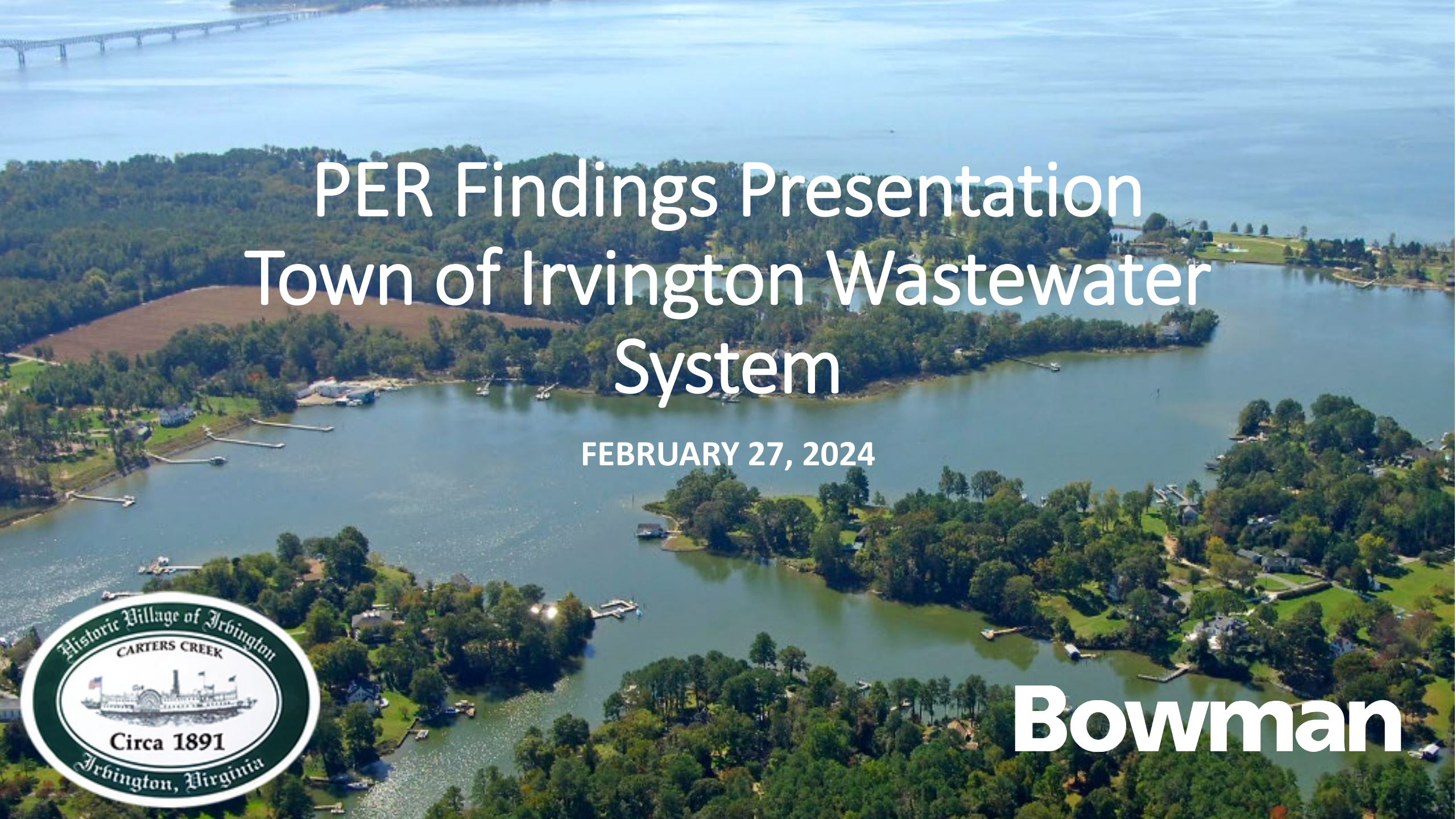

PER Findings Presentation Town of Irvington Wastewater System

FEBRUARY 27, 2024

Historic Village of Irvington
CARTERS CREEK
Circa 1891
Irvington, Virginia

Bowman

Agenda

- Call To Order
- Introduction
- Bowman Presentation of Preliminary Engineering Report (PER)
- Sewer Committee Presentation of Alternatives and Next Steps
- Public Questions and Comments

