Burke County



Water and Sewer System
Asset Inventory and Assessment

willis ENGINEERS

March 2026

System Goals

Housing infrastructure

Sanitary sewer and clean water access

Economic development

System Overview

- Total Water Customers: 2,175
  - Purchase from 7 sources
- Total Sewer Customers: 211
  - Treat at 2 sources

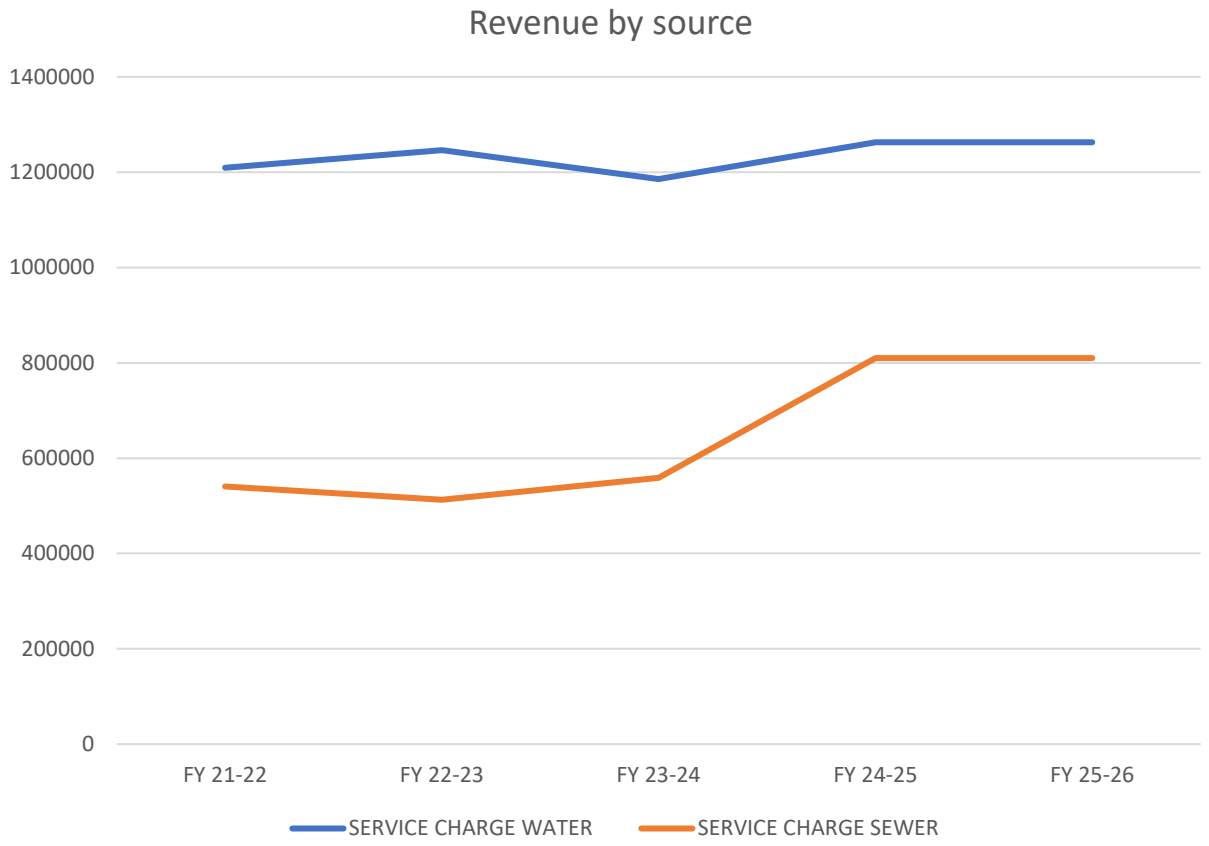
- System Challenges
  - Limited financial performance
  - High volume of pass-through customers
  - Deferred maintenance and repairs

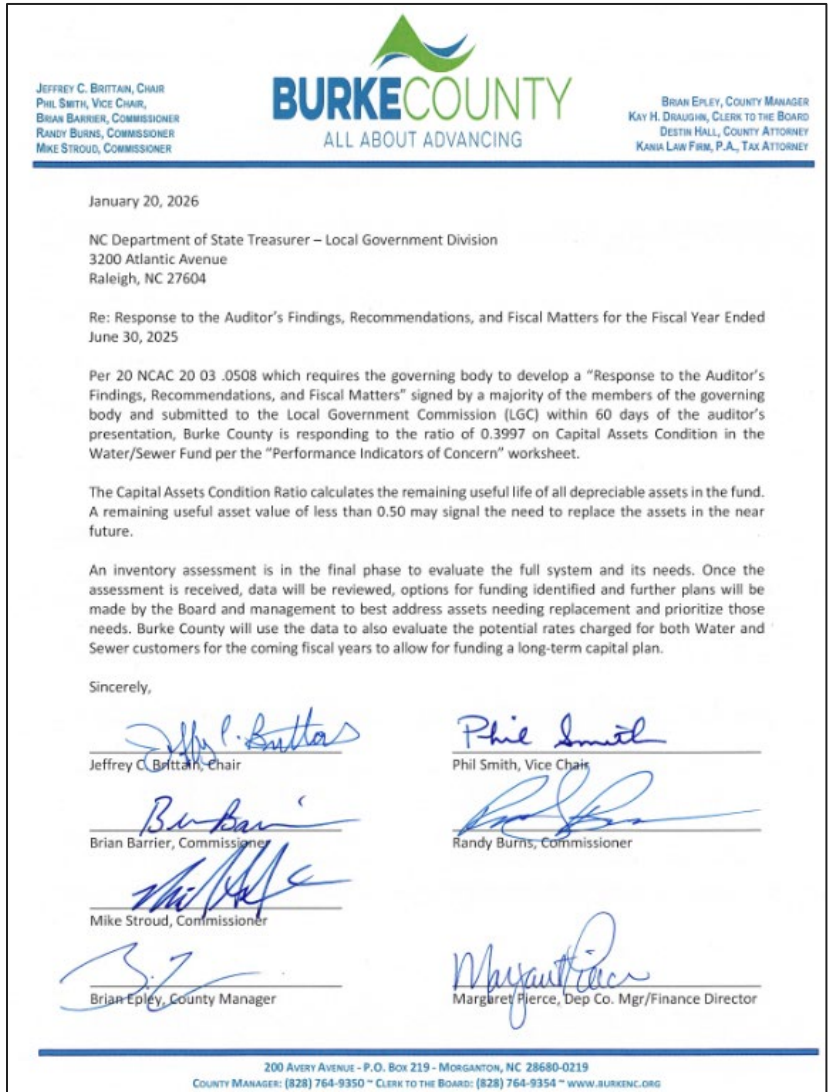
2022 Systemic Financial Losses

Enterprise Fund - An enterprise fund is a type of fund used in local government to account for activities that provide goods or services to the public for a fee that is meant to make the entity self-sustaining. It operates in a manner **similar to private business enterprise**, supported by user fees (consumption).

Water	Gallons Billed	# of Customers	Revenue Per customer	Revenue Per Month	Fixed Cost Per Month	Loss per Month
2020	$100,358,403.00	2,170	$564.52	$47.04	$65.57	$18.53
2021	$101,371,892.00	2,162	$566.60	$47.22	$62.40	$15.18
2022	$106,123,217.00	2,175	$572.87	$47.74	$63.36	$15.62
		6,507				
Sewer	Gallons Billed	# of Customers				
2020	$123,659,517.00	198	$3,409.09	$284.09	$375.60	$91.50
2021	$118,013,878.00	199	$3,391.96	$282.66	$365.03	$82.37
2022	$111,632,130.00	211	$3,199.05	$266.59	$363.13	$96.54
		608				

Minimal Operating Margin





Jeffrey C. Brittain, Chair
Phil Smith, Vice Chair,
Brian Barrier, Commissioner
Randy Burns, Commissioner
Mike Stroud, Commissioner

BURKECOUNTY
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Brian Epley, County Manager
Kay H. Draughn, Clerk to the Board
Destin Hall, County Attorney
Kania Law Firm, P.A., Tax Attorney

January 20, 2026

NC Department of State Treasurer – Local Government Division
3200 Atlantic Avenue
Raleigh, NC 27604

Re: Response to the Auditor's Findings, Recommendations, and Fiscal Matters for the Fiscal Year Ended June 30, 2025

Per 20 NCAC 20 03 .0508 which requires the governing body to develop a "Response to the Auditor's Findings, Recommendations, and Fiscal Matters" signed by a majority of the members of the governing body and submitted to the Local Government Commission (LGC) within 60 days of the auditor's presentation, Burke County is responding to the ratio of 0.3997 on Capital Assets Condition in the Water/Sewer Fund per the "Performance Indicators of Concern" worksheet.

The Capital Assets Condition Ratio calculates the remaining useful life of all depreciable assets in the fund. A remaining useful asset value of less than 0.50 may signal the need to replace the assets in the near future.

An inventory assessment is in the final phase to evaluate the full system and its needs. Once the assessment is received, data will be reviewed, options for funding identified and further plans will be made by the Board and management to best address assets needing replacement and prioritize those needs. Burke County will use the data to also evaluate the potential rates charged for both Water and Sewer customers for the coming fiscal years to allow for funding a long-term capital plan.

Sincerely,

Jeffrey C. Brittain, Chair
Phil Smith, Vice Chair
Brian Barrier, Commissioner
Randy Burns, Commissioner
Mike Stroud, Commissioner
Brian Epley, County Manager
Margaret Pierce, Dep Co. Mgr/Finance Director

200 Avery Avenue - P.O. Box 219 - Morganton, NC 28680-0219
County Manager: (828) 764-9350 ~ Clerk to the Board: (828) 764-9354 ~ www.burkenc.org

3 Phase System Evaluation Approach

Phase I – Pump Lift Station Replacement:

- Located in East Burke, the Indian Hills sewer pump station is subject to frequent stream flooding and experiences excessive peak flows.
- The pump station and force main need to be upgraded such that peak flows of up to 2,000 gpm can be handled.

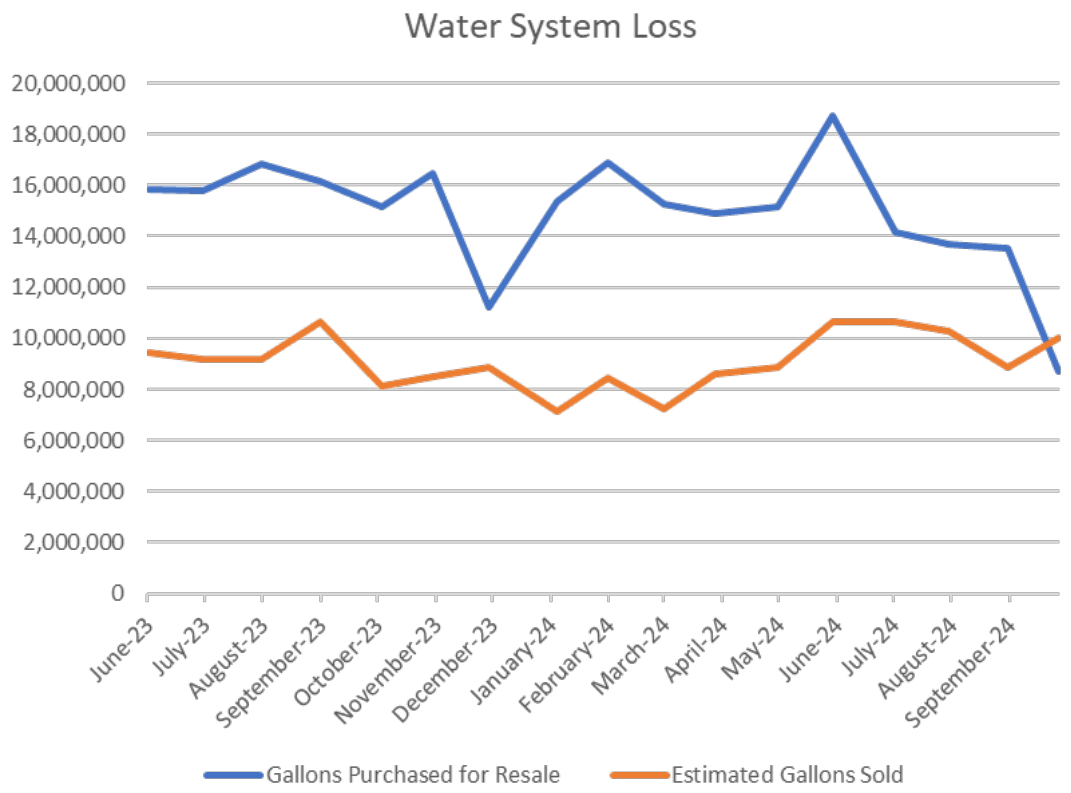
Phase II – Water & Sewer Asset Inventory Analysis (AIA):

