



LEHIGH COUNTY AUTHORITY

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

Agendas & Minutes Posted:
www.lehighcountyauthority.org

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BOARD MEETING AGENDA – January 10, 2022 – 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

- *December 13, 2021 Board meeting minutes*

4. Public Comments

5. Action / Discussion Items:

FINANCE AND ADMINISTRATION

WATER

- *Allentown Division – Water Filtration Plant & System Master Plan (Approval) (yellow) (digital Board packet, page 9-17)*

WASTEWATER

6. Monthly Project Updates / Information Items (1st Board meeting per month) – **January report attached** (digital Board packet, pages 18-30)

7. Monthly Financial Review (2nd Board meeting per month)

8. Monthly System Operations Overview (2nd Board meeting per month)

9. Staff Comments

10. Solicitor's Comments

11. Public Comments / Other Comments

12. Executive Sessions

13. Adjournment

UPCOMING BOARD MEETINGS		
January 24, 2022	February 14, 2022	February 28, 2022

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

December 13, 2021

The Regular Meeting of the Lehigh County Authority Board of Directors was called to order at 12:00 p.m. on Monday, December 13, 2021, 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. Chairman Brian Nagle, Scott Bieber, Richard Bohner, Norma Cusick, Ted Lyons, Linda Rosenfeld, and Amir Famili were present for the duration of the meeting. Jeff Morgan was present at the beginning of the meeting but left the meeting early. Kevin Baker arrived after the meeting began and was present for the duration of the meeting.

Solicitor Michael Gaul of KingSpry was present along with Authority Staff, Liesel Gross, Ed Klein, John Parsons, Chris Moughan, Chuck Volk, Susan Sampson, Andrew Moore, Phil DePoe, Lisa Miller, Todd Marion, and Kathy Martin.

Chairman Nagle announced that the Board received their electronic and hard copies of the Board packet in advance and 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 to the agenda and no Executive Session is planned.

Liesel Gross also announced that Andrew Moore has accepted the position of the Authority's Director of Plant Operations. Mr. Moore will be working with John Parsons on succession planning in advance of Mr. Parsons' retirement next year.

APPROVAL OF MINUTES

November 8, 2021 Meeting Minutes

On a motion by Richard Bohner, seconded by Linda Rosenfeld, the Board approved the minutes of the November 8, 2021 Board meeting as written (7-0). Scott Bieber and Kevin Baker abstained.

November 10, 2021 Special Meeting Minutes

On a motion by Richard Bohner, seconded by Amir Famili, the Board approved the minutes of the November 10, 2021 Board meeting as written (8-0). Scott Bieber abstained.

PUBLIC COMMENTS

None.

ACTION AND DISCUSSION ITEMS

2022 Board Meeting Schedule (Approval)

Liesel Gross recommended one change to the 2022 meeting dates as submitted for Board approval. The September 26, 2022 meeting falls on Rosh Hashanah, and Ms. Gross recommended the meeting be moved to September 19, 2022.

On a motion by Ted Lyons, seconded by Scott Bieber, the Board approved the 2022 Board meeting schedule as revised (9-0).

Resolution No. 12-2021-1 – Customer Facility Fees; Connection Fees; and Suburban Wastewater Tapping Fees (Approval)

Liesel Gross explained that the tapping fees are required to be adopted by Board Resolution and the tapping fee legislation sets the parameters as to how those fees are calculated. The fees described in detail in Attachment A to the Resolution are the connection fees, which recapture the actual costs that the Authority bears to install meters or service lines for new customers. Attachment B to the Resolution shows the detailed calculations of the Suburban Division wastewater tapping fees, which were developed by the Authority's rate consultant, Keystone Alliance Consulting, Inc. Ed Klein added that the same methodology was used as in past calculations and capital costs were updated through 2020.

On a motion by Richard Bohner, seconded by Linda Rosenfeld, the Board approved Resolution No. 12-2021-1 (9-0).

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

Brian Nagle – yes
Scott Bieber – yes
Richard Bohner – yes
Norma Cusick – yes
Ted Lyons – yes
Kevin Baker – yes
Linda Rosenfeld – yes
Jeff Morgan – yes
Amir Famili – yes

Lehigh County Authority Strategic Plan (Approval)

Liesel Gross gave a presentation of the Strategic Plan and an overview of the history and evolution of the Authority, its goals, and work that shaped the plan. The key components of the plan are the Mission, Vision, Values, the Priorities, Strategies and Planned work, and the Measures.

The Mission statement provides a clear message about the organization's purpose. The Authority's new Mission statement is "to protect public health and the environment by providing high quality, safe, and reliable water and wastewater services." The Vision statement is designed to provide inspiration and clarity on the organization's future. The Authority's new Vision statement is "to be a trusted and engaged community partner, advancing the vitality of our region through exceptional water and wastewater services."

Ms. Gross explained that the Values are more conceptual and describe the beliefs and behaviors that drive the Authority's actions and decisions. Chuck Volk and John Parsons gave an overview of the Values which include Service, Engagement, Dedication, Positivity, and Excellences. These Values embody the Authority's beliefs, and qualities which drive the staff's day-to-day activities.

The six priorities represent the most important issues that must be addressed to achieve the Authority's desired future. They are: Regional Collaboration and Leadership, Operational Excellence, Customer Engagement and Support, System Capacity and Reliability, Financial Stewardship, and Employee Engagement and Safety.

Liesel Gross presented the priority area related to Regional Collaboration and Leadership. She explained this priority area highlights the vital role that the Authority plays in the community and outlines the Authority's goals to support the region's needs. Some of the strategies in this area will focus on building relationships with the community and the municipalities served, being more responsive to community needs, sharing the Authority's story, and joining the region's crucial conversations on environmental sustainability and water affordability.

Andrew Moore reviewed the Operational Excellence priority, which focuses on proactively ensuring safe and reliable service delivery, regulatory compliance, and resilient operations through streamlined processes, best practices, and data-driven decision-making. The strategies to achieve this include process improvement, regulatory compliance, leveraging technology and data, and improving the Authority's response when things go wrong. Key initiatives include small systems compliance review and planning, evaluate and update operating procedures, transition all maintenance items into digital systems, Suburban Division technology upgrades, and large diameter valve maintenance program.

Chris Moughan and Susan Sampson reviewed the Customer Engagement and Support priority area, which will create an exceptional customer experience and build trust and understanding of the Authority's essential services. Some of the key strategies include process improvements, responsiveness to become faster and more accurate in addressing customer inquiries, and building awareness so customers can understand the Authority's goals. The Authority will focus on defining the metrics for customer service excellence, technology enhancements and team training, improving customer self-service tools, and creating a sewer system customer education program.

Phil DePoe reviewed the System Reliability and Capacity priority area, which will focus on meeting the region's future and current service needs with thoughtful planning. Some key strategies include developing regional wastewater capacity plans, assessing water capacity to enhance the Authority's supplies and systems to address future customer demands, and managing assets using a comprehensive approach to lower overall costs to customers. The key initiatives for next year will be to meet the deadlines for the Act 537 plan and Suburban Division water supply study, standardize the Authority's master planning approach, and address asset management staffing needs.

Ed Klein reviewed the Financial Stewardship priority area. The Authority's goals focus on cost-effectively serving the community by managing funds effectively and supporting debt commitments, operational needs, and asset management. Key strategies include carefully managing rising costs, improving internal financial processes, finding balance between revenue needs and customer affordability, and considering growth opportunities in a standard and thoughtful way. Key initiatives in the next year will include evaluating the long-term viability of financial system (MUNIS), enhancing financial management tools, increasing focus on the Authority's collections program, and pursuing alternative funding sources for capital projects.

Kathy Martin and Ed Klein reviewed the Employee Engagement and Safety priority area. The Authority's goal is to build a safe, cohesive, and engaging workplace where employees feel personally connected to their work, each other, and the Authority's commitment to excellence. The key safety initiatives include improving accident and root cause analyses processes, increasing safety communications, developing a safety training program for existing and new employees, and

establishing more robust safety metrics. Next year, employee engagement initiatives will focus on standardizing the onboarding process for new hires and new supervisors, developing a mentoring program, and developing internal training tools on critical topics.

Kevin Baker commented on the Customer Engagement and Support priority area, highlighting some ideas and tools that could be used with new technology to improve call handling or self-service tools for customers to use. Ms. Gross explained these are part of the more detailed plans the staff will be pursuing. Mr. Baker also suggested the staff compensation and performance metrics should be incorporated into the plan.

