

Interim Act 537 Plan & Trexlerstown Upgrade Project Updates

Presented to the Lehigh
County Authority Board
of Directors

June 28, 2021

Abbreviations & Definitions

KIWWTP – Kline's Island Wastewater Treatment Plant (Allentown)

KISS – Kline's Island Sewer System – all municipal systems and facilities that connect to the KIWWTP

AO – Administrative Order – issued by EPA in 2007 and 2009 related to sewer overflows and bypasses throughout the KISS and at the KIWWTP

EPA – U.S. Environmental Protection Agency

DEP – Pa. Department of Environmental Protection

MGD – Million Gallons per Day

CMP – Connection Management Plan – a DEP-approved plan to allow a pre-determined number of new sewer connections to occur during a given time period while corrective actions are being taken by the KISS municipalities

Act 537 Plan – Sewage facilities plan outlining current system requirements and detailed alternatives for meeting future needs

I&I – Inflow & Infiltration

PTP – LCA Industrial Pretreatment Plant (Fogelsville)

SBM – Sewage Billing Meters – permanent sewer flow meters used for calculating bills to municipalities for their flows to the KIWWTP

Brief Background

- ***The Wet Years: 2018-2019***

- August 2018-July 2019: Region received 80" of rain (compared to 45" normal)
- KIWWTP flows > permitted 40 MGD for several months (all other permit requirements met)
- March 2019: EPA withdraws AO, transfers oversight back to DEP

- ***Moving Forward with DEP: 2019-2020***

- DEP collaboration with KISS municipalities -> puts focus back on Act 537 planning
- KIWWTP flows return to normal at ~32 MGD
- DEP approves connection management plan (CMP) to allow new connections during 2020 calendar year
- Approval of new connections contingent on regional collaboration on Act 537 Plan
- KISS municipalities must continue removing I&I

Interim Act 537 Plan

- Overview / overarching goals
 - 2020 CMP continuation through 2025
 - 2021 Flow Characterization Study
 - KIWWTP hydraulic capacity re-rate to ~45 MGD
 - Address the Trexlertown “bottleneck”
 - Long-term 537 Plan developed by 2025
- Approval process/status
 - Submitted to DEP in September 2020
 - Approved on June 25, 2021



Interim Act 537 Plan Planning Module Projections

KISS Municipalities' projections for new connections:

- 2020 = 1.5 MGD
- 2021-2025 = 3.1 MGD

CMP 2020-2025 = 4.6 MGD

Municipality / Authority	Projected 2020 Planning Modules (gpd)	Projected 2021-2025 Planning Modules (gpd) FINAL JULY 24, 2020	Projected 2021-2025 Planning Modules (gpd) REVISED MAY 12, 2021
Borough of Alburtis ³	0	2,230	2,230
City of Allentown	444,807	1,358,949	1,358,980
Coplay-Whitehall Sewer Authority ²	76,110	191,350	191,350
Borough of Emmaus	63,630	20,160	54,600
Hanover Township	0	100,000	99,904
Lehigh County Authority ¹	0	152,000	151,640
Lower Macungie Township	276,996	260,766	286,778
Lowhill Township ³	0	2,230	2,230
Borough of Macungie	1,115	37,464	45,269
North Whitehall Township	30,975	34,125	30,975
Salisbury Township	4,446	60,268	60,268
South Whitehall Township	169,175	344,230	344,312
Upper Macungie Township	428,269	325,772	458,711
Upper Milford Township	669	27,652	27,652
Weisenberg Township ³	0	2,230	2,230
Rounding	3,808		
TOTAL	1,500,000	2,919,426	3,117,129