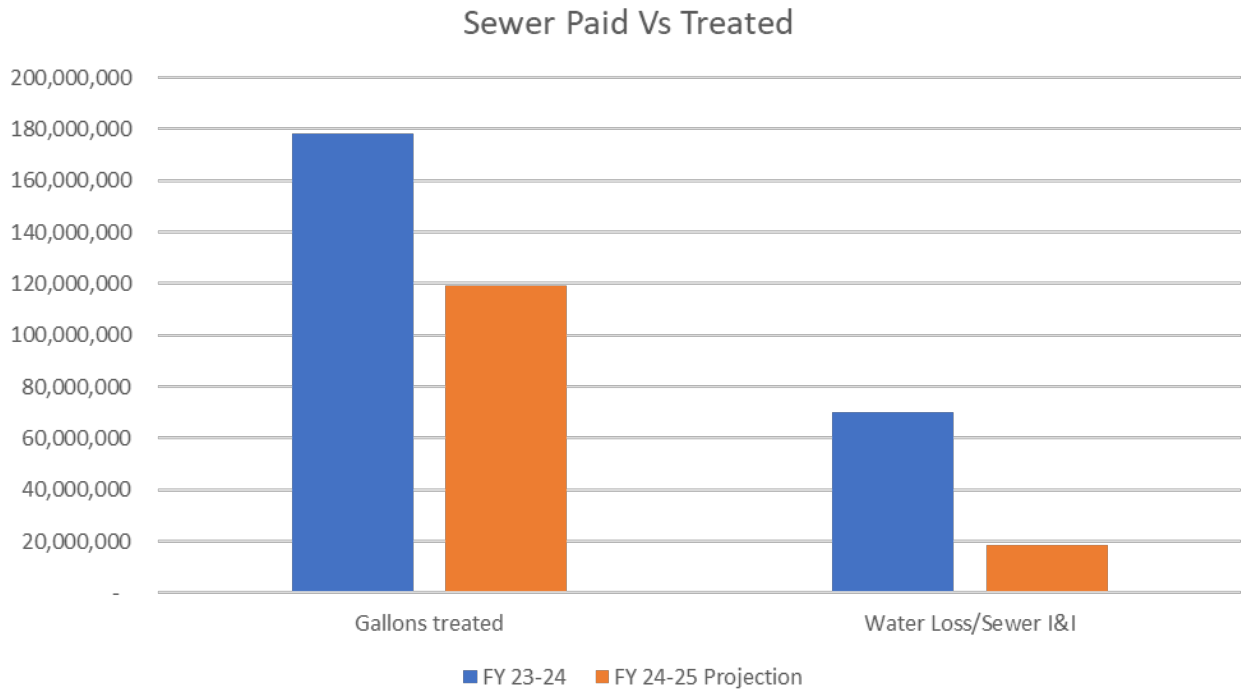
- Complete assessment of existing water and sewer infrastructure – including all force main and pump stations.
- Planning, design, and permitting for the proposed sewer projects.
- Infrastructure Mapping and GIS Layering Coordination
- Prioritized listing of needed improvements, repairs, and enhancements
- Probable Cost Analysis
- Review of existing system purchase contracts

Phase II – Water & Sewer Asset Inventory Analysis (AIA):

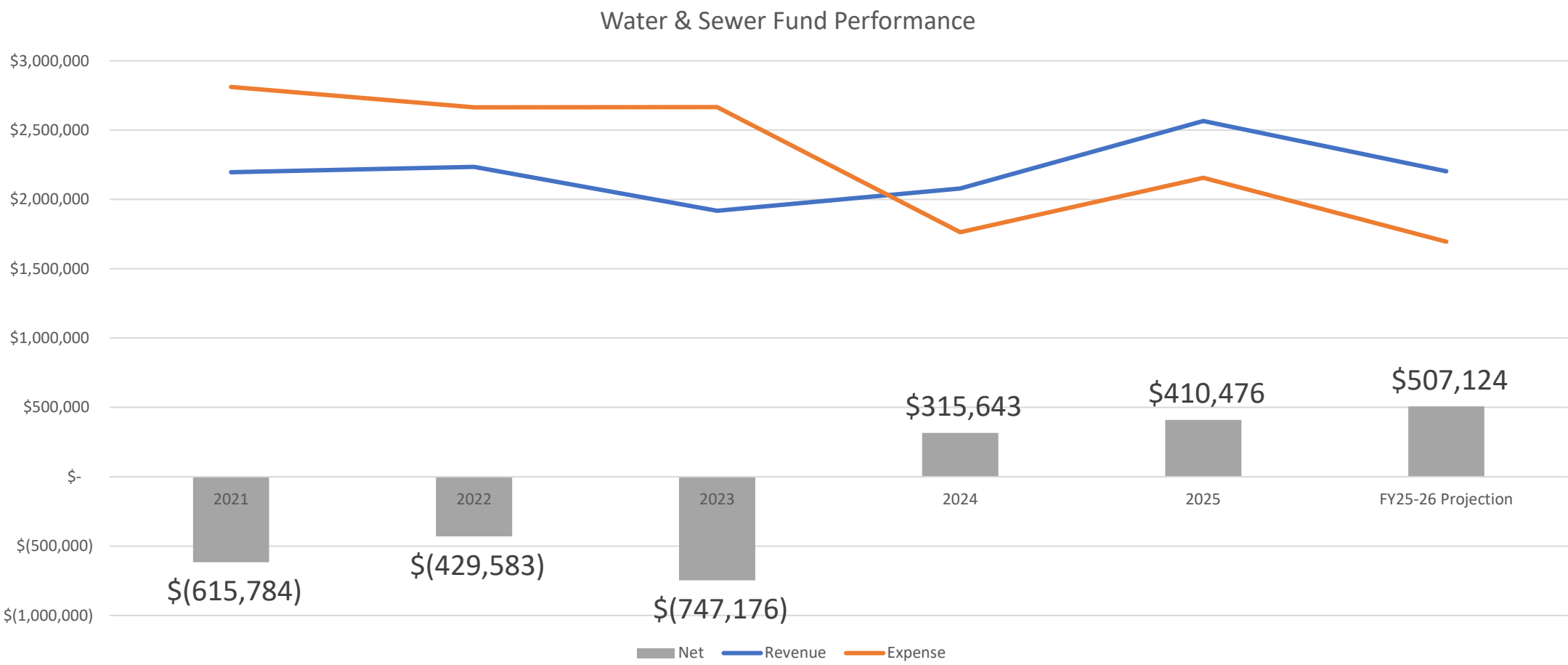
- Rate Stabilization Analysis
- Expansion, Acquisition, and/or Regionalization Metrics
- In Source / Outsource Evaluation

Water & Sewer


Water System Loss
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
June-23
July-23
August-23
September-23
October-23
November-23
December-23
January-24
February-24
March-24
April-24
May-24
June-24
July-24
August-24
September-24
Gallons Purchased for Resale
Estimated Gallons Sold


Sewer Paid Vs Treated
200,000,000
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
-
Gallons treated
Water Loss/Sewer I&I
FY 23-24
FY 24-25 Projection

Historical Fund Performance



Presentation Summary

Background

Project Overview

Asset Management Plan Framework

Water and Sewer Systems Overview

Findings

Next Steps

Background

About Willis Engineers

Why do Counties provide water and sewer service?

- No municipal service (no other option)
- Promote industrial development
- Allow higher residential density (affordable housing)

What is an Asset Inventory and why is the State funding it?

- Typically overlooked and underfunded
- NC DEQ priority in grant funding
- Burke Co. $500,000 direct appropriation in 2023 State budget

Definitions

Asset Inventory and Assessment (AIA) – Developing a tangible record of all system assets and their condition.

Capital Improvement Plan (CIP) – A guide for future capital projects that will be required to best serve your customers.

Asset Management Plan (AMP) – A tactical plan for managing infrastructure to minimize the total operation and maintenance costs while maintaining a desired level of service for your customers.

Project Overview

Began work in March 2024

Completed in December 2025

Final Deliverables

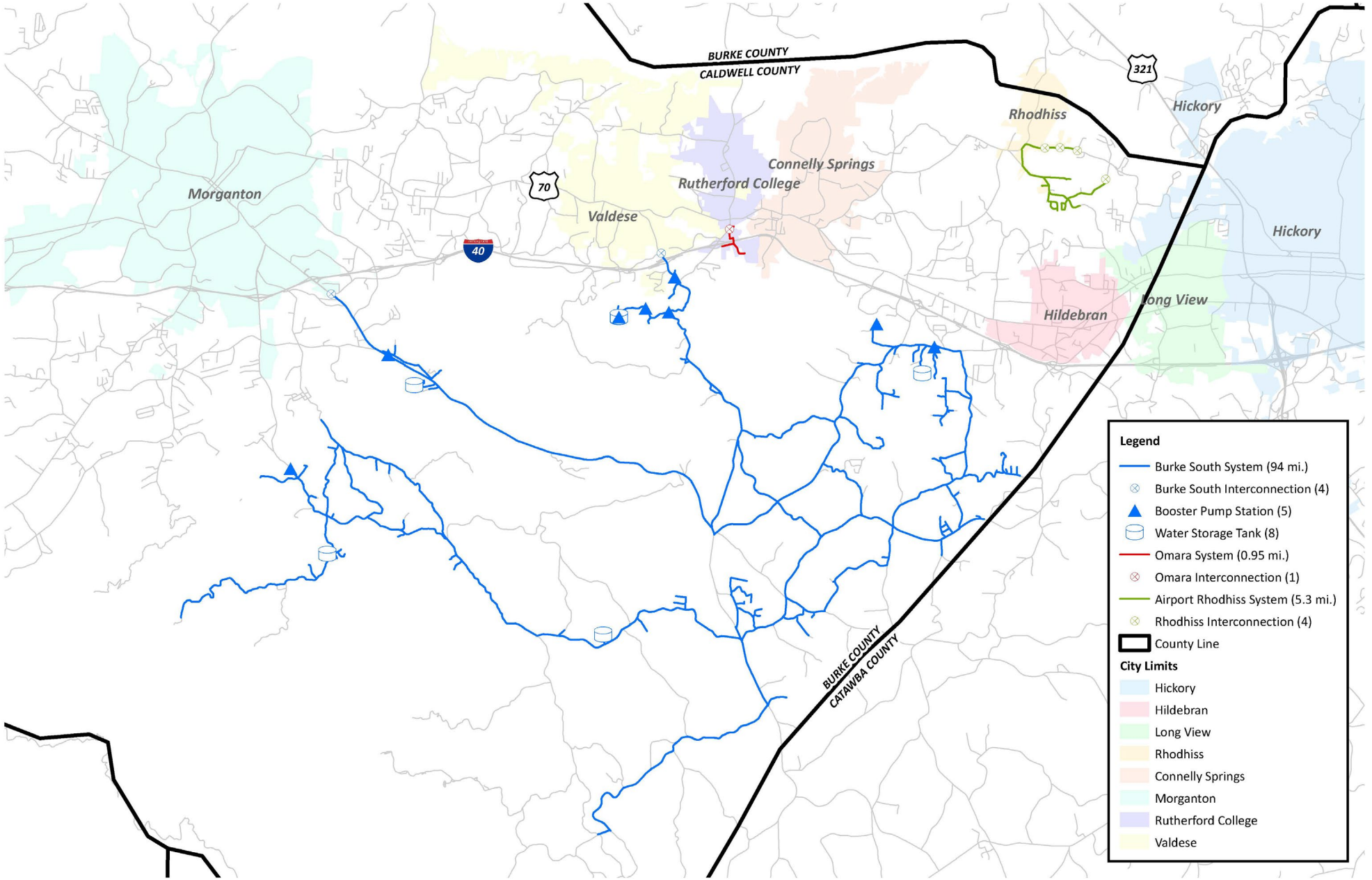
- Asset Management Plan Reports
- Maintenance Map Books
- GIS Shapefiles
- Field Program Data and Reports
- Wastewater Capacity Model

