehigh River must be made into a reliable back-up. LCA partnered with HDR in 2016 on a chemical feed study for the pump station. HDR plans to advance that evaluation into preliminary design for a chemical feed system along with additional pumping and intake screening improvements. The 2022 Master Plan identified the pump improvements as a near-term project and recommended rehabilitation of pump 2 to allow for a firm pumping capacity of 20 MGD with 1 of the 3 pumps out of service. The intake screens at the pump station must be cleaned manually and it is a difficult and labor-intensive effort. The proposed upgrades will improve water quality, increase pumping efficiency, improve intake screening and reduce maintenance efforts for intake screening. The following professional services are included:

Professional Services *(1)*
1. Project Management and Meetings
2. System Evaluations, Code Review, and Condition Assessment
3. Basis of Design Report and Drawings

(1) *Per attached February 2024 HDR, Inc. proposal.*

Preliminary Design Phase:

This Authorizations: ***$77,000***

Time Table and Completion Deadline: As outlined in the proposal to satisfactorily complete the preliminary design phase services. Anticipated completion of Basis of Design Report in mid-July.

(For Authority Use Only)

Authorization Completion:
Approval: _____ **Actual Cost:** _____ **Date:** _____

Lehigh County Authority

1053 SPRUCE RD * P.O. BOX 3348 * ALLENTOWN, PA 18106-0348
610-398-2503 * email: service@lehighcountyauthority.org
www.lehighcountyauthority.org

MEMORANDUM

TO: LCA Board of Directors
FROM: Liesel Gross, CEO
DATE: March 18, 2024
RE: Lead Service Line Program Documents

Approvals Requested: Lead Service Line (LSL) Replacement Policy
LCA Property Owner Agreement – LSL Replacement Program

Over the past year, Lehigh County Authority (LCA) has been developing procedures and projects needed to comply with new regulatory requirements by the U.S. Environmental Protection Agency (EPA) related to lead in drinking water. A key provision in the updated regulations is a requirement for lead service lines (LSLs) to be removed from public water distribution systems. EPA has defined the LSLs requiring replacement to include both the publicly owned and privately owned portions. In the City of Allentown water system, LCA has estimated that more than 10,000 LSLs are currently in place that will require replacement over the next decade.

This new requirement is raising some challenging questions and scenarios that all water utilities will face, such as:

- When can the utility require a property owner to replace their LSL?
- Does a utility have the authority to replace a privately owned LSL, and in what conditions?
- Are utilities able to use public funds to replace privately owned LSLs?

LCA staff, in consultation with the Solicitor and several other utilities with successful LSL replacement programs, have developed two key documents (attached) for Board discussion and potential adoption at the March 25, 2024 meeting. These documents are important to have in place prior to beginning work on the first cycle of the LSL replacement program, which is scheduled to begin this Spring.

Lead Service Line Replacement Policy:
This Policy has been developed as an Appendix to LCA's existing Rules & Regulations for Water Service and will serve to document LCA's overarching commitment to replacing LSLs. The Policy includes a description of the public health concern related to lead in drinking water, and the commitment to use public funds to replace privately owned LSLs in instances where needed to comply with EPA regulations. The Policy also describes LCA's commitment to providing adequate notice to customers, and requiring customer consent in the form of an agreement prior to replacing a privately owned LSL. The Policy is written broadly to allow for some discretion in the development of specific procedures and practices associated with implementing the LSL Replacement Program.

LCA Property Owner Agreement:
An Agreement between LCA and the property owner will be required when LCA determines the property owner is eligible to receive an LSL replacement from LCA. The Agreement specifies LCA's and the property owner's responsibilities including those related to site preparation, restoration, maintenance periods, and other terms. Before LCA will replace a customer's privately owned LSL, this Agreement must be executed by both parties. Similarly, to protect LCA and document the attempts made to meet regulatory requirements, a "Decline" form is available for customers who may not wish to participate in the program.

At the March 25, 2024 Board meeting, LCA staff will provide a more detailed explanation of how these documents will be used. The Board of Directors will be asked to approve both documents, with the flexibility to make periodic minor changes to the Property Owner Agreement, in consultation with the Solicitor, for purposes of including details of specific LSL replacement projects or circumstances that may arise over the course of this multi-year program.

Lehigh County Authority

RULES & REGULATIONS FOR WATER SERVICE – APPENDIX A

LEAD SERVICE LINE REPLACEMENT POLICY

DRAFT

Adopted
March 25, 2024

INTRODUCTION

This Lead Service Line Replacement Policy ("Policy") has been developed to support efforts by Lehigh County Authority ("the Authority") to reduce the amount of lead in the Authority's water distribution systems, mitigate customers' risk of lead exposure through water consumption, and comply with current and future state and federal regulations related to lead in drinking water. However, the responsibility for maintenance of certain components of water distributions systems is shared between the Authority and the owners of the properties served. Therefore, this Policy seeks to clarify the Authority's position and plans related to the removal of lead service lines from these systems.

BACKGROUND

Lead is a common metal found in the environment and has been used in a variety of products throughout history including the production of plumbing materials, paints, and many other household products. The health effects of lead exposure have been studied extensively, and it is well understood that lead can cause damage to the brain and kidneys, especially in infants, young children, and pregnant women. While lead is often not found in public drinking water sources, such as water drawn from wells, springs and rivers, lead can be found in customers' tap water if lead pipes and other plumbing fixtures that contain lead exist in the property. Lead enters a customer's tap water by leaching from those pipes and plumbing fixtures as the water travels through them.

In 2019, the U.S. Environment Protection Agency ("EPA") began revising regulations related to lead in drinking water, with which all water utilities must comply. A key provision in the updated regulations is a requirement for lead service lines to be removed from public water distribution systems. This effort will be difficult and costly to implement for both the Authority and its customers. Some portions of the service lines are owned by the property owner directly. However, replacing only the publicly owned portion of a lead service line can increase the health risk for consumers, and EPA has indicated that all portions of the lead service lines must be removed regardless of ownership. As a result, this Policy provides the framework by which the Authority will replace lead service lines encountered within its water distribution systems, to support a program to meet primary goals of regulatory compliance, public health protection, and sound financial management.

DEFINITIONS

The following definitions are excerpted from the Authority's Rules & Regulations for Water Service, restated below for convenience:

> Authority's Service Line: The lateral pipe, including the tee or tap in the main, from the main to a point at or near the property line, and the curb stop and curb box.
>
> Curb Box: A structure which permits access to the curb stop.

Curb Stop: A shutoff valve placed on a service line generally at the property line.

Customer: Any person who receives service from the Authority.

Customer's Service Line: The pipe from the customer-side of the curb stop to the meter setting.

Meter: A device for measuring the quantity of water used.

Meter Setting: The location of the meter and components, including shutoff valves and any meter bypass.

Premises: The property, building or other site to which service is furnished, comprising, but not limited to the following:

- a residential building under one roof occupied by one person or family; or
- a nonresidential building or combined residential/non-residential building under one roof occupied by more than one person; or
- each combination of buildings owned by one person, or leased and occupied by one person, and served by a single service line on a single lot; or
- each side of a double house, a townhouse, a condominium unit, a mobile home site or an apartment, having an individual service line; or
- a complex of buildings, including mobile homes, which are connected to a water system not owned by the Authority, but which water system is connected to and served by the Authority System through a single connection.
- such other situations as the Authority shall deem applicable.

Property Owner: The person in whose name the property is deeded.

Service Line: The pipeline comprised of the Authority's Service Line and the Customer's Service Line.

System: The Authority's water supply, transmission and distribution facilities, in whole or in part.

Tenant: A person who leases or rents premises.

Other definitions pertaining to this Policy are listed below:

Customer Agreement: An agreement between the Authority and the Property Owner detailing the terms and conditions by which the Authority will replace a Customer Service Line.

Grant Funds: Funding provided to the Authority or directly to an Authority customer by another agency for purposes of completing a project, with no expectation of repayment from the Authority or the Authority's customer.

Lead Service Line: Any portion of a Service Line, including the Authority's Service Line or the Customer's Service Line, that meets the EPA definition of requiring replacement under a lead service line replacement program. This may include Service Lines composed of lead material or galvanized steel in certain circumstances, or other circumstances as determined by EPA. For purposes of this Policy, any such Service Line shall be referred to as a Lead Service Line ("LSL").