Interim Act 537 Plan: Work Schedule

Work Categories & Description	Start	Finish
Immediate: <ul style="list-style-type: none"> ■ Sewage Billing Meter (SBM) Upgrades & data validation / capture method ■ Defined scope and meter placement for Flow Characterization Study ■ Agreement on Cost-Sharing for Planning work ■ Municipal Flow Projections → 2050 ■ Part 2 Permit Resubmission for the KIWWTP hydraulic rerate 	As soon as possible	December 2020 <i>* Timing required to design flow metering program</i>
Preliminary: <ul style="list-style-type: none"> ■ Preliminary Treatment Alternatives Evaluation –Resolve concepts with preliminary regulatory and engineering evaluation so signatories can review impacts to inter-municipal agreements, cost-sharing, etc. 	As soon as possible	September 2021 <i>* Timing required to have inputs available for flow modeling work</i>
Flow Monitoring & Model Calibration: <ul style="list-style-type: none"> ■ Flow Monitoring ■ Rainfall Monitoring ■ RDII Characterization ■ KISS Model Calibration ■ Preliminary modeling of alternatives ■ Update treatment alternatives analysis 	January 2021	June 2022
Trexlerstown Special Planning Study: <ul style="list-style-type: none"> ■ Develop Alternatives ■ Select Alternative ■ Pre-Planning Meeting with PADEP ■ Develop Special Planning Study ■ Submit Special Planning Study ■ Prepare Part II Permit Application 	January 2021	January 2023

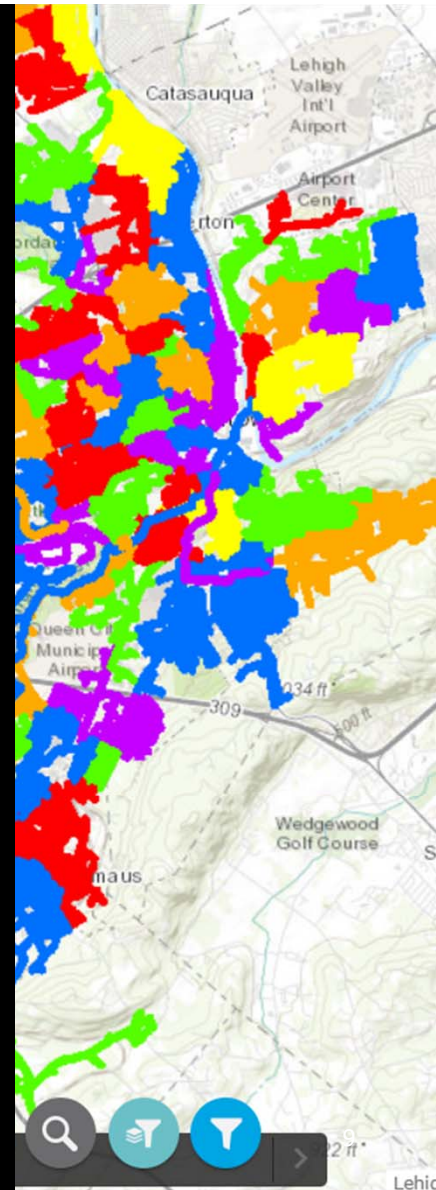
Interim Act 537 Plan: Work Schedule

Administrative Issues: <ul style="list-style-type: none"> ■ Inter-Municipal Agreements ■ Discuss Regional Approach ■ Develop Cost Sharing Agreement 	September 2021	June 2024
Alternatives Analysis: <ul style="list-style-type: none"> ■ KIWWTP vs. Pretreatment Plant ■ Storage vs. conveyance/pumping alternatives ■ Peak flow capacity alternatives ■ I&I removal impacts on alternatives ■ Preliminary cost estimates 	June 2022	June 2023
Selection of Preferred Alternative: <ul style="list-style-type: none"> ■ Detailed cost estimates ■ Address impact to inter-municipal agreements ■ Develop implementation schedule ■ Stakeholder input 	June 2023	June 2024
Act 537 Plan Development (Write the plan)	June 2024	September 2024
Public Notice & Municipal Adoptions	September 2024	February 2025
Final Submission		March 2025