Ted Lyons commented on the financial processes and challenges the staff seems to face with the software tool currently being used. This appears to be a major barrier to progress for the Authority. Ed Klein and Liesel Gross agreed and stated this will be a key initiative to be addressed within the strategic plan.

Scott Bieber asked if the Authority's challenges in handling the customer call volume is associated with not having enough staffing. Liesel Gross stated the call volume on most days is manageable with current staff. However, on certain days such as during a water termination proceeding, high call volumes put pressure on the staff. Adding some self-service features will help the Authority staff manage calls more effectively on peak days. Mr. Bieber asked about the Authority's plans for participation in the legislative or regulatory review process. Ms. Gross explained that the staff is actively engaged in this work already, but more could be done, as described in the strategic plan.

Chairman Nagle said he is proud of this strategic plan and would like to see the document be shared with key stakeholders so they can see the value in their participation in the process. It conveys a message of planning and further commitment to the community.

Jeff Morgan departed the Board meeting during the discussion on the Strategic Plan.

On a motion by Linda Rosenfeld, seconded by Ted Lyons, the Board approved the Strategic Plan (8-0).

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

Brian Nagle – yes
Scott Bieber – yes
Richard Bohner – yes
Norma Cusick – yes
Ted Lyons – yes
Kevin Baker – yes
Linda Rosenfeld – yes
Amir Famili – yes

Liesel Gross thanked the Board for their active participation in the planning process and mentioned that Brian Chamberlain and Jennie McKenna from the City of Allentown Office of Compliance, who were in attendance at the Board meeting, also participated in the process.

Suburban Division – Industrial Pretreatment Plant Master Plan (Approval)

Phil DePoe gave an overview of the project that is part of the ongoing Act 537 planning process. The master plan for the Pretreatment Plant will be a roadmap for the implementation of short- and long-

term improvements to the plant and identify the renewals, replacements, and capital improvements necessary to keep the plant fully operational and in compliance for the next 30 years. The plan will also identify improvements to accommodate growth of Boston Beer for loads greater than the current allocation as well as projected growth in non-Boston Beer flows and loads in Upper Macungie Township. Projections for Boston Beer change depending on the market and numerous other factors. They also have a separate contract that details how they pay for pretreatment service. The difficult part is to determine the costs and run up time so the Authority can plan and be reactive to their needs. There was some discussion regarding the flows and loads of Boston Beer.

Jacobs is serving as the Technical Lead for the regional Act 537 plan Pretreatment Plant upgrade option. Because Jacobs is the current plant operator and have developed proprietary modeling software of the facility, their involvement is critical to the planning process. The services they would provide for the Master Plan includes flow and load projection refinement, regulatory review, Pretreatment Plant capacity evaluation, improvement recommendations and cost estimates, renewal and replacement needs and cost estimates, combined heat and power evaluation, and presentation of the Master Plan.

Scott Bieber asked if Jacobs will look into what the potential future regulations may be that would have potential impact on the plant. Mr. DePoe said that the direct discharge report looked at this in great detail. Amir Famili asked if bottlenecks have been identified within the plant to improve capacity. Chuck Volk said there is an identified bottleneck in the solids processing side of the plan, but the cryogenic system has become the most critical process for the longevity of the plant. Some discussion followed regarding plant processes including the use of oxygen, the on-site oxygen generation system, and the capacity of the clarifiers.

Amir Famili asked if Jacobs, as part of their operating agreement, are already providing a master plan. Mr. DePoe said a condition assessment must be completed every five years. Ms. Gross said that Jacobs has not been looking at long-term capital needs for the facility because their contract is a 10-year term and they look at what is within that term. Amir Famili asked if the Authority has the internal capability to complete portions of the work to evaluate capital replacement needs. Chuck Volk explained Jacobs is responsible for the assets and has more information and capacity to do this work than the Authority staff currently has.

Mr. DePoe added that the schedule is to complete the plan this summer and Jacobs will give a presentation to the Board upon completion.

On a motion by Scott Bieber, seconded by Ted Lyons, the Board approved the Capital Plan Authorization for the Suburban Division Industrial Pretreatment Plant Master Plan in the amount of \$191,700.00 which includes the Professional Services Authorization to Jacobs in the amount of \$166,700.00 (8-0).

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

Brian Nagle – yes
Scott Bieber – yes
Richard Bohner – yes
Norma Cusick – yes
Ted Lyons – yes
Kevin Baker – yes
Linda Rosenfeld – yes
Amir Famili – yes

MONTHLY PROJECT UPDATES / INFORMATION ITEMS

Liesel Gross reviewed the monthly project report for December and noted that there is no second meeting in December. As a result, any items not covered today are either for information or will be discussed in January. The 2020 Audit will remain on the report until the audit is completed, which will occur upon receipt of the Pennsylvania Municipal Retirement System's audit.

Amir Famili asked about the sodium hypochlorite project and the status of the Computational Fluid Dynamics modeling. Chuck Volk said that the modeling is substantially complete and a meeting is scheduled this week to review the results of that modeling. The gaseous chlorine will be used at the wastewater treatment plant until the project is complete.

STAFF COMMENTS

Liesel Gross wished the Board members and guests a wonderful holiday season and a happy New Year.

SOLICITOR'S COMMENTS

None.

PUBLIC COMMENTS / OTHER COMMENTS

None.

EXECUTIVE SESSION

None.

ADJOURNMENT

There being no further business, the Chairman adjourned the meeting at 2:10 p.m.

Richard Bohner
Secretary

MEMORANDUM

Date: January 13, 2022

To: LCA Board of Directors
Liesel Gross, CEO

From: Phil DePoe, Senior Planning Engineer

Subject: Allentown Division: Water Filtration Plant (WFP) Master Plan – Planning Phase

MOTIONS / APPROVALS REQUESTED:

No.	Item	Amount
1	Capital Plan Authorization: Arcadis – WFP Master Plan	\$110,000
1A	Professional Services Authorization: Arcadis – WFP Master Plan	\$85,000*

**Included in the Capital Project Authorization*

1. Allentown Division: Allentown WFP Master Plan

AUTHORIZATION OVERVIEW:

Lehigh County Authority (LCA) is responsible for performing capital improvement planning in accordance with the Allentown Concession and Lease Agreement. The Operating Standards require the capital improvement planning to include a comprehensive facility inspection, system performance evaluation, and development/update of a long-term improvement plan including project cost estimates.

Arcadis most recently completed this work for LCA with the final report being delivered in July 2017.

See attached proposal for further details.

FINANCIAL:

The LCA Allentown Division will fund these 2022 services.

CURRENT STATUS:

Deliverables from the 2017 Master Plan are routinely used by multiple departments across LCA (Operations, Planning, Capital Works, and Finance) when creating the five-year capital plan and annual capital budgets, developing project details prior to design authorization, and developing long-range financial forecasts. The Lease Agreement requires this Master Plan be updated every five years (next one is due by December 31, 2022).

THIS APPROVAL:

Upon successful completion of the 2017 Master Plan for this facility, Arcadis is now again recommended for this latest approval. These Master Plan services in 2022 include, but are not limited to, the following tasks:

Professional Services:
• Condition Assessment and Recommendations
• Process Evaluation Update
• Updated Prioritized Capital Plan

- | |
|--|
| <ul style="list-style-type: none">• Presentation to Board/Upper Management |
|--|

CONSULTANT SELECTION PROCESS:

The proposed consulting engineer completed the Master Plan for this facility in 2017. In addition, the firm has intimate knowledge of the facility via their completion of an annual Bond Indenture Report. To deliver this Master Plan update in the most cost efficient and timely manner, Arcadis is recommended for this approval.

SCHEDULE:

The final report will be delivered in the third quarter 2022, followed by a presentation to LCA Upper Management and the LCA Board of Directors.

FUTURE AUTHORIZATIONS:

An update to this Master Plan will occur in 2027.

Arcadis U.S., Inc.
1600 Market St., Suite 1810
Philadelphia
Pennsylvania 19103
Tel 215.931.4372
www.arcadis-us.com

Mr. Philip DePoe
Capital Works Program Manager
Lehigh County Authority
1053 Spruce Road
Allentown, PA 18106-0348

Subject:
Allentown Water System Master Plan Update Scope and Budget

Dear Mr. DePoe:

Date:
December 27, 2021

The Lehigh County Authority (LCA) is responsible for performing capital improvement planning in accordance with the Allentown Concession and Lease Agreement. The Operating Standards require the capital improvement planning to include a comprehensive facility inspection, system performance evaluation, and development/update of a long-term improvement plan including project cost estimates.