LSL Replacement Program: The Authority's overall effort to remove LSLs from the System, which will primarily occur in the following circumstances:

> Emergency LSL Replacement – LSLs replaced when encountered during System maintenance, including but not limited to emergency repairs and water main breaks.
>
> LSL Replacement Project – Projects planned for the sole purpose of replacing LSLs in the System.
>
> Water Main Replacement – LSLs replaced through the course of an associated water main replacement project, when Service Lines are already uncovered for purposes of connecting them to a new water main.

Full LSL Replacement: Complete removal and replacement of an LSL in a manner that meets EPA's definition of a satisfactory LSL replacement. This may include either the Authority Service Line, the Customer Service Line, or both, as determined by the pipe material.

Notice: Any form of communication attempted by the Authority to gain access to replace a Customer Service Line for purposes of the LSL Replacement Program.

Partial LSL Replacement: Replacement of only a portion of the LSL. This may occur in circumstances where the Authority has been unable to gain access to replace a portion of the LSL. Partial LSL Replacements are undesirable due to increased health risks to customers served by such Service Lines, and should be avoided when possible, in accordance with EPA regulations.

Public Funds: Funding derived from Authority revenues, including bonds or other loans secured by Authority revenues.

Risk Mitigation Measures: Steps taken by the Authority to reduce a customer's risk of lead exposure following a Full LSL Replacement or Partial LSL Replacement. Such measures are required by EPA and defined in more detail by the Pennsylvania Department of Environmental Protection.

POLICY

The Authority is committed to the removal of all known Lead Service Lines within the System. To achieve this goal, the Authority is also committed to the following:

1. Pursuit of Grant Funds to the extent possible to reduce the rate impact of the LSL Replacement Program. This may include grants to be awarded to the Authority for implementation of any portion of the LSL Replacement Program, or grants awarded to an individual customer to assist with replacement of a Customer Service Line that meets the definition of requiring replacement.

2. Use of Public Funds to implement the LSL Replacement Program, in circumstances where Grant Funds are not available.

3. Use of Public Funds to complete Full LSL Replacement, when needed to avoid Partial LSL Replacement.

4. Provision of adequate Notice to affected customers, who will be provided with the opportunity to participate in the LSL Replacement Program. Such Notice will be provided to Property Owners as well as Tenants.

5. Execution of a Customer Agreement in advance of the Authority completing replacement of a Customer Service Line as part of the LSL Replacement Program. Absence of an executed Customer Agreement may result in a Partial LSL Replacement, which the Authority will find acceptable so long as adequate Notice has been provided.

6. Implementation of Risk Mitigation Measures in circumstances as required to reduce lead exposure and associated health risks for any Authority customer.

7. Prioritization of the LSL Replacement Program activities based on public health risk, most efficient use of Grant Funds and Public Funds, and socio-economic factors.

This Policy shall be implemented in conjunction with the Authority's routine System maintenance, capital planning, project reporting, rate-setting, and capital financing practices.

AUTHORIZATION AGREEMENT FOR REPLACEMENT OF LEAD SERVICE LINE ON YOUR PROPERTY

Es necesario tomar medidas con respecto al reemplazo de la línea de servicio de agua con plomo en su propiedad. Una copia en español de este documento está disponible solo como referencia. Escanea el código QR o visita www.lehighcountyauthority.org/leadfree. Por favor, devuelva la copia en inglés del acuerdo.

Escanéame

RESPONSE REQUIRED

Lehigh County Authority (LCA) is offering certain property owners replacement of their lead service line from the water main to the curb stop and from the curb stop to the meter or to interior plumbing, at no cost to the property owner as part of the 2024 project. In accordance with U.S. Environmental Protection Agency regulations, the property owner's portion of the service line is considered to be composed of lead and requires replacement if the service line is made of lead material or is made of galvanized steel requiring replacement due to prior exposure to a lead service line from the water main to the curb stop. You are receiving this information, agreement form, and the opportunity to replace your service line at no cost because your service line has been identified as requiring replacement in accordance with the above.

Under LCA's Rules and Regulations, LCA owns and maintains residential service lines from the water main to and including the curb stop. The property owner owns and is responsible for the maintenance of that portion of the water service line running from the curb stop to the meter at the premises being served with LCA water. As part of our work on your street, LCA, subject to available funding, will be (1) replacing lead service lines for which the LCA has maintenance responsibility (from the water main to the curb stop) and (2) replacing the portion of the lead water service line owned by the property owner (from the curb stop to the water meter or to interior plumbing), when the property owner signs this Agreement. (See Exhibit A – "Service responsibilities explained")

Property owners, or the owner's legal representative, must give their authorization by signing this Agreement.

If LCA determines at any time before or after this Agreement is signed, in its sole discretion, that replacement of the portion of the lead water service line owned by the property owner at a particular property or related interior plumbing modification is not technically feasible or that safe and secure conditions are not present, or will result in excess expense, due to conditions such as length, terrain, obstructions, structures, pavement, trees, or other utilities, LCA may exclude such property from the project and not replace the remaining portion of the lead water service line. In addition, upon further inspection of the property and service line, if LCA determines the property owner's service line is not a

lead service line requiring replacement, LCA may exclude such property from the project and not replace the service line.

Following is a description of responsibilities of LCA and property owners who will participate in this program to have their service line replaced:

LCA's Responsibilities:

- As part of its project and with property owner's signed Agreement, LCA, subject to the terms and conditions set forth in this form, will (1) replace the service line from the water main to the curb stop if it is determined to require replacement, (2) replace the service line from the curb stop to the water meter (for meters inside the property) or to a point within 1-foot inside the outer foundation wall of the property (for meters outside the property), (3) backfill any excavation from the curb stop to the property, (4) make interior plumbing modifications related to service line replacement (limited to installation of a backflow preventer and thermal expansion tank); (5) restore interior property (limited to drywall and foundation repair and not including repainting and finishing); and (6) restore exterior property, as near as practical, to the condition it existed in prior to the commencement of work, all at no cost to property owner. LCA reserves the right to determine the appropriate stopping point for private service line replacement due to encountered site conditions such as those affecting the property structure or impacting other customers who have not consented to the work.
- LCA's contractor or sub-contractor will be responsible for obtaining all necessary permits.
- LCA will require by contract that the contractor and/or sub-contractor are insured.
- LCA's contractor or sub-contractor will be responsible for providing all pipe, fittings, miscellaneous material, equipment, tools, and labor to (1) replace the service line from the curb stop to the water meter or to interior plumbing, (2) backfill any excavation from the curb stop to the property, and (3) make any interior plumbing modifications related to service line replacement included in the project. All replacement and repair debris will be removed from the work area by LCA's contractor or sub-contractor upon completion of work.
- LCA's contractor or sub-contractor, before any work is done, will examine the areas of the property that will be disturbed by construction and provide a list of related work that needs to be done by the property owner prior to or after the service line replacement.
- LCA or its contractor may take interior and exterior photos before and after work begins.
- If the service line or any plumbing connected to it is damaged during the replacement of the service line and the property owner notifies LCA of the damage within eighteen (18) months of installation of the new service line, LCA's contractor will be responsible for repairing or replacing the damaged service line and any damaged plumbing connected to it. LCA will be responsible for normal maintenance of the part of the service line from the curb stop to the meter for a period of eighteen (18) months from the date of installation. LCA will not be responsible for damage to the service line caused by the property owner, any tenant, any resident, or any third party. LCA will otherwise have no maintenance responsibility or any other responsibility for (1) the part of the service line from the curb stop to the water meter or from an outside meter into the property or (2) interior plumbing modifications.

- LCA is responsible for final grading, seeding, and the restoration of exterior landscaping and hardscaping on the property that will be disturbed as part of the project. Replacement and/or restoration shall be done to restore the property to its original condition, or as near thereto as practicable.
- LCA will provide educational materials and other information and materials (including lead filters and intructions for use) to inform the property owner of the risks associated with lead in drinking water and methods to mitigate those risks for a period of time following replacement of the lead service line.