Asset Management Plan Framework

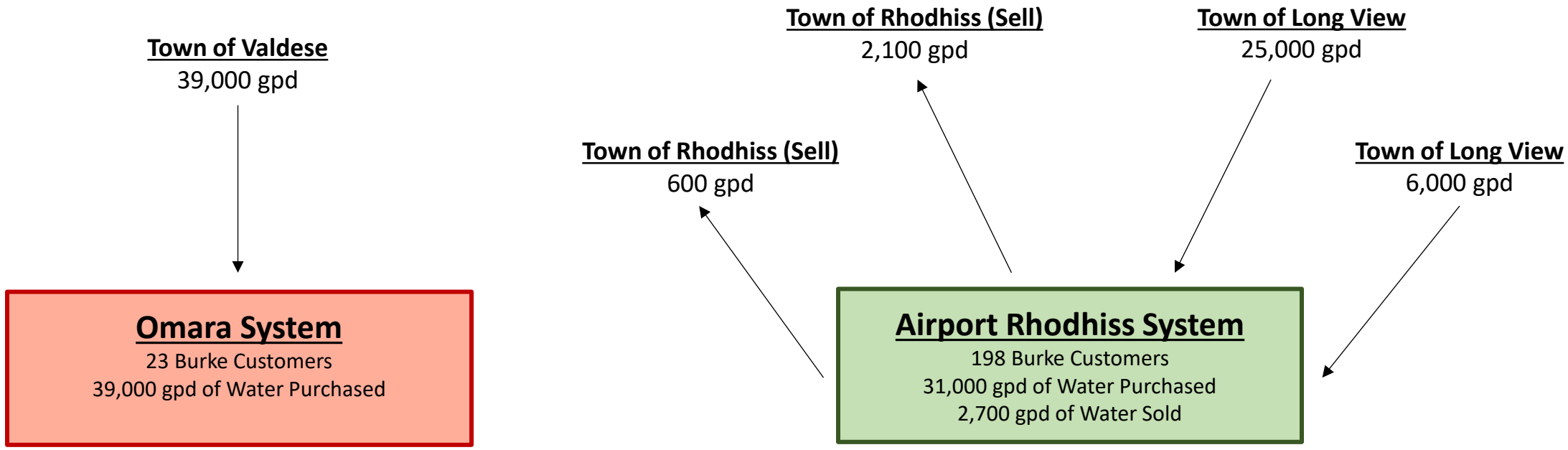


Water System Assets

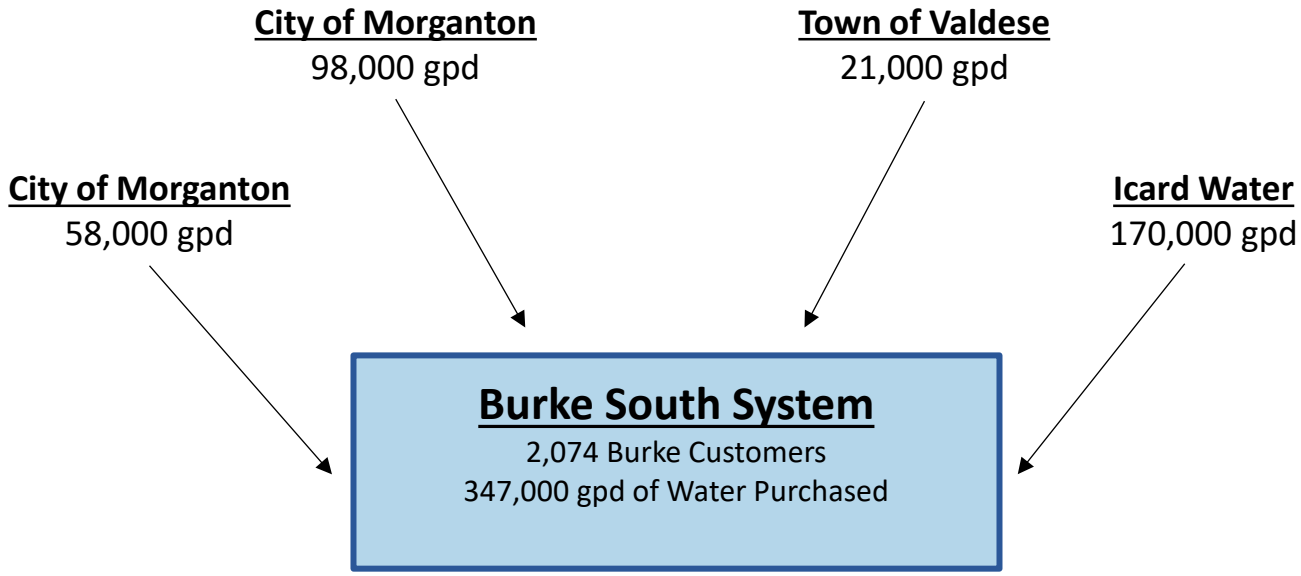
Asset	Summary
Customer Connections	2,342
Water Distribution Piping	103 miles
Valves	1,000
Fire Hydrants	386
Elevated Storage Tanks	5
Booster Pump Stations	8


BURKE COUNTY
CALDWELL COUNTY
321
Hickory
Rhodhiss
Connelly Springs
Rutherford College
70
Morganton
Valdese
40
Hickory
Hildebran
Long View
BURKE COUNTY
CATAWBA COUNTY
Legend
Burke South System (94 mi.)
Burke South Interconnection (4)
Booster Pump Station (5)
Water Storage Tank (8)
Omara System (0.95 mi.)
Omara Interconnection (1)
Airport Rhodhiss System (5.3 mi.)
Rhodhiss Interconnection (4)
County Line
City Limits
Hickory
Hildebran
Long View
Rhodhiss
Connelly Springs
Morganton
Rutherford College
Valdese

Omara & Airport Rhodhiss Water

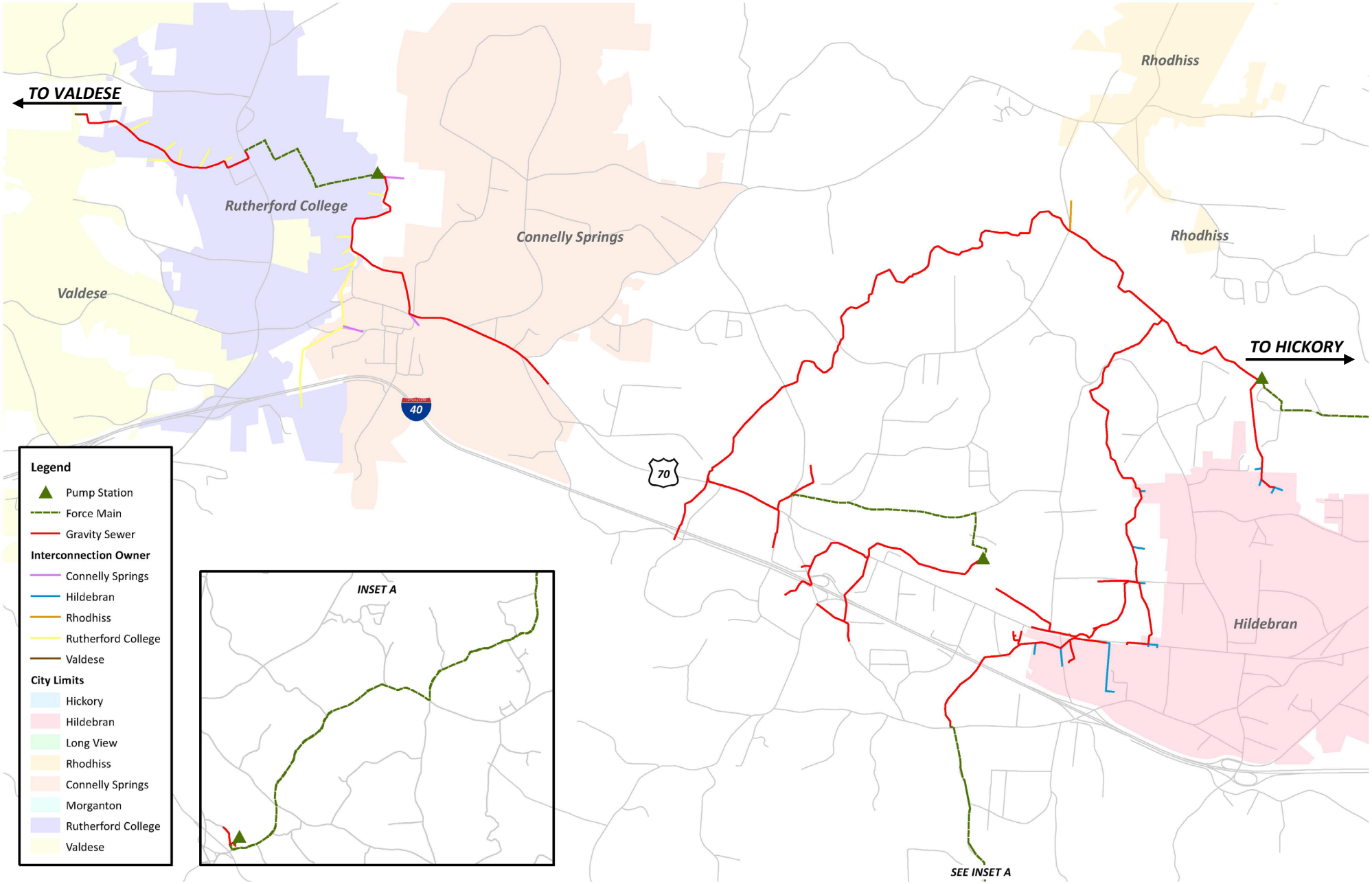


Burke South Water

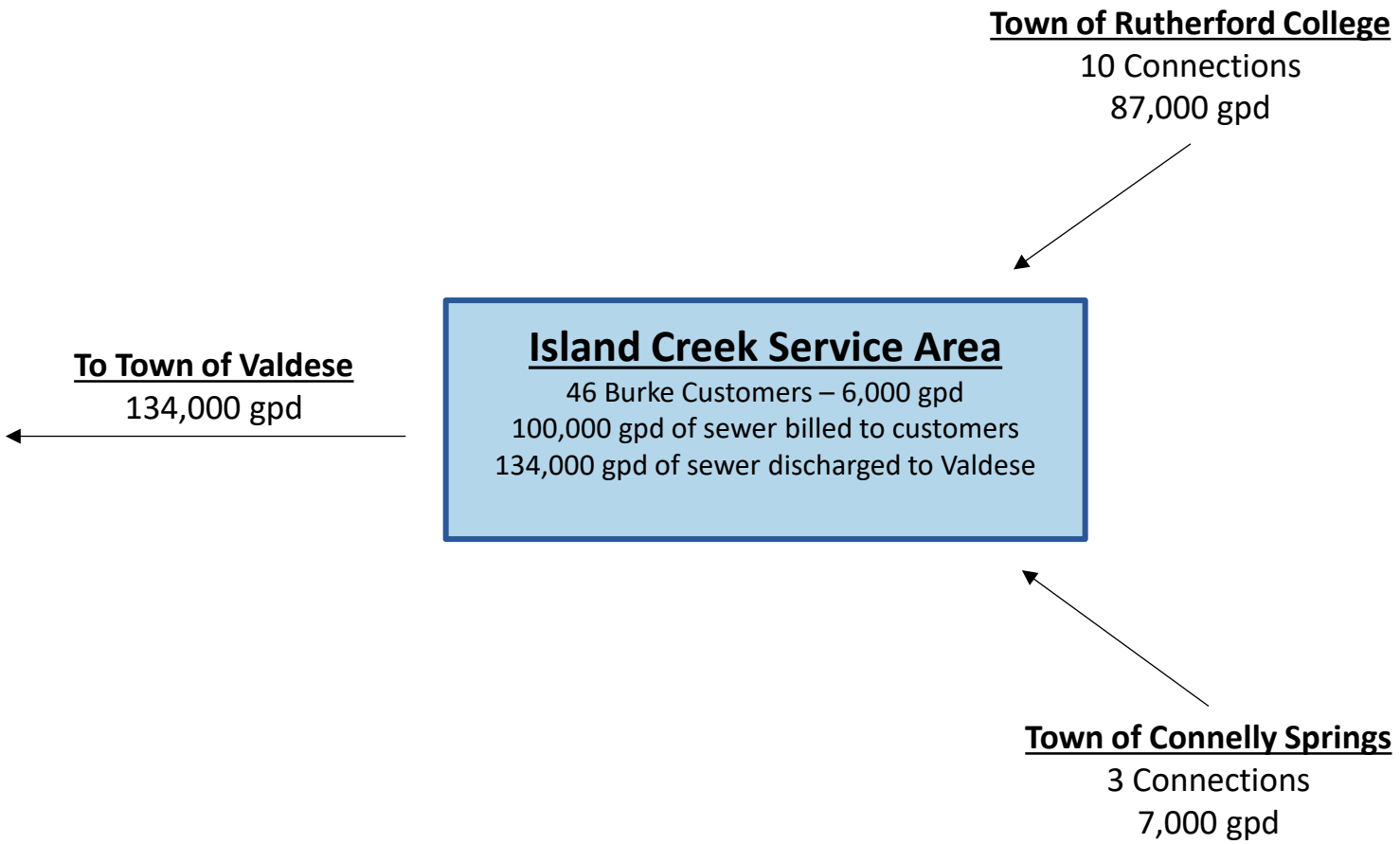


Sewer System Asset Summary

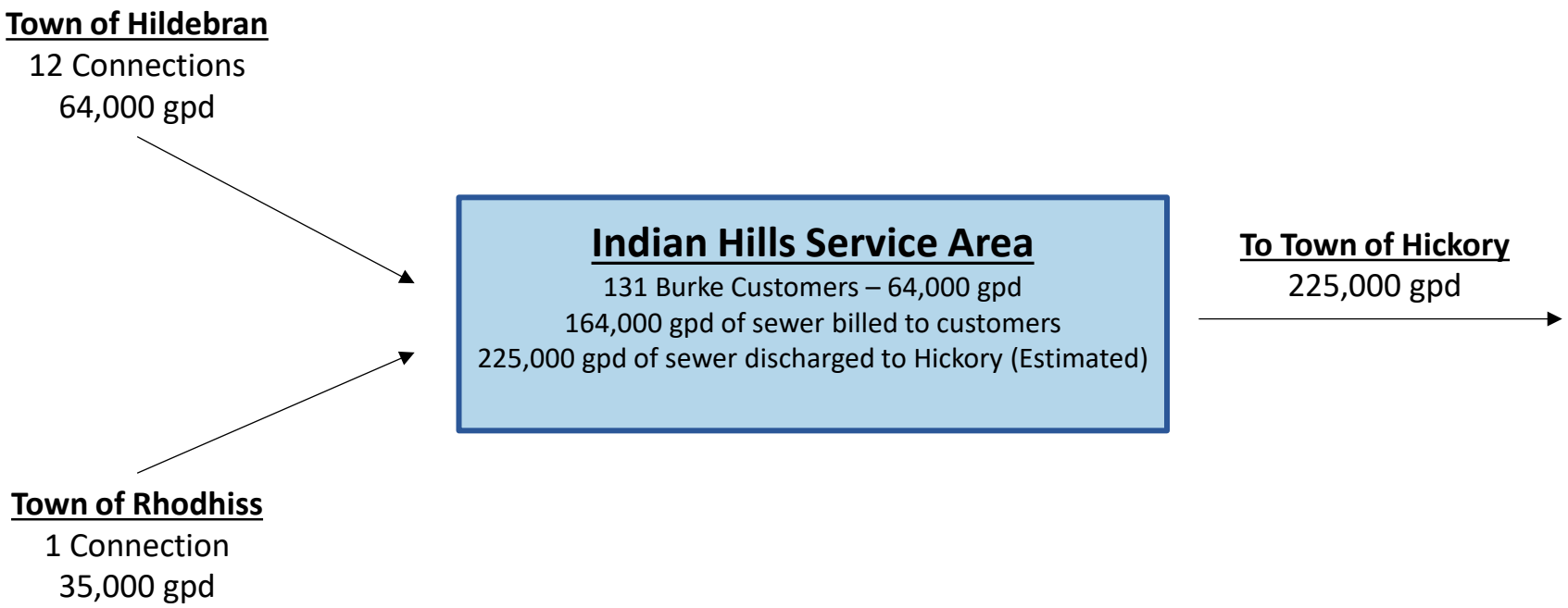
Asset	Summary
Customer Connections	185
Gravity Collection Sewer	19 miles
Manholes	429
Pump Stations	4
Force Main	12 miles
Air Relief Manhole	15