Work in Progress

- PTP Option Evaluation
 - Upgrade PTP to full treatment with new / separate discharge (vs. upgrading KIWWTP)
 - AECOM (project manager), Arcadis, Jacobs, Kleinfelder
 - AECOM Revenue Planning Tool
 - Preliminary results expected summer/fall 2021
- KISS Flow Characterization Study & Modeling
 - 105 sewage flow meters (32 permanent, 73 temporary)
 - 25 rain gauges (4 permanent, 21 temporary)
 - Monitoring period – March - October 2021
 - System modeling – to be completed by June 2022
- KIWWTP Hydraulic Re-rate
 - DEP permit submitted in January 2021 (awaiting feedback / decision)

KISS GIS App



Work in Progress

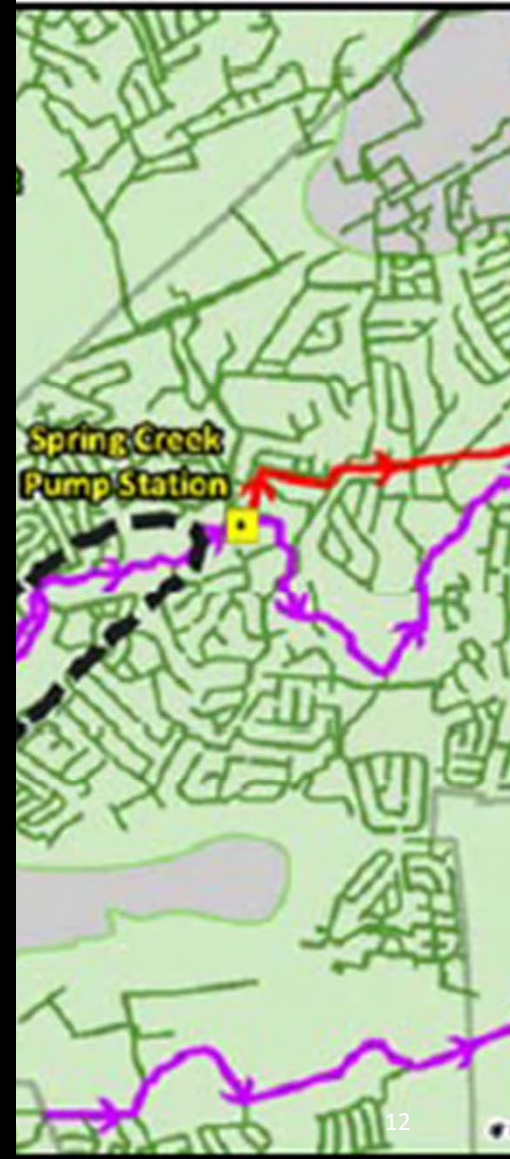
- I&I Reduction Efforts
 - Each municipality provides quarterly updates
 - LCA-City collaboration on I&I projects in City system
- Administrative Processes to Support Regional Collaboration
 - Monthly KISS meetings (18 held since January 2020)
 - 537 Steering Committee meetings (6 held since January 2021)
 - Moved to Zoom or Teams platform in March 2020 due to COVID-19
 - DEP quarterly reports (5 submitted since January 2020)
- Long-Term Act 537 Plan – Alternatives Analysis
 - Schedule: June 2022 – June 2024
 - Build upon prior work:
 - PTP Options Analysis
 - Flow Characterization Study & System Modeling
 - Measured I&I Reductions
 - KISS Municipality Flow Projections – 2025-2050

Questions/Comments?

