865.328.3138
www.LJA.com
265 Brookview Centre Way, Suite 504, Knoxville, Tennessee 37919

January 8, 2026 **TASK ORDER**

Mr. Chad Austin
City of Kingsport
1113 Konnarock Road
Kingsport, Tennessee 37664

RE: Engineering Services as Related to the
Phase 3 Sanitary Sewer Inspection Project
City of Kingsport, Tennessee
LJA Task Order 20260108

Dear Mr. Austin,

LJA Engineering, Inc. ("LJA") is pleased to provide this Task Order for engineering services associated with the Phase 3 Sanitary Sewer Inspection Project for the City of Kingsport ("Client"). This task order is made pursuant to the terms and conditions of the Professional Services Agreement ("PSA") entered into on November 28, 2022, by and between LJA Engineering, Inc. and the City of Kingsport.

Background

The Client is actively working through inflow/infiltration (I/I) correction measures within the sanitary sewer collection system. LJA staff completed a flow monitoring study and Phases 1 & 2 Sanitary Sewer Evaluation Survey (SSES) Inspection Projects in high priority areas identified through the flow monitoring results.

The Client has requested LJA to provide a proposal for a similar SSES project in Basins 5605_12 and 6101_12 which were both identified as high priority areas during the flow monitoring study. Combined, the proposed study area is approximately 60,000 linear feet with approximately 275 manholes (See Exhibit A).

Approach

It is expected that project activities will begin (manhole inspections and CCTV inspections) once weather conditions are more wet and be completed by the end of April 2026. The manhole wet weather inspections will be performed utilizing NASSCO defect criteria such that all defects can be relatively ranked and prioritized. The inspections will provide a condition assessment for each manhole and identify defects to be prioritized. It is critical that these inspections be performed during wetter periods to identify those contributing Rain-dependent inflow & infiltration (RDII) into the system since manhole/line connections are a typical inflow and infiltration (I/I) source. During the manhole inspection process, system connectivity and map verification is also performed which is critical for the next phases of work. Survey grade GPS coordinates will be taken at each manhole during the process of identifying system connectivity. It is imperative to have a corrected map prior to beginning any rehabilitation projects in order to minimize change orders and provide the most efficient repairs.

Smoke testing efforts will be completed during the spring/summer of 2026, approximately between the months of April through July when groundwater levels are at the lowest. This will identify inflow type defects which contribute to the significant peaks observed with intense rainfall events. These type defects also significantly contribute to SSO events due to the quick response during intense storms.

CCTV inspections are necessary to identify defects within mainlines and provide a means to formulate a rehabilitation design. Once completed, the CCTV inspection results are analyzed (coupled with the smoke testing and wet weather manhole inspection results) to finalize the priority ranking of work to be performed during rehabilitation.

Upon completion of all field work, LJA staff will compile the findings into a summary spreadsheet to provide a general indication of defects observed. LJA staff would integrate the associated reports from the SSES activities into the Client's current GIS and provide an updated GIS map layer. LJA would work with the Client's GIS staff to incorporate the updated layers into the Client's current GIS system.

The associated Scope of Services outline the tasks to be performed to meet the approach discussed in the above narrative.

Scope of Services

1.0 SSES Activities, Field Services Management, & GIS Integration

SSES field activities performed during this Task include the following with approximate quantities based on Client's current GIS:

- Manhole inspections (approximately 275) – Manhole inspections will be conducted during wet weather periods (~ January through March) to identify I/I sources. Data collected during manhole inspections will include the material of each manhole component (cover, frame, chimney, cone, wall, bench and invert) and will be based on NASSCO coding. The condition of each component will be assessed, defects identified, and pertinent photos will be taken. Additionally, connectivity will be verified with the GIS on each incoming and outgoing pipe segment such that map corrections can be made. A PDF report summarizing the information collected will be provided including photos. A sample is included in Exhibit B.
- GPS Surveying of Manholes (approximately 275) – A GPS survey of each manhole will be performed to obtain x, y, and z coordinates. Each point will be gathered with survey grade accuracy using a Trimble GPS data collector. Manhole GPS work will be performed during the wintertime period (between February through April) when the tree canopy is at a minimum. Any manholes where survey grade accuracy cannot be obtained will be collected with mapping grade accuracy (+/- 3 feet). At the time a model is formulated utilizing the GPS data, other survey means will be utilized as part of that effort to obtain survey grade data for any locations required. LJA staff will coordinate with the Client to integrate the GPS data and revised sanitary sewer layer into the Client's existing GIS mapping system.
- Smoke testing (approximately 60,000 LF) – Smoke testing will be conducted to identify cross connection defects and severe inflow sources. These activities will be conducted during drier periods of the year (~ April through July) when ground conditions are dry allowing the smoke to permeate through the soil and into the air. Strategic smoke testing points will be identified throughout the project area to accommodate approximately 600-800 foot stretches of sewer mainline. While

smoke is being pushed through the mainlines by a smoke blower, GPS points will be taken of each observed defect where smoke is exiting the ground. A photo will be taken of each defect and logged with the associated data collected. A summary report of each segment will be provided detailing the type of leak observed and an aerial map of the marked location. A sample is provided in Exhibit B.

