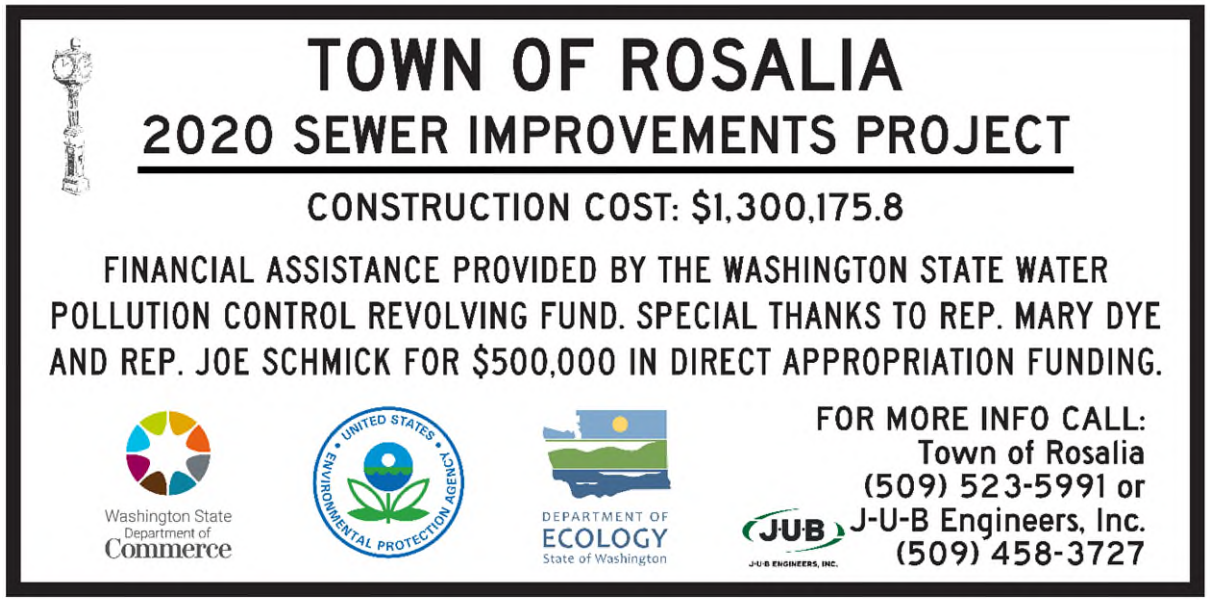
S48: Rosalia's Infiltration and Inflow (I&I) Reduction Program

IACC Conference - October 24, 2024



Helping Each Other Create Better Communities

OVERVIEW

- Identifying I/I
- Background/NPDES Permit
- Timeline
- Funding Partners
- Inspections
- Community Outreach and Education
- GIS Mapping
- Construction Highlights
- Water Quality Improvements
- Lessons Learned
- Next Steps

I/I REDUCTION PLAN (EPA)

1

Identify the sources of I/I

2

Evaluate alternatives for sewer rehabilitation

3

Implement sewer rehabilitation

WHAT IS INFLOW AND INFILTRATION (I&I)?

What is Inflow and Infiltration?

Inflow and infiltration (I/I) is when excess water enters the sewer system. I/I can impact the facility's ability to properly treat the Town's wastewater before entering Pine Creek. Most I/I is caused by old or broken infrastructure that needs to be fixed or replaced, and commonly occurs during or after high rain or snow melt events.

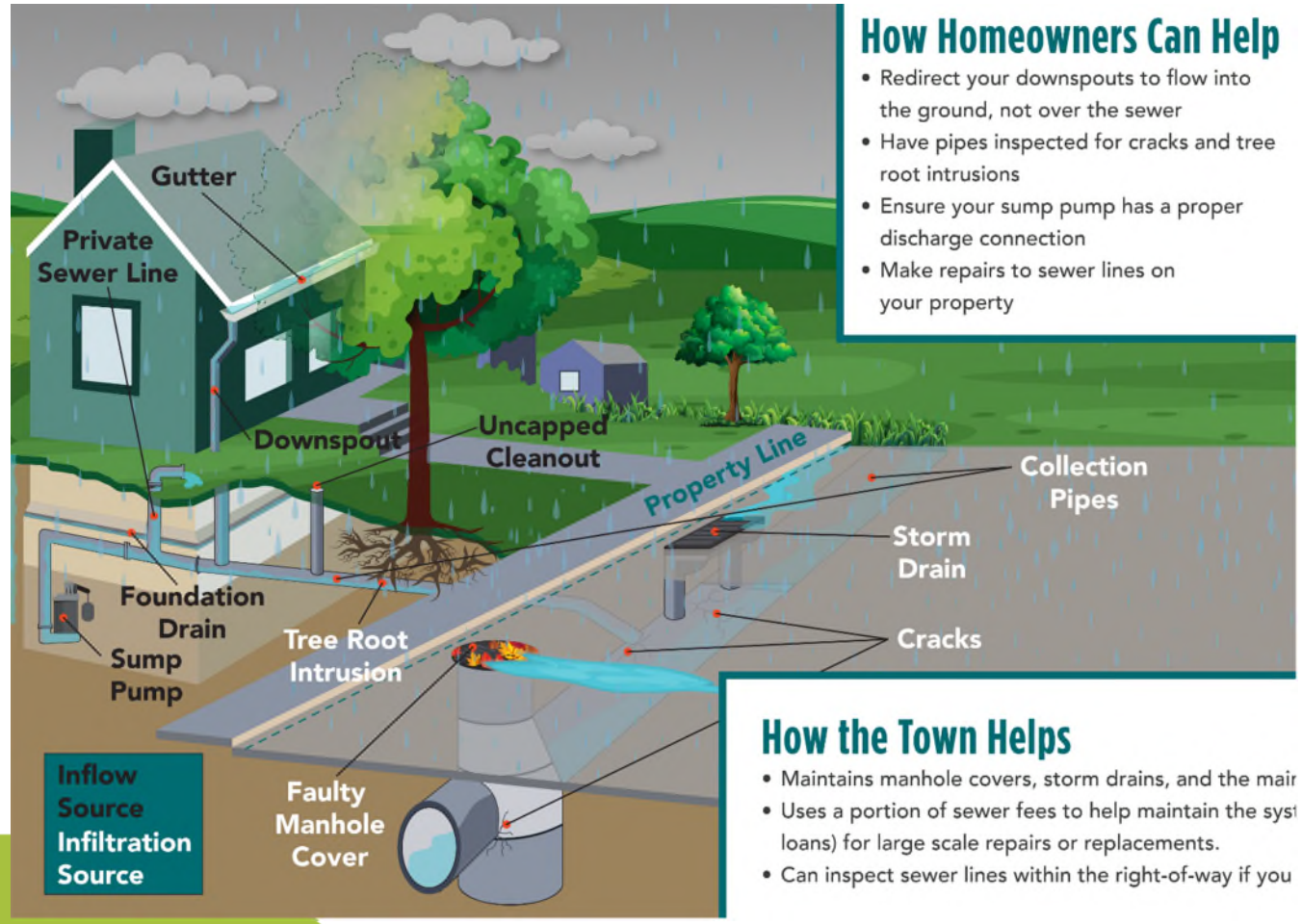
Inflow

Occurs from surface runoff that enters a sewer system through manhole covers, exposed broken pipes and defective pipe joints, cross connections between storm sewers, and illegal connection of roof leaders, cellar drains, yard drains, or catch basins.

Infiltration

Occurs when groundwater enters a sewer system through broken pipes, defective pipe joints or illegal connections of foundation drains.*

*EPA, Office of Municipal Pollution Control. (1985). I/I Analysis and Project Certification. Ecology Publication, 97(03).



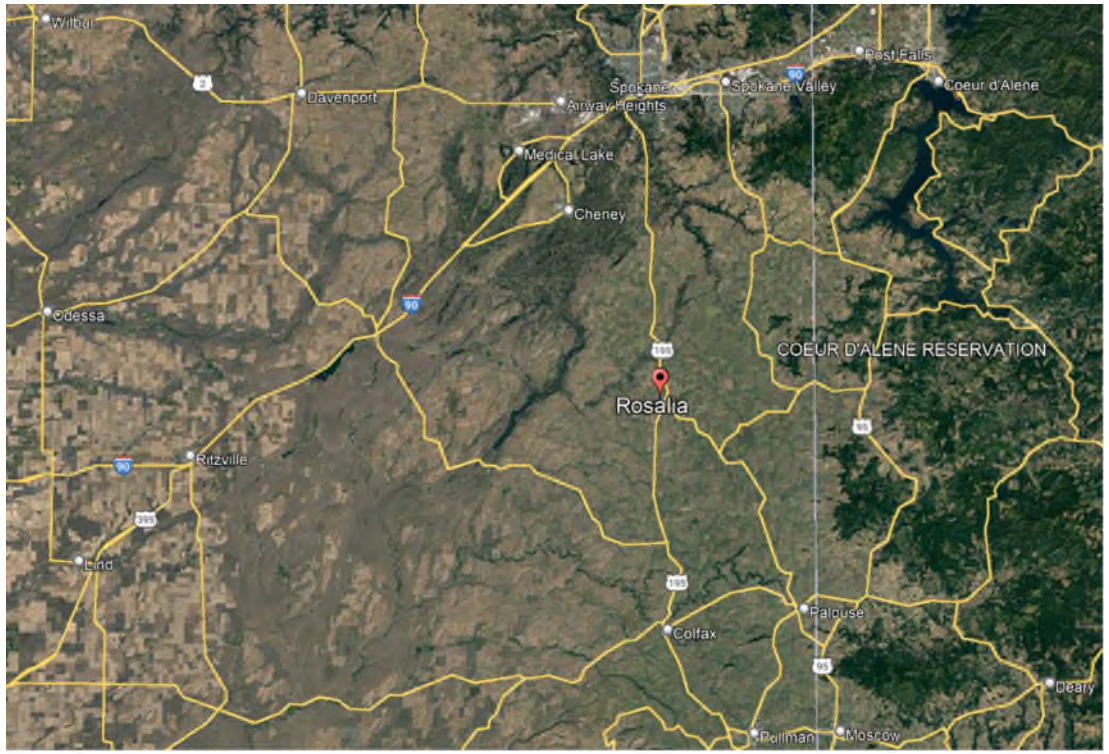
How Homeowners Can Help

- Redirect your downspouts to flow into the ground, not over the sewer
- Have pipes inspected for cracks and tree root intrusions
- Ensure your sump pump has a proper discharge connection
- Make repairs to sewer lines on your property

How the Town Helps

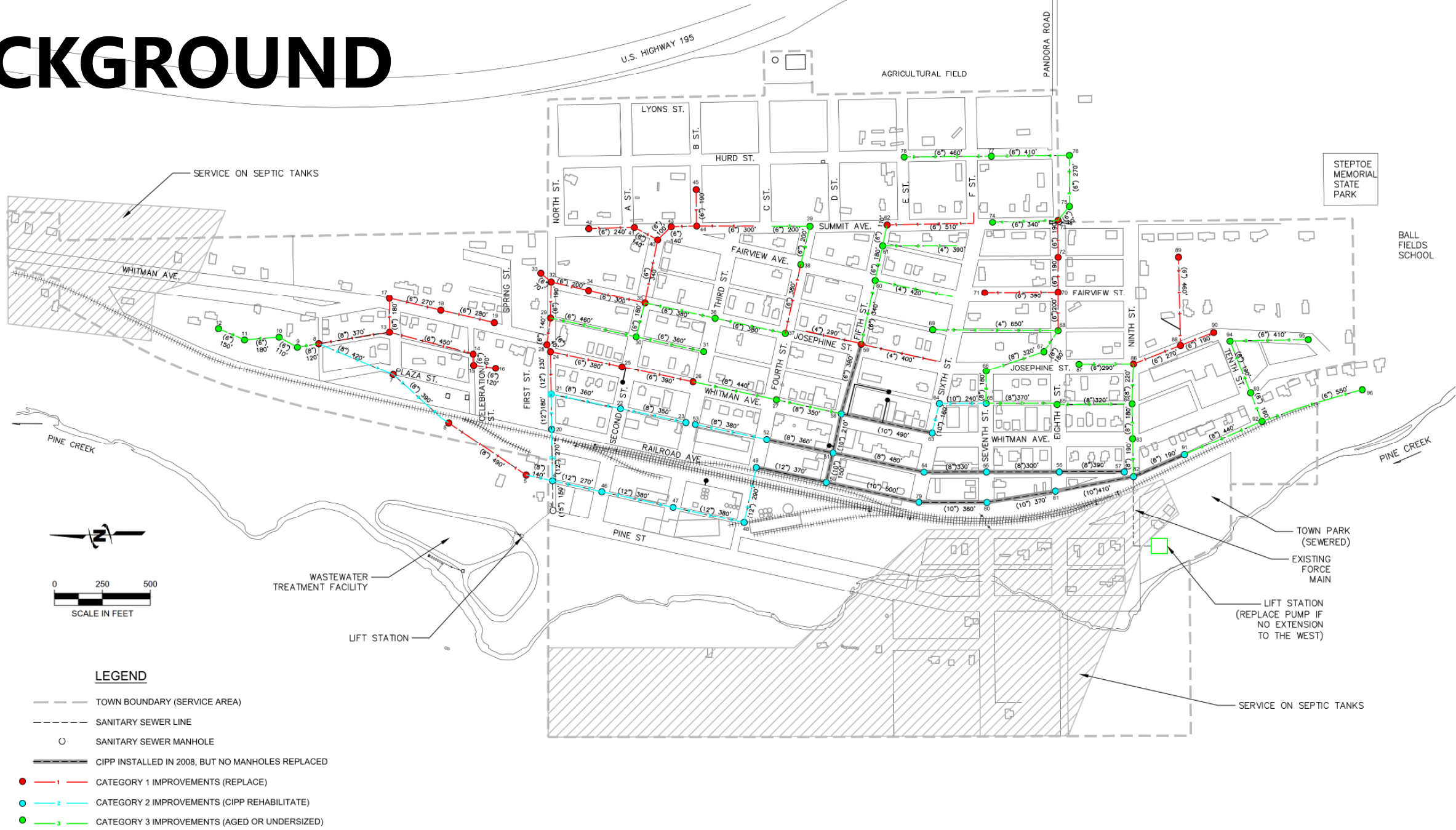
- Maintains manhole covers, storm drains, and the mair
- Uses a portion of sewer fees to help maintain the syst loans) for large scale repairs or replacements.
- Can inspect sewer lines within the right-of-way if you

BACKGROUND

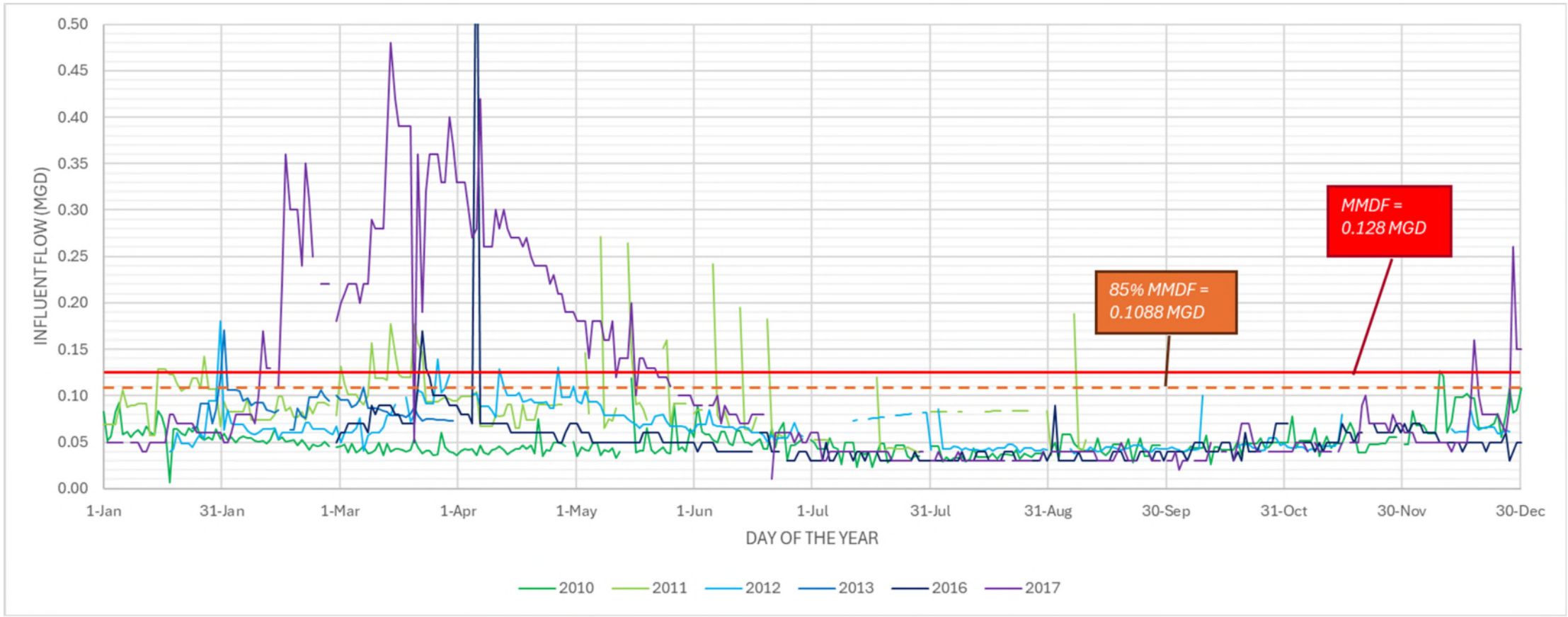

Wilbur
Davenport
Spokane
Airway Heights
Spokane Valley
Post Falls
Coeur d'Alene
Medical Lake
Cheney
Odessa
COEUR D'ALENE RESERVATION
Rosalia
Ritzville
Lind
Colfax
Palouse
Pullman
Moscow
Deary


S Josephine Ave
W 9th St
W 7th St
S Park Ave
E 8th St
Rosalia Rd

BACKGROUND

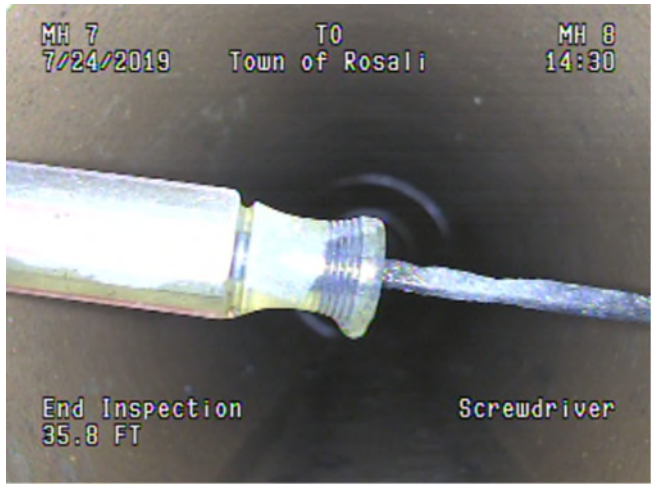

U.S. HIGHWAY 195
PANDORA ROAD
AGRICULTURAL FIELD
LYONS ST.
HURD ST.
NORTH ST.
A ST.
B ST.
C ST.
D ST.
E ST.
F ST.
SUMMIT AVE.
FAIRVIEW AVE.
FAIRVIEW ST.
THIRD ST.
FOURTH ST.
FIFTH ST.
SIXTH ST.
SEVENTH ST.
EIGHTH ST.
NINTH ST.
TENTH ST.
JOSEPHINE ST.
WHITMAN AVE.
RAILROAD AVE.
PINE ST
PLAZA ST.
SPRING ST.
FIRST ST.
SECOND ST.
CELEBRATION ST.
SERVICE ON SEPTIC TANKS
STEPTOE MEMORIAL STATE PARK
BALL FIELDS SCHOOL
PINE CREEK
WASTEWATER TREATMENT FACILITY
LIFT STATION
TOWN PARK (SEWERED)
EXISTING FORCE MAIN
LIFT STATION (REPLACE PUMP IF NO EXTENSION TO THE WEST)
SERVICE ON SEPTIC TANKS
0 250 500
SCALE IN FEET
LEGEND
TOWN BOUNDARY (SERVICE AREA)
SANITARY SEWER LINE
SANITARY SEWER MANHOLE
CIPP INSTALLED IN 2008, BUT NO MANHOLES REPLACED
CATEGORY 1 IMPROVEMENTS (REPLACE)
CATEGORY 2 IMPROVEMENTS (CIPP REHABILITATE)
CATEGORY 3 IMPROVEMENTS (AGED OR UNDERSIZED)

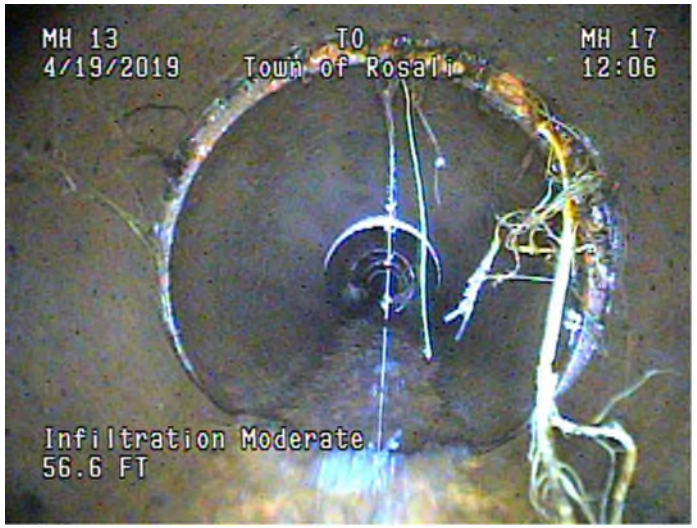
NPDES PERMIT #WA0044687



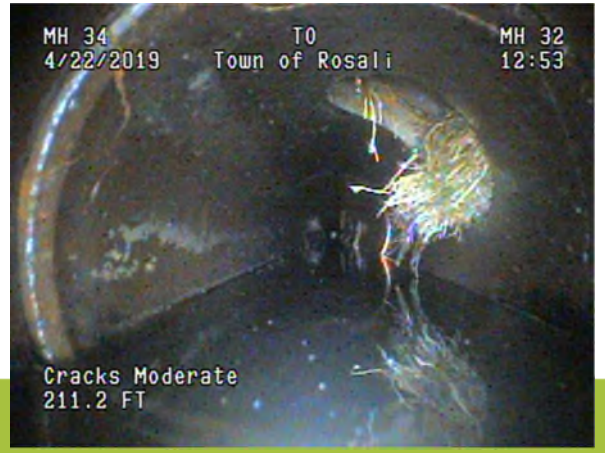
MANHOLE INSPECTION

CCTV INSPECTION