Property Owner's Responsibilities:

- Property owner recognizes that during the replacement and any maintenance of the service line there will be an interruption of water service to the property.
- Property owner or designee, at least 18 years in age, must be at the property on the dates and times scheduled for the contractor to perform the work.
- Property owner must provide reasonable, safe, secured, lighted, and unencumbered access to the water meter and to the water service piping inside the property, including maintaining the area in a reasonably sanitary and odor free condition, and including access to the wall or floor area where the water service line enters the building, and moving any items blocking access such as boxes, furniture, washers, dryers, etc. If property owner does not provide these accommodations, LCA reserves the right to not complete the lead service line replacement.
- If the meter and/or service line is located behind a finished wall, or under a finished floor such that gaining access will disrupt the room finish, the property owner is responsible for removing the obstruction and establishing the necessary access to perform the work.
- After installation of the new service line, maintenance of the service line from the curb stop to the water meter and any interior plumbing modifications remain the responsibility of the property owner (except for LCA's limited responsibility for normal maintenance of private service lines for eighteen (18) months as provided above).
- Property owner is responsible for performing the required flushing of the property's plumbing system as described in LCA's Flushing Instructions for Replacement of Service Lines (attached as Exhibit B) after completion of the work.
- Property owner agrees to take tap water samples and return them to the laboratory in accordance with the Tap Water Sample Instructions for Replacement of Service Lines (attached to this Form as Exhibit C).
- For service lines for which LCA will provide maintenance, as described herein, property owner agrees to (1) promptly notify LCA in writing of any conditions that may require maintenance of the service line, (2) promptly notify LCA in writing before any sale or transfer of the property and (3) provide to the purchaser or transferee of the property, before a sale or transfer within eighteen months of installation of the new service line, a copy of this Agreement.
- Property owner agrees that by signing this Agreement that LCA is permitted, but not obligated, to replace the service line and make any/all included interior plumbing modifications.

Property Owner's Authorization:

I hereby authorize LCA to (1) replace the service line from the water main to the curb stop, (2) replace the service line from the curb stop to the water meter (for meters inside the property) or to a point within 1-foot inside the outer foundation wall of the property (for meters outside the property), (3) make any included interior plumbing modifications and (4) provide any included maintenance of the service line in or on my property in accordance with the terms and conditions set forth in this Agreement and I agree to all of the terms and conditions of this Agreement.

I agree that by signing this Agreement that LCA is permitted, but not obligated, to replace the service line and make any included interior plumbing modifications. I agree this Agreement is the final Agreement between the parties, that it will be governed by Pennsylvania law and that it will be binding on the successors to the parties.

I certify that I am the owner, or the legal representative for the owner, of the below service address property and have the legal right and authority to execute this Agreement and to grant LCA the rights set forth in this Agreement. I hereby grant to LCA and its contractors or sub-contractors the license and the right to enter this property and perform such inspections, testing, construction and repairs as determined reasonably necessary for (1) the replacement of my service line and any related interior plumbing modifications and (2) any included maintenance of the service line. I certify that if there are any tenants or other residents of the property other than the undersigned, I will provide them advance notice of the scheduled work and provide a copy of the LCA Flushing Instructions for Replacement of Service Lines to them.

I agree that I am responsible for ensuring that the property is in safe and sanitary condition and that the necessary plumbing shall be accessible for workers to complete the replacement of the service line and any required interior plumbing modifications.

I understand that if the LCA determines that safe and sanitary conditions are not met, or that the plumbing is not accessible, replacement will not be done.

SERVICE LINE REPLACEMENT AGREEMENT - YOUR RESPONSE IS REQUIRED:

You must sign and submit this Agreement in order for Lehigh County Authority to replace your service line. You own the portion of the service line on your property, and we will not replace it without your consent.

USE THE ENCLOSED ENVELOPE TO SEND US YOUR RESPONSE AS SOON AS POSSIBLE.

Owner Information

_____

_____

Property Information

Property ID: _____

Address: _____

APPROVE LEAD LINE REPLACEMENT AGREEMENT:

I agree, on my own behalf, and on behalf of all other persons who could claim by or through me, except for the express obligations in this Agreement, to release and hold harmless LCA from any and all claims, causes of action, damages, or losses, of any nature whatsoever, that I may have with respect to the work authorized by this Agreement; it being acknowledged and agreed by me that I have accepted the offer of (1) replacement of the service line and any included interior plumbing modifications and (2) maintenance of the service line voluntarily at no cost.

_____ Date: _____

(Signature of Property Owner)

_____

(Typed or Printed Name)

Please provide the contact information where you can be reached during normal business hours:

Daytime Phone: _____

Evening Phone: _____

Email: _____

If you cannot be present during the replacement, please provide the contact information of a representative that you have authorized to provide us with access to your property: (Optional)

Representative Name: _____

Daytime Phone: _____

Email: _____

Lehigh County Authority

610-437-7515 customer service
lehighcountyauthority.org
service@lehighcountyauthority.org

EXHIBIT A: Service responsibilities explained

A common question customers have is what they are responsible for when there is an issue with the water or sewer line. This diagram explains what LCA is financially responsible for and what you, the customer, are responsible for.

1. For your water service, there is a service line that goes from the water line in the street into the house. There is valve in the curb line, called curb box, and that is where the valve is located to turn the water on or off in your house.
2. LCA's responsibility is from the water main in the street up to that curb box.
3. The customer's responsibility is from the curb box into the house.
4. The only thing inside the house that LCA is responsible for is the water meter.
5. Responsibilities related to your sewer service lateral vary based on the municipality you live in. To learn more, please contact LCA if you receive a sewer bill from us, or your municipality if you do not receive a sewer bill directly from LCA.

If you have a problem with your water or sewer line, LCA will come out and investigate the issue. If the problem is LCA's responsibility, there is no cost to the customer. If the issue is the customer's responsibility, you will incur a site visit fee, plus the actual cost of repair to fix the problem.

