

Kline's Island Sewer System (KISS): Act 537 Planning

Preliminary Screening of Alternatives (PSOA) Proposal

Presented to:
Lehigh County Authority
Board of Directors

October 10, 2022

10/10/22
Agenda

BRIEF REVIEW OF 537
TIMELINE TO DATE

DETAILED REVIEW OF
CURRENT 537 PROPOSAL

DISCUSS WHAT IS NEXT
WITH 537

PSOA:
Prep work from
2021 – Present

Flow Characterization Study

- March – October 2021

QA/QC of flow data concludes

- December 2021

KISS Model Preparation/Calibration

- Q1 2021 – June 2022

Capacity Problem Definition

- July 2022 – October 2022

Current 537 Proposal:

PSOA

Introduction:

- Preliminary Screening of Alternatives (PSOA)
- Solutions fall under: Common components, treatment, conveyance, storage

Objectives:

- Determine size, extent, and cost of infrastructure improvements
- Using Hurricane Ida (NOAA rainfall data) as the selected surrogate event
- Apply various I&I treatments under 2050 wastewater usage demands

Scope of Work:

- Identified via Tasks 1-6
- Detailed on next slides

Deliverables:

- Combination of figures, tables, memos, spreadsheets
- Assumes a variety of monthly meetings

Schedule:

- Early October 2022 – late April 2023 (if proposal authorized)

Budget estimate:

- PSA = \$404,000
- CPA = \$454,000

Task 1:

Common Component Modeling and Sizing

Using the 2021 KISS Model...

- Increase the KIWWTP wet weather capabilities from 84 to 100 MGD; 100 to 120 MGD
- Extend Park Pump Station Force main to KIWWTP
- I&I will continue to increase at 0.5%/year
- Water conservation at 0.2%/year through 2035; 0.1%/year through 2050

Using input from the 1981 Signatories...

- Determine their segment's hydraulic grade line level of service (HGLLOS) goals
- Determine years remaining service line for critical interceptors, pump stations, and force mains

Deliverable(s)

- Common component model descriptions memo
 - Settings in the model for each of the common components
- Common component cost estimate
 - Compilation of estimates prepared by Arcadis and other 537 consultants

Task 2: Source Reduction Modeling

Using the 2021 flow data and 2022 SSES...

- Develop multiple versions of the “Benchmark SRP”
 - % of manholes and pipes to rehabilitated and their method will be determined by Arcadis
 - Only one version of the “Benchmark SRP” will be modeled

Upon meeting with each Signatory...

- Share ideas for optimizing the cost benefit of SRPs
- Explain how various sewer rehabilitation methods are modeled
- Emphasize the direct impact their SRPs will have on the future KIWWTP peak flow

Deliverable(s)

- Figures and tables showing impact of “Benchmark” and “Signatory SRPs” compared to “no source reductions”
- Signatory Source Reduction Memo

Task 3:

Conveyance and Treatment Module Modeling

Using input from Jacobs, AECOM, and Kleinfelder...

- Will model the proposed treatment changes and proposed pumping options
- Will match modifications described above with proposed conveyance changes

Modeling will also include...

- Upsizing, as needed, of the “non-LCA” existing pump stations (CWSA Eberhart, UMT Applewood, UMT Rabenold)
- Identification of any potential issues with the existing SBMs

Deliverable(s)

- Pipe Upsizing Methodology Memo
- Pump Station and Force Main PSOA Model Memo
- PSOA Figures and Tables (to describe the PSOA alternatives)

Task 4: Alternatives Modeling

Using the 2021 KISS Model...

- Model several alternatives to evaluate impact of major corrective measures
- Assess their associated costs
- Broken into two rounds

Round 1 Alternatives

- PSOA #1-6
 - #1 uses no SRPs (worst case)
 - #2-6 uses the “Benchmark SRP”
 - #1-4 → gravity; PTP remains as is
 - #5-6 → gravity + PTP FM to KIWWTP
 - All dry day flow treated at KIWWTP

Round 2 Alternatives

- Results from Round 1 + 4 Signatory SRP-related alternatives
- 5 additional alternatives may be defined

Task 5:

Alternatives Costing

Using the 2020-2021 costing effort...

- Reflect changes in construction prices since 2020, if applicable

Using the PSOA model runs...

- Estimate capital construction and energy costs for each alternative
- Assumes overflows are eliminated
- Assumes hydraulic grade line level of service goals are achieved

Deliverable(s)

- Cost estimating spreadsheet with updated unit costs
- PSOA cost estimate table showing capital and energy costs:
 - Common
 - Treatment
 - Conveyance
 - Source Reduction Components

*Task 6:
Meetings,
Presentations,
Workshops, & Project
Management*

Presentations and workshops

- As needed and upon major milestone achievements

Project management

- Standard costs and activities

Monthly meetings

- LCA staff, Program steering committee, KISS Signatories, regulators, LCA Board (as needed), etc.

What are
the next
major Act
537
activities?
(tentative)

Preliminary Screening of Alternatives

- October 2022 – April 2023 (current proposal)

Final Alternatives Analyses

- April 2023 – December 2023

Selection of Solution

- January 2024 – April 2024

Finalize Act 537 Plan

- May 2024 – August 2024

Act 537 Municipal Approval Process

- September 2024 – March 2025 (Act 537 Plan submission)

Questions?