Irvington Sewer Committee

- Phil Robinson
- Jeremy Taylor
- Jackie Brown
- Albert Pollard, JR
- Tom Chapman

Sewer Committee Recommendations 5/22 updates in bold

A. Conventional and AOSS with clustered Decentralized Systems

- EPA endorses these systems as long term treatment alternatives
- Residents and Businesses continue to operate and maintain their systems
- New and replacement systems installed as needed
  - Conventional system replacement $8,000
  - Drain field replacement $4,500
  - **Engineered** AOSS replacement $30,000

B. Town Center collection system with treatment by Kilmarnock

- **1.35 mile low pressure force main down KC drive and out RT 200 to town limit with 1.25-mile to Kilmarnock connection at Compass.**
- **Assumes 22 resident, 10 light business connections, Tides, and ICN/King Carter Holdings and Vineyard Meadows.**
- Kilmarnock connection fee estimate $10,000 and home connection estimate $2,000 ????
- Best Guess Capital cost: **$3.5 million** ($2.4 million, range $2.3 to $3.2 million)

C. Complete Town collection system with treatment by Kilmarnock

- **Estimate 8 miles of low pressure force main through Town with 1.25 miles to Kilmarnock connection at Compass.**
- **165 Connections** (380 potential connections with assumed 266 actual connections)
- Kilmarnock connection fee **$5000 - $10,000** ($10,000 and home connection $2,000)
- Best Guess Capital cost**: $7.9 million, 40% of residents** ($7.5 million, range $7.2 to $9.8 million (70% of residents connect)

Interest in Central Sewer Service

Business:

- The Tides Inn:
  - Wants to get out of operating wastewater treatment plants
  - Shutting down their treatment plants will likely allow the central branch of Carters Creek to be closed to shellfish harvesting seasonally versus the current year-round.
- ICN/King Carter Holdings:
  - Considers central collection system important to development plans for business district
  - Considers central collection system important to development of Farm Road property
- Vineyard Meadows:
  - Considers central collection system important to future development

Residential:

- **Due to lack of maintenance, poor soil conditions a number of homeowners have had to replace their existing systems over the years sometimes** with advanced systems. **A number** still have issues in periods of heavy rain. 40% of residents in Survey expressed interest in connecting if cost was $12,000.

Preliminary Engineering Review Agenda

- Brief Overview of Project
- PER Findings and Observations
- Proposed Alternative
- Associated Costs

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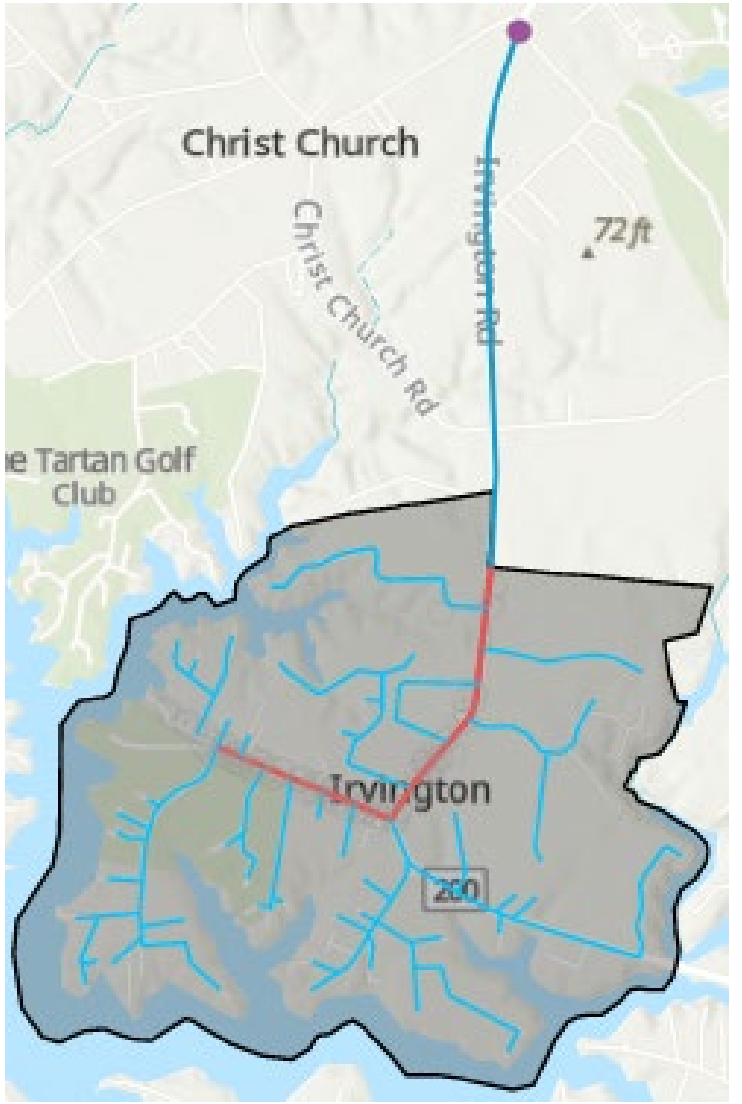
Project Overview