TO VALDESE
Rutherford College
Valdese
Connelly Springs
Rhodhiss
Rhodhiss
TO HICKORY
40
70
Hildebran
SEE INSET A
INSET A
Legend
Pump Station
Force Main
Gravity Sewer
Interconnection Owner
Connelly Springs
Hildebran
Rhodhiss
Rutherford College
Valdese
City Limits
Hickory
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Long View
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Rutherford College
Valdese

Island Creek Sewer



Indian Hills Sewer

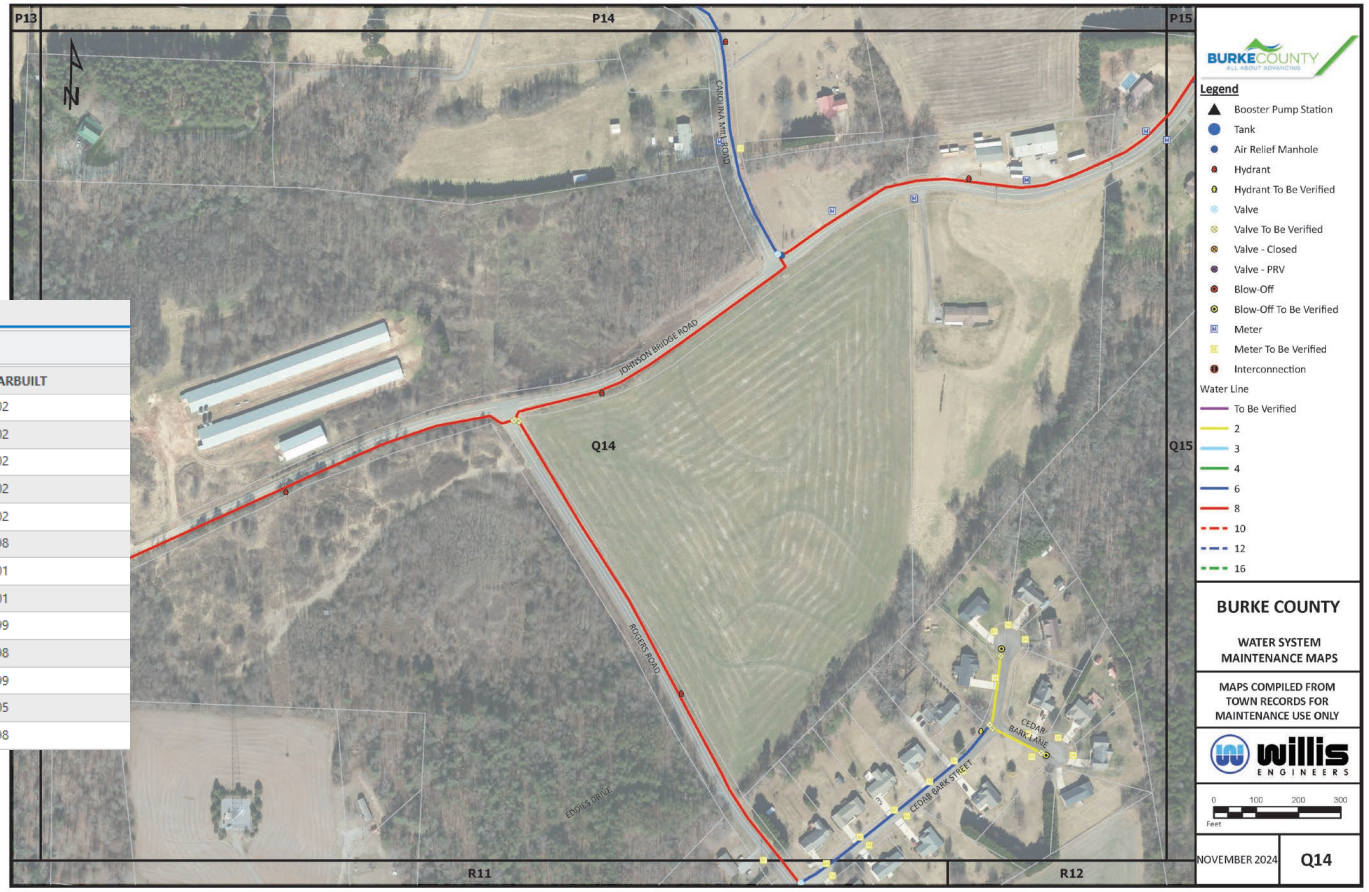


Maintenance Maps and GIS Database

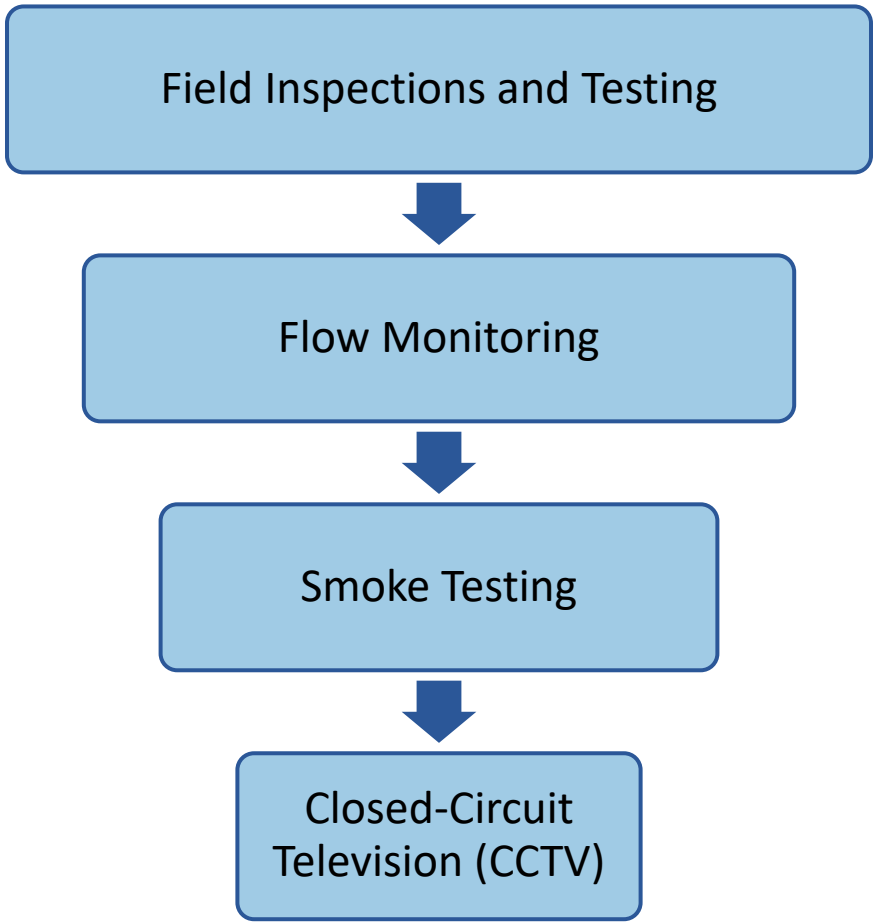
Water Line

Field: Add Calculate Selection: Select By Attributes Zoom To Switch Clear Delete Copy

	FID	Shape *	System	Length	Diameter	UPDATEDBY	Material	YEARBUILT
7	6	Polyline ZM	ENOLA	3817.253428	6	WE	PVC	2002
8	7	Polyline ZM	ENOLA	500.146707	2	WE	PVC	2002
9	8	Polyline ZM	ENOLA	1384.04557	6	WE	PVC	2002
10	9	Polyline ZM	ENOLA	638.982094	2	WE	PVC	2002
11	10	Polyline ZM	ENOLA	53009.891463	8	WE	PVC	2002
12	11	Polyline ZM	ENOLA	9406.737184	8	WE	PVC	1998
13	12	Polyline ZM	ENOLA	171.859717	2	WE	PVC	2001
14	13	Polyline ZM	ENOLA	783.106574	6	WE	PVC	2001
15	14	Polyline ZM	ENOLA	833.200498	6	WE	PVC	1999
16	15	Polyline ZM	ENOLA	921.259948	6	WE	PVC	1998
17	16	Polyline ZM	ENOLA	915.462697	6	WE	PVC	1999
18	17	Polyline ZM	ENOLA	762.226144	6	WE	PVC	2005
19	18	Polyline ZM	ENOLA	1814.914472	6	WE	PVC	1998



Field Investigations



Inspections and Testing

- Drawdown Testing
- Condition Assessment
  - Mechanical
  - Electrical
  - Structures
  - Site Safety (Access, Fencing, Locks, etc.)
  - Other Site Components





Flow Monitoring

- Flow Meters
- Level Monitors
- Rain Gauges

- Quantifies Flows
- Guides Subsequent Investigations
- Used in Model Calibration





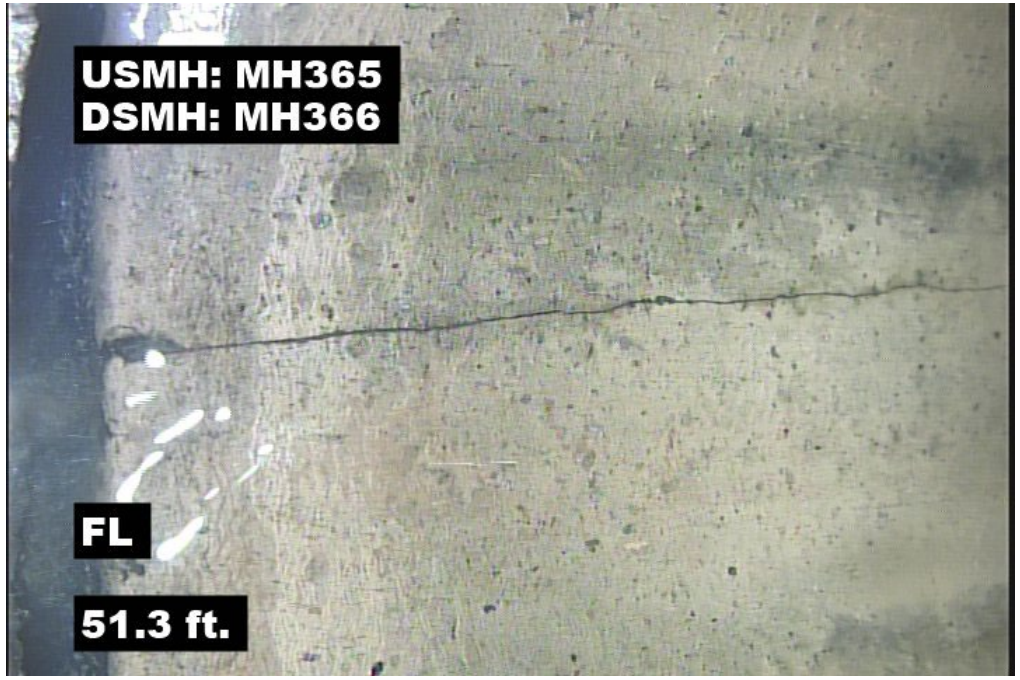
Smoke Testing

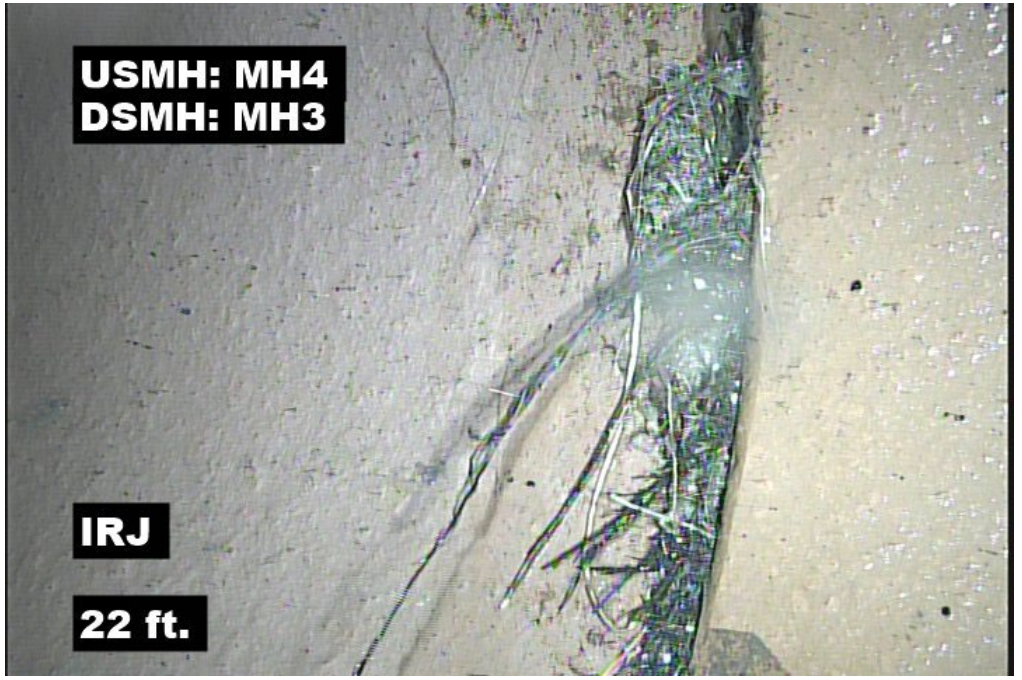
- Detects Manhole Leaks
- Defective Sewer Cleanouts
- Mainline Issues Including Cracks
- Sewer Lateral Deficiencies
- Storm Drainage Connections
- Unknown Connections