Contact:
Anthony J. Dill

Phone:
215.931.4372

Arcadis most recently completed this work for LCA with the final report being delivered in July 2017. Leveraging our previous Master Plan work, consulting engineer annual report and knowledge of the water industry we are prepared to again support LCA with meeting your needs in a cost-effective, efficient and insightful manner.

Email:
Anthony.Dill@arcadis.com

Our ref:
10471836

PROPOSED SCOPE OF SERVICES

Task 1 – Condition Assessment

A comprehensive condition assessment was conducted during the development of the 2016 Master Plan. This included discipline-specific inspections of all major equipment, assignment of a baseline performance and physical condition, estimate of remaining useful life, criticality and risk of failure was assigned to each asset. This database of information was provided to the Authority as part of the project conclusion.

This proposal and its contents shall not be duplicated, used or disclosed — in whole or in part — for any purpose other than to evaluate the proposal. This proposal is not intended to be binding or form the terms of a contract. The scope and price of this proposal will be superseded by the contract. If this proposal is accepted and a contract is awarded to Arcadis as a result of — or in connection with — the submission of this proposal, Arcadis and/or the client shall have the right to make appropriate revisions of its terms, including scope and price, for purposes of the contract. Further, client shall have the right to duplicate, use or disclose the data contained in this proposal only to the extent provided in the resulting contract.

The majority of the assets were categorized as being in fair, good or very good condition and a summary of recommended improvements for each facility/process was provided for 0-10 years, 10-25 years and 25-50 years.

Conduct Additional On-Site Inspections - Arcadis will review these recommendations with LCA staff via a PowerPoint presentation to understand major projects which have been completed or if there have been significant changes in operational performance or physical condition of any major equipment. Arcadis will also spend up to 3 days visiting each major facility/process with an LCA staff member to re-review the previous recommendations and collect additional photo documentation of current conditions and any major deficiencies which need to be addressed. The condition assessment reviews will be conducted by a water engineer familiar with water treatment systems and mechanical equipment. If required, a follow-up electrical-specific inspection can be conducted.

Develop an Updated List of Recommendations - This information will then be summarized for LCA in a PowerPoint presentation along with a Technical Memorandum which will include an update of the previous Summary of Recommendations, Table 2-11 of the Condition Assessment Report.

Task 2 – Process Evaluation Update

A comprehensive operational and water quality evaluation was conducted during the development of the 2016 Master Plan. Arcadis will use the findings of this previous work as a starting point for the operational and water quality evaluation that will be conducted as part of this Master Plan Update. We will review the previous findings with LCA operations staff to determine whether there have been significant operational and/or water quality changes since 2016. We will also conduct a targeted review of operational and water quality data from 2016-2021, with a focus on the areas where changes may have occurred (as identified by the LCA operations staff).

Conduct Additional Evaluations - Following discussions of the previous operational and water quality findings and a historical data review, Arcadis may identify additional operational and/or water quality evaluations that could benefit LCA and aid in completing the Master Plan Update. It is expected that a desktop clarification/filtration assessment would likely be useful. Floc carryover from the clarifiers and elevated rates of head loss buildup in the filters were previously identified as key performance limitations at the water treatment plant. Evaluating the current performance of the clarifiers and filters will help to better define the objectives

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for the upcoming filter rehabilitation project and determine whether additional upstream improvements (e.g., modifications to the clarifiers) are worth pursuing.

Arcadis will also consider the need for in-depth evaluations of the compliance strategies that LCA has adopted for various regulated contaminants, including disinfection byproducts and *Cryptosporidium*. The need for these evaluations will depend on the historical data and compliance history for these contaminants.

Develop an Updated List of Recommendations - Arcadis will summarize the findings of the operational and/or water quality evaluations that occur as part of the Master Plan Update and prepare recommendations for addressing any deficiencies that are discovered. Where appropriate, the recommendations will include both operational and capital improvement options. The findings of the evaluations and the associated recommendations will be shared with LCA in a workshop, after which the findings and recommendations will be revised (as needed) in accordance with the feedback provided by LCA. The final versions of the findings summary and the recommendations will be included in the Updated Master Plan. The Plan will also include the recommendations from the 2016 Master Plan that continue to be relevant.

Task 3 – Capital Plan

Using the previously developed Capital Improvement Plan (CIP) and the output of Tasks 1 and 2 an updated prioritized capital improvement plan for the Allentown water system will be prepared. Preparation of the CIP will be a collaborative process between Arcadis and LCA and will include the following activities:

- **Identification of alternatives** to address the noted facilities and process needs and deficiencies, including preparation of cost estimates and life-cycle cost analysis for each alternative.
- **Preparation of a CIP spreadsheet** that can be used to summarize needed improvements and the rationale for prioritization (e.g., reliability, compliance, obsolescence, regulatory compliance, etc.).
- **A Prioritization Workshop** during which Arcadis and LCA will define the criteria by which alternatives will be prioritized, and during which non-economic factors, such as reliability, compliance, safety, etc. will be evaluated to see how each criterion impacts prioritization.

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- **CIP Project Proposals** for each project recommended in the first 10-year planning period.
- **Final Capital Improvement Plans** for three planning periods: years 0-10, 10-25 and 25-50.

The Capital Improvement Plan will be similar in nature to what was previously provided in August 2017, inclusive of updated Exhibits D, E and F. Exhibits A, B and C will be brief Technical Memorandums, PowerPoint presentations and/or figures as described herein.

Task 4 – Presentation to LCA Board/Upper Management

Arcadis will present the key findings and recommendation of the master plan to the LCA Board and Upper Management. It is assumed that two Arcadis staff will present the results at an in-person meeting.

SCHEDULE

We anticipate completion of this work within six to nine months of authorization.

BUDGET

We propose to complete Tasks 1 through 4 for a lump sum \$85,000.

Task #	Description	Hours	Budget
1	Condition Assessment	140	\$25,000
2	Process Evaluation	150	\$30,000
3	Capital Plan	145	\$25,000
4	Presentation to Board/Upper Management	25	\$5,000
Total for all Tasks		460	\$85,000

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Mr. Philip DePoe
December 27, 2021

Please contact me with your authorization to proceed if this scope and budget are acceptable to you. If you have any questions please do not hesitate to call me at 215-931-4372 or 610-761-3253 (mobile).

Sincerely,

Arcadis U.S., Inc.

A handwritten signature in blue ink that reads "Tony Dill". The signature is fluid and cursive, with the first name "Tony" and last name "Dill" clearly distinguishable.

Tony Dill, PE, BCEE
Program Manager

Cc: Jim Shelton & Mark Lenz, Arcadis

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CAPITAL PROJECT AUTHORIZATION

PROJECT NO.:	AD-W-9	BUDGET FUND:	Allentown Div\Water\Capital
PROJECT TITLE:	Allentown Water Filtration Plant (WFP) Master Plan	PROJECT TYPE:	<input type="checkbox"/> Construction <input checked="" type="checkbox"/> Engineering Study <input type="checkbox"/> Equipment Purchase <input type="checkbox"/> Amendment
THIS AUTHORIZATION:	\$110,000		
TO DATE (W/ ABOVE)	\$405,000		

DESCRIPTION AND BENEFITS:

Lehigh County Authority (LCA) is responsible for performing capital improvement planning in accordance with the Allentown Concession and Lease Agreement. The Operating Standards require the capital improvement planning to include a comprehensive facility inspection, system performance evaluation, and development/update of a long-term improvement plan including project cost estimates.

Arcadis most recently completed this work for LCA with the final report being delivered in July 2017.

Prior Authorization: 2016-2017 Authorization for the first Allentown WFP Master Plan development.

This Authorization: 2022 Allentown WFP Master Plan development.

See attached Board Memo for further project details.

Authorization Status:

Requested This Authorization	
<i>Design Phase</i>	
Staff	\$15,000
Contractor	\$0
Engineering Consultant	\$85,000
Contingency	\$10,000
Total This Authorization	\$110,000

Prior Authorization	
\$295,000	
Subtotal (Both Authorizations)	\$405,000
<i>Future Authorizations (2027)</i>	
<i>TBD</i>	

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

Professional: ARCADIS U.S., INC.
1600 Market St., Suite 1810
Philadelphia, PA 19103

Date: January 13, 2022

Requested By: Phil DePoe

Approvals

Department Head: _____

Chief Executive

Officer: _____

Allentown Division: Allentown Filtration Plant (WFP) Master Plan - Planning Phase

Lehigh County Authority (LCA) is responsible for performing capital improvement planning in accordance with the Allentown Concession and Lease Agreement. The Operating Standards require the capital improvement planning to include a comprehensive facility inspection, system performance evaluation, and development/update of a long-term improvement plan including project cost estimates.