- The Town Council and Town's Sewer Committee has commissioned Bowman to develop a Preliminary Engineering Report (PER) for submittal to USDA regarding the proposed upgrades for the existing wastewater system.
- The PER details three alternatives and costs for wastewater collection and three alternatives and costs for wastewater treatment.

PER Treatment Alternatives - Refresher

- Construct WWTP – Surface Water Discharge
  - Highest Capital Cost: Purchasing Land with access to Carter's Creek
  - Town responsible for operation and maintenance
- Construct WWTP – AOSS with Drainfields (White Stone)
  - High Capital Cost: Purchasing Land with enough space and quality soil for Drainfields
  - Town responsible for operation and maintenance
- Existing Town of Kilmarnock WWTP
  - Requires a more robust collection system, otherwise no construction cost
  - Town responsible for paying connection fees to Town of Kilmarnock
  - Recommended Option



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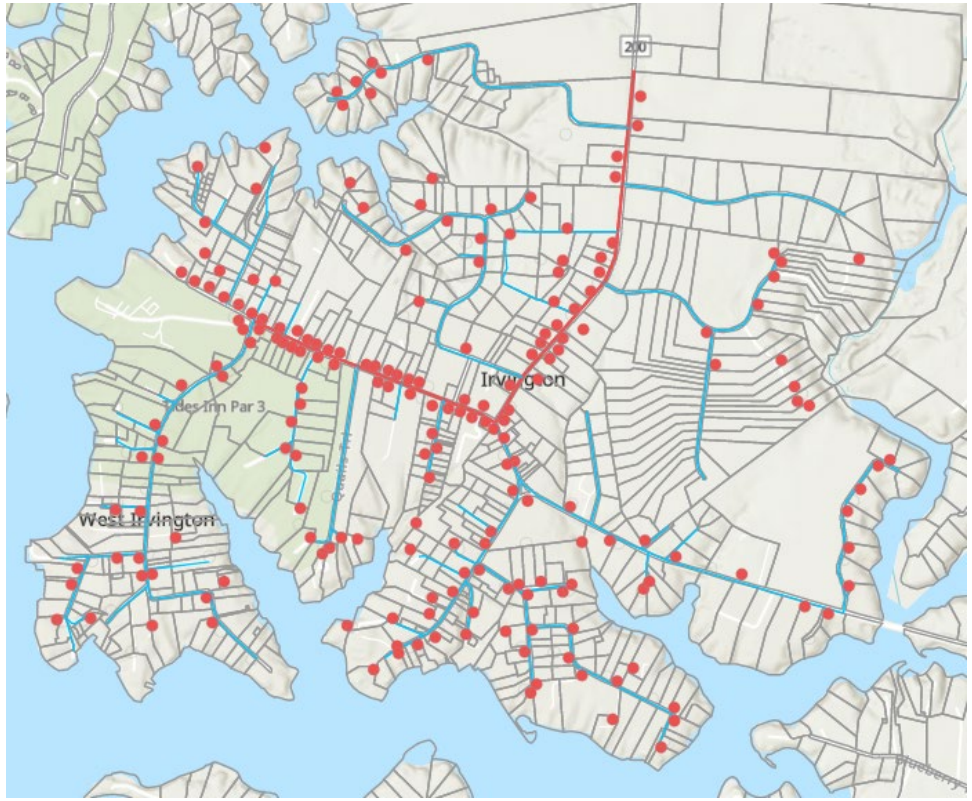
Selected Alternative – Connection to Kilmarnock System