Interim Act 537 Plan & Work in Progress

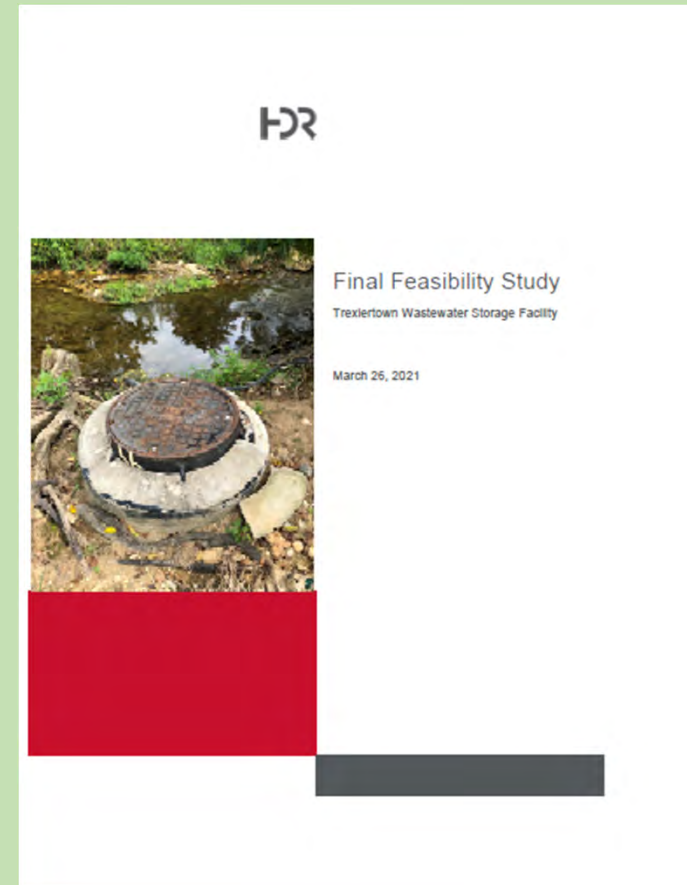
Trexlerstown “Bottleneck” Issue

- 2-mile flat stretch of interceptor (downstream of PTP to Spring Creek Pump Station)
- Manhole overflow issues during significant rain events



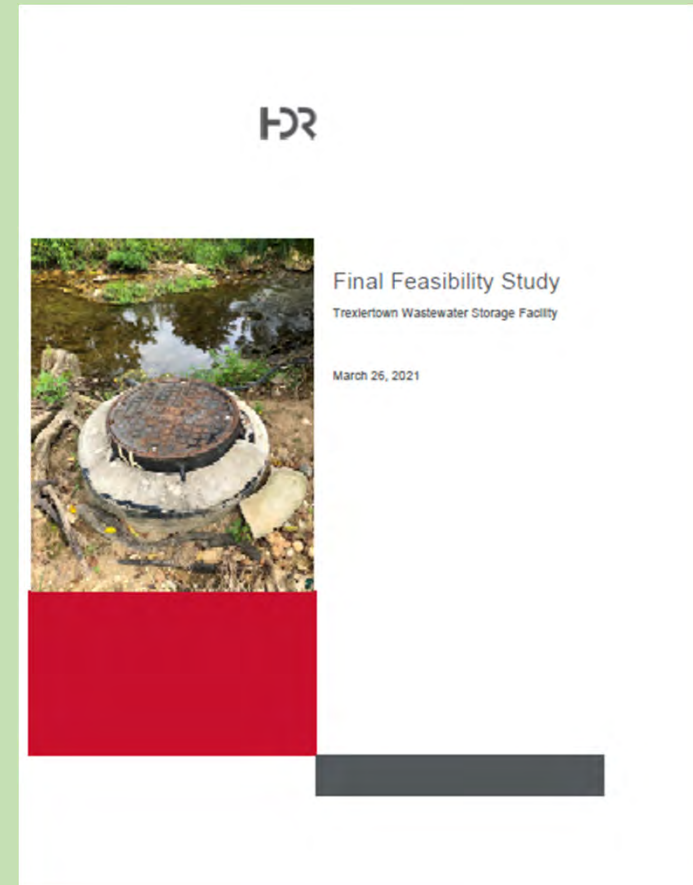
Trexlerstown “Bottleneck” Option 1

- **Parallel interceptor option → modeled by Arcadis and evaluated by HDR**
- **Summary:**
 - Parallel interceptor must extend to Spring Creek Pump Station to eliminate dry day overflows
 - Requires increase of pumping capacity at Spring Creek
 - Increases pressurized flows in downstream interceptors
 - 3-6 years to design/construct
 - \$25-30 Million
- **Conclusion:**
 - Additional study of downstream conditions required for this option to be feasible
 - Will add significant time and expense to project
 - Requires Act 537 planning & approvals