Arcadis most recently completed this work for LCA with the final report being delivered in July 2017.

The scope of services include, but are not limited to, the following:

Professional Services ⁽¹⁾
1. Condition Assessment and Recommendations
2. Process Evaluation Update
3. Updated Prioritized Capital Plan
4. Presentation to Board/Upper Management

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

This Approval: \$85,000

Approval Amount (not to be exceeded without further authorization): \$85,000

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:** _____

FINANCE & ADMINISTRATION

ACTION ITEMS

1. 2020 Audit & Financial Statements – Schedule TBD

Completion of the Authority's 2020 Audited Financial Statements was delayed due to the delayed completion of the Pennsylvania Municipal Retirement System (PMRS) financial audit. PMRS completed their audit in December 2021, and the Authority's audit was subsequently completed and filed with the appropriate agencies by the end of 2021. Auditors will be scheduled to present the Authority's 2020 Audited Financial Statements to the Board of Directors at an upcoming meeting.

DISCUSSION ITEMS

INFORMATION ITEMS

1. Recently Purchased Investments – Certificates of Deposit (CDs)

CERTIFICATES OF DEPOSIT						
28-Oct-21						
Fund	Bank	Location	Gross Amount	Date of Purchase	Date Due	Net Rate %
Cons Wtr (2)	Synchrony Bank	Draper, UT	249,000.00	10/15/21	10/16/23	0.400

Cons Wtr (2)	Consolidated Water (2)
LLRI CR	Little Lehigh Relief Interceptor Capital Reserves
Cons LL2 (314)	Consolidated Little Lehigh Relief Interceptor 2
WW Capac	Wastewater Capacity
2010 Wtr Cons A	2010 Water Construction, Series A Bond
Wtr R&R	Renewal and Replacement

2. Developments

Water system construction is occurring in the following developments:

5420 Crackersport Road, 1 commercial lot, UMT
 8323/8449 Congdon Hill Drive, 2 industrial lots with warehouses, LMT
 Fields at Indian Creek, Phases 4 & 5, 86 residential units (sfd), water and sewer, UMiIT & Emmaus
 Kohler Tract, 123 residential lots (sfa), water and sewer, UMiIT
 Lehigh Hills, Lot 5 Phase 2, 240 residential units (sfd.), UMT
 Lehigh Hills Townhouses, 24 townhouse units (sfa), UMT
 Mountain View Estates, 27 residential units (sfd), LMT
 Sauerkraut Lane Extension – Roadway & water line extension, LMT
 Shepherds Corner, 1 commercial lot, LMT
 West Hills Business Center – Lot H, 1 commercial lot, Weisenburg T

Water system plans are being reviewed for the following developments:

749 Route 100, 1 industrial lot with warehouse, UMT
 3369 Rt 100 Neighborhood Hospital & Medical Offices, 1 commercial lot, LMT
 5329-5347-5357 Hamilton Blvd., 1 commercial lot, LMT
 ABE Doors & Windows Redevelopment, 1 commercial lot, LMT
 Advanced Health Care of Allentown, 1 commercial lot, LMT
 ATAS International, 1 industrial lot, UMT

Fields at Brookside, water main relocation, LMT - New
Estates at Maple Ridge, 30 residential units (sfd), UMiIT
Fallbrooke Residential Subdivision, 90 sf residential units, UMT
Glenlivet Drive West Extension & Subdivision, 52 residential units (sfd), UMT
Green Hills Commerce Center III, 1 commercial lot, UMT
Guardian Self-Storage, 1 commercial lot, LMT
Laurel Field, Phase 5, 25 townhouses, UMT
Madison Village at Penn's View, 66 manufactured homes, 1 lot, water and sewer, LynnT
Mertztown Residential Subdivision, 264 sf units & 136 townhouse units, LMT
Mosser Road Subdivision, 10 sf units, UMT
Parkland Crossing (formerly 1224 Weilers Rd Twins), 144 townhouse units, UMT
Ridings at Parkland – Phase 2, 38 residential units (sfd), NWT
Self-Storage Facility – Cedarbrook Road – 1 Commercial Lot, LMT
Schoeneck Road, Lot 1, 1 lot, warehouse, LMT
Sheetz – Cetronia Road, 1 commercial lot, UMT
Spring Creek Properties, Lot 12, 1 lot, warehouse, LMT
The Annex at Fields at Indian Creek, 22 S.F. residential units, Emmaus Borough
Towneplace Suites by Marriott, 91-room hotel, UMT
Towns At Schaefer Run, 128 townhouse unit (sfd), UMT

Sewage Facilities Planning Modules Reviewed in Prior Month:

Building Addition for 4815 Crackersport Road, SWT, 1,115 gpd.
1010 Apartments, Allentown, 26,085 gpd.
GOPUFF, SWT, 605 gpd.

WATER**ACTION ITEMS**

1. Allentown Division – Water Filtration Plant & System Master Plan – January 10, 2022

This project involves the preparation of a Master Plan for the Allentown Water Filtration Plant, water storage tanks, water storage reservoirs, pressure booster stations, raw water springs, and surface water intakes. The Master Plan will involve several key sections including, but not limited to: full-scale condition assessments, treatment process optimization, and development of short-term and long-term capital plans. The Master Plan is a requirement included within the Allentown Water & Sewer Lease, to be updated every five years throughout the life of the lease. The first Master Plan was prepared in 2017. Board authorization will be requested at the January 10, 2022 Board Meeting. The project will be funded by the LCA Allentown Division.

DISCUSSION ITEMS

INFORMATION ITEMS

1. Allentown Division – Water Filtration Plant: High Lift Pump VFD Replacements

The High Service Pumping System (HSPS) at the WFP is the primary means of conveying treated water into the distribution system. The HSPS has experienced regular failures from aging electrical components in recent years. The July 2017 Allentown Water Master Plan categorizes the pump variable frequency drives (VFDs) in very poor condition and notes that the VFDs are no longer supported by the manufacturer. This project will replace two of the existing VFDs and add a third VFD to the constant speed pump. Design phase was completed in late 2020. LCA submitted a funding application and supporting documentation to PennVEST in early November 2020, which was approved in January 2021. Construction phase of the project was approved at the 3/22/2021 Board meeting. In May 2021, PennVEST granted consent to proceed with construction prior to closing on the loan, which will follow completion of construction in 2022. Notices to Proceed was issued for both contracts in May 2021 and construction phase is in progress. The general contractor will mobilize on site in December 2021, and the electrical contractor's mobilization has been pushed back to March 2021, due to manufacturer delays for the VFD equipment. Construction is anticipated to be completed by early Summer 2022. **(No Change)**

2. Suburban Division – Upper Milford-CLD Interconnection Project (Kohler Tract)

The project features the installation of a new booster pumping station and water main extension to interconnect the Central Lehigh Division (CLD) with the Upper Milford Division (UMD) allowing the abandonment of the UMD water supply facilities, and to provide water service to the proposed 123-lot Kohler Tract subdivision in Upper Milford Township. Costs are being shared between the LCA Suburban Division and the developer of the Kohler Tract (Jasper Ridge). Pumping station bids were opened on 4/25/2019. Board approval for the construction phase of the project was granted at the 5/13/2019 meeting. The station went on-line on 11/19/2020. The contractors are addressing the remaining punch list items. **(No Change)**

3. Suburban Division – Watershed Monitoring Program

The project involves construction of a surface water flow-monitoring network for the Little Lehigh Creek. The work is in response to the Watershed Monitoring Plan that was developed and reported to LCA by AI Guiseppe (SSM, Inc.) in 2017. Project update meetings with SSM and USGS will be conducted periodically. **(No Change)**

4. Suburban Division – Buss Acres Pump Station Replacement Construction

The project consists of the consolidation and replacement of two well stations with a single new pump station and a new water storage tank to replace two antiquated hydropneumatic pump stations. The new station will be a variable frequency drive controlled double pumping system

with full SCADA control. The design will include radon reduction elements and accommodate the future installation of additional radon removal equipment, to be implemented upon DEP's mandate of a regulatory limit. The project is at the end of the construction phase. The new station, the finished water reservoir and both the Gary and Laurie wells are online. The contractors were issued Certificates of Substantial Completion in September. Change order and punch list items are being addressed. **(No Change)**