- Kilmarnock's Existing Sewer Infrastructure
  - Collection System Extends into Lancaster County
  - Conventional Gravity Sewer and Pumping Stations Generally Used
  - Wastewater Treatment Facility
    - There is available capacity within their wastewater plant
- Lowest Cost Alternative
  - Connection to existing Treatment infrastructure in Kilmarnock
  - Low/Negligible Operation and Maintenance Costs
  - No discharge permitting for Surface Water Discharge
  - No Land Acquisition required for AOSS Systems

PER Conveyance Alternatives - Refresher

- Low Pressure Sewer (White Stone)
  - Network of Individual Grinder Stations – 1 installed at each system connection
  - No Centralized Pumping Station(s) required
  - Recommended Option
- Vacuum Sewer and Vacuum Station
  - Network of Vacuum Stations – 1 installed every 2 system connections
  - Centralized Vacuum Pump Station(s) required
- Conventional Gravity Sewer and Pumping Station
  - Network of Manholes and Gravity Sewer – Deeper excavations required
  - Centralized Pump Station(s) required



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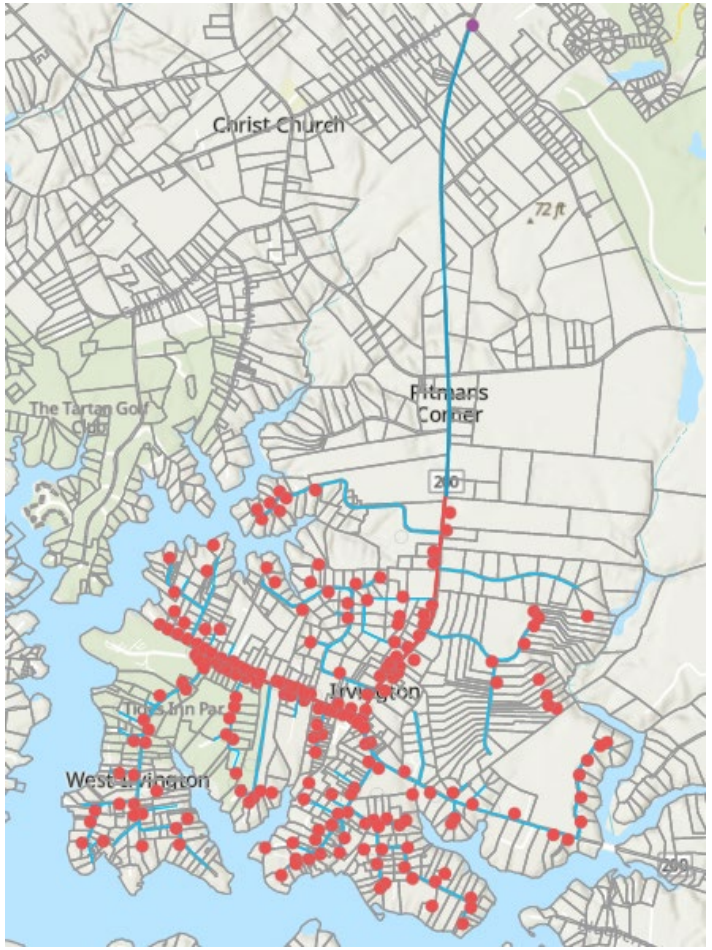
Selected Alternative – Low Pressure Sewer System

- Low Pressure Sewer System shall send wastewater to existing wastewater treatment plant in Town of Kilmarnock.
- System will run from Tides Inn to Compass Entertainment along “Town Center Line”
- Collection System Connections based on 40% connection rate from Town Survey
- Project will have phased approach: Phase 1 will build connections along “Town Center Line” and main line to Compass; Phase 2 will build remaining connections.