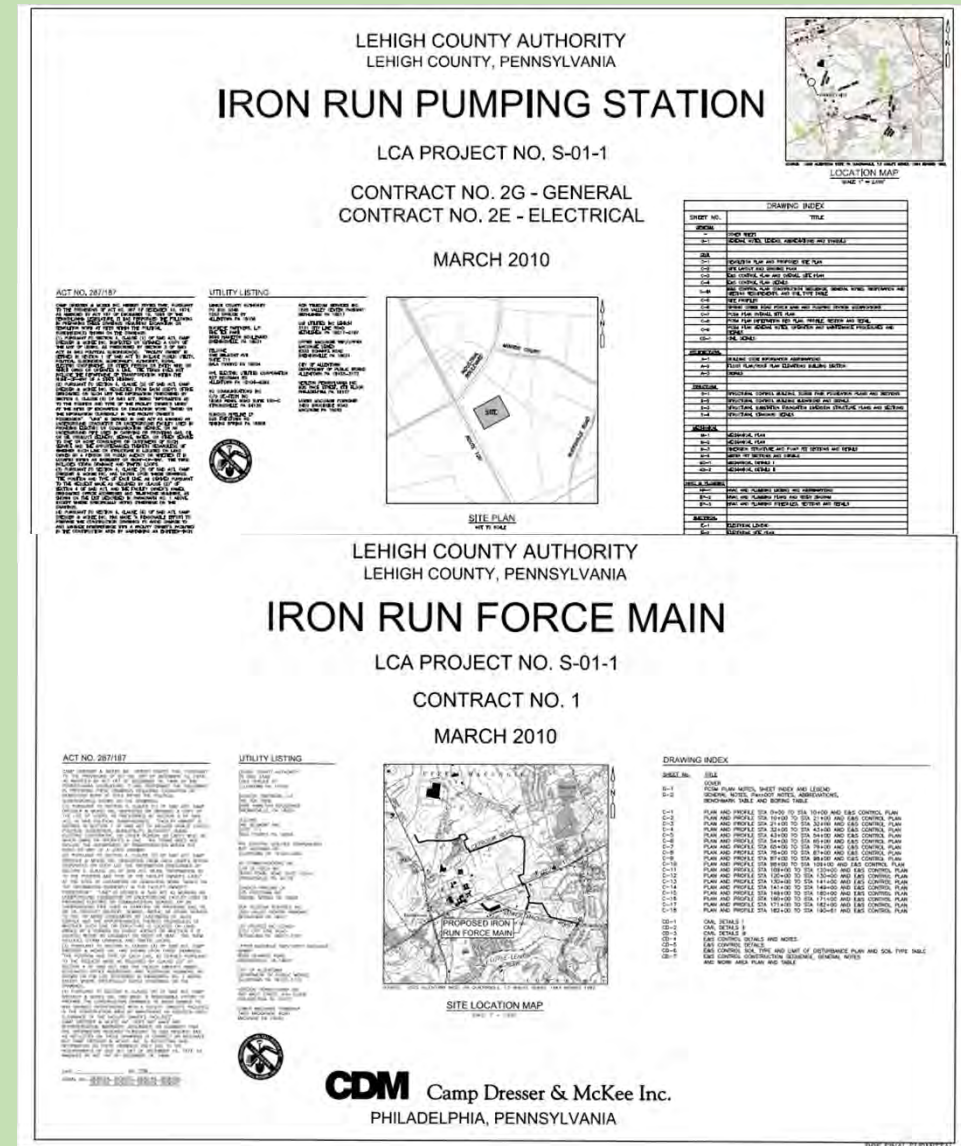
Trexlerstown “Bottleneck” Option 2

- **Underground storage option → modeled by Arcadis and evaluated by HDR**
- **Summary:**
 - Storage cannot be emptied for extended periods due to full downstream interceptors
 - Requires additional downstream interceptor and Spring Creek Pump Station upgrades
- **Conclusion:**
 - Option provides minimal improvement in system performance
 - Discard with no additional study

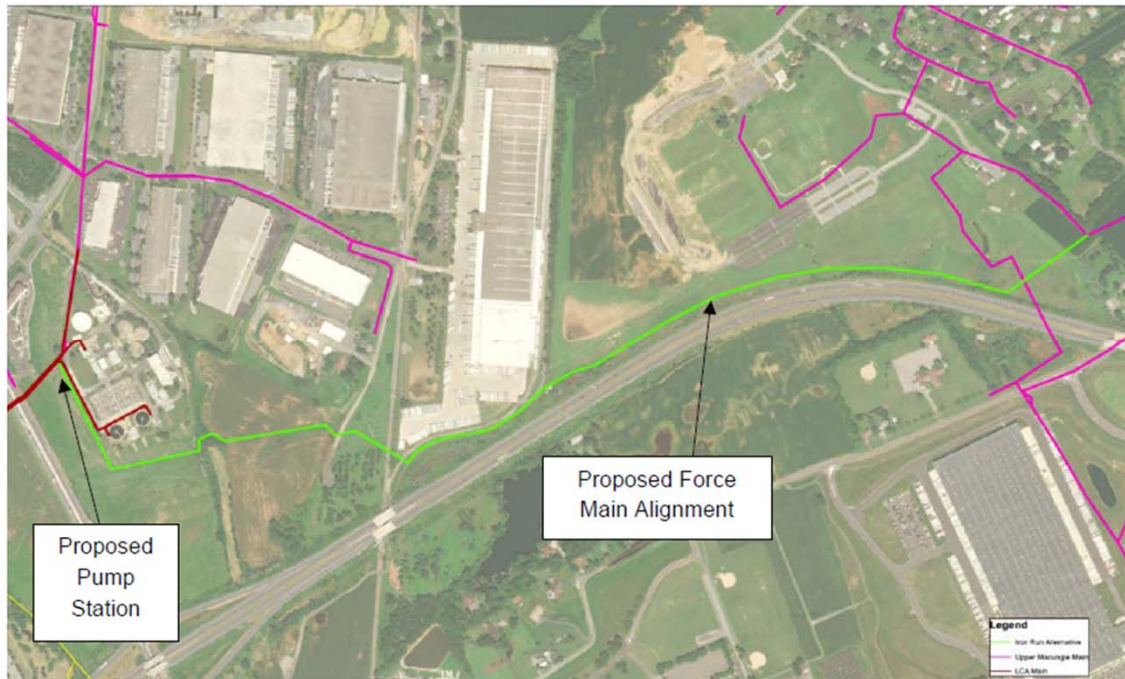


Trexlerstown “Bottleneck” Option 3

- Re-evaluate Iron Run Pump Station concept
→ 2010 preliminary design by CDM
- **Summary:**
 - 5 MGD pump station at PTP to redirect flows to Spring Creek (bypass Trexlerstown bottleneck)
 - Requires additional downstream interceptor and Spring Creek Pump Station upgrades
 - \$20-25 Million
- **Conclusion:**
 - Original project concept not workable without downstream improvements
 - Evaluate smaller scale approach as interim solution