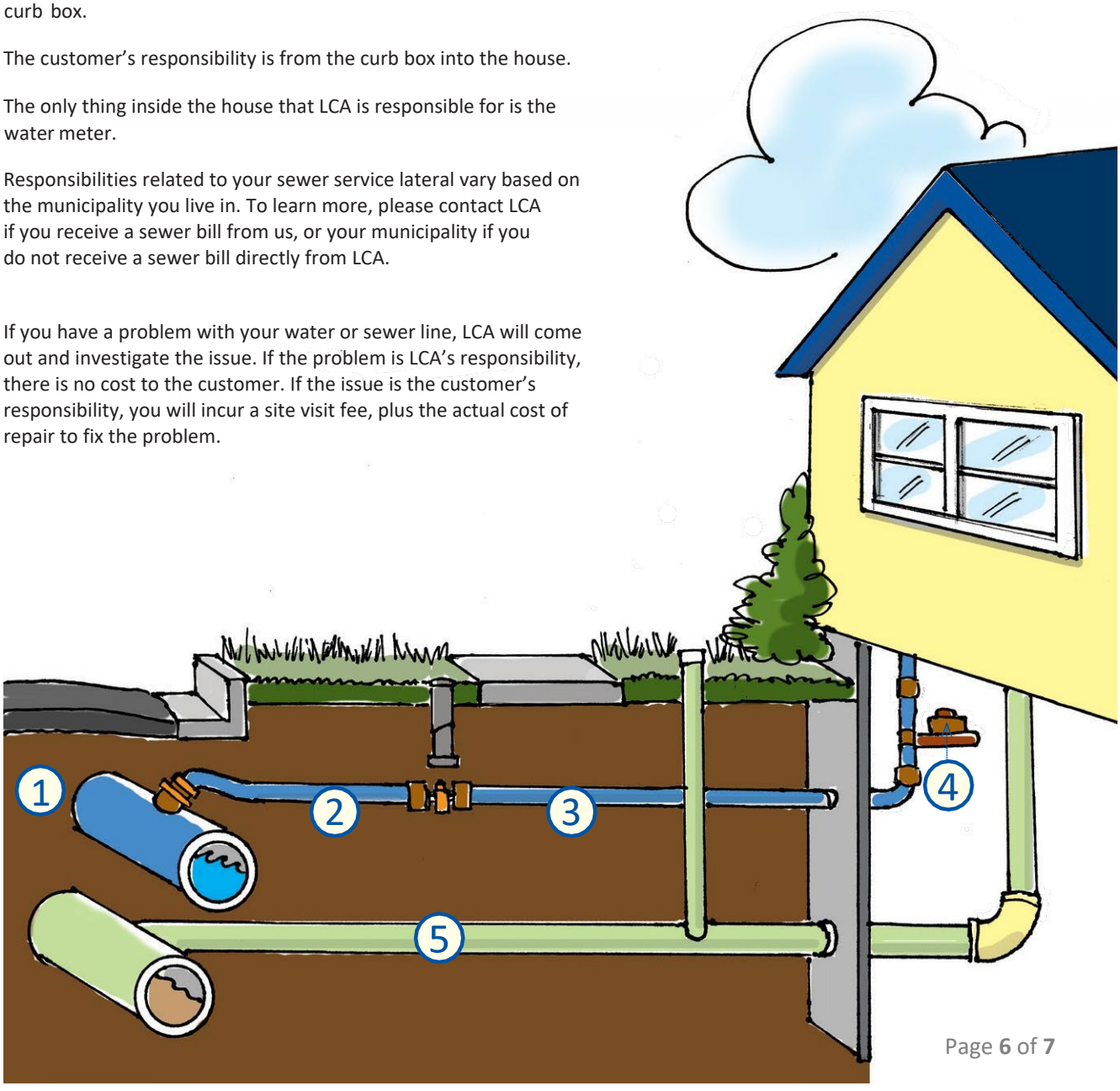

EXHIBIT B - FLUSHING INSTRUCTIONS

HAZARDS RELATED TO LEAD SERVICE LINE REPLACEMENT AND YOUR OPTIONS

Even though we are replacing the lead service line at your property, disturbance during work may temporarily increase lead levels. These flushing instructions are an additional method to minimize lead in your property's water supply. Do not consume any tap water or open hot water faucets during the following procedures.

IMMEDIATELY AFTER LCA PERFORMS REPLACEMENT WORK, FLUSH ALL FAUCETS USING THESE STEPS:

- Throw away any ice in your freezer. If you have an automatic ice maker, shut it off.
  Tip: Do not use any filtered water from your refrigerator or any other source until you complete the flushing.
- Unscrew and remove the aerators from all of your sinks and taps.
  Tip: If your aerator is difficult to remove, you may need to use a pair of pliers.
- Once your aerators are removed, separate the parts and remove any debris. Soak the parts in white vinegar and scrub them with a brush.
- Starting at the lowest level of your property and working your way up, fully turn on all the cold water taps in your sinks, tubs, and showers.
  Tip: Make sure to turn on any taps and hose spigots on the outside of your property as well.
- After you turn on the last tap, allow the water to run for at least 30 minutes.
- Starting at the highest level of your property and working your way down, shut off each of your water taps.

EXHIBIT C - WATER SAMPLE TEST INSTRUCTIONS

LCA asks the property owner to collect a water sample after the line is replaced. Follow the instructions for sampling the water and send to the lab as instructed in the water sample kit.

Post-Construction Water Sample

After replacing the lead water service line at your property, LCA requires the Owner or Occupant to sample the water in your property. In addition, LCA may ask you to resample the water if your initial sample shows lead levels above the Action Level of 15 parts per billion set by the U.S. Environmental Protection Agency and the Pennsylvania Department of Environmental Protection. This will help to inform you and LCA about the quality of drinking water in your property after lead service line replacement.

Sample Collection Instructions

Three to six months after lead service line replacement, you will be contacted regarding getting a test kit. Follow directions included with the test kit on how and when to collect samples. Instructions on how to return the samples to LCA will also be included with the test kit.

THANK YOU FOR YOUR COOPERATION IN THIS IMPORTANT EFFORT TO REMOVE LEAD PIPES!

LEHIGH COUNTY AUTHORITY – COMMUNITY LEAD RESPONSE

PROPERTY OWNER AGREEMENT

DECLINE SERVICE LINE REPLACEMENT – YOUR RESPONSE IS REQUIRED:

If you DO NOT wish for Lehigh County Authority (LCA) to replace your lead water service line, you may decline using the form below. By completing and returning this form, you acknowledge you have received information from LCA regarding the lead service line replacement project and presence of a lead service line requiring replacement located at the property listed below. LCA has also provided information regarding health risks associated with lead in drinking water and ways to mitigate those risks.

USE THE ENCLOSED ENVELOPE TO SEND US YOUR RESPONSE.

Owner Information

_____

_____

Property Information

Property ID: _____

Address: _____

DECLINE PRIVATE LEAD LINE REPLACEMENT:

If you **DO NOT** want Lehigh County Authority to replace your lead water service line, sign here and return this form. Declining the private water line replacement will not impact any LCA plans to replace the public portion of your water line.

I understand and decline the private water line replacement to my property.

_____
(Signature of Property Owner)

_____
(Typed or Printed Name)

Date: _____

Why have you decided to decline?

_____

_____

_____

Daytime Phone: _____

KEEP A COPY FOR YOUR RECORDS

MEMORANDUM

Date: March 25, 2024

To: LCA Board of Directors
Liesel Gross, CEO

From: Phil DePoe, Senior Planning Engineer

Subject: Regional Act 537 Plan Program Management, 2024 Amendment: Planning Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Project Authorization: Regional Act 537 Plan Program Management, Planning Phase	$315,400
1A	Professional Services Authorization: AECOM – Regional Act 537 Plan Program Management, 2024 Amendment	$275,400*

**Included in the Capital Project Authorization*

1. Regional Act 537 Plan Program Management

AUTHORIZATION OVERVIEW:
To begin the process of developing the long-term Regional Act 537 Plan, the evaluation of the Lehigh County Authority (LCA) Pretreatment Plant (PTP) Alternatives was identified as an immediate need to assist with completing the full alternatives analysis to be completed by March 2025. AECOM began this initial effort in late 2019 and was fully authorized in August 2020. While their authorizations in 2019 and 2020 were focused on the PTP, AECOM was designated as the Act 537 Program Manager in 2021 and have been instrumental in reviewing the work of the engineering team and providing advice to both LCA and the City of Allentown related to the entire planning process for the Kline's Island Sewer System (KISS).

In addition to the August 2020 authorization, additional Act 537 authorization requests have been granted through February 2024. An additional authorization is now requested to continue AECOM's Act 537 Plan Program Management planning efforts. This Program Management effort will cover a work scope that is starting to coalesce as the KISS region finalizes Act 537 planning.

FINANCIAL:
The LCA Suburban Division will fund Task A of these services related to the PTP alternatives evaluation. The LCA Allentown Division will fund the remaining portion of the 2024 services (Tasks B, C, EE). See attached proposal for price per task.

CURRENT STATUS:
See below for brief a review of authorizations related to AECOM's role as Act 537 Program Manager to date:

- During 2013 through 2016, LCA engaged AECOM to assist with sewer planning needs on behalf of the Western Lehigh Interceptor (WLI) group. A major technical memorandum was delivered in May 2016.
- In late 2019, AECOM was re-engaged to review the current Act 537 planning status. A memorandum was delivered in March 2020.

- In August 2020 AECOM was authorized by the Board (along with major assistance from Jacobs) to perform a detailed Pretreatment Plant (PTP) direct discharge analysis for Act 537 planning. A major technical memorandum was delivered in October 2021.
- Minor authorizations occurred from June 2021 through February 2022.
- In both February and June of 2022, AECOM was re-authorized by the Board to continue Act 537 planning efforts.
- In May 2023, another re-authorization was granted to continue these services as Act 537 Program Manager.
- Minor authorization (PTP focused) occurred in February 2024.
- In March 2024, another re-authorization is requested to continue these services as Act 537 Program Manager.