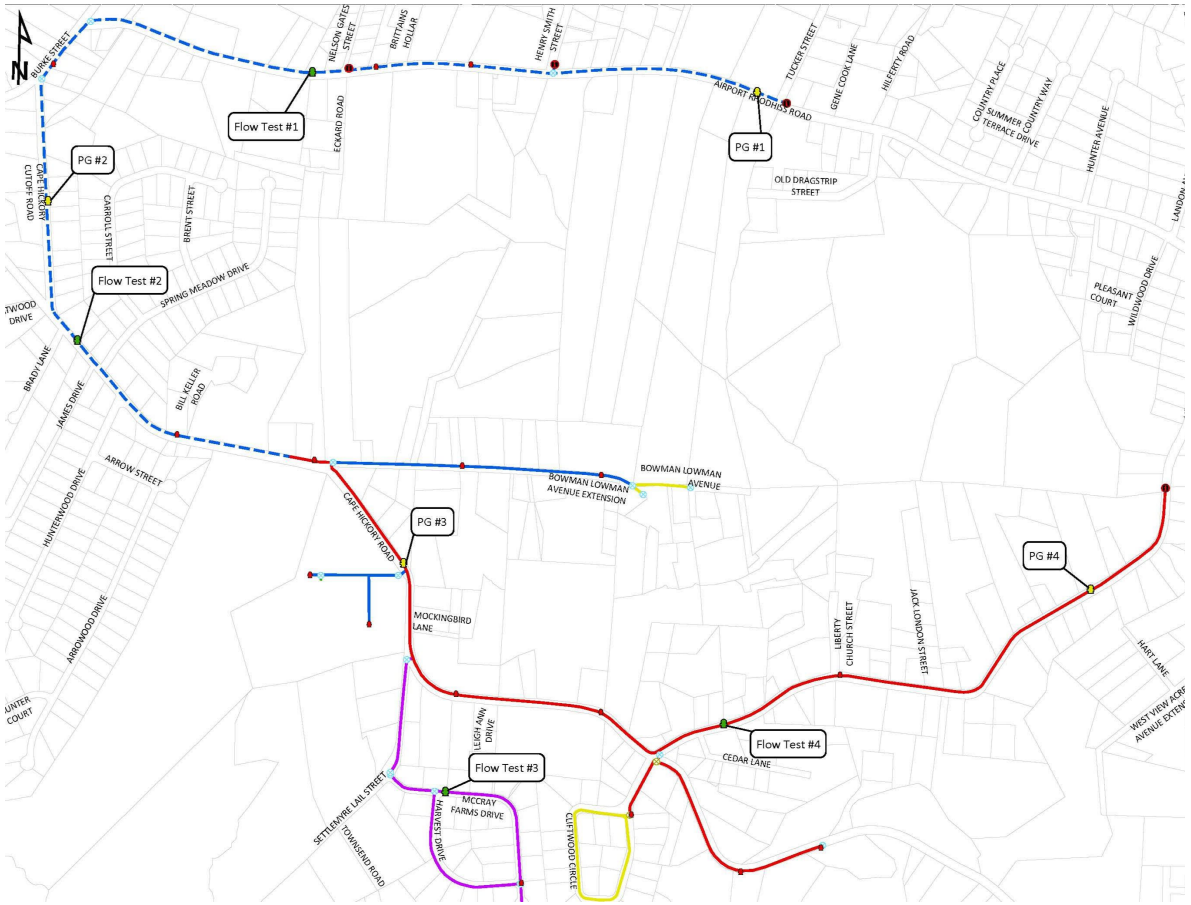
Closed-Circuit Television (CCTV)





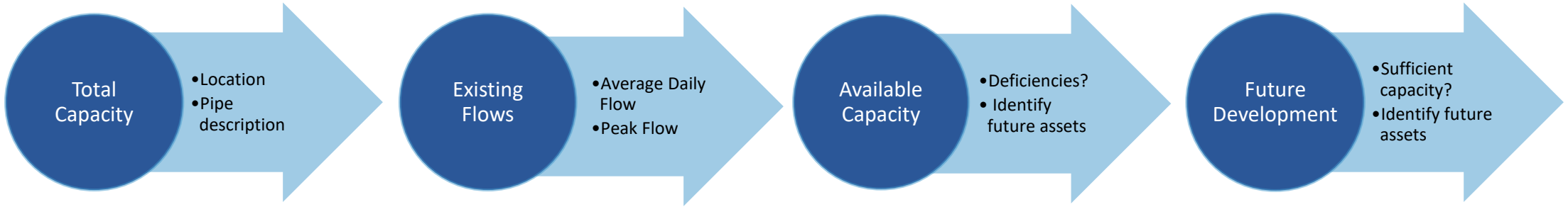
Water Distribution Model

- WaterGEMS Software
- Fire Hydrant Testing for Model Calibration
- Identify Potential Deficiencies
  - Normal Flow
  - Fire Flow
- Simulate Demand from Future Development



Sewer Collection Model

- Analyze Flow
- Calibrate Model
- Evaluate Potential Sources of Infiltration and Inflow
- Identify Deficiencies
- Simulate Future Development
- Assist in Development of Capacity Assurance Worksheets



Findings – Data Review

Field Program Findings

Excessive Unaccounted-for Water

Excessive Infiltration and Inflow

Disparities in Billing Rates

Wastewater Capacity Limitation

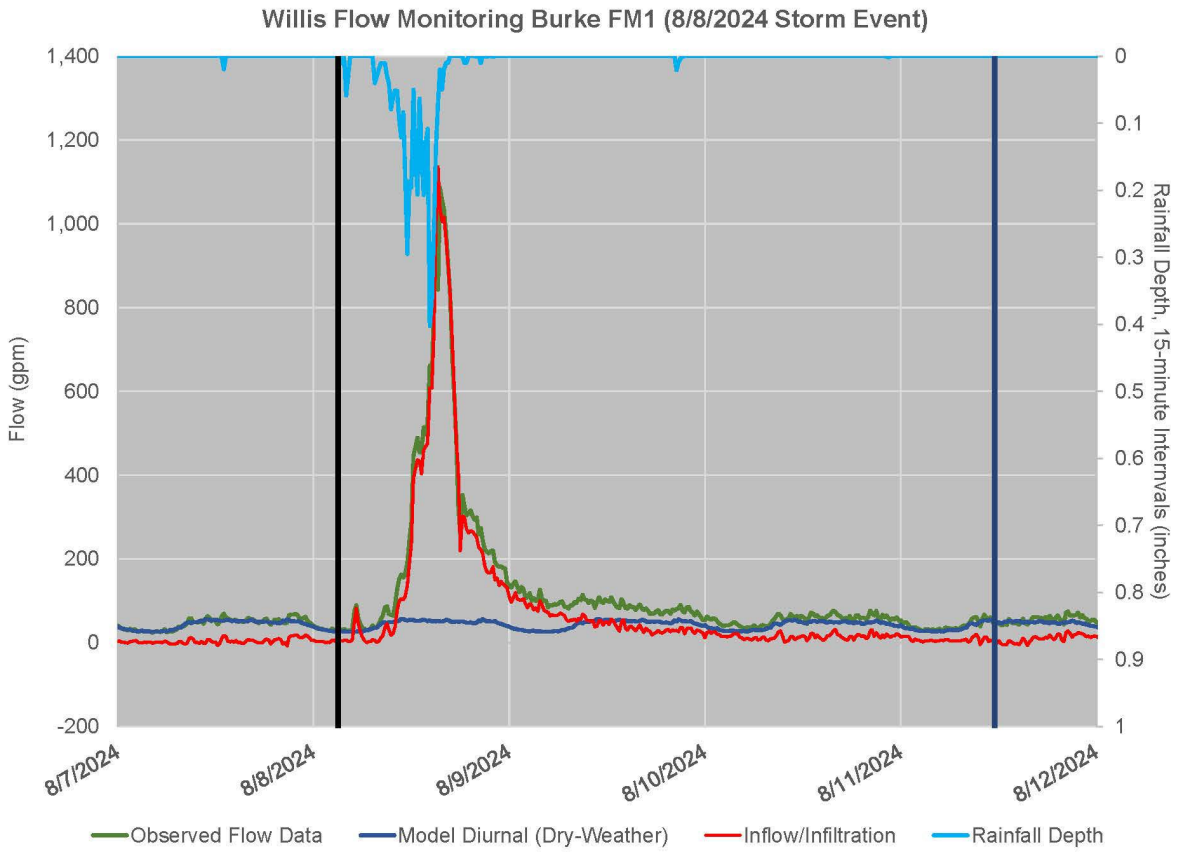
Findings – GIS System

- All system assets incorporated
- Attributes
- Construction drawings versus as-built drawings
- Field verifications



Findings – Flow Monitoring

- 10 Flow Meters and 1 Level Monitor Installed
- May – August 2024
- Average Daily Flow Analysis
- Peak Flow Analysis – 5 Rain Events
- Identified locations for additional investigation (smoke testing)



Findings – Smoke Testing

- 81 Total Defects
  - 52 Manhole
  - 20 Cleanout
  - 5 Main Line
  - 1 Concrete Box
  - 1 Grease Trap
  - 1 Roof Downspout
  - 1 Abandoned Line





Findings – Visual Inspections

- Condition Assessment
- Risk Analysis
- Drawdown Testing
- Additional I&I Sources Identified



5433 Mineral Springs Mtn Avenue
35° 43' 2" N / 81° 33' 6" W

Original Construction 1996



General Description – This is a duplex-style pump station with two vertical multi-stage pumps. The electrical equipment, pumps, and valving are located inside the pump station building. The pump station utilizes internet for communication with the County's SCADA system.

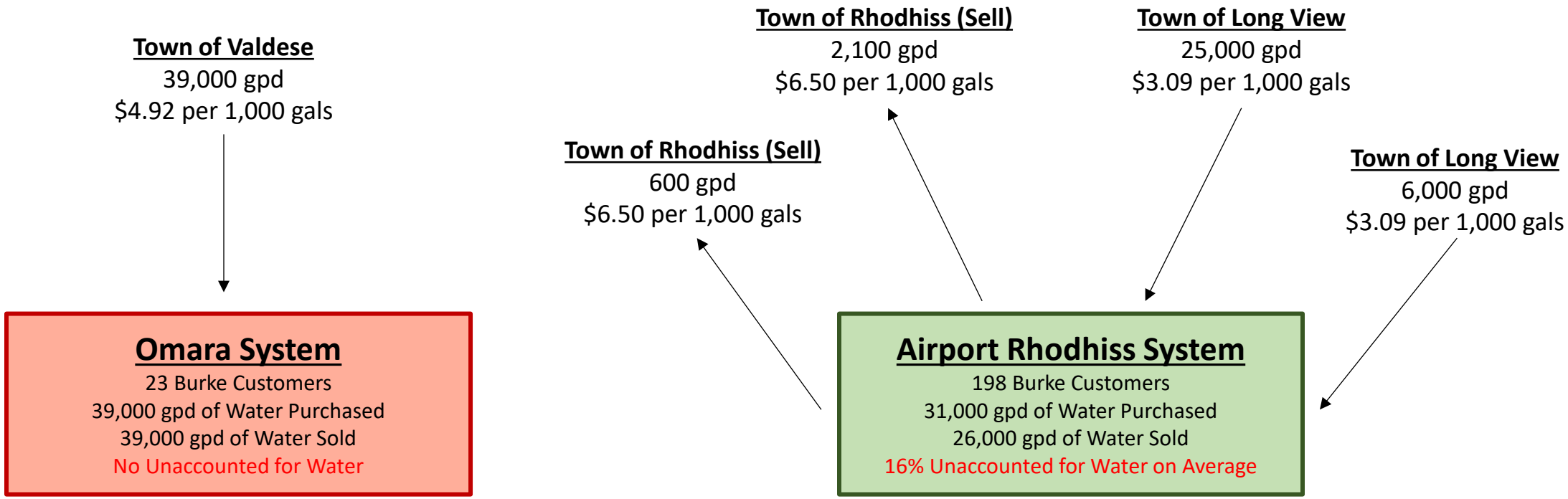
Service History – Installed replacement pump (year unknown).

Pumping Equipment	Pump 1 (original)	Pump 2 (replacement)
Pump Manufacturer/Model	Grundfos CR-60-30U	Grundfos CR64
Motor Size	30 HP, 3525 rpm	40 HP, 3525 rpm
Estimated Pump Duty Point	340 gpm @ 130' TDH	339 GPM @ 290' TDH
Electrical Characteristics	230/460 V, 3 Phase, 60 Hz	230/460 V, 3 Phase, 60 Hz

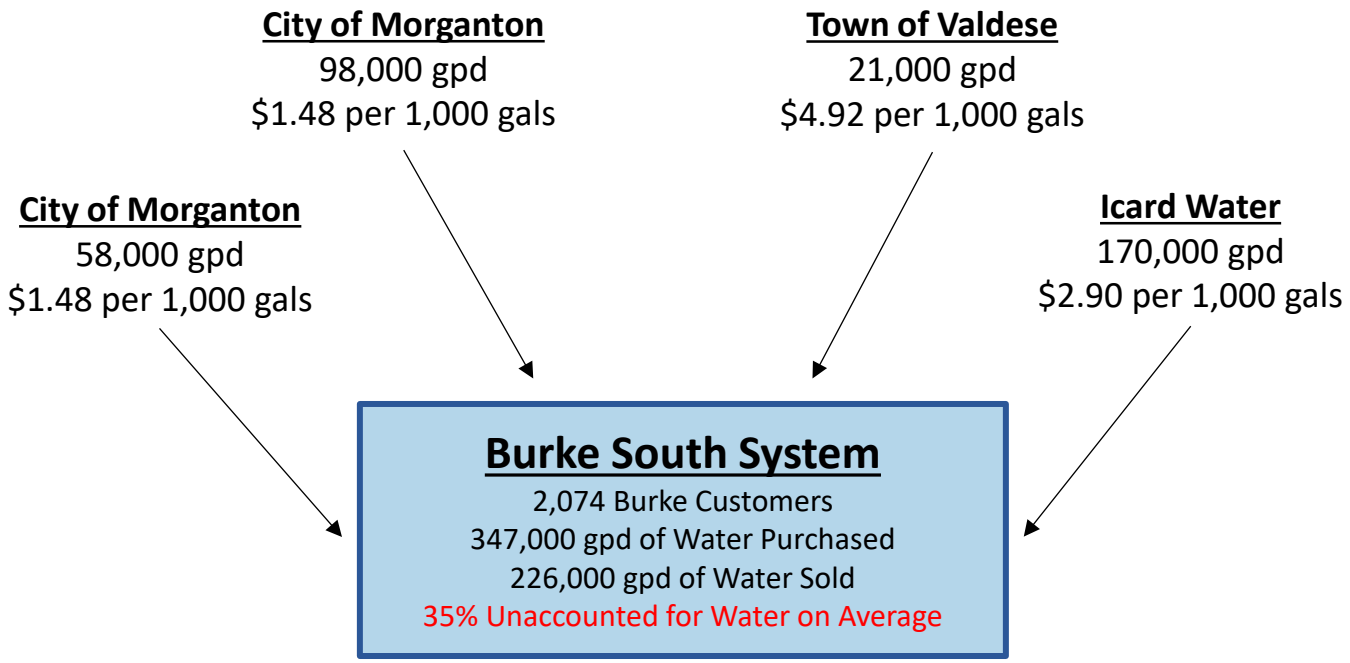
Evaluation Scoring	**Score**	**Comments**
Site	8	No site fence
Structures	10	
Mechanical Equipment	8	Aging pumps
Electrical & Controls	4	Gear improperly sized
Overall Score	7.5	

Inspection Observations – Pump 2 has been replaced with a larger pump. The electrical gear at the station appears to be from the original construction and was not upsized to accommodate the larger pump. Other minor deficiencies noted.