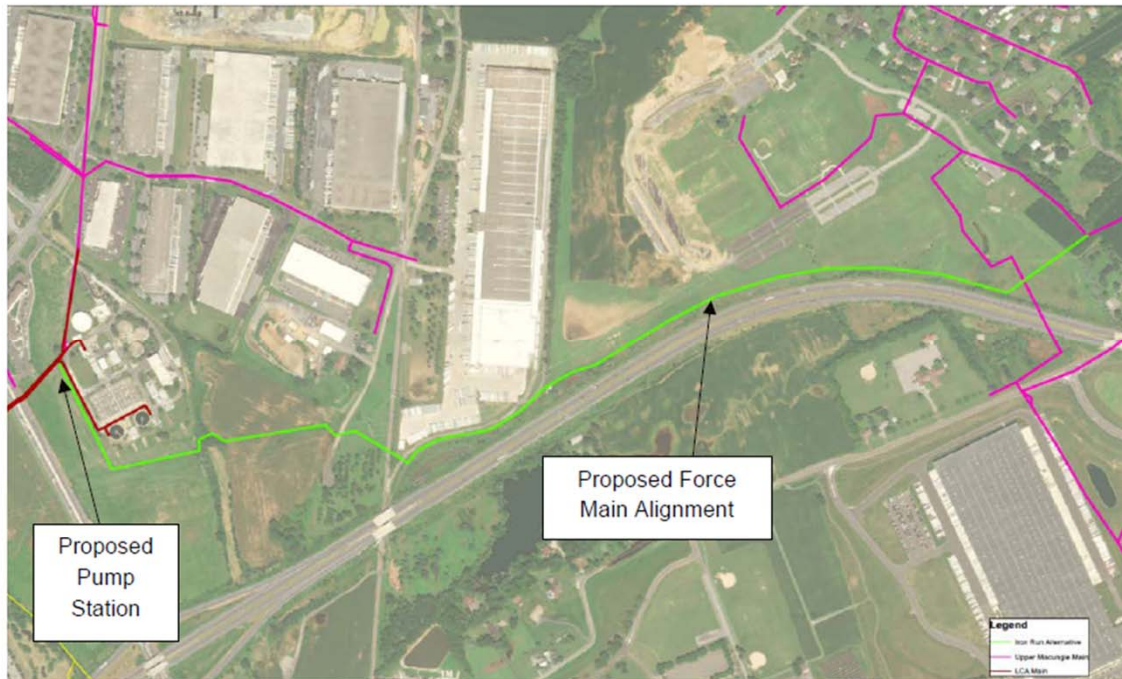


Trexkertown “Bottleneck” Interim Solution



- Construct a pump station at the PTP and a 1.5-mile force main to the existing Upper Macungie Interceptor
- Upper Macungie Interceptor flows to Spring Creek Pump Station by gravity
- Arcadis hydraulic model results:
 - 2.5 MGD pump station will relieve Trexlertown bottleneck
 - No overflows in Upper Macungie Interceptor (up to the 5-year storm)
 - Utilizes existing Spring Creek Pump Station capacity with no downstream impact
 - 94.5% reduction in predicted overflows

Trexlertown “Bottleneck” Interim Solution



- Easements previously acquired during design on original Iron Run Pump Station project
- 2-3 years to design and construct
- \$3-5 Million
- Requires Act 537 Special Study
- Considered an “interim” solution
 - Relieves Trexlertown “bottleneck”
 - Does not address downstream system capacity challenges that will be subject to full Act 537 review

Regional Long-Term Solution – Act 537 Plan

- Two Primary Options:
 1. Convert PTP to full treatment with a direct discharge to the Lehigh River:
 2. Construct parallel interceptors & pump stations with KIWWTP upgrades:
- Needs for Trexlertown area will be incorporated into alternatives analysis
- Long-term solution will be identified in the Act 537 Plan to be developed by 2025

Next Steps for 2021:

- Review Trexlertown “Bottleneck” Interim Solution concept with DEP
- Determine requirements for “Special Study”
- Move to permitting and preliminary design phase

Questions/Comments?

Trexlertown Upgrade Project