5. **Allentown Division – 36" DI Water Main Condition Assessment**

Water distribution system consultant Gannett Fleming, Inc is working with Pure Technologies to develop a condition assessment project focusing on the 36" ductile iron transmission line that feeds the north end of Allentown and Huckleberry Ridge Reservoir. This line has had two recent major failures and it would be beneficial to determine if there is a root cause for these failures that can be corrected to prevent further damage and water loss. The work was performed on December 14-15, 2020. Final report was received. Exploratory excavations and one pipe segment replacement were done on the 36" line (10/18/2021) and the 30" line (10/19/2021). Both segments are currently being analyzed by Pure Technologies. **(No Change)**

6. **Suburban Division – Fixed Base Meter Reading Stations**

The project focuses on securing land development and zoning approvals to construct eight fixed base water meter reading stations located throughout the Suburban Division water service area. The land development and zoning approvals will allow for the future construction of the stations as part a program to transition to a centralized advanced metering infrastructure system which will provide more consistent, timely and accurate billing to the customers. LCA will conduct additional investigatory work to refine construction costs and identify all zoning restrictions and limitations with the prospective tower sites, and present that information to the Board at a future date. A temporary base station will be erected in the Central Lehigh Division in January as a pilot study to demonstrate the capabilities of Advanced Metering Infrastructure.

7. **Allentown Division – Water Main Replacement Program Cycle 5**

The project is for the annual replacement of aged and/or failing cast iron water mains in multiple locations throughout the City, in accordance with the new amended lease requirements (one mile per year), based on the design engineer's risk prioritization protocol. The design engineer (Gannett Fleming) halted work on Cycle 5 in 2019 following City Compliance office acceptance of the Cycle 5 main replacement prioritization, pending available funding. LCA restarted Cycle 5 design phase for construction in 2021 of a water main replacement project. As of November 2020, LCA began the process of negotiations for cost sharing agreement with the City for road surface restoration. In December 2020 LCA formally submitted the substantially complete plans and specifications to the City for approval, and City comments were reviewed on January 19, 2021. The project was advertised for bid on March 1, 2021, pre-bid meeting was held on March 17, 2021, and bids opened on March 31, 2021. The Board authorized the construction phase of this project at the April 12, 2021 LCA Board meeting. Construction work, punch list completion and road restoration agreement with COA completion all have been completed by December 2, 2021. LCA anticipates final payment to our contractor before the end of 2021.

8. **Allentown Division – Water Filtration Plant: 2021 Indenture Upgrades – Construction Phase**

As a condition of the financing of LCA's up-front concession payment to the City, LCA entered into a Trust Indenture with the Manufacturers and Traders Trust Company that requires the preparation of an annual Consulting Engineer's Report (Report). The Report, which is prepared each year by Arcadis, documents the condition of the water and wastewater facilities (KIWWTP and WFP) based on physical inspections by the engineer, identifies repairs and upgrades required, and reflects progress made in addressing deficiencies. This project consists of addressing structural deficiencies at the Water Filtration Plant, with work located at various concrete structures in exterior areas. D'Huy Engineering completed design in February 2021,

the project was advertised for bid in late March 2021, and bids were opened on April 22, 2021. Award of bids and construction phase authorization was granted at the May 10, 2021 LCA Board meeting. Construction has commenced and will be substantially completed by the end of 2021. **(No Change)**

9. **Suburban Division – Arcadia West Water Storage Tank Replacement – Construction Phase**

The Arcadia West water storage tank has had several leaks in recent years and the coating system has reached the end of its useful life. A condition assessment study was done in 2019 which determined that the most cost-effective solution is to replace the aging tank with a new concrete tank. This project is for the replacement of the existing steel tank with a new tank of the same size, demolition of the existing tank, and miscellaneous yard piping and site work. Entech Engineering completed design in March 2021, the project was advertised for bid in late March 2021, and bids were opened on April 22, 2021. A Notice of Award was issued to the contractor following approval at the May 10, 2021 LCA Board meeting and the Notice to Proceed was issued in June 2021. Construction began in mid-August and is approximately 85% complete. The new tank is expected to be in operation the first week of January 2022. Demolition of the old tank will occur in the spring of 2022.

10. **Suburban Division – Upper System Pump Station and Main Extension – Design Phase**

Based on current and future demand for water service in the Upper System portion of the Central Lehigh Division, LCA's water system engineer, Gannett Fleming, has run various scenarios in the hydraulic model to simulate the impacts of this expected growth. The preferred alternative to increase water capacity and system resiliency in the Upper System is a system extension under Interstate-78 just west of Fogelsville and a new water booster station, which will supplement existing well supplies and pumping capacity in this area of the water system. Due to the near-term requirements of an industrial development slated to be constructed within the next two years in this area, the project will need to move forward immediately. Design phase was approved at the 7/26/2021 Board meeting and is proceeding. **(No Change)**

11. **Suburban Division – Suburban Water Supply Study**

This project involves the preparation of a preliminary water supply study for the Suburban Water systems in 2022. The study will review supply capacity requirements to meet current and future demands, and evaluate existing water sources, storage, and interconnections to ensure long-term supply needs can be met. This study will be completed by the end of 2022, and Board authorization will be requested at a February Board meeting. From this study, additional engineering work will be initiated to develop water supply projects that enhance the region's water system resiliency and redundancy. This water supply study will serve as the backbone for future development of a Master Plan for the entire LCA Suburban Water System. The project will be funded by the LCA Suburban Division.

WASTEWATER**ACTION ITEMS**

DISCUSSION ITEMS

INFORMATION ITEMS

1. Regional Act 537 Plan Alternatives Analysis: Pretreatment Plant Upgrade Option

To begin the process of developing the long-term Regional Act 537 Plan, the evaluation of the LCA Pretreatment Plant Alternatives was identified as an immediate need to assist with completing the full alternatives analysis to be completed within the next five years. The alternative to upgrade the Pretreatment Plant to full treatment was previously evaluated in the 2011-2016 timeframe. Additional study is required to fully evaluate the facility's capacity to treat current and future dry-day, wet-weather, and peak flows. The Board approved professional services authorizations for this work in August 2020. Internal presentations occurred in August 2021 and a summary of results was provided to the Board in September 2021. A draft, preliminary report was delivered in October 2021. In order to maintain the Act 537 planning schedule, various recommendations from the Report will be requested in 2022. **(No Change)**

2. Suburban Division – Western Lehigh Service Area: Revenue Planning Tool

As part of the long-term Act 537 planning process, a revenue planning tool is required to help predict the impact of proposed system modifications in the Western Lehigh Service Area. This tool will simulate financial impacts based on current and future flows and loads and utilizing the terms of existing inter-municipal agreements. For the alternatives being evaluated by LCA's engineering consultants for potential upgrade of the Pretreatment Plant to full treatment, the revenue planning tool will simulate changes in future flows and loads and general financial analyses to assist with decision-making regarding these alternatives. Prior phases of this work were completed in 2019 and 2020 to review the assumptions and parameters required to develop the financial model. Authorization for Phase 2 (development of the actual revenue planning tool) was approved at the 12/14/2020 Board Meeting. Final tool delivery occurred in July 2021 with additional staff evaluation of the results occurring in August. A summary of this work was provided to the Board in September. Two specific scenarios (base case and PTP upgrade option) were modeled in December.

3. Suburban Division – Western Lehigh Service Area: 2020 Sewer Modeling

The Western Lehigh Sewer Partnership (WLSP) hydraulic model has been calibrated using 2019 flow meter and rainfall data and is available to support long-term Act 537 planning for the Western Lehigh Interceptor (WLI). Five separate modeling tasks will be performed in order to facilitate broader Kline's Island Sewer System (KISS) planning need discussions. The results of this 2020 modeling will help to inform further future modeling decisions and alternative analyses that will occur during the full KISS model calibration period in 2022. A consulting engineer has been retained and full authorization was granted at the 5/11/2020 Board meeting. A presentation was presented to the Board at the 8/10/20 Board Meeting. Various modeling alternatives related to the Western Lehigh Service Area for the final Act 537 Plan are still ongoing (specifically residential flow segregation from the PTP). The project is funded by the LCA Suburban Division.