Omara & Airport Rhodhiss Water



Burke South Water

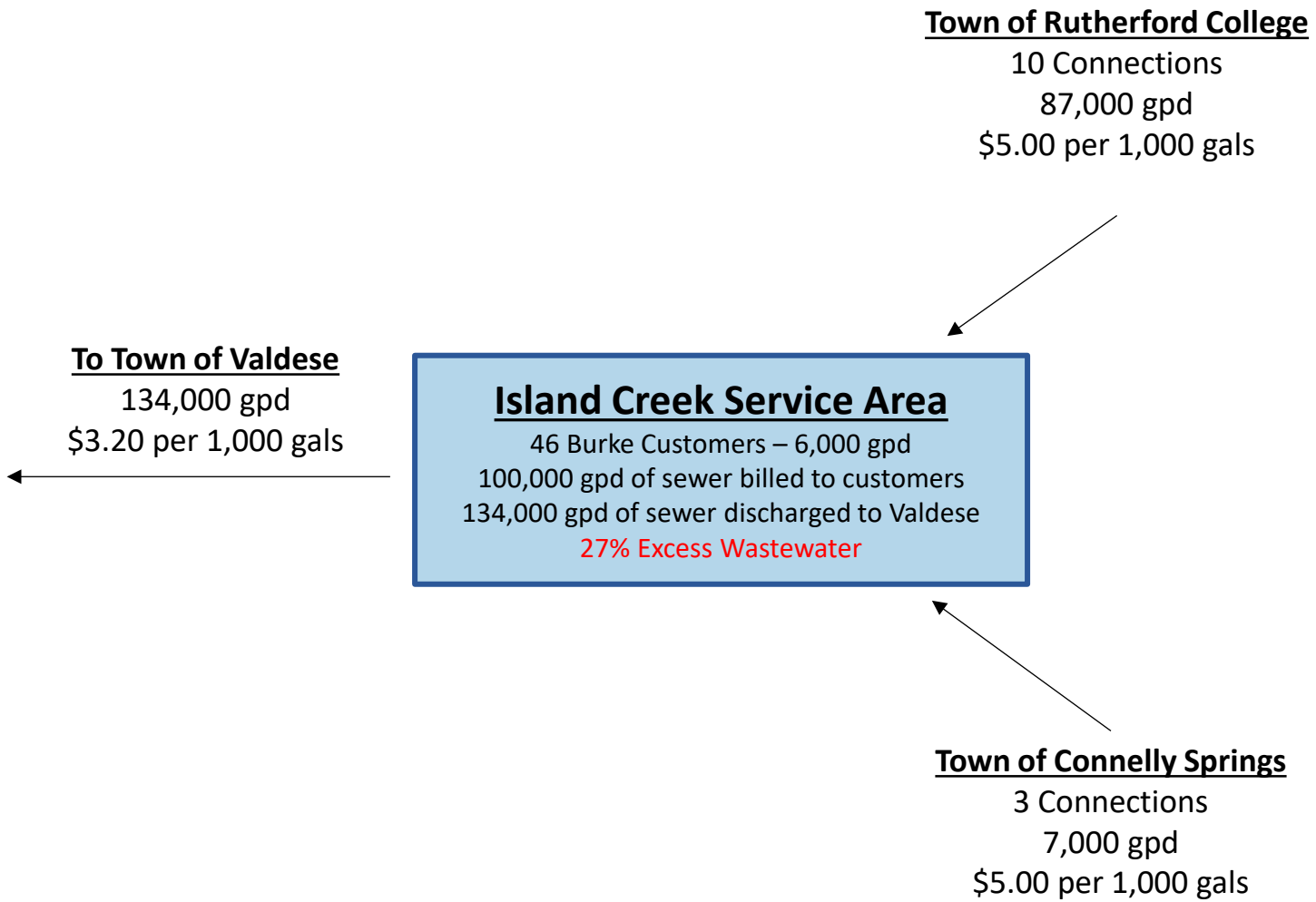


Unaccounted For Water Summary

System	Purchased Water (MGD)	Water Sold to Customers (MGD)	Unaccounted For Water (MGD)	Unaccounted For Water (%)
Omara	0.039	0.039	0.000	0%
Airport Rhodhiss	0.031	0.026	0.005	16%
Burke South	0.347	0.226	0.121	35%
Total	**0.417**	**0.291**	**0.126**	**30%**

Unaccounted For Water Summary based on water billings for Fiscal Year 2024 – 2025.

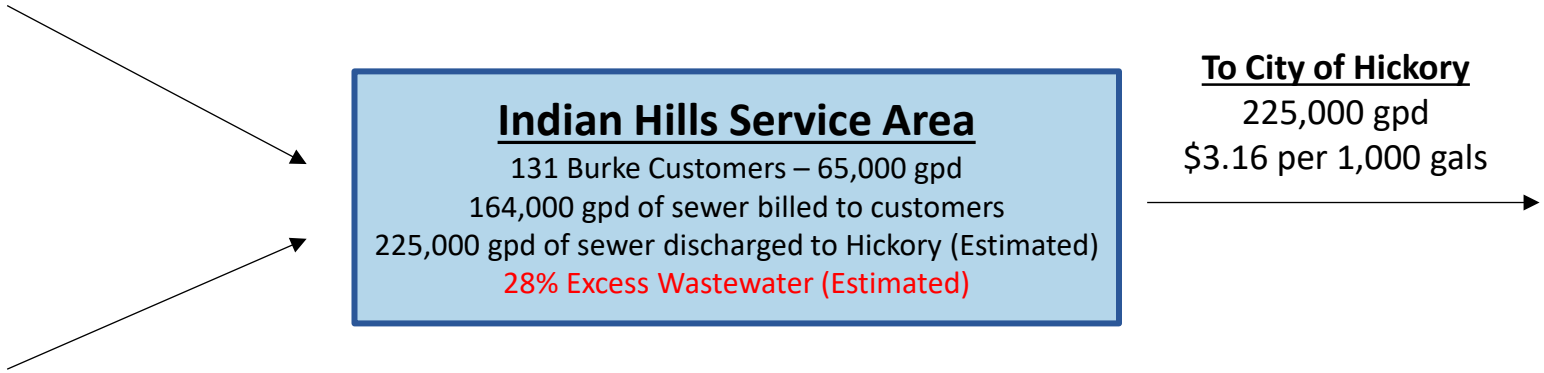
Island Creek Sewer



Indian Hills Sewer

Town of Hildebran (Hickory)
12 Connections
64,000 gpd
$5.00 per 1,000 gals

Town of Rhodhiss
1 Connection
35,000 gpd
$5.00 per 1,000 gals



To City of Hickory
225,000 gpd
$3.16 per 1,000 gals

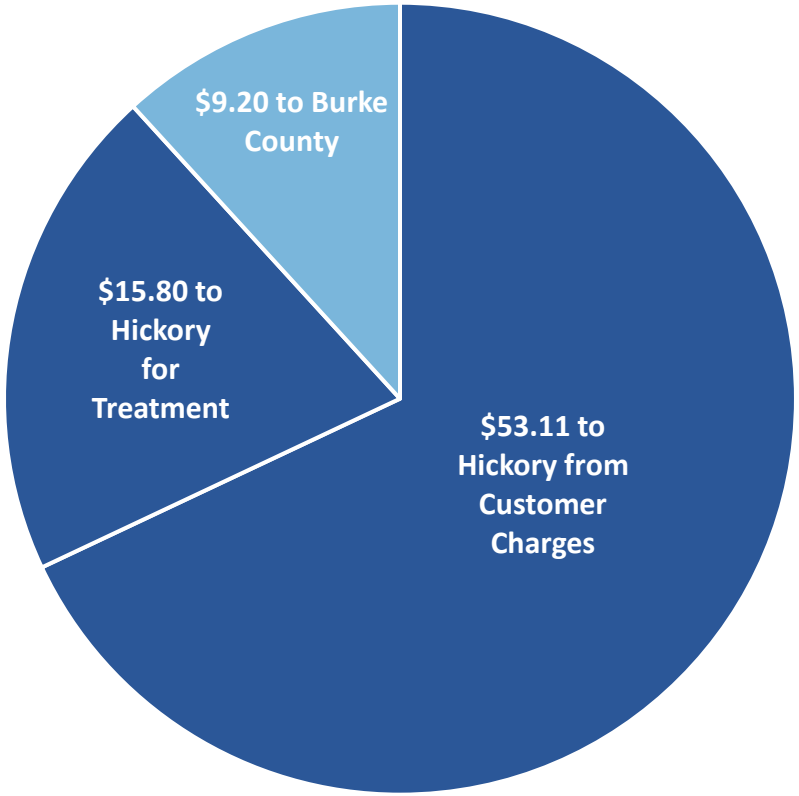
Current Sewer Rate Structure

Customer Type	Customer Count	Base Monthly Fee	Consumption Rate	Burke Charge for 5,000 gal/month
Burke County	177 (13%)	$30	$6.50 per 1,000 gals	$62.50
Municipalities	1,155 (87%)	$0	$5.00 per 1,000 gals	$25.00

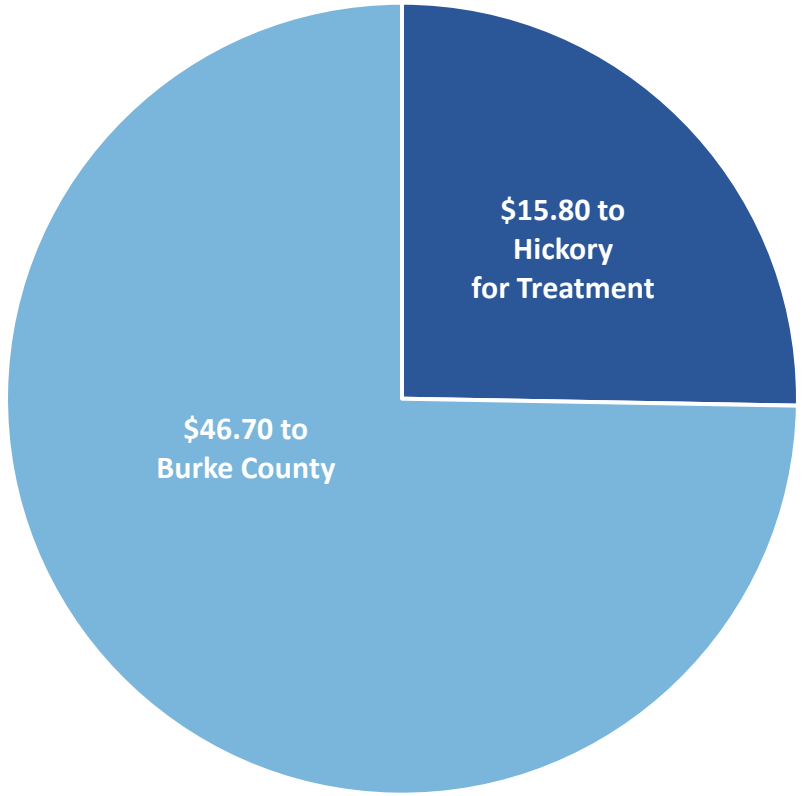
Current Sewer Rate Structure for Fiscal Year 2025-2026.