Major program management deliverables to date include the following:

- Western Lehigh Interceptor (WLI) Capacity Planning – Phase 1 Report (March 2020)
- DRBC Regulatory Assessment – LCA Direct Discharge to the Lehigh River (August 2020)
- Revenue Planning Tool Phase 1 Memo (November 2020)
- Act 537 Plan Report: Lehigh River PTP Direct Discharge Force Main (June 2021)
- BioActiflo Treatability Study (KIWWTP and PTP) (July 2021)
- Revenue Planning Tool, Phase 2, and User's Manual (July 2021)
- CEPT Bench Study at PTP (September 2021)
- Act 537 Plan – AECOM Report 2021 (October 2021)
- BioActiflo Additional Study (January 2022)
- Miscellaneous workshops (risk registry, tunneling, cost estimating, innovative PTP technology, GIS analyses of peak contribution by catchment/capita)
- KISS Relief Interceptor (KRI) Concept Design Report of Micro-tunnel Concept (2023)
- Multiple independent workshops with stakeholders to enable decision making for Final Alternative Analyses (WLI, KRI, and KIWWTP Wet Weather Approach) (2023)
- Multicriteria Decision Tool for weighting and evaluation of alternatives (2023)
- Decision Memo for KIWWTP Wet Weather Approach (December 2023)
- Decision Memo for KRI Conveyance for hybrid approach of trenchless and open cut construction methodologies (co-authored with Arcadis) (December 2023)
- KIWWTP BioActiflo Wet Weather Preliminary Design Memo and Figures (2023)
- Multiple PTP Stakeholder Workshops throughout fall and winter (2023)
- Sankey Diagrams to Illustrate Load Condition and Load Shift Scenarios (2023)
- Chemically Enhanced Primary Treatment Protocol for field trials at KIWWTP (2023)
- Fact Sheets for Multiple Arrangements of Future PTP Configurations including CAPEX/OPEX/Energy Needs (2024)
- Process modeling and cost estimates for KIWWTP improvements to accept higher loads (2024)
- KIWWTP Load Shift Technical Memo (2024)

THIS APPROVAL – PLANNING PHASE:

AECOM serves as the Program Manager for the Regional Act 537 Plan development and this authorization will continue their current role. These services include, but are not limited to, the following:

Professional Services
• Pretreatment Plant Expansion (Task A)
• Kline's Island WWTP Coordination (Task B)
• Arcadis Coordination (Task C)

- General Coordination (Task EE)

These services are segmented into the following tasks:

- Pretreatment Plant Expansion/Rehabilitation Needs (Task A)
    - Review of additional scenarios including expanding industrial waste additions for anaerobic pre-treatment
    - Review the implication of load shifting directly to KIWWTP
    - Integrate hauled waste program considerations into the alternative logic
    - Development and further refinement of construction cost estimates and develop full O&M costs
- Kline's Island WWTP Coordination (Task B)
    - Use the updated KIWWTP GPS-X process model to run analyses
    - Support LCA in in further investigations for full-scale trialing for optimizing CEPT (Chemically Enhanced Primary Treatment) dosing
    - Review of PADEP and DRBC permitting needs
    - Perform cost estimating reviews
- Arcadis Coordination (Task C)
    - Collaboration of modeling, source reduction impacts, and overall alternative evaluations for long-term needs
    - Perform cost estimating reviews
- General Coordination (Task EE)
    - On-going general program management support
    - Attendance at various meetings
    - Updating costs estimates during selection of solution phase

See proposal for detailed scope of services.

Major program management deliverables within this current authorization request include the following:

- Act 537 Revised Technical Memorandum (2024 delivery)
    - PTP Solution Decision Memo (PTP)
    - Summary of process modeling evaluations, if warranted (KIWWTP)
    - Brief Technical Memoranda of miscellaneous items (KIWWTP)
    - Pertinent Appendices for inclusion in Final Act 537
    - Risk Register for KIWWTP Wet Weather, KRI (KISS Relief Interceptor), WLI, PTP
    - Compilation of updated opinions of probable construction
    - Updating the Microsoft Project Act 537 schedule

CONSULTANT SELECTION PROCESS:

See above sections for a history of AECOM's involvement in the Act 537 process. LCA recommends AECOM be retained once again for this current phase of the Regional Act 537 Plan development.

SCHEDULE:

This authorization is a continuation of their Regional Act 537 Plan Program Management services granted by the Board in August 2020, February 2022, June 2022, and May 2023. This Act 537 planning work is mandated by PA DEP to be submitted by March 2025.

FUTURE AUTHORIZATIONS:

This is the last anticipated Program Manager authorization request before the Act 537 Plan is submitted in March 2025.

AECOM
625 West Ridge Pike, Suite E-100
Conshohocken, PA 19428
610.832.3500 tel
610.832.3501 fax

March 15, 2024

Ms. Liesel M. Gross
Chief Executive Officer
Lehigh County Authority
1053 Spruce Street
Allentown, PA 18106-0348

RE: **Lehigh County Authority Act 537 Support Proposal, 2024 Amendment**

Dear Ms. Gross,

AECOM Technical Services, Inc. (AECOM) appreciates the opportunity to provide this proposal to Lehigh County Authority (the "Authority", or "LCA") for continuing our support of the Act 537 planning effort as described herein. The prior Phase ran through December 2023 and we have been continuing our Program support of LCA under that Authorization through February based on your direction. As such, we are now requesting additional budget to continue our support as Program Manager through submission of the ACT 537 document to the Signatories in September, 2024 based on the additions in scope to the prior Professional Services Authorization titled: ***Regional Act 537 Plan Alternatives Analysis: Pretreatment Plant Upgrade Option - Planning Phase (signed August 24, 2020).***

As this work progresses and as additional information is better understood from the previously completed work under this scope, new meaningful tasks have been requested by LCA to further this effort. AECOM will continue to collaborate with the LCA and your other consultant partners and act as the overall Act 537 Program Manager to facilitate efforts, provide coordination, and provide critical technical insight for specific components to meet LCA's program goals. The following section identifies the details of the anticipated proposed scope of work for 2024 through September when the ACT 537 will be issued to Signatories for review and approval. We recognize that priorities shift as new information is made available and AECOM will continue to work closely with LCA and communicate regularly to monitor progress and make any alterations to the currently defined scope of work to focus our efforts and budget were LCA feels most necessary.

1.0 Scope of Work

The following sections outline AECOM's anticipated scope elements, assumptions, schedule, and proposed budget through September 2024 for this Project:

Task A Pretreatment Plant Expansion/Rehabilitation Needs

AECOM will continue providing support to LCA as the PTP options are further refined based on flow and load refinements, expert panel input, process considerations, industrial user input, and funding opportunities such as with RNG through the Inflation Reduction Act. The elements of this anticipated Work include a continuation of the following:

- Review of additional scenarios including expanding industrial waste additions to Boston Beer segregation for anaerobic pre-treatment.
- Review the implications of load shifting directly to KIWWTP on PTP immediate and future needs.

- Evaluate dry weather partial by-pass of flows and load shifting around PTP to reduce capital investment needs of Master Plan.
- Review process simulations for alternate effluent goals to find the most cost-effective scenario.
- Integrate hauled waste program considerations into the alternative logic.
- Coordinate with Jacobs and expert panel findings for continued concept evaluation for presentation to LCA and Industrial contributors.
- Development and further refinement of construction cost estimates and develop full O&M costs for assessment of long term comparison of alternatives and to supply Raftelis with rate modeling. Review estimates prepared by others.

Deliverables for this task will include:

1. Preparation of a Decision Memo for PTP solution.
2. Population of LCA Fact Sheets that compile capital cost info, operation cost info, basis of design information and process flow diagrams.

Task B Kline's Island WWTP Coordination

AECOM will continue providing support to LCA with discussions around Kline's Island needs associated with the base case, load diversion scenarios from PTP and wet weather needs. The elements of this anticipated Work include:

- Use the updated KIWWTP GPS-X process model to run analyses to support understanding of impacts to Kline's Island. This information will inform considerations for Chemically Enhanced Primary Treatment (CEPT), digestion and solids handling needs, and any update for the scenarios of mothballing or significantly reducing the scale of PTP and sending higher loads assuming Boston Beer Company provides pretreatment on-site. Results will inform the PTP organic load needs.
- Support LCA in further investigations of full-scale trialing for optimizing CEPT dosing, mixing and flocculation to enhance performance and cost-effectiveness.
- Review of Kline's Island permitting (PADEP and DRBC) needs associated with any proposed alternatives.
- Continued coordination with Kleinfelder and City of Allentown regarding wastewater planning implications related to dry weather flows / loads and wet weather flow scenarios.
- Perform cost estimating reviews to evaluate compatibility with other estimates developed.

Deliverables for this task will include:

1. Provide summary of process modeling evaluations.
2. Provide documentation of reviews via short Technical Memoranda.

Task C ARCADIS Coordination

AECOM will continue providing support to LCA with further review and evaluation around collection and conveyance system needs associated with the near term 2035 horizon as well as 2050 conditions. The elements of this anticipated Work include:

- Collaborate with ARCADIS on the selection of solution and overall alternative evaluations for long-term needs.
- Perform cost estimating reviews to evaluate compatibility with other estimates developed.