4. Suburban Division – Western Lehigh Manhole Rehabilitation Project – Phase 2 Construction Phase

This project involves the rehabilitation of key manholes in the Western Lehigh Interceptor service area. The project includes flood-proofing, interior pipe connection grouting, exterior concrete work and sealing of manholes, particularly those manholes in close proximity to the floodway, which experience floodwater inundation. The purpose of the project is to eliminate floodwater inflow into the system. The project scope for Phase 1 included 50 manholes that

were rehabilitated in 2020 as part of a phased manhole rehabilitation program. The Phase 1 project construction was completed in early 2021. Phase 2 of the WLI Manhole Rehabilitation Project, which includes a similar scope with manholes moving downstream in the WLI drainage basin, was advertised for bid in June 2021, with the construction phase authorized at the 7/26/2021 Board meeting. Construction began in fall 2021 and was completed on December 17, 2021. LCA anticipates final payment to our contractor by the end of year 2021.

5. **Suburban Division – Western Lehigh Service Area – Engineering & Program Support**

The municipalities in the Western Lehigh Service Area will continue to work on inflow and infiltration source removal as part of the approved Interim Act 537 Plan. Ongoing engineering support is required to facilitate continued progress and coordination among the Western Lehigh municipalities. In addition, LCA and its Western Lehigh municipalities will be participating in the Regional Act 537 Plan development and will require engineering support to compile data on current and future sewer flows and assess conveyance system requirements. This is an extension of ongoing engineering and program support that Arcadis has provided for many years. The Board granted a Professional Services Authorization for program support in 2022 at the November 8, 2021 Board meeting. **(No Change)**

6. **Suburban Division - Trexlertown Area Capacity Solution Alternative**

As part of the Interim Act 537 Plan that was approved by DEP in June 2021, a conveyance capacity “bottleneck” was identified in the Trexlertown area of the Western Lehigh Interceptor, and this area was assigned a high priority due to occurrence of sanitary sewer overflows and basement backups in the vicinity. A parallel interceptor was originally conceived to run approximately from Cetronia Rd to Spring Creek Rd. An alternative concept also studied to focus on providing storage capacity in the system for this area, due to concerns about downstream hydraulic impacts. These two alternatives were studied by HDR as authorized by the Board in 2019, with results indicating downstream impacts and long construction timelines due to location in environmentally sensitive areas. A third alternative was developed which includes bypass pumping from a location at the Industrial Pretreatment Plant to a location in the Upper Macungie Township interceptor which has capacity for the additional flows, thereby relieving this bottleneck. This third alternative has been modeled successfully by Arcadis showing minimal downstream impact and a significant reduction of overflows in the Trexlertown area. An overview of these alternatives was provided to the Board in June 2021. Upon successful Special Act 537 Planning completion, a Part 2 permit will be submitted to DEP. Board authorization requests for planning, permitting, and design services are forthcoming in early 2022. The Special Act 537 Study will be submitted to both Upper and Lower Macungie townships’ planning commissions in early 2022 as well. A submission to DEP is expected by the Summer of 2022.

7. **Suburban Division – Park Pump Station Force Main Rehabilitation**

The Park Pump Station and Force Main line were constructed in 1980 to provide wet weather relief to the Little Lehigh Creek Interceptor, which conveys wastewater from ten municipalities from outlying areas to the Kline’s Island Wastewater Treatment Plant (KIWWTP). The force main consists of 8,715 linear feet of prestressed concrete cylinder pipe (PCCP) of various sizes (2,615’ of 24”; 2,695’ of 30”; and 3,405’ of 36”) and connects with the 54” sanitary sewer interceptor that runs to KIWWTP. PCCP is particularly sensitive to deterioration due to hydrogen sulfide gas from wastewater, and corrosion of exposed reinforcing steel can result in structural degradation and pipe failure. An internal investigation of the pipe is required to assess the condition of the PCCP pipe and identify damage areas, in order to determine the locations and extent of rehabilitation needed to restore the level of service, prolong service life, and mitigate the risk of failure. On April 10, 2021, LCA conducted a limited manned inspection of the force main pipe at 3 air release valve (ARV) locations, 100 feet in both directions from the ARV

manhole, which will be used as the initial evaluation of the representative condition of the pipe. On October 23, 2021, a second manned entry was performed at two (2) additional air valves. A report on this evaluation will be provided by the consultant. **(No Change)**

8. Suburban Division – Park Pump Station Phase 2 Upgrade - Design Phase

The Park Pump Station Phase 1 Upgrade was completed in early 2020, and consisted of new pumps, new pump control center with variable frequency drives, new automatic transfer switch, new wet well level control system, upgraded HVAC system, roof replacement, new pump removal access hatch, new pump hoist system, and associated mechanical and instrumentation equipment. The existing 40-year-old generator does not have the capacity to handle the full loads of the upgraded station at 100% design flow and is at the end of its useful life. The Phase 2 Upgrade project consists of replacement of the original station backup generator system. The designer of record for the Phase 1 Upgrade was Whitman, Requardt & Associates, LLP (WRA). As WRA is already very familiar with the power systems and controls at the station, Capital Works requested a design phase proposal from the firm for the Phase 2 project. Authorization for design phase was granted at the 3/22/2021 Board meeting. Design is anticipated to be substantially completed by early 2022. **(No Change)**

9. Suburban Division – Sand Spring WWTP Upgrade Project Construction

The Sand Spring WWTP was constructed in 1972 by the developer to serve the Sand Spring development, located in the Schnecksville area in North Whitehall Township. Sewer service is provided to approximately 248 apartment units, 8 commercial properties, and an elementary school. Lehigh County Authority (LCA) acquired the system in 2005. The project includes replacement of the existing deteriorating treatment facility in entirety with new technology and concrete tanks appropriate for the wastewater flows and loading characteristics. The new facility shall meet the effluent limits criteria established in the respective DEP and DRBC permits, including new or additional limits that may be imposed during the permitting process. Design phase was authorized in February 2017 and final design was delayed due to DEP Part 2 Water Quality Management and NPDES permitting issues. DEP approval of the Water Quality Management Permit was received in late December 2018, the design was finalized in Spring 2019. Construction phase authorization was approved at the 8/26/2019 Board meeting. Conditional Use approval and land development waiver were granted by North Whitehall Township in Spring 2020. Substantial completion and start-up of the new facility occurred in May 2021 and the project is being closed out. **(No Change)**

10. Suburban Division - Lynn Township Corrective Action Plan

Excessive inflow and infiltration (I&I) and high wet-weather flows into the Lynn Township sewer system has been ongoing and increasingly challenging to address. As noted in LCA's monthly operations reports, treatment plant bypasses and sanitary sewer overflows have occurred in this system and must be addressed. A meeting was held at Lynn Township with DEP and township representatives in June 2019 to discuss the Lynn Township Corrective Action Plan and Township sewer planning/growth issues, and DEP directed LCA to submit a CAP Amendment by the end of summer 2019. The CAP Amendment contained an updated sewer system condition assessment and a corrective plan to further mitigate I/I flows. Updated CCTV work of the entire system was substantially completed in August 2019, and the inspection data was summarized in the CAP Amendment and is being used to scope a capital repair project. The Lynn Township Board of Supervisors adopted a sewer system rules and regulations ordinance on 9/12/19, which gives LCA the authority to inspect private laterals and facilities for illegal connections and perform follow-up enforcement. A meeting with DEP and Lynn Township representatives was held on 1/15/20 to discuss the CAP Amendment and plan moving forward. DEP sent a letter to LCA dated 6/8/20 granting 55 EDUs of sewer allocation relief for new connections to the system. **(No Change)**

11. Suburban Division - Heidelberg Heights Consent Order & Agreement

On 2/11/2019, DEP submitted a notice of violation to LCA regarding bypasses and permit exceedances at the Heidelberg Heights wastewater treatment plant. The system has been challenged by high groundwater levels and significant infiltration and inflow (I&I) of clear water into the sewer system during rain events. LCA staff developed a Corrective Action Plan (CAP) which was submitted to DEP in April 2019. The Heidelberg Township Board of Supervisors adopted an updated sewer system rules and regulations ordinance in October 2019, which gives LCA the authority to inspect private laterals and facilities for unauthorized connections and perform follow-up enforcement. A Consent Order & Agreement (CO&A) was approved by DEP and LCA in June 2020, which incorporates the projects and schedule outlined in LCA's CAP. The first annual report was submitted to DEP per the CO&A requirements in late March 2021. A public outreach program was initiated in October 2021 regarding upcoming inspections of private side sewer facilities, to commence in 2022. **(No Change)**