Billing Disparities

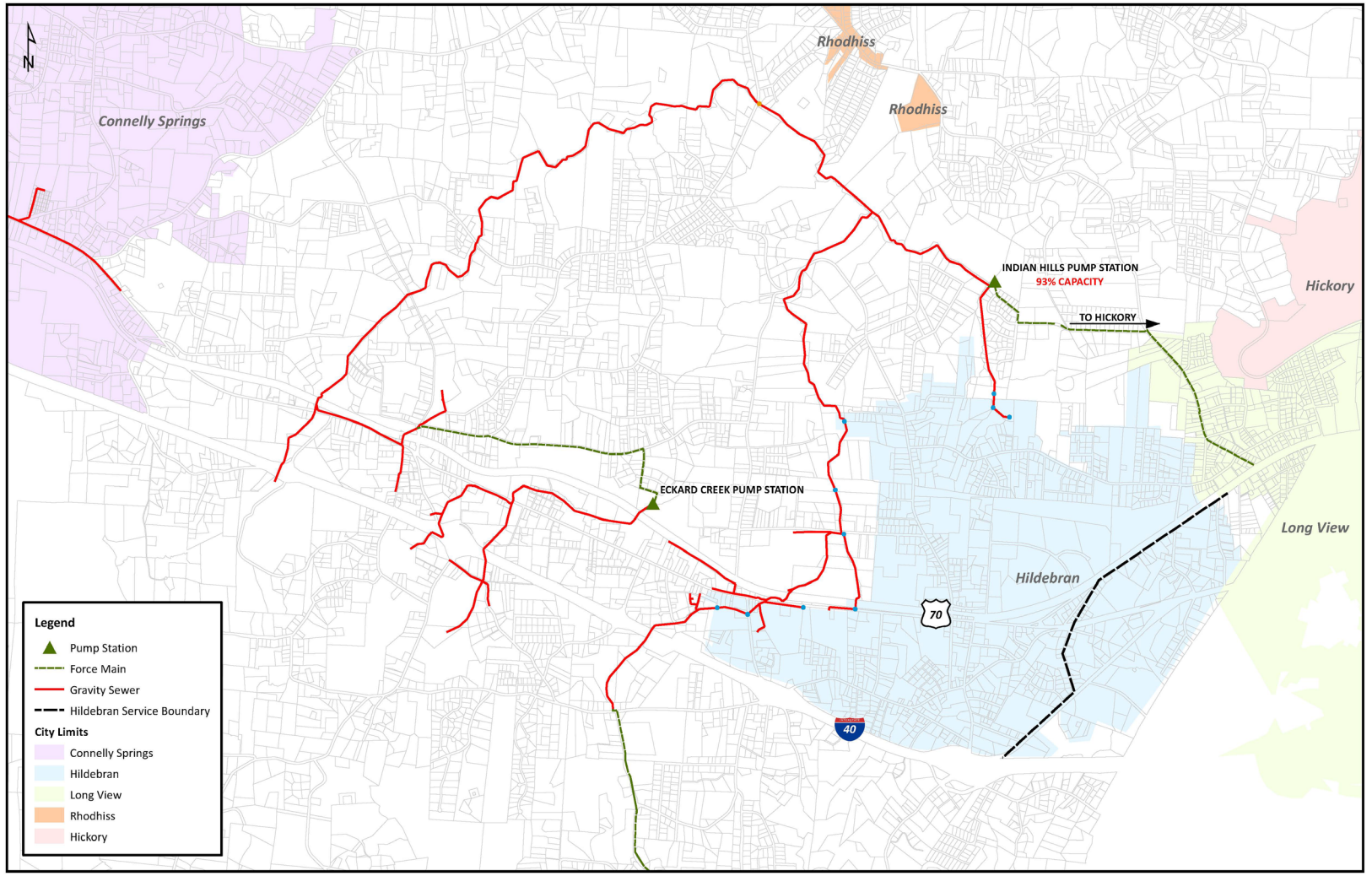
$78.11 Sewer Bill for a 5,000 gal/month Hildebran Customer



$62.50 Sewer Bill for a 5,000 gal/month Burke County Customer



Indian Hills Capacity Limitation



Next Steps

Currently Underway

- Water Meter Replacement Project
- Long-Term Wastewater Flow Metering Project
- Wastewater System Rehabilitation
- Additional Capacity for Future Development

Long-Term

- Capital Improvement Plan Projects
- Long-Term AMP Recommendations

Water Meter Replacement Project

Replacement of roughly 2,200 water meters

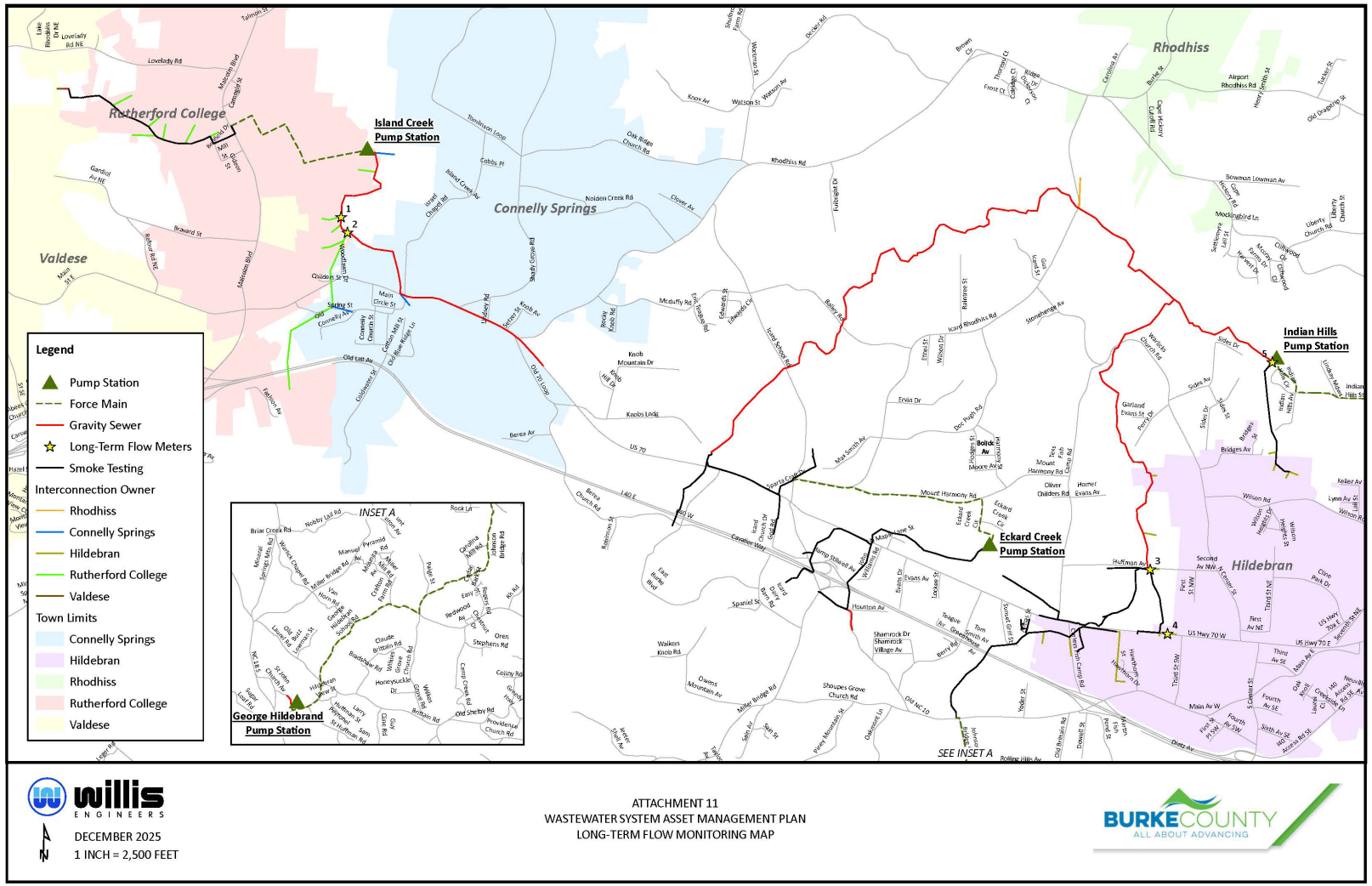
Project Underway in early 2025

Anticipated Completion by June 2026

Total Project Cost: $752,036.42

ARPA Grant through the SFRF

Long-Term Wastewater Metering Project



willis ENGINEERS

DECEMBER 2025
1 INCH = 2,500 FEET

ATTACHMENT 11
WASTEWATER SYSTEM ASSET MANAGEMENT PLAN
LONG-TERM FLOW MONITORING MAP

BURKECOUNTY
ALL ABOUT ADVANCING

Long-Term Wastewater Metering Project

Flow Meter Location	Percentage of Flow Captured
1	10%
2	26%
3	4%
4	7%
5	26%
Existing*	16%
Total	**90%**

*Existing flow meter measures pumped flow from the Town of Rhodhiss.

Wastewater System Rehabilitation

MH ID	Rehabilitation Recommendation	Priority
13	Reset Existing F&C	High
23	Replace Manhole	High
29	Install Cementitious Lining	High
42	Install Cementitious Lining, Replace F&C, Seal Precast Joints	High
89	Install Cementitious Lining, Reset Existing F&C, Seal Precast Joints	High
215	Install Cementitious Lining, Seal Pipe Seals	High
285	Reset & Raise Existing F&C, Replace Chimney Section	High
300	Install Cementitious Lining	High
333	Install Cementitious Lining, Rebuild Bench & Invert, Replace F&C	High
341	Install Cementitious Lining, Replace F&C	High
343	Raise F&C to grade	High
348	Install Cementitious Lining, Seal Pipe Seals	High
12	Seal Precast Joints	Medium
19	Install Cementitious Lining	Medium
20	Install Cementitious Lining	Medium
40	Replace F&C, Seal Pipe Seals	Medium
209	Install Cementitious Lining	Medium
212	Install Cementitious Lining, Reset Existing F&C, Seal Pipe Seals	Medium
249	Reset Existing F&C	Medium
259	Replace F&C	Medium
278	Install Cementitious Lining	Medium
286	Install Cementitious Lining	Medium
298	Install Cementitious Lining	Medium
304	Reset Existing F&C	Medium
331	Install Cementitious Lining	Medium
332	Install Cementitious Lining	Medium
336	Install Epoxy Lining	Medium
337	Install Cementitious Lining, Seal Pipe Seals	Medium
338	Reset Existing F&C, Seal Pipe Seals, Smooth/Slope Channel	Medium
339	Install Cementitious Lining	Medium
344	Install Cementitious Lining, Reset F&C	Medium
349	Install Cementitious Lining, Reset Existing F&C, Rebuild Bench & Invert	Medium
351	Install Cementitious Lining, Reset Existing F&C, Seal Pipe Seals	Medium
352	Install Cementitious Lining, Reset Existing F&C, Seal Precast Joints	Medium
354	Install Cementitious Lining, Replace F&C	Medium
355	Install Cementitious Lining, Replace F&C	Medium
357	Install Cementitious Lining	Medium
365	Raise F&C to grade	Medium
366	Raise F&C to grade	Medium
370	Install Cementitious Lining, Seal Pipe Seals	Medium
373	Install Cementitious Lining, Seal Precast Joints	Medium
375	Install Cementitious Lining, Reset F&C, Rebuild Bench & Invert	Medium
376	Rebuild Bench & Invert, Seal Precast Joints	Medium
379	Install Cementitious Lining	Medium
381	Install Cementitious Lining, Replace F&C	Medium
382	Install Cementitious Lining	Medium
384	Install Cementitious Lining	Medium
387	Install Cementitious Lining	Medium
430	Seal Precast Joints, Reset Existing F&C	Medium

Address	Rehabilitation Recommendation	Priority
3450 Miller Bridge Rd, Connelly Springs	Remove abandoned line	High
Near MH 364 south of US 70	Replace missing cleanout in low lying area	High
232 Excelsior Drive, Rutherford College	Replace broken cleanout in low lying area	Medium
1031 Malcolm Blvd, Rutherford College	Replace broken cleanout in low lying area	Medium
3266 US 70, Hildebran	Replace broken cleanout in low lying area	Medium
3274 N. Maple St., Connelly Springs	Replace missing cleanout in low lying area	Medium
John Williams Rd, Connelly Springs	Replace broken cleanout in low lying area	Low
3653 Curleys Fish Camp Rd, Hildebran	Replace missing cleanout in low lying area	Low
3653 Curleys Fish Camp Rd, Hildebran	Replace missing cleanout in low lying area	Low
1 Jacquard Dr, Hildebran	Replace broken cleanout in low lying area	Low
3584 Curleys Fish Camp Rd, Hildebran	Replace broken cleanout in low lying area	Low
3540 Texs Fish Camp Rd, Connelly Springs	Replace broken cleanout in low lying area	Low
2082 US-70, Connelly Springs	Replace broken cleanout in low lying area	Low
101 Benfield Dr, Rutherford College	Replace broken cleanout in low lying area	Low
1111 Malcolm Blvd, Rutherford College	Replace broken cleanout in low lying area	Low
1111 Malcolm Blvd, Rutherford College	Replace broken cleanout in low lying area	Low
244 Excelsior Dr, Rutherford College	Replace missing cleanout in low lying area	Low
Icard Church of God Rd, Connelly Springs	Replace broken cleanout in low lying area	Low
232 Excelsior Dr, Rutherford College	Replace broken cleanout in low lying area	Low
232 Excelsior Dr, Rutherford College	Replace broken cleanout in low lying area	Low
2735?2807 Indian Hills Cir, Hickory	Replace missing cleanout in low lying area	Low
3540 Texs Fish Camp Rd, Connelly Springs	Concrete box - additional investigation	Low
3653 Curleys Fish Camp Rd, Hildebran	Seal grease trap	Low
3184 E. Burke Blvd, Connelly Springs	Roof downspout - additional investigation	Low

5-Year Capital Improvement Plan

Project	FY 26	FY 27	FY 28	FY 29	FY 30	Project Total
Wastewater Collection System						
1 Wastewater System Rehabilitation Project	150,000		150,000			300,000
2 Long-Term Meter Installation	350,000					350,000
3 Smoke Testing		40,000				40,000
4 Island Creek Pump Station and Force Main Improvements			3,500,000			3,500,000
5 Indian Hills Pump Station and Force Main					9,900,000	9,900,000
Water Distribution System						
6 Water System SCADA Improvements	230,000					
7 Booster Pump Station Pump Replacements		315,000				315,000
8 Interstate-40 Parallel Water Line			1,000,000			1,000,000
9 Hickory Interconnection Facilities				2,500,000		2,500,000
10 Methodist Park Road Water Line Replacement				890,000		890,000
Total Improvement Cost	730,000	355,000	4,650,000	3,390,000	9,900,000	19,025,000