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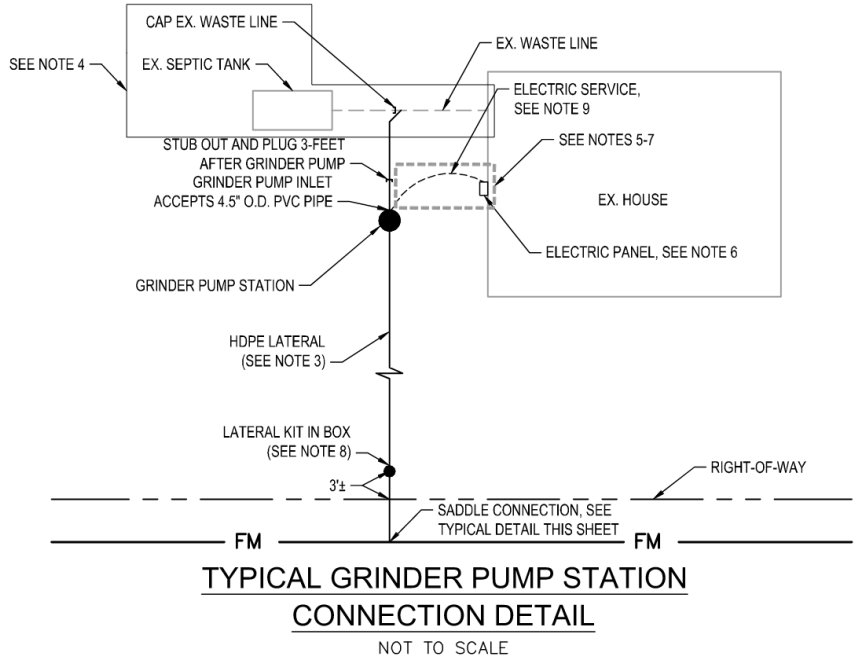
Low Pressure Sewer Alternative

- Individual Grinder Stations
  - ~11 gpm flow rates
  - Single Phase Electrical Connections
    - Powered from Home Supply
- Easy to Phase throughout Town
- Multiple options for Flow Requirements
- Lowest Cost and Most Effective Solution
  - Low Property Impact
  - Economy of Scale



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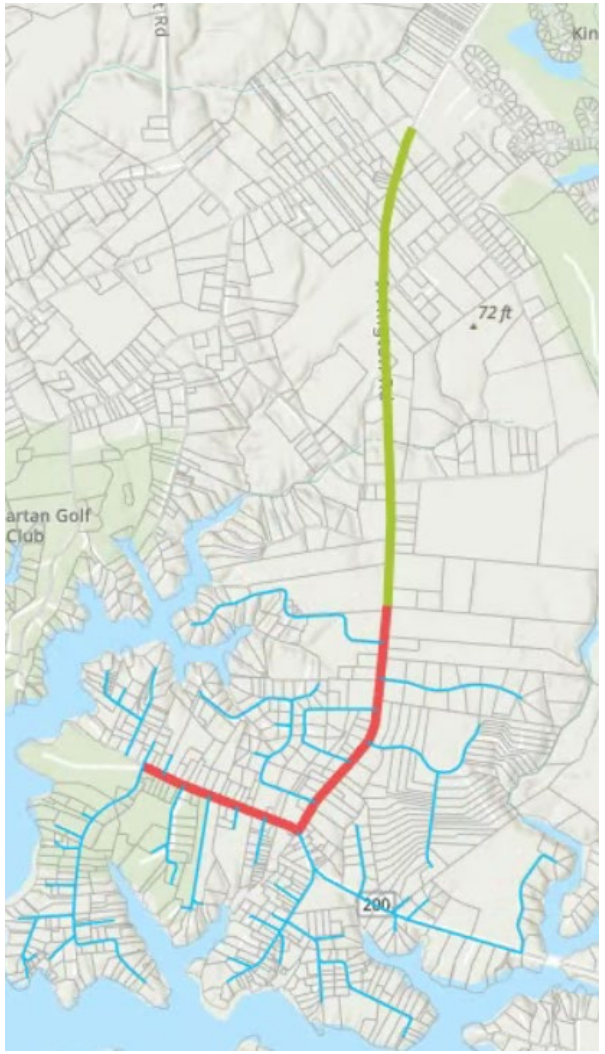
Associated Costs – Proposed Alternative Selected

Selected alternatives require costs for conveyance to Kilmarnock and connection fees to the Kilmarnock System.