12. Suburban Division – Heidelberg Heights 2021 and 2022 Sanitary Sewer Replacement Project

In accordance with the Consent Order and Agreement (CO&A) executed by LCA and DEP, LCA is required to complete annual inflow and infiltration mitigation projects to eliminate hydraulic overloads and bypass events at the Heidelberg Heights wastewater treatment plant. The CO&A requires that all original vitrified clay sewer main and lateral pipe be replaced within five years. The 2021 sewer replacement project bids were opened on 3/31/2021. Only two bids were received, both of which significantly exceeded the engineer's estimate. The Board approved rejection of bids at the 4/26/2021 Board meeting. The project scope was expanded to include the 2022 required sewer main replacement (Phase 2), in order to gain economy of scale and attract more bidders. The expanded project was advertised for bid on 8/24/2021, and bids were opened on 9/15/2021. Construction phase authorization was granted at the 9/27/2021 Board meeting. Phase 1 of the project will be completed by the end of 2021, and Phase 2 will be completed in Spring 2022. **(No Change)**

13. Suburban Division – Industrial Pretreatment Plant Master Plan

This project involves the preparation of a Master Plan for the LCA Industrial Pretreatment Plant, the first of its kind for this facility. The Master Plan will involve several key sections including, but not limited to: full-scale condition assessments, treatment process optimization, and development of short term/long term capital plans. The Master Plan will be incorporated into the ongoing final Act 537 Plan that is due to DEP by March 2025. As part of the Act 537 planning process that is currently underway, a detailed upgrade analysis was recently completed by the plant operator (Jacobs). That analysis will also be incorporated into this proposed Master Plan. Board authorization was approved on December 13, 2021. The project will be funded by the LCA Suburban Division. Final report submission is expected by the Summer of 2022.

14. Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning – Sewage Billing Meter QA/QC Data Analytics and 2021 Flow Metering Preparation

As part of the Interim Act 537 Plan, the municipalities served by the Kline's Island Sewer System have committed to completing a flow metering and modeling project beginning in 2021. The flow metering data will be used to prepare modeling and identify the capital improvements needed to meet the future sewage capacity needs of the region through 2050. The flow metering will include a mix of temporary meters and the existing sewage billing meters. Data delivery and storage procedures, quality assurance, and flow analytics were implemented in 2020 for these sewage billing meters. Without this meter development program, the data cannot be used from these billing meters. A consulting engineer's professional service proposal was granted at the April 27, 2020 Board meeting. Costs associated with the development of the QA/QC data analytics and the 2021 flow metering preparation will be paid by the City of Allentown and reimbursed through existing intermunicipal agreements and by City customers through the use of the Administrative Order Fee. The main flow metering program concluded in later October 2021. In 2022, a focus will shift onto the long-term goals of the existing sewer billing meters.

15. **Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning: 2021 Model Expansion and Calibration**

The prior KISS sewer model from 2014 included only the City of Allentown and LCA/Western Lehigh municipalities. The primary goal of this work is to expand the sanitary sewer model into the surrounding Signatories (Coplay, Whitehall, North Whitehall, Hanover, South Whitehall, Salisbury, and Emmaus). Calibration of this expanded model to current flow characteristics will aid in the identification and evaluation of regional alternatives for solutions to both treatment and conveyance through the year 2050 Act 537 planning horizon (the LCA/Western Lehigh portion of this model calibration work was completed in 2019 and 2020). The end result of this proposed work will provide one comprehensive, calibrated sewer model for the entire KISS system using 2021 temporary meter flow data and rainfall data. On February 22, 2021, Board approval was granted for this next phase of Act 537 planning efforts. The model is anticipated to be complete by June 2022. Upon completion of the modeling calibration, a preliminary screening of alternatives will occur in the second half of 2022. **(No Change)**

16. **Kline's Island Sewer System – Regional Sewer Capacity & Wet-Weather Planning: Rain Derived Inflow and Infiltration (RDII) Analysis**

The main goal of this work (Signatory Systems only) is to conduct an RDII analysis of storm events during the flow monitoring period to determine the nature and extent of infiltration and inflow (I&I) leakage. Using hydrograph interpretation, this will help Signatories focus their rehabilitation work through Sanitary Sewer Evaluation Survey (SSES) investigations toward the sources contributing the leakage. Using this analysis, it can be identified where and what type of SSES work should be completed to allow successful targeted source reduction projects. Data from approximately 53 temporary flow meters and multiple rain gauges from the 2021 flow metering program will be used for this analysis. The analysis itself will begin in late 2021 and will be concluded by March of 2022. Board authorization for this Signatory RDII Analysis was granted at the November 8, 2021 Meeting. The Board authorization of the City's RDII analysis was previously approved on February 22, 2021. **(No Change)**

17. **Allentown Division – Sanitary Sewer Collection System: Rain Derived Inflow and Infiltration (RDII) Analysis**

The main goal of this work (City System only) is to conduct an RDII analysis of storm events during the flow monitoring period to determine the nature and extent of infiltration and inflow (I&I) leakage, and to use hydrograph interpretation to help the City focus their rehabilitation work (both secondary Sanitary Sewer Evaluation Survey (SSES) investigations and rehabilitation efforts) toward the sources contributing the leakage. It will also be determined where the flow meters should be installed for the next monitoring period and where SSES future work should be completed. Data from approximately 43 temporary flow meters and five rain gauges from the 2021 flow metering program will be used for this analysis. The analysis itself will begin in late 2021 and will be concluded by March of 2022. On February 22, 2021, Board approval was granted for this project. Board authorization of a RDII analysis for the remaining 1981 Signatories was granted at the November 8, 2021 Meeting. **(No Change)**

18. **Kline's Island Sewer System – Act 537 Planning: 2021 Flow Data QA/QC**

As part of the Interim Act 537 Plan, the municipalities served by the Kline's Island Sewer System have committed to completing a sewage flow metering and modeling project beginning in 2021. The flow metering data will be used to prepare sewer modeling and identify the capital improvements needed to meet the future sewage capacity needs of the region through 2050. The flow metering program will include a mix of temporary meters (~63), existing sewage billing meters (~24), and various permanent, non-billing Signatory meters (~11). Flow metering services will be provided by Flow Assessment Services, as previously authorized in 2020. To ensure the data collected from the nine-month monitoring period are accurate and to ensure the validity of the resulting hydraulic model, a rigorous quality assurance and quality control program must be implemented. Approval of a consulting engineer's proposal for this work was granted at

the January 25, 2021 Board meeting. Costs associated with these services will be paid by the City of Allentown and reimbursed through existing intermunicipal agreements and by City customers through the use of the Administrative Order Fee. The majority of the 2021 flow characterization program concluded on October 29, 2021 (only three temporary meters remain in the ground). The third round of QA/QC was recently completed and only the fourth round will be concluded before January. **(No Change)**

19. Allentown Division – Sanitary Sewer Collection System: I&I Source Reduction Program Plan (Year 2)

This project includes the design of the City of Allentown's I&I Source Reduction Program Plan. In 2014, Video Pipe Services complete various CCTV inspections throughout twenty Primary and Secondary Basins. All pipe segments that called for complete pipe replacement have already been repaired. The remaining source reduction activities within the twenty Basins have been organized into a 5-Year Plan, with each year focusing on a different geographic region of the City's sewer collection system. Design has been approved for all five years, with the first project completed in 2020 and the last project finishing in 2023 (the Year 5 project has been incorporated into the Year 3 and Year 4 projects). Board approval for the Year 2 construction phase was granted at the March 22, 2021 Meeting. Construction began in May 2021 and will be completed by early January 2022. Authorization for the Year 3 project will be requested at a March 2022 Board Meeting. This project is considered an AO expense under terms of the Lease and is City funded.