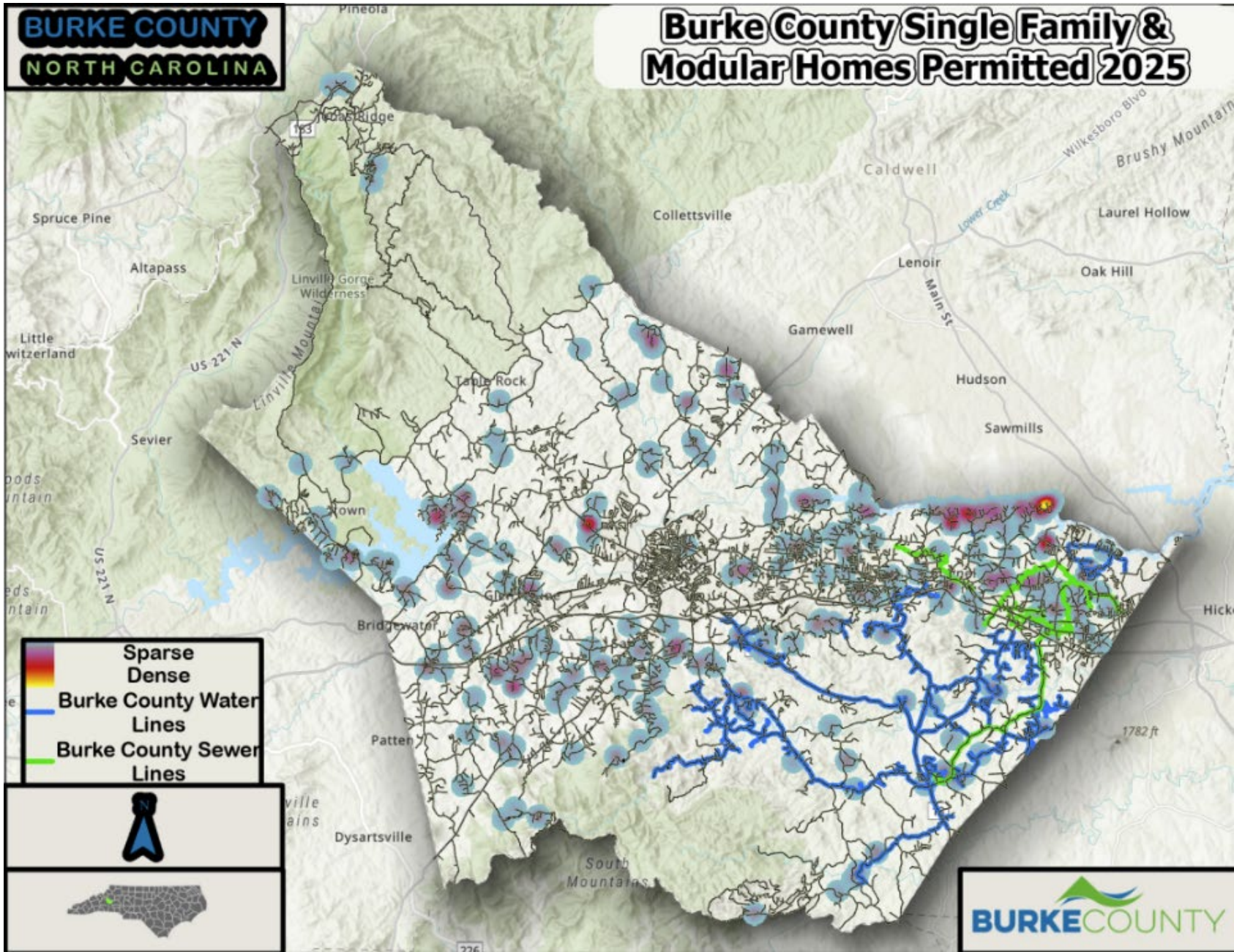
Long-Term AMP Recommendations

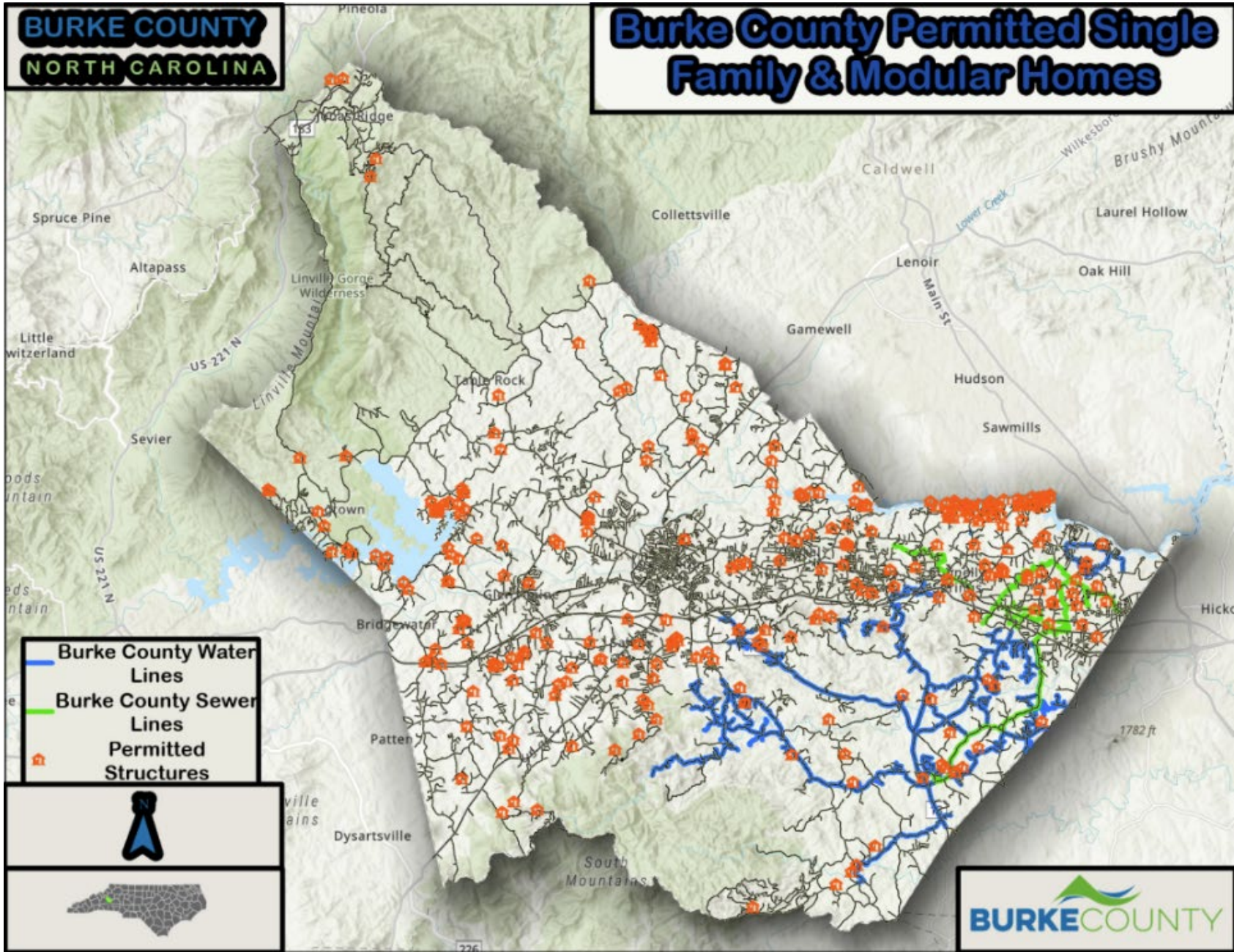
- Annual GIS Updates
- Routine Smoke Testing and Flow Monitoring
- Implement Preventative Maintenance Strategies
- Complete Rate Study and Long-Term Financial Strategy
- Seek Funding Opportunities
    - 10-Year CIP

Indian Hills Pump Station Funding

1. Brick Funding
   - Applied in 2021, awarded in 2024
     $2.3M, 50% county match.
2. FEMA Hazard Mitigation Funding
   - 2-4 years for funding approval
3. NC Legislative Funding




BURKE COUNTY
NORTH CAROLINA
Burke County Single Family & Modular Homes Permitted 2025
Pineola
Table Rock
Spruce Pine
Altapass
Linville Gorge Wilderness
Linville Mountains
Little Switzerland
US 221 N
Sevier
Rown
Bridgewater
Patten
Dysartsville
South Mountains
Caldwell
Collettsville
Wilkesboro Blvd
Brushy Mountains
Lower Creek
Laurel Hollow
Lenoir
Main St
Oak Hill
Gamewell
Hudson
Sawmills
1782 ft
Sparse
Dense
Burke County Water Lines
Burke County Sewer Lines
N
BURKECOUNTY

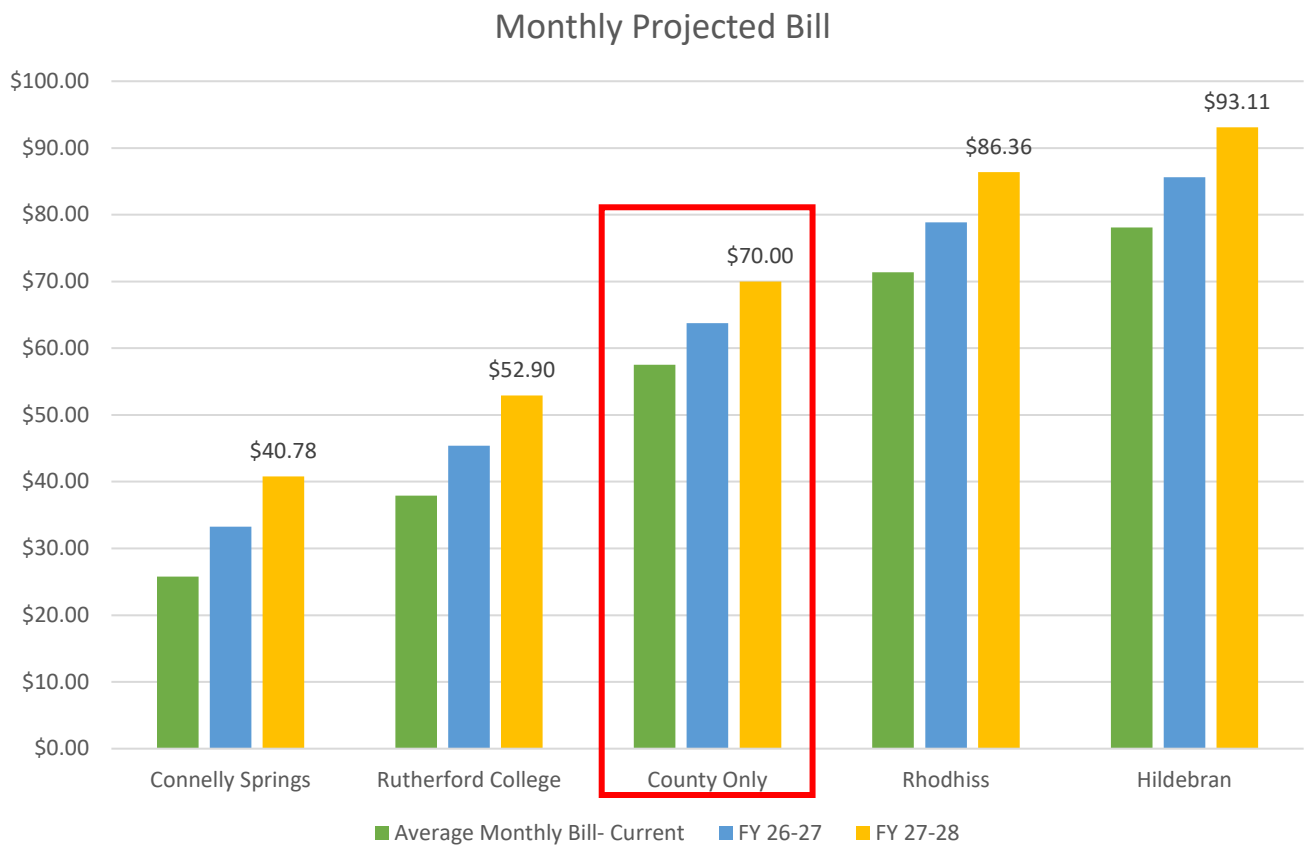

BURKE COUNTY
NORTH CAROLINA
Burke County Permitted Single Family & Modular Homes
Pineola
Table Rock
Spruce Pine
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Little Switzerland
US 221 N
Sevier
Caldwell
Collettsville
Laurel Hollow
Lenoir
Oak Hill
Main St
Gamewell
Hudson
Sawmills
Lower Creek
Brushy Mountains
Wilkesboro
Rhodhiss
Bridgewater
Patten
Dysartsville
South Mountains
1782 ft
Burke County Water Lines
Burke County Sewer Lines
Permitted Structures
BURKECOUNTY

Proposed Sewer Rate Ladder

	Consumption Rate Per 1,000 Gallons		Projected Revenue		
	Municipal	Direct Consumer	Municipal	Direct Consumer	Total
FY 25-26-Current	$5.00	$6.50	$536,550	$129,575	$666,125
FY 26-27	$6.50	$7.25	$697,515	$187,884	$885,399
FY 27-28	$8.00	$8.00	$858,480	$207,320	$1,065,800

Consumer Rate Impact

- 5-year funding Impact: $1,998,375
- 5-year capital improvement needs, not including Indian Hills: $9,125,000



Board Consideration

1. Direction on planned rate structure

2. Identify legislative priority for Indian Hills funding