No additional cost for land, treatment or other costs anticipated in alternatives selected.

- Total Phase 1 – Town Center Sewer Conveyance
  - Project Cost: $3,482,897
  - Includes infrastructure from Town Limits to Kilmarnock
- Total Phase 2 – Town Wide Sewer Conveyance
  - Project Cost: $4,389,858
  - Includes individual connections and pipe network throughout Irvington



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Total Phase 1 – Town Center Sewer Conveyance Cost Breakdown

TOWN OF IRVINGTON WASTEWATER SYSTEM				
Consolidated Cost Estimate - Proposed Project - Phase 1				
ITEM	**QUANTITY**	**UNITS**	**UNIT**	**ITEM**
DESCRIPTION			**COST**	**COST**
CONSTRUCTION COSTS				
Mobilization/Demobilization/Bonds/Permits (5%)	1	LS	$ 125,108	$ 125,108
Simplex - Residential Connections	22	EA	$ 8,250	$ 181,500
Simplex - Retail and Light Commercial Connections	8	EA	$ 8,250	$ 66,000
Simplex - Office Connections	2	EA	$ 8,250	$ 16,500
Duplex - Restaurant and Hotel Connections	5	EA	$ 18,000	$ 90,000
Duplex - School and Church Connections	2	EA	$ 18,000	$ 36,000
Quadplex - Tides Inn	2	EA	$ 37,500	$ 75,000
1.25" Lateral Piping (Simplex)	3,000	LF	$ 50	$ 150,000
1.5" Lateral Piping (Duplex and Quadplex)	1,150	LF	$ 55	$ 62,790
4" Force Main	7,700	LF	$ 70	$ 539,000
6" Force Main (From Town Limits to Kilmarnock)	6,520	LF	$ 100	$ 652,000
Traffic Control	1	LS	$ 273,000	$ 273,000
Road Crossings Crossings (Encased)	2	EA	$ 109,200	$ 218,400
Air/Vacuum Release Valve	10	EA	$ 6,825	$ 68,250
1.25" Ball Valve	1	EA	$ 1,365	$ 1,365
4" Gate Valve	30	EA	$ 2,048	$ 61,425
6" Gate Valve	4	EA	$ 2,730	$ 10,920
			Subtotal for Construction Cost:	**$ 2,627,258**
			15% Contingency:	**$ 394,089**
			Total Construction Cost Estimate:	**$ 3,021,346**
NON-CONSTRUCTION COSTS				
Engineering (Incl. Permits, Prelim. & Final Design)	1	LS	$ 80,236	$ 80,236
Topographic Survey	1	LS	$ 66,764	$ 66,764
Subsurface Utility Engineering (SUE) Survey	1	LS	$ 31,452	$ 31,452
Construction Adminstration Inc. Bidding Phase	1	LS	$ 63,000	$ 63,000
Resident Project Inspections	1	LS	$ 56,280	$ 56,280
Estimated Easement Acquisitions	1	LS	$ 7,350	$ 7,350
PER and Environmental Assessment & Amendments	1	LS	$ 96,879	$ 96,879
Out of Town Residential Connection Cost to Kilmarnock	1	LS	$ 201	$ 201
Out of Town Commercial Connection Cost to Kilmarnock	1	LS	$ 1,892	$ 1,892
Funding Assistance & Coordination	1	LS	$ 2,125	$ 2,125
Technical Assistance	1	LS	$ 6,040	$ 6,040
Legal Fees	1	LS	$ 10,313	$ 10,313
Interest	1	LS	$ 39,019	$ 39,019
			Total Non-Construction Cost:	**$ 461,550**
			Total Project Cost:	**$ 3,482,896**

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Total Phase 2 – Town Wide Sewer Conveyance