Deliverables for this task will include:

1. None anticipated.

Task EE General Coordination

- On-going general program management support through the end of September (7 additional months at $10,000/month)
- Attendance at monthly KISS meetings (10 in total).
- Update schedule in Microsoft Project to illustrate critical path components of submitting the Act 537 plan based on the interdependencies of tasks.
- Support final evaluation of alternatives for the wastewater improvements.
- Further develop Risk Register and conduct workshops to solicit input from stakeholders to accompany the ACT 537 submission.
- Attendance at one meeting with the City of Allentown.
- Support discussions with DRBC and PADEP regarding new Part II WQS permit and Ch 94 reporting.
- Update estimates during selection of solution phase.
- In addition, AECOM anticipates supporting and attending four outreach meetings with the WL and Allentown signatories regarding the project as part of driving the Act 537 wastewater planning effort to completion.

Deliverables for this task will include:

1. Provide pertinent appendices previously prepared for inclusion in the ACT 537 submittal.
2. Preparation of Risk Register for PTP, WLI, KIWWTP Wet Weather Solution and KRI.
3. Compilation of Updated opinions of probable construction costs for scenarios to append to the ACT 537 submission.
4. Microsoft Project Schedule detailing the overall progression of Act 537 Planning needs.

2.0 Assumptions

The proposal has been based on the following assumptions:

1. Local travel will be based on mileage from AECOM's Conshohocken Office to LCA's offices or facilities.
2. Support with Signatory outreach and approvals has not been included.
3. No further action with the Revenue Tool developed previously.
4. Budget can transfer between tasks.
5. Virtual meetings will be used in lieu of in-person meetings whenever feasible.

3.0 Schedule and Budget Estimate

AECOM is continuing services on this project and has already been in active consultation with the Authority staff through studies, meetings and conference calls in order to be responsive to LCA's questions and needs, avoid delays and enable initial planning and insight on the project objectives.

A proposed budget to complete the additional requested scope of anticipated services extending through the end of September 2024 is indicated below:

Item	Estimated Hours	ODCs	Labor Budget	Estimated Budget
Task A - Pretreatment Plant Evaluations	326	$250	$61,850	$62,100
Task B - Kline's Island WWTP Coordination	310	$250	$61,432	$61,682
Task C - ARCADIS Coordination	70	$0	$14,600	$14,600
Task EE - General Program Management Support	631	$1,700	$135,318	$137,018
Total	**1,337**	**$2,200**	**$273,200**	**$275,400**

AECOM proposes to conduct this project on a Time and Materials basis in accordance with the Master Services Agreement for Professional Services between Lehigh County Authority and AECOM Technical Services, dated April 24, 2023.

Once again, we appreciate the opportunity to provide this proposal to you and look forward to assisting the Authority with this important project. Please reply that we are authorized to proceed in accordance with this proposal for our records. If you have any questions or need additional information, please contact me at 302-379-0267 or chris.curran@aecom.com.

Sincerely,

Christopher Curran, PE
VP, Project Director

Cc: Mr. Philip DePoe, PE

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.:	SD-S-3/AD-S-27	**BUDGET FUND:**	BOTH WW Div\Wastewater\Capital
PROJECT TITLE:	Regional Act 537 Plan Program Management – Planning Phase	**PROJECT TYPE:**	
		☐	Construction
		☒	Engineering Study
THIS AUTHORIZATION:	**$315,400**	☐	Equipment Purchase
TO DATE (W/ ABOVE)	**$1,519,206**	☐	**Amendment**

DESCRIPTION AND BENEFITS:

To begin the process of developing the long-term Regional Act 537 Plan, the evaluation of the LCA Pretreatment Plant (PTP) Alternatives was identified as an immediate need to assist with completing the full alternatives analysis to be completed by March 2025. AECOM began this initial effort in late 2019 and was fully authorized in August 2020. While their authorizations in 2019 and 2020 were focused on the PTP, AECOM was designated as the Act 537 Program Manager in 2021 and have been instrumental in reviewing the work of the engineering team and providing advice to both LCA and the City related to the entire planning process. In addition to the August of 2020 authorization, additional Act 537 authorization requests have been granted through February 2024. This Program Management effort will cover a work scope that continues to evolve as the Region finalizes Act 537 planning.

Prior Authorizations: *In late 2019, AECOM was re-engaged to review the current Act 537 planning status. From August 2020 through October 2021, AECOM was authorized (along with major assistance from Jacobs) to perform a detailed Pretreatment Plant direct discharge analysis for Act 537 planning. In February 2022, June 2022, and May 2023, AECOM was re-authorized to continue Act 537 planning efforts for the entire KISS system (acting as the Program Manager).*
This Authorization: *Act 537 Program Management Support Amendment through September 2024. See attached Board Memo and proposal for further project details.*

AUTHORIZATION STATUS:

Requested This Authorization (3/25/24)	
Design Phase	
Staff	**$20,000**
Contractor	**$0**
Engineering Consultant	**$275,400**
Contingency	**$20,000**
Total This Authorization	**$315,400**

Prior Authorizations (2019-present)	$1,203,806
Subtotal (Prior + This Authorization)	**$1,519,206**
Future Authorizations (2024 and beyond)	*TBD*

REVIEW AND APPROVALS:

Project Manager	Date	Chief Executive Officer	Date
Chief Capital Works Officer	Date	Chairman	Date

Lehigh County Authority

1053 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2503 * FAX (610)398-8413 * Email: service@lehighcountyauthority.org

PROFESSIONAL SERVICES AUTHORIZATION
AMENDMENT NO. 9

Professional: AECOM
625 West Ridge Pike, Suite E-100
Conshohocken, PA 19428

Date: March 25, 2024
Requested By: Phil DePoe

Approvals
Department Head: _____
Chief Executive Officer: _____

Suburban/Allentown Division: Regional Act 537 Plan Program Management Support (2024) - Planning Phase

To begin the process of developing the long-term Regional Act 537 Plan, the evaluation of the LCA Pretreatment Plant (PTP) Alternatives was identified as an immediate need to assist with completing the full alternatives analysis to be completed by March 2025. AECOM began this initial effort in late 2019 and was fully authorized in August 2020. While their authorizations in 2019 and 2020 were focused on the PTP, AECOM was designated as the Act 537 Program Manager in 2021 and have been instrumental in reviewing the work of the engineering team and providing advice to both LCA and the City related to the entire planning process.
In addition to the August of 2020 authorization, additional Act 537 authorization requests have been granted through February 2024. This additional scope of services include, but are not limited to, the following:

Professional Services (1)
1. Pretreatment Plant Expansion (Task A)
2. Kline's Island WWTP Coordination (Task B)
3. Arcadis Coordination (Task C)
4. General Coordination (Task EE)

(1) Please reference the cover Memo for additional information.

- **Prior Program Manager Approvals:**
  (a) $39,696 in August 2019; (b) $203,500 in August 2020; (c) $37,100 in June 2021; (d) $40,000 in October 2021; (e) $100,000 in February 2022; (f) $270,000 in June 2022; (g) $13,000 in February 2023; (h) $405,510 in May 2023; (i) $40,000 in February 2024

- **This Program Manager Approval (March 2024): $275,400**

- **Approval Amount (not to be exceeded without further authorization): $1,424,206**

Time Table and Completion Deadline: As required to meet various critical deadlines as set forth in the proposal.

(For Authority Use Only)

Authorization Completion:

Approval: _____ **Actual Cost:** _____ **Date:** _____

Lehigh County Authority 1053 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2503 * FAX (610)398-8413 * Email: service@lehighcountyauthority.org

MEMORANDUM

Date: March 25, 2024

To: Lehigh County Authority Board of Directors

From: Charles Volk, P.E., Chief Capital Works Officer

Subject: Suburban Division – Sand Spring Wastewater Treatment Plant Process Intensification Upgrade Project

MOTIONS /APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Project Authorization – Construction Phase	$303,077
2	Construction Contract: DESCCO Design & Construction, Inc.	$273,077

Note: Capital Project Authorization includes all construction and engineering costs

PROJECT BACKGROUND AND OBJECTIVE

Sand Spring Wastewater Treatment Plant (WWTP) is located along Sand Spring Road in Schnecksville, North Whitehall Township. The original facility was constructed in 1972 by a developer to serve the Sand Spring Apartment Development in North Whitehall Township. LCA took over ownership and operations of the WWTP in 2005. The sewer service area includes approximately 248 apartment units, 8 commercial properties, and an elementary school. The original plant was completely replaced by LCA in 2021.