20. Allentown Division – Kline's Island WWTP: Phase 1 AO Design Improvements

This project includes the design of the AO improvements at the wastewater treatment plant. This conceptual design concept was approved by the City and the relevant final deliverables were received by LCA. The City then directed LCA to proceed with the final design of improvements related to the blending alternative. Board approval for the Professional Services Authorization with Kleinfelder was granted at the September 11, 2017 Board Meeting. The project is identified as Administrative Order Work and will be funded by the City. The 30% design drawings and specifications have been received. The City then directed to "pause" the design phase of the project. The City has now directed LCA to keep this project on indefinite hold, pending submission of the final Act 537 Plan in March 2025. **(No Change)**

21. Allentown Division – Kline's Island WWTP: Max Monthly Flow Capacity Evaluation

DEP has noted that the KIWWTP has been performing at a high level and meeting its permitted effluent quality limits during a period of prolonged wet weather in 2018 and 2019. This study provided the basis for confirming the plant's maximum monthly average that can be sustained during prolonged periods of wet weather – while remaining in full compliance with effluent quality requirements of the plant's permit. Approval of the study was granted at the 8/26/2019 Board Meeting. The study was completed in mid-October 2019 and a Part II Permit was sent to DEP on 10/18/2019, seeking a re-rate of the KIWWTP's hydraulic design capacity. Upon receipt of the Interim Act 537 Plan approval from DEP on 6/25/2021, the permit submission was slightly modified to correspond with a 44.6 MGD hydraulic re-rate in accordance with discussion with DEP. On December 1, 2021, the Part II Permit for the hydraulic design capacity of 44.6 MGD was received. This project is considered an AO expense under terms of the Lease and is City funded. **(No Change)**

22. Allentown Division – Kline's Island WWTP: Sodium Hypochlorite System Installation Project – Construction Phase

This project involves the replacement of the existing gaseous chlorination system at the Kline's Island Wastewater Treatment Plant (KIWWTP). The use of gaseous chlorine for effluent disinfection, while reliable, is outdated and creates significant public health and employee safety risks. In addition, the existing equipment has reached the end of its useful life. The 2018 KIWWTP Master Plan recommended abandoning gaseous chlorine and switching to (liquid) sodium hypochlorite. The design commenced in March of 2019 and was completed in early

2020. The project was advertised for bid in February 2020, construction phase was authorized at the 6/8/2020 meeting and the contractor mobilized in late summer 2020. The project was anticipated to be completed by the end of 2021. However, final demolition of the gaseous chlorine system was paused pending completion of a Computational Fluid Dynamics (CFD) modeling of the chlorine contact tank to identify short-term improvements to improve mixing and optimize dosage rates of the new hypochlorite solution. The CFD modeling will be completed in early 2022. **(No Change)**

23. Allentown Division – Kline's Island WWTP: 2021 Indenture Upgrades - Construction Phase

As a condition of the financing of LCA's up-front concession payment to the City, LCA entered into a Trust Indenture with the Manufacturers and Traders Trust Company that requires the preparation of an annual Consulting Engineer's Report (Report). The Report, which is prepared each year by Arcadis, documents the condition of the water and wastewater facilities (KIWWTP and WFP) based on physical inspections by the engineer, identifies repairs and upgrades required, and reflects progress made in addressing deficiencies. This project consists of addressing structural deficiencies at KIWWTP, with work located at the Main Pump Station, Auxiliary Pump Station, Effluent Pump Station, and Plastic Media Trickling Filters. Work includes masonry repointing and restoration, door and window lintel replacement, concrete crack repair and resurfacing, and pipe painting. D'Huy Engineering completed design in February 2021, the project was advertised for bid in mid-March 2021, and bids were opened on April 19, 2021. Award of bids and construction phase authorization was approved at the May 10, 2021 LCA Board meeting. Construction is anticipated to be completed by the end of 2021. **(No Change)**

24. Allentown Division – Kline's Island WWTP: Solids Process Boiler and HVAC System Upgrade Project - Design Phase

The solids process boiler system is more than 25 years old and provides critical heat to the anaerobic digesters and solids dewatering and processing buildings. The equipment has reached the end of its service life, and replacement of the equipment is identified as a near-term (0 – 5 years) project priority in the KIWWTP Master Plan. This project includes replacement of the boilers and associated solids processing HVAC equipment. A preliminary engineering Basis of Design Report was prepared by GHD Engineering and submitted to the City Office of Compliance in January 2021. The City granted approval of the report in a letter dated 3/22/21 and the project is classified as a Major Capital Improvement. Approval of design phase engineering was granted at the 5/24/21 LCA Board meeting and design is proceeding and is anticipated to be substantially completed in Q1 of 2022. **(No Change)**

25. Allentown Division – Lehigh Street (Rte. 145) Water and Sewer Main Relocation Project

As part of the Pennsylvania Rapid Bridge Replacement Program, the proposed replacement of the Lehigh Street Bridge near the intersection with MLK Boulevard has required the relocation of existing City water and sewer lines that are located within the PennDOT right of way. Because the bridge is owned by Lehigh County and not the Commonwealth, the normal PennDOT relocation reimbursement schedules do not apply. Therefore, the County and LCA have executed an agreement on cost reimbursement on similar terms. LCA's engineer is working on behalf of LCA on a final sewer relocation design that minimizes the extent of the relocation. There will be less water infrastructure relocation work required since the existing water main is attached under the bridge and will be reattached after the new bridge is constructed. Construction will commence in late 2021. **(No Change)**

26. Kline's Island Sewer System – Act 537 Planning: Wet Weather Treatment Options

As part of the final Act 537 Plan that is due to DEP by March 2025, three separate alternatives are being evaluated to address current and future wet weather events at the Kline's Island WWTP. One alternative involves equalization tanks to store wet weather flow; a second alternative involves internal plumbing modifications to temporarily re-route flow to ensure secondary treatment for all wet weather flow; and a third alternative involves the construction of a high-rate wet weather treatment system known as BioActiflo. Three rounds of bench scale

testing for BioActiflo have occurred for proof-of-concept validation. The next step is a full-scale pilot facility. An authorization request for this pilot facility is expected in the first quarter of 2022. **(No Change)**

27. Allentown Division – Kline’s Island WWTP: Sludge Thickener Tank No. 3 Mechanical Upgrade – Design Phase

This project consists of the refurbishment and replacement of mechanical component of Sludge Thickener Tank No. 3. The steel mechanical components are severely corroded and at the end of their service life and require replacement. The components to be replaced include the drive unit, stilling well, influent piping, weirs, access bridge and miscellaneous piping and conduits. This project is identified in the KIWWTP Master Plan as a “near term” project, and is being performed as part of annual General Improvements. Design was completed in late 2021 and bid phase commenced in December 2021, with bids to be opened bids in January 2022.

28. Allentown Division – Kline’s Island WWTP: Main and Auxiliary Pump Station Improvements - Preliminary Design Phase

This project consists of mechanical and electrical upgrades of the Main and Auxiliary Pump Stations, and is listed in the KIWWTP Master Plan as a “near term” project. The Main Pump Station is a critical element of the plant that conveys screened influent wastewater to the aerated grit chambers and primary clarifiers. The four (4) existing pumps are more than 50 years old and at the end of their service life. In addition to pump replacement, new Variable Frequency Drives (VFDs) will be installed along with associated piping and valves. Replacement of the pumps will reduce risk and long-term maintenance costs, and maximize wet weather pumping capacity.

The Auxiliary Pump Station functions with the Main Pump Station to convey screened influent wastewater to the aerated grit chambers and primary clarifiers. The pump impellers, motors and VFDs are presently undersized and require replacement in order to maximize wet weather pumping capacity and extend service life and station reliability. The pump station check valves and suction and discharge isolation valves are also approaching the end of their service life and require replacement to maintain satisfactory pump station operation.

The project is currently in preliminary design phase (Kleinfelder Engineering) and the Conceptual Design is anticipated to be submitted to the City for Major Capital Improvement consideration in Q1 of 2022. **(No Change)**

29. Allentown Division – Kline’s Island WWTP: Intermediate Pump Station Improvements – Preliminary Design Phase

The Intermediate Pump Station (IPS) consists of two separate pump stations: a primary effluent pump station (conveys effluent from primary clarifiers to plastic media trickling filters) and a plastic media trickling filter (PMTF) effluent pump station (conveys effluent from the PMTFs to the intermediate settling tanks). This project, also listed in the KIWWTP Master Plan, consists of mechanical and electrical upgrades of the Intermediate Pump Station primary effluent station. The existing five (5) primary effluent pumps are nearing the end of their service life, and overheating of the electrical system components has been problematic during high flow events, which is caused by the existing pumps operating within their capacity service factor. The project includes the replacement of all five (5) primary effluent pumps with upsized pumps and motors, and replacement of three (3) VFDs consistent with the current configuration (2 pumps to remain constant speed). The IPS improvements will improve station reliability, eliminate emergency maintenance operations due to overheating of equipment, and enhance facility wet weather pumping capacity.

The project is currently in preliminary design phase (Kleinfelder Engineering) and the Conceptual Design is anticipated to be submitted to the City for Major Capital Improvement consideration in Q1 of 2022. **(No Change)**