TOWN OF IRVINGTON WASTEWATER SYSTEM				
Consolidated Cost Estimate - Proposed Project - Phase 2				
ITEM DESCRIPTION	**QUANTITY**	**UNITS**	**UNIT COST**	**ITEM COST**
CONSTRUCTION COSTS				
Mobilization/Demobilization/Bonds/Permits (5%)	1	LS	$ 159,746	$ 159,746
Simplex - Residential Connections	131	EA	$ 8,250	$ 1,080,750
Simplex - Retail and Light Commercial Connections	3	EA	$ 8,250	$ 24,750
Simplex - Office Connections	23	EA	$ 8,250	$ 189,750
Duplex - Restaurant Connections	5	EA	$ 18,000	$ 90,000
Duplex - School and Church Connections	3	EA	$ 18,000	$ 54,000
1.25" Lateral Piping (Simplex)	19,000	LF	$ 50	$ 950,000
1.5" Lateral Piping (Duplex and Quadplex)	2,300	LF	$ 55	$ 125,580
4" Force Main	50	LF	$ 70	$ 3,500
6" Force Main	480	LF	$ 100	$ 48,000
Traffic Control	1	LS	$ 273,000	$ 273,000
Road Crossings Crossings (Encased)	1	EA	$ 109,200	$ 109,200
Air/Vacuum Release Valve	10	EA	$ 6,825	$ 68,250
1.25" Ball Valve	1	EA	$ 1,365	$ 1,365
4" Gate Valve	85	EA	$ 2,048	$ 174,038
6" Gate Valve	1	EA	$ 2,730	$ 2,730
			Subtotal for Construction Cost:	**$ 3,354,658**
			15% Contingency:	**$ 503,199**
			Total Construction Cost Estimate:	**$ 3,857,857**
NON-CONSTRUCTION COSTS				
Engineering (Incl. Permits, Prelim. & Final Design)	1	LS	$ 3,998	$ 3,998
Topographic Survey	1	LS	$ 183,602	$ 183,602
Subsurface Utility Engineering (SUE) Survey	1	LS	$ 31,452	$ 31,452
Construction Adminstration Inc. Bidding Phase	1	LS	$ 63,000	$ 63,000
Resident Project Inspections	1	LS	$ 56,280	$ 56,280
Estimated Easement Acquisitions	1	LS	$ 18,900	$ 18,900
Out of Town Residential Connection Cost to Kilmarnock	1	LS	$ 1,091	$ 1,091
Out of Town Commercial Connection Cost to Kilmarnock	1	LS	$ 1,189	$ 1,189
Funding Assistance & Coordination	1	LS	$ 6,375	$ 6,375
Technical Assistance	1	LS	$ 18,121	$ 18,121
Legal Fees	1	LS	$ 30,938	$ 30,938
Interest	1	LS	$ 117,056	$ 117,056
			Total Non-Construction Cost:	**$ 532,001**
			Total Project Cost:	**$ 4,389,858**

Bowman

Alternative A Cost Estimates

Clustered AOSS for Farm Road and ICN Downtown Development*	$300,000
Clustered AOSS for Vineyard Meadows*	$900,000
Tides Inn Creek Crossing to Weems*	$1,000,000
Resident New Homes and Repairs	$6,000 to $30,000
Preliminary estimates by Bowman, various assumptions *	

Bowman

Town Center Line – Minimizing Cost to Town

Town Center Sewer Line	**$3,493,000**
Removal of Out-of-Town Portion	$760,000
Net Cost	$2,733,000
Removal of Laterals and Grinders	$750,000
Net Cost	$1,983,000
Potential Private Capital Contributions*	$600,000
Net Cost	**$1,400,000**

Resident Connection Cost

Lateral Piping	$5,000
Grinder	$8,500
Power and Piping to Grinder	$1,500
Kilmarnock Connection Fee*	$5,000
Total	**$20,000**

*Kilmarnock out of town connection fee is currently $15,000

Next Steps

USDA Review	2/26/24 to 6/1/24*
TC-PC Workshop	3/12/24
Investigate Funding Alternatives *	3/15/24 to 7/1/224
Lancaster County Collaboration*	4/1/24 to 7/1/24
Kilmarnock Collaboration*	4/1/24 to 7/1/24
Public Private Collaboration*	3/15/24 to 7/1/24
Identify Residents and Business Connections	5/1/24-7/1/224
* All end dates are estimates	

Public Comments and Questions