The new WWTP was designed to meet revised/updated effluent discharge limits established in the DEP and DRBC permits for construction of the new facility, including stricter limits required by the NPDES permit (final permit issued 6/14/19) following startup of the new facility for total residual chlorine, total nitrogen, ammonia-nitrogen, nitrate and zinc. The capacity of the new plant was not increased beyond the pre-existing plant capacity.

Since the WWTP was commissioned in late 2021, it has experienced NPDES permit violations and process performance issues. LCA has observed that the plant loading and flow characteristics have changed since the new plant was designed, which has been largely attributed to a nearby warehouse development that connected to the sewer system around the time of the new plant being put online.

The purpose of this project is to implement short term recommendations as outlined in a compliance study performed by Tetra Tech, Inc. (April 2023) to eliminate DEP NPDES permit violations and bring the plant into compliance.

The project scope includes the following components:

a. Addition of heavy carrier IFAS media (40 m^3, 20 m^3 per SBR),
b. Waste Activated Sludge (WAS) Pump Isolation Screens (2, one per SBR),
c. Vertical mixers with associated Variable Frequency Drive (VFD), mounting platform and access walkway (2), electrical connections
d. Diffuser supports (16, eight per SBR)
e. Chemical feed system piping will be disassembled, flushed, re-glued in the previous arrangement and tested for leaks
f. SBR influent discharge piping will be disassembled and reassembled to allow for a 90-degree gooseneck

FINANCIAL

The Project will be funded by the LCA Suburban Division.

PROJECT STATUS

The feasibility study was completed by Tetra Tech in late 2022 and the DEP Part 2 Water Quality Management Permit approval is pending. The project was advertised for bid (via PennBid) on 2/19/24, the pre-bid meeting was held on 2/28/24, and bids were opened on 3/12/24.

THIS APPROVAL: Construction Phase

BID SUMMARY

Two (2) bids were received for the General Construction Contract, summarized in Table No. 1 as follows:

Table 1 – Bid Results	
GENERAL CONSTRUCTION	
Contractor	**Total Bid**
Blooming Glen Contractors WW	**$274,565.15**
DESCCO Construction, Inc.	**$273,077.00**

The low bidder for the General Contract is DESCCO Design & Construction, Inc. (DESCCO). DESCCO is based in Fleetwood PA and has been in operation for nearly 50 years, performing primarily municipal and institutional construction, including water and wastewater treatment plant projects. We have reviewed their qualifications and experience documents; the firm has completed many similar wastewater projects and appears well qualified to perform the work. Capital Works recommends authorization to award the General Contract to DESCCO.

MATERIAL PROCUREMENT: N/A

PROFESSIONAL SERVICES

Construction Phase project engineering support was included in the previously approved design engineer's proposal for design-bid-construction phase services (Tetra Tech). The project will be managed in-house by LCA staff.

SCHEDULE

Assuming approval at the March 25, 2024, LCA Board meeting, the Notice to Proceed is anticipated to be issued by mid-April with construction completed in fall 2024.

FUTURE AUTHORIZATIONS

None anticipated.

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.: SD-S-13 **BUDGET FUND:** Suburban Div\Wastewater\Capital

PROJECT TITLE: Sand Spring Wastewater Treatment Plant Process Upgrade – Construction Phase

PROJECT TYPE:

- ☒ Construction
- ☐ Engineering Design
- ☐ Equipment Purchase
- ☐ Amendment

THIS AUTHORIZATION: **$303,077**

TO DATE (W/ ABOVE) **$555,458**

DESCRIPTION AND BENEFITS:

Sand Spring WWTP Process Intensification Upgrade - Construction Phase:

The purpose of this project is to implement short term recommendations as outlined in a compliance study performed by Tetra Tech, Inc. (April 2023) in order to eliminate NPDES discharge permit exceedances and DEP violations and bring the plant into compliance. The project scope includes the following components:

a. Addition of heavy carrier IFAS media (40 m^3, 20 m^3 per SBR),
b. Waste Activated Sludge (WAS) Pump Isolation Screens (2, one per SBR),
c. Vertical mixers with associated Variable Frequency Drive (VFD), mounting platform and access walkway (2), electrical connections
d. Diffuser supports (16, eight per SBR)
e. Chemical feed system piping will be disassembled, flushed, re-glued in the previous arrangement and tested for leaks
f. SBR influent discharge piping will be disassembled and reassembled to allow for a 90-degree gooseneck

Previous Authorizations	
Design/bid/construction phase engineering	$252,381

REQUESTED THIS AUTHORIZATION	
Construction Phase Change Order	
General Contract – DESSCO Design & Construction, Inc.	**$273,077**
Staff	**$10,000**
Contingency	**$20,000**
Total This Authorization	**$303,077**

Total Estimated Project	$555,458

REVIEW AND APPROVALS:

Project Manager	Date	Chief Executive Officer	Date
Chief Capital Works Officer	Date	Chairman	Date

Lehigh County Authority

1053 SPRUCE RD * P.O. BOX 3348 * ALLENTOWN, PA 18106-0348
610-398-2503 * Email: service@lehighcountyauthority.org
www.lehighcountyauthority.org

MEMORANDUM

Date: March 15, 2024

To: LCA Board of Directors
Liesel Gross, CEO

From: Andrew Moore, Director of Plant Operations

Re: Suburban Division - Emergency Declaration: Lynn Township Sewer Lateral Replacement

In 2019, the PA Department of Environmental Protection (DEP) approved a Corrective Action Plan (CAP) amendment to address a hydraulic overload condition at the Lynn Township Wastewater Treatment Plant (LTWWTP). The CAP committed Lehigh County Authority (LCA) to conduct a condition assessment of the entire sanitary sewer system (CCTV inspection) with identification and tabulation of pipe and manhole deficiencies, along with a construction schedule to perform those repairs in order to significantly reduce inflow and infiltration (I/I) flows. The work that has been completed to date has shown improvements in the amount of I/I, however the plant has been experiencing high influent flows over the past several months due to abnormal precipitation.

The LTWWTP influent flow, which has a design capacity of 0.08 MGD, averaged over 0.088 MGD in December 2023 and January 2024. The normal average flow of the plant is ~0.06 MGD, but with the high ground water levels and rainfall the plant was experiencing additional I/I. This was most evident on December 18, 2023 and January 9, 2024 when the plant bypassed a total of 0.35 MG and 0.70 MG, respectively.

On February 1, 2024, the Suburban Field Service team discovered two significant sewer lateral leaks on Oswald Road, located within the LTWWTP service area, which were estimated to be ~15 gallons per minute. Due to the depth of the laterals, the Field Service team was not capable of repairing the leaks. Recognizing the severity of the leaks and high influent flows, an emergency declaration was administratively approved on February 6, 2024 to repair the laterals utilizing a contractor. The repairs, which were delayed due to inclement weather, were completed

Lehigh County Authority

1053 SPRUCE RD * P.O. BOX 3348 * ALLENTOWN, PA 18106-0348
610-398-2503 * Email: service@lehighcountyauthority.org
www.lehighcountyauthority.org

on February 14, 2024, by Scheurmann Excavating, LLC. Once the repairs were completed the influent flows at LTWWTP were reduced by approximately ten percent.

The total cost for the emergency work was $56,662.50. The LCA Board of Directors is asked to approve this declaration retroactively to February 7, 2024, to cover the expenses already incurred and waive standard purchasing guidelines as a result of acting as expeditiously as possible to address the emergency.

Application #: 1
Period Ending: February 23, 2024
Payment Due: March 23, 2024
Invoice #: 36492
Project #: 999

SCHEUERMANN Excavating, inc.