In order to facilitate the field work listed above, LJA staff will perform the following:

- Provide oversight and direct management of subcontractors working on the project performing the above activities including scheduling, coordinating with the Client, coordinating during specific weather periods.
- Track progress throughout the project and provide updates to the Client as requested, including evaluating production logs and "cannot locate" lists for manholes. LJA staff will coordinate with subcontractor and the Client to get necessary access/manholes raised to facilitate work.
- A professional licensed surveyor (PLS) will validate any GPS shots taken to verify accuracy and ensure the points are imported into ESRI platform to be used in the Client's current GIS layer.
- Track progress during the smoke testing phase and provide updates to the Client as requested. Any significant findings will be submitted to the Client as they are identified.
- Perform various site visits during field activities.
- Conduct interim meetings/progress meetings with the Client during work to provide updates and discuss project progress and details.

Throughout the course of each field activity, LJA staff will receive preliminary data cuts of the database deliverable to ensure data is being collected properly, perform QA/QC checks, and verify accuracy. As each type of field work is completed, LJA staff will receive a final database submittal and perform a final review of the information collected. Upon receipt and final review of each dataset, LJA staff will integrate the data collected within the Client's current GIS layer. Using any GPS data collected, LJA staff will initially create the geometric network within the GIS to provide connectivity from manhole to manhole throughout the project area and enable the ability to perform tracing functions within ESRI. The manhole reports and individual data will be linked to each associated manhole within the manhole shape file. The smoke testing reports and individual data will be linked to each associated mainline segment within the sewer line shape file. LJA staff will compile the digital information and create point and linear defect events in personal geodatabases that will contain all the data to be served and queried within the GIS. Specific information about the defect such as type, location and severity score will be available in tabular format via the "Identify Tool" of ArcGIS. LJA staff will provide the Client with a final layer set to be imported into current GIS system. The final layer will contain links to each manhole and smoke testing report submitted.

Upon finalization of the GIS integration, LJA staff will compile the findings and create a list of priority mainline segments to be CCTV inspected. A map book will be created in PDF format, with index pages and map numbering, to be provided to the CCTV subcontractor to complete inspection work. An associated listing of each segment will also be exported from the GIS layer to create an Excel spreadsheet which will also be provided to the subcontractor to be used during the project to facilitate work.

2.0 CCTV Surveys, Field Services Management, & GIS Integration

It is anticipated that approximately 60,000 linear feet will be inspected. Preconditioning (cleaning) will only be conducted when needed. It is not expected that each pipe will need to be cleaned prior to inspections. A budgeted quantity of 60% of the inspected footage will be used for segments to be cleaned. However, this footage is a budgetary number and the segments that need to be cleaned in order to complete the work will be cleaned.

Of the pipe segments on the priority CCTV inspection list, only those mainlines requiring cleaning will be cleaned. It is expected that up to 60% (~36,000 LF) of the mainlines inspected may require preconditioning prior to inspection and 20% (~12,000 LF) of the mainlines may require heavy cleaning. However, should the pipes have a significant amount of debris, the totals could be higher. The projected footage to be cleaned and associated fees are only estimates. Should more cleaning be required than anticipated, fees will need to be increased appropriately or an associated reduction in scope for the inspection will be necessary. Although the service lateral connections within the mainline will be visible during the mainline inspections, the inspection of each individual service lateral via a lateral launch will not be included as part of the scope of this project. It will be required to inspect each lateral included in the rehabilitation project at the time of construction to verify final rehabilitation once that data becomes available.

CCTV mainline inspections will be performed utilizing NASSCO standards. The camera will stop and pan each defect and tap to record pertinent information. Pre-conditioning of the pipe will be performed as needed to obtain an unobstructed view of the pipe. Heavy cleaning may be required to remove roots, heavy debris/silt, or remove protruding taps. It is estimated/budgeted that approximately 20% of the pipelines will require heavy cleaning. This is only an estimate. Should the actual footage requiring heavy cleaning be higher than the estimated amount, additional monies would be required to complete the work or work would need to be eliminated accordingly. A log will be provided that indicates the footage inspected, the footage preconditioned, and the footage heavy cleaned. A PDF report will be created from the inspection summarizing each item observed along with pictures.

In order to facilitate the CCTV inspections listed above, LJA staff will perform the following:

- Provide oversight and direct management of subcontractors working on the project performing the above activities including scheduling, coordinating with Client, coordinating during specific weather periods
- Track progress throughout the project and provide updates to Client as requested, including evaluating production logs and manholes that have been located and marked for Client to raise.
- Perform various site visits during field activities.
- Conduct interim meetings/progress meetings with Client during work to provide updates and discuss project progress and details as needed.

Throughout the course work, LJA staff will receive preliminary data cuts of the database deliverable to ensure data is being collected properly, perform QA/QC checks, and verify accuracy. As field work is completed, LJA staff will receive a preliminary database submittal and perform a review of the information collected. Upon receipt and final review of each dataset, LJA staff will integrate the data collected within the GIS layer. LJA staff will compile the digital information and create point and linear defect events in personal geodatabases that will contain all the data to be served and queried within the GIS. Specific information about the defect such

as type, location and severity score will be available in tabular format via the “Identify Tool” of ArcGIS. LJA staff will provide Client with a final layer set to be imported into Client’s current GIS system. The final layer will contain links to the associated inspection report.

3.0 Engineering Summary of Findings

Upon finalization of the GIS integration, LJA staff will perform a general prioritization for each sewer mainline segment, taking into account each SSES activity completed. This summary of information will be shown in ESRI ArcGIS via symbology based on severity of defects or I/I observed. LJA staff will provide a summary spreadsheet with defects prioritized based on the NASSCO scoring system. LJA staff will present the findings to Client staff and discuss the criteria used during the evaluation. LJA staff and Client staff will jointly review the results and findings and discuss steps to perform the next phase of work (rehabilitation).

LJA staff will provide a summary GIS dataset that can be incorporated into Client’s existing GIS network. LJA will coordinate with Client’s GIS department to facilitate the delivery.

Client’s Responsibilities

Client shall be responsible for the following items:

- Provide assistance and coordinate with property owners as needed for property access.
- Assist LJA staff by locating manholes not easily identified both above and below grade.
- Provide access to buried manholes that are below grade (raising manholes to facilitate entry).
- Provide water at no charge during cleaning and CCTV inspections. Contractors will provide an accounting of water used for water loss purposes.
- Provide access at the WWTP to offload debris from the Vac-truck during cleaning and inspections.
- Allow CCTV inspections to be performed during Monday through Saturday if needed to ensure deadlines are met.

Compensation

We propose to provide the specific services described above to be billed as follows:

Task 1.0 SSES Activities, Field Services Management, & GIS Integration

Item No.	Description	Units	Unit Cost	Total
1a.	Manhole Inspections	275	$165	$45,375
1b.	Manhole GPS	275	$55	$15,125
1c.	Smoke Testing	60,000	$0.65	$39,000
1d.	Engineering/GIS integration Field/Management	LS	$28,125	$28,125
Sub-Total Task 1				**$127,625**

Task 2.0 CCTV Inspections, Field Services Management, & GIS Integration

Item No.	Description	Units	Unit Cost	Total
2a.	Mobilization	1	$5,400	$5,400
2b1.	CCTV Inspection 6-inch to 8-inch	50,950	$1.93	$98,435
2b2.	CCTV Inspection 10-inch	4,050	$1.99	$8,068
2b2.	CCTV Inspection 12-inch	3,000	$2.03	$6,084
2c1.	Preconditioning 6-inch to 8-inch	30,570	$2.07	$63,341
2c2.	Preconditioning 10-inch	2,430	$2.13	$5,171
2c2.	Preconditioning 12-inch	1,800	$2.17	$3,911
2d1.	Heavy Cleaning Adder to Preconditioning 6-inch to 8-inch	10,190	$1.40	$14,307
2d3.	Heavy Cleaning Adder to Preconditioning 10-inch	810	$1.48	$1,196
2d2.	Heavy Cleaning Adder to Preconditioning 12-inch	600	$1.54	$922
2e.	Reverse Setup	20	$210	$4,200
2f.	Locate, Sonde, Mark MH	28	$158	$4,345
2g.	CCTV Reports and Data Delivery	LS	$10,945	$10,945
2h.	Engineering/GIS CCTV & Management	LS	$38,325	$38,325
Sub-Total Task 2				**$264,649**

Task 3.0 Engineering Summary of Findings

Item No.	Description	Units	Unit Cost	Total
3	Engineering Reporting	LS	$27,990	$27,990

Total Not-to-Exceed Amount	**$420,264**

Any work not authorized within three (3) months of the date of this agreement will be subject to renegotiations based on current rates.

Schedule

LJA staff would tentatively schedule to begin manhole inspections and manhole GPS work immediately upon approval. It is anticipated the manhole inspections will take approximately 6-8 weeks to complete pending weather conditions. CCTV inspections will begin within 2-3 weeks of authorization. It is anticipated that CCTV inspections will take approximately 6-8 weeks to complete the field portion of the work. It is anticipated that smoke testing would begin in the when groundwater conditions are at the lowest. Timing to complete smoke testing would tentatively be between April 2026 and July 2026. It is anticipated that smoke testing would take approximately 4 weeks to complete pending weather conditions. Upon completion of all field work, LJA staff will present the findings and discuss the recommendations for the rehabilitation project and design parameters. LJA staff will then coordinate with the Client to determine the tentative schedule for advertisement and bidding of the project.

Reimbursables and additional services

Included in the above fees are reimbursable expenses incurred on the project's behalf, including: mileage, printing, plotting, photocopies, reproduction, express mail, and/or courier services. Any regulatory agency review fees associated with plan reviews shall be the responsibility of the Client. Reimbursable expenses will be billed at cost plus ten percent (10%). LJA will bill monthly for all work performed and expenses incurred on the project's behalf. Unpaid invoices after thirty (30) days will accrue service charges at 1-1/2% per month and include any costs of collections and reasonable attorney's fees.

Authorization

If this proposal meets with your approval, your signature below and on the attached Professional Services Agreement will be sufficient authorization for LJA to commence the stated work as indicated in the above Scope of Services.

We appreciate the opportunity to submit this proposal and look forward to working with you on this project. If you have any questions, please contact me at 931.273.8999.

Sincerely,

Travis E. Wilson, PE
Vice President

TEW

Attachments:

Accepted By:
City of Kingsport

By:_____

Name:_____

Title:_____

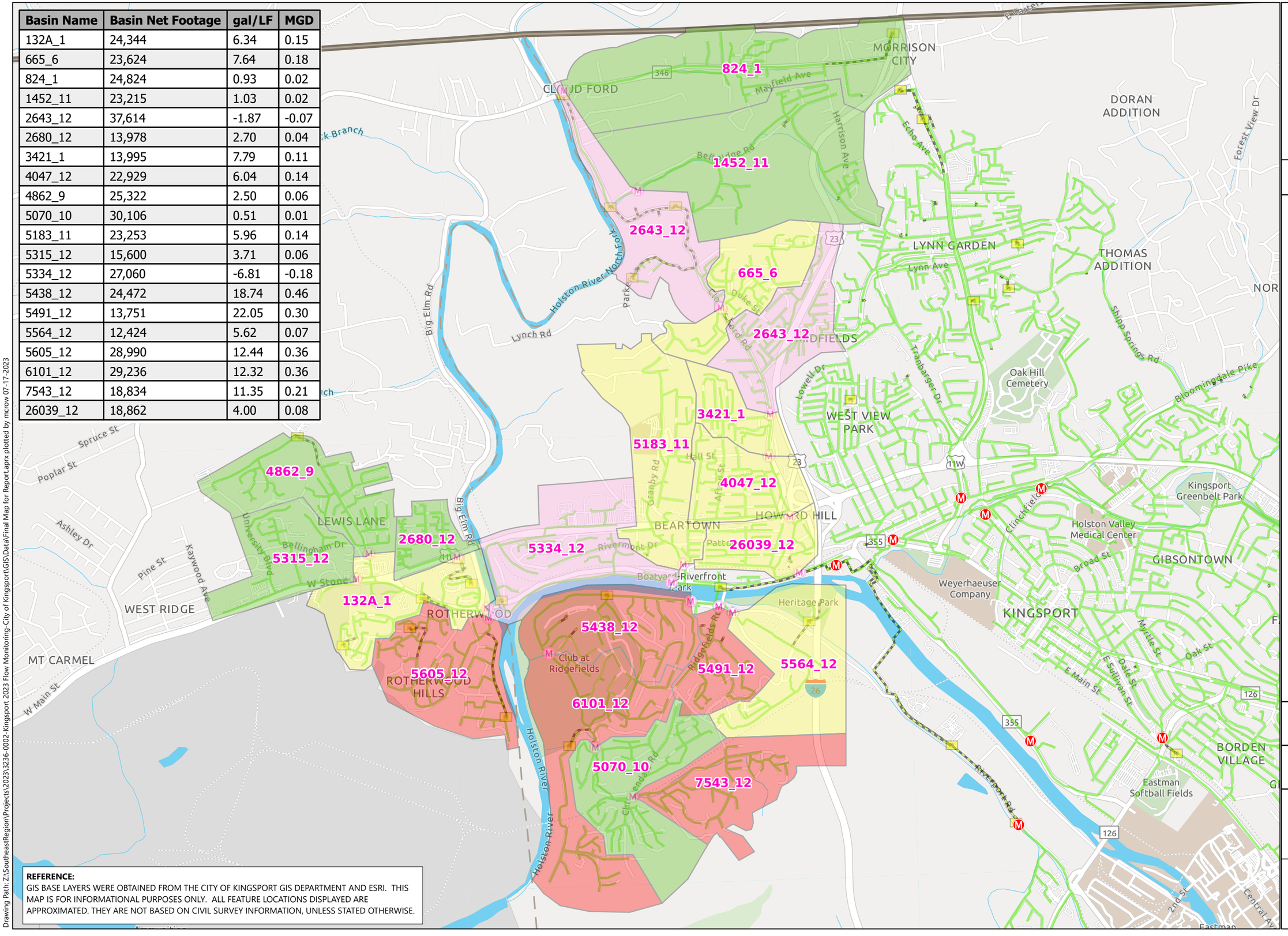
Date:_____

Exhibit A – Basin Maps
Exhibit B – Sample Field Reports

EXHIBITS

EXHIBIT A
Basin Maps

Basin Name	Basin Net Footage	gal/LF	MGD
132A_1	24,344	6.34	0.15
665_6	23,624	7.64	0.18
824_1	24,824	0.93	0.02
1452_11	23,215	1.03	0.02
2643_12	37,614	-1.87	-0.07
2680_12	13,978	2.70	0.04
3421_1	13,995	7.79	0.11
4047_12	22,929	6.04	0.14
4862_9	25,322	2.50	0.06
5070_10	30,106	0.51	0.01
5183_11	23,253	5.96	0.14
5315_12	15,600	3.71	0.06
5334_12	27,060	-6.81	-0.18
5438_12	24,472	18.74	0.46
5491_12	13,751	22.05	0.30
5564_12	12,424	5.62	0.07
5605_12	28,990	12.44	0.36
6101_12	29,236	12.32	0.36
7543_12	18,834	11.35	0.21
26039_12	18,862	4.00	0.08



REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM THE CITY OF KINGSPORT GIS DEPARTMENT AND ESRI. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

Drawing Path: Z:\SoutheastRegion\Projects\2023\3236-0002-Kingsport 2023 Flow Monitoring-City of Kingsport\GIS\Data\Final Map for Report.aprx plotted by mcrow 07-17-2023

City of Kingsport

Flow Monitoring Location Map

Legend

- Pump and Lift Stations
- Sewer Force Mains
- Sewer Gravity Mains
- Existing Flow Meters
- Temporary Flow Meters
- Minimal RDII
- Significant RDII
- Severe RDII
- Inconclusive due to Balancing

N

1 inch = 2,500 feet

0 1,250 2,500 Feet

DATE:
7/17/2023

LJA PROJECT NO.
3236-0002

KINGSPORT TENNESSEE

LJA ENGINEERING
LJA Engineering | 265 Brookview Centre Way
Suite 504 Knoxville, TN 37919 | www.lja.com

EXHIBIT B
Sample Field Reports

Manhole Inspection Report

Date: 05/21/2024

Manhole ID: 139
Crew: FB
Street Address: 272 RIVER EDGE CT
General Location: Next to street

Inspection Type:	Internal	**Cover Type:**	Pick	**Ponding Type:**	None
Structure Type:	Standard	**Cover Fit:**	Good	**Ponding Depth:**	0
Location:	Grass	**# Holes in Cover:**	2	**Grade +/-:**	0
Surface Type:	Dirt/Grass	**Riser Present?:**	0	**Inflow Dish?:**	No
Weather:	Dry	**Riser Height:**	0	**Frame Offset:**	0 in

Chimney Material:	Pre-Cast	**Wall Material:**	Pre-Cast	**Bench Type:**	Poured
Chimney Height:	4 in	**Wall Lining Type:**	Cementitious	**Trough Type:**	Poured
Cone Material:	Pre-Cast	**Wall Length:**	0	**Step Type:**	Plastic
Cone Shape:	Eccentric	**Wall Width/Dia:**	48 in		

Manhole Depth: 5.15 ft **Evidence of Surcharge?:** No **Surcharge Depth:** 0

Comments: Roughness increased on cover and frame. Deposits on bench.

Area Photo

Internal Photo

Manhole Defect Information

Components with Defects: Bench,Cone,Chimney,Frame,Cover

	I/I Code Type	Broken	Lining Failure	Deposits	Roots	Fracture	Crack	Hole	Surface Damage	Brickwork	Joint
Cover:									Roughness Increased		
Frame:									Roughness Increased		
Frame Seal:											
Chimney:	Staining										
Cone:	Staining										
Wall:											
Bench:				Settled - Fine							
Trough:											

Manhole Defect Photos:

LJA ENGINEERING

Manhole Inspection Report - Pipes

Pipe #: 1
Upstream MH: 139
Downstream MH: 5584
Clock Position: 6
Shape of Pipe: Round
Diameter/Height: 8 in

Material: PVC
Rim to Invert: 5.15 ft
Flow Depth: 0 in


Comments: None

Pipe #: 2
Upstream MH: 5733
Downstream MH: 139
Clock Position: 12
Shape of Pipe: Round
Diameter/Height: 8 in

Material: PVC
Rim to Invert: 5 ft
Flow Depth: 1 in


Comments: None

Smoke Test Inspection Report

Observation: 1-1

Collected By: Finn Basler

Date Inspected: 8/5/2024

Address: 305 Pleasley Road

Upstream Manhole: 5526

Downstream Manhole: 5448

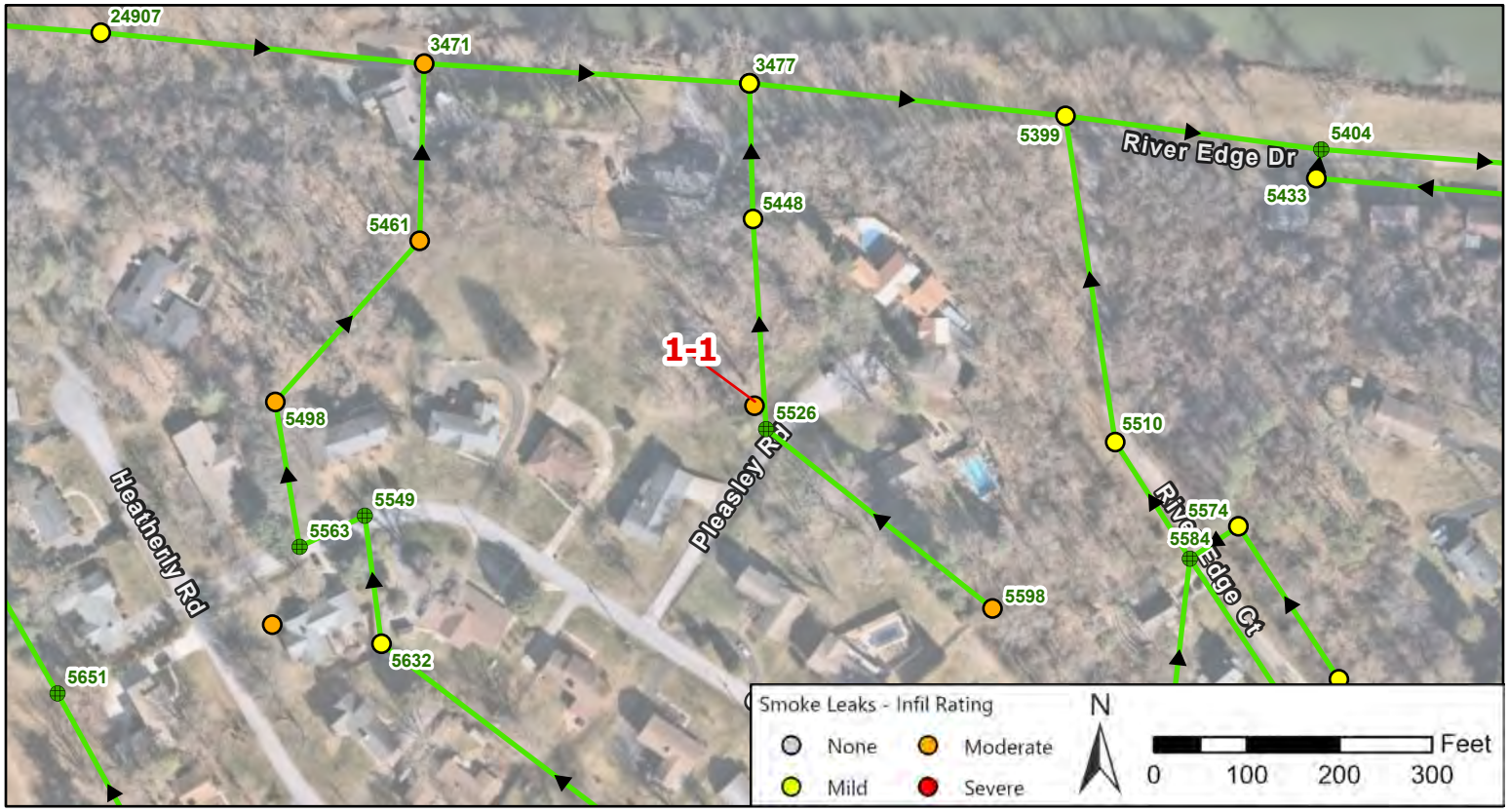
Property Type: Private

Source: Service Cleanout

Smoke Intensity: Heavy

I & I Rating: Moderate

Comments: Smoke from 6" cleanout. Cleanout missing cap.



LJA ENGINEERING

KINGSPORT TENNESSEE

PACP Inspection Report

LJA

Project:		Date/Time:	May 7 2024 - 16:02
Street and City:	256 River Edge Dr - Kingsport	Weather:	Dry - No precipitation during survey
Owner:	Kingsport	Inspection Status:	Complete Inspection
Customer:	LJA	Segment:	5404_24908
Surveyor Name and Certificate:	Spencer Seidel P0039857-112022	Direction:	Downstream
Reviewer Name and Certificate:	Elisabeth Lowery U-0220-70308547	Up MH:	5404
P.O. #	3236-0003	Down MH:	24908

Pipe Details and Measurements

Pipe Use:	SS	Material:	CP
Height:	15	Lining:	N
Width:		Joint Length:	4
Shape:	C	Purpose:	B
Pre-Cleaning:	No Pre-Cleaning	Additional Info:	

Pipe Ratings

Overall Quick Rating: 3121

Structural Quick Rating:	3100	O&M Quick Rating:	2112
Structural Pipe Rating Index:	3.0	O&M Pipe Rating Index:	1.3

Surveyed Length: 350

Total Length: 353

Inspection Technology Used: CCTV

Kingsport — May 7 2024	Up MH: 5404
Pipe: 5404_24908	Down MH: 24908

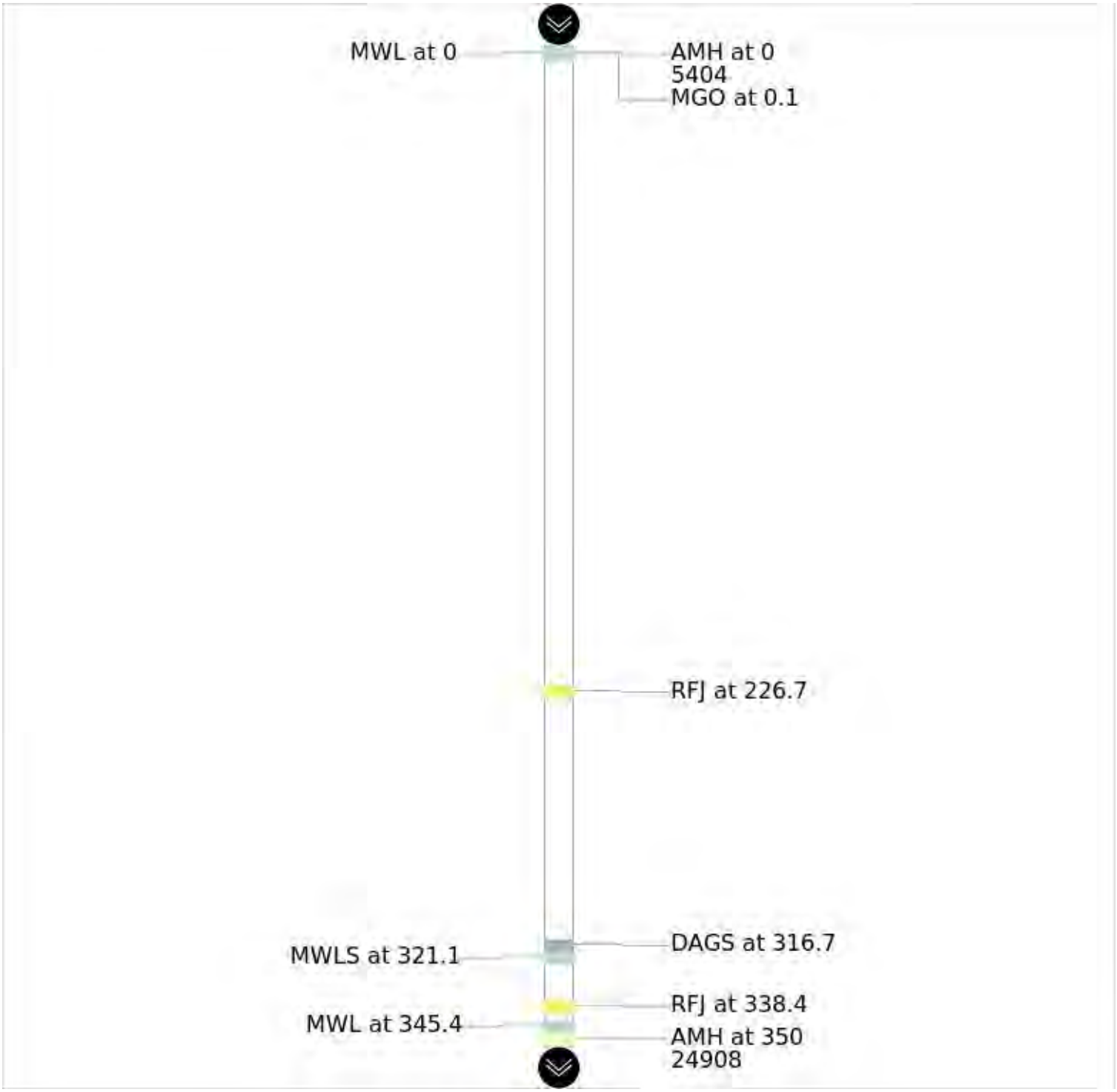
Observations & Defects

Surveyed Length: 350

Total Length: 350

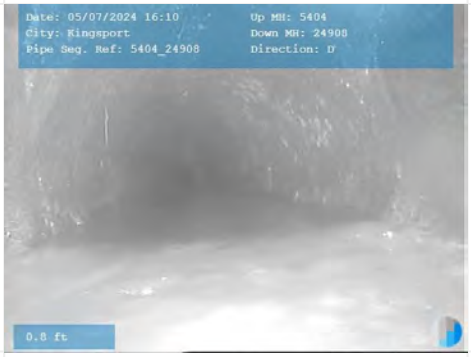
Survey Direction: Downstream

Flow Direction:



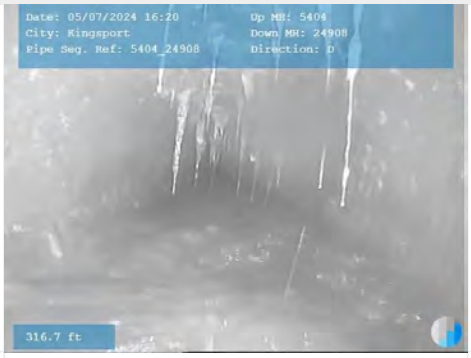
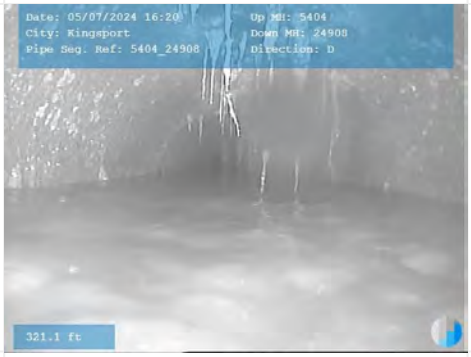
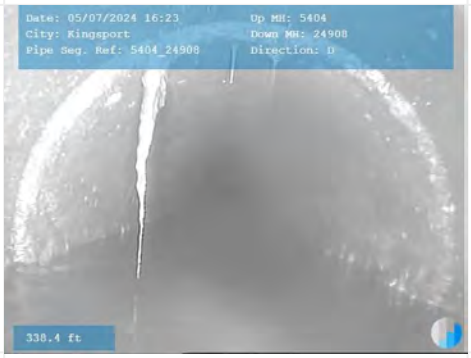
PACP Inspection Report
LJA

Kingsport — May 7 2024	Up MH: 5404
Pipe: 5404_24908	Down MH: 24908

Photo	Distance	Description	Time
	0	AMH - Manhole Remark = 5404	00:00:17
	0	MWL - Miscellaneous Water Level Percent: 30	00:01:33
	0.1	MGO - Miscellaneous General Observation Remark = Pipe Diameter Confirmation	00:01:11
	226.7	RFJ - Roots Fine Joint Joint: True Clock from 10 to 11 Grade = 1	00:07:58

PACP Inspection Report
LJA

Kingsport — May 7 2024	Up MH: 5404
Pipe: 5404_24908	Down MH: 24908

Photo	Distance	Description	Time
	316.7	DAGS - Deposits Attached Grease Percent: 5 Clock from 10 to 1 Grade = 2	00:11:13
	321.1	MWLS - Miscellaneous Water Level Sag Percent: 50 Grade = 3	00:11:29
	338.4	RFJ - Roots Fine Joint Joint: True Clock At 11 Grade = 1	00:14:54
	345.4	MWL - Miscellaneous Water Level Percent: 35	00:15:13

Kingsport — May 7 2024	Up MH: 5404
Pipe: 5404_24908	Down MH: 24908

Photo	Distance	Description	Time
	350	AMH - Manhole Remark = 24908	00:16:13

Kingsport — May 7 2024	Up MH: 5404
Pipe: 5404_24908	Down MH: 24908

Time	Dist.	Code	Cont.	Dim. 1	Dim. 2	%	Joint	Clock From	Clock To	Remarks
00:00:17	0	AMH								5404
00:01:33	0	MWL				30				
00:01:11	0.1	MGO								Pipe Diameter Confirmation
00:07:58	226.7	RFJ					True	10	11	
00:11:13	316.7	DAGS				5		10	1	
00:11:29	321.1	MWLS				50				
00:11:29	338.4	RFJ					True	11		
00:15:13	345.4	MWL				35				
00:16:13	350	AMH								24908

Kingsport — May 7 2024	Up MH: 5404
Pipe: 5404_24908	Down MH: 24908

Additional PACP Header Information

Media Label:		Up Rim to Invert:	
Work Order:	24-06639	Up Rim to Grade:	
Sheet Number:		Up Grade to Invert:	
Date Cleaned:	Unknown	Up Northing:	
Flow Control:	N	Up Easting:	
Consequence of Failure		Up Elevation:	
Pressure Value:		Down Rim to Invert:	
Drainage Area:	5	Down Rim to Grade:	
Location Code:	D	Down Grade to Invert:	
Location Details:		Down Northing:	
Coating Method:		Down Easting:	
Pipe Joint Length:	4	Down Elevation:	
Year Constructed:	1900	Coordinate System:	
Year Renewed:	1900	Vertical Datum:	
		GPS Accuracy:	
Reverse Setup:		Imperial?:	True