5285 W. Coplay Road • Whitehall, PA 18052
Phone: (610) 262-5000 • Fax: (610) 262-5600

BILLING DETAIL

PROJECT: OSWALD RD SANITARY REPLACEMENT
BILLING DATE: 2/23/2024

OWNER: LEHIGH COUNTY AUTHORITY
DRAWING DATE: NONE

LOCATION: NEW TRIPOLI, PA
ARCH./ENGR.: NONE

	Description	Quantity		Total Unit		Unit Totals	Sub Totals	% Completed	Billing to Date	Internal Use
1	Preliminary									
	Mobilization	1	LS	$ 2,500.00	LS	$ 2,500.00		100%	$ 2,500.00	
	Sub Total						$ 2,500.00			
2	Site Clearing									
	Remove existing pipe	130	LF	$ 7.50	LF	$ 975.00		100%	$ 975.00	
	Remove paving	110	SY	$ 20.00	SY	$ 2,200.00		100%	$ 2,200.00	
	Sawcut	275	LF	$ 7.50	LF	$ 2,062.50		100%	$ 2,062.50	
	Sub total						$ 5,237.50			
3	Sanitary Sewer									
	Connect to existing	2	EA	$ 750.00	EA	$ 1,500.00		100%	$ 1,500.00	
	8" SDR26 PVC	140	LF	$ 135.00	LF	$ 18,900.00		100%	$ 18,900.00	
	Stone backfill (export spoils)	215	CY	$ 75.00	CY	$ 16,125.00		100%	$ 16,125.00	
	Patch pave	120	SY	$ 85.00	LS	$ 10,200.00		100%	$ 10,200.00	
	Traffic control									
	Sub Total						$ 46,725.00			
4	Miscellaneous									
	Repair flow channel	1	LS	$ 950.00	LS	$ 950.00		100%	$ 950.00	
	Dewatering	1	LS	$ 1,250.00	LS	$ 1,250.00		100%	$ 1,250.00	
	Line striping									
	Sub Total						$ 2,200.00			
	TOTAL						$ 56,662.50		$ 56,662.50	

	Description	Quantity		Total Unit		Unit Totals	Sub Totals	% Completed	Billing to Date	Internal Use
	NOTE:									
	All material pricing is based on									
	February 2024 costs and are good for									
	thirty days only from time of bid -									
	A material price adjustment may be									
	necessary at time of installation									
	Asphalt material pricing is based on									
	an asphalt material index of 572.00									
	A material price adjustment will be									
	necessary at time of installation									

Lehigh County Authority
System Operations Review - February 2024
Presented: March 25, 2024

		Feb-24	2024 Totals	2023 Totals	2022 Totals
Recordable Safety Incidents*	Total LCA	0	0	33	7
Non-Recordable Safety Incidents	Total LCA	4	6	[redacted]	[redacted]
Incident Types **	Injuries	1	1	[redacted]	[redacted]
	Property Damage	4	6	[redacted]	[redacted]
	Near Miss	0	0	[redacted]	[redacted]

* Recordable Safety Incidents are those that result in death, days away from work, restricted duty, medical treatment beyond first aid.

** Safety incidents may be categorized in more than one incident type.

Year To Date Safety Incidents	Root Cause Analysis Completed	Corrective Actions Indentified	Corrective Actions Completed
[redacted]	4	3	3

Current Month Incidents

Description	Date	Type	Root Cause(s)	Corrective Action(s)
Incident # 68 - Breaking up concrete with backhoe caused window to break in backhoe	2/7/2024	Vehicle Incident	N/A	N/A
Incident # 67 - Glass cracked	2/7/2024	Vehicle Incident	N/A	N/A
Incident # 69 - Branch fell from tree, broken rear view miror	2/14/2024	Vehicle Incident	N/A	N/A
Incident # 70 - While loading stone into 7098 the bucket hit the tarp arm causing it to break.	2/14/2024	Vehicle Incident	Poor upper visibility with bucket extended	Make sure there is a spotter to assist
Incident # 71 - Grate from pit at WWTP struck leg	2/26/2024	Injury	Improper lifting technique	Training

Lehigh County Authority

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Critical Activities	System	Description	Feb-24	2024 Totals	2023 Totals	Permit
			Daily Avg (MGD)	Daily Avg (MGD)	Daily Avg (MGD)	Daily Max (MGD)
Water Production	Allentown	Total	21.34	21.21	22.52	39.0
		Schantz Spring	6.51	6.49	6.93	9.0
		Crystal Spring	3.81	3.84	3.89	4.0
		Little Lehigh Creek	9.94	10.31	11.66	30.0
		Lehigh River	1.08	0.56	0.04	28.0
	Central Lehigh	Total	10.31	10.31	11.27	19.04 MGD Avg
		Feed from Allentown	5.96	5.92	7.28	7.0 MGD Avg 10.5 MGD Max
		Well Production (CLD)	4.36	4.39	3.98	8.54 MGD Avg
		Sum of all (12) other Suburban Water Systems	0.14	0.14	0.13	1.71 Sum of all wells
Wastewater Treatment		Kline's Island	35.14	37.96	32.24	40.0
		Pretreatment Plant	4.87	5.07	4.78	5.75 (design capacity)
		Sum of all (5) other Suburban WW Systems	0.19	0.24	0.19	0.36

		Feb-24	2024 Totals	2023 Totals	2022 Totals
Precipitation Totals (inches)		2.33	8.65	46.38	46.47
Compliance Reports Submitted to Allentown		20	48	280	277
Notices of Violation (NOVs)	(Allentown + Suburban)	0	1	3	4
Sanitary Sewer Overflows (SSOs)/Bypasses	(Allentown + Suburban)	1	10	24	18
Main Breaks Repaired	Allentown	4	12	8	34
	Suburban	1	3	12	15
Customer Service Phone Inquiries	(Allentown + Suburban)	1556	2798	11,221	10,539
Water Shutoffs for Non-Payment	(Allentown + Suburban)	162	326	1,995	1,975
Injury Accidents	(Allentown + Suburban)	1	1	19	7
Emergency Declarations	Allentown	0	0	2	(3) @ $386,225.43
	Suburban	1	1	0	(4) @ $933,077.1

Significant Repairs/Upgrades:

N/A

Description of Non-Compliance Events:

The Lehigh Valley recorded ~2.33" of rain in February. Due to the significant amount of rainfall and the effects of inflow & infiltration, the Heidelberg Heights WWTP initiated a bypass on February 28, 2024.
A Boil Water Advisory (BWA) was issued for a section of the North Whitehall Division on February 15, 2024. A contractor caused a main break while performing a main lay project, which caused loss of system pressure. The BWA was lifted after two consecutive days of coliform sampling.

Other:

An emergency declaration was administratively approved on February 7, 2024 to repair two leaking sewer laterals within the Lynn Township WWTP service area. The board will be asked to retroactively approve the emergency declaration on March 25, 2024 for the amount of $56,662.50.

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Critical Activities	System	Description	Feb-24	2024 Totals	2023 Totals
Wastewater Compliance	Allentown	Bypass	0	1	4
		Bypass Volume	0	1,585,280	1,589,466
		Permit Exceedances	0	0	0
		Sanitary Sewer Overflows	0	2	6
		COA Issued NOVs	0	0	1
		Regulatory Agency issued NOVs	0	0	0
	Arcadia	Bypass	0	0	0
		Bypass Volume	0	0	0
		Permit Exceedances	0	0	3
		Sanitary Sewer Overflows	0	0	0
		NOVs	0	1	0
	Heidelberg Heights	Bypass	1	3	8
		Bypass Volume	539,795	1,583,595	1,872,796
		Permit Exceedances	1	4	14
		Sanitary Sewer Overflows	0	0	0
		NOVs	0	0	0
	Lynn	Bypass	0	1	1
		Bypass Volume	0	695,000	350,000
		Permit Exceedances	0	2	1
		Sanitary Sewer Overflows	0	0	0
		NOVs	0	0	0
	Sand Spring	Bypass	0	0	0
		Bypass Volume	0	0	0
		Permit Exceedances	3	6	39
		Sanitary Sewer Overflows	0	0	1
		NOVs	0	0	0
	Wynnewood	Bypass	0	0	0
		Bypass Volume	0	0	0
		Permit Exceedances	3	3	5
		Sanitary Sewer Overflows	0	3	3
		NOVs	0	0	0
Water Compliance	Allentown	Boil Water Advisories	0	0	2
	Central Lehigh	Boil Water Advisories	0	0	1
	Suburban Water Systems	Boil Water Advisories	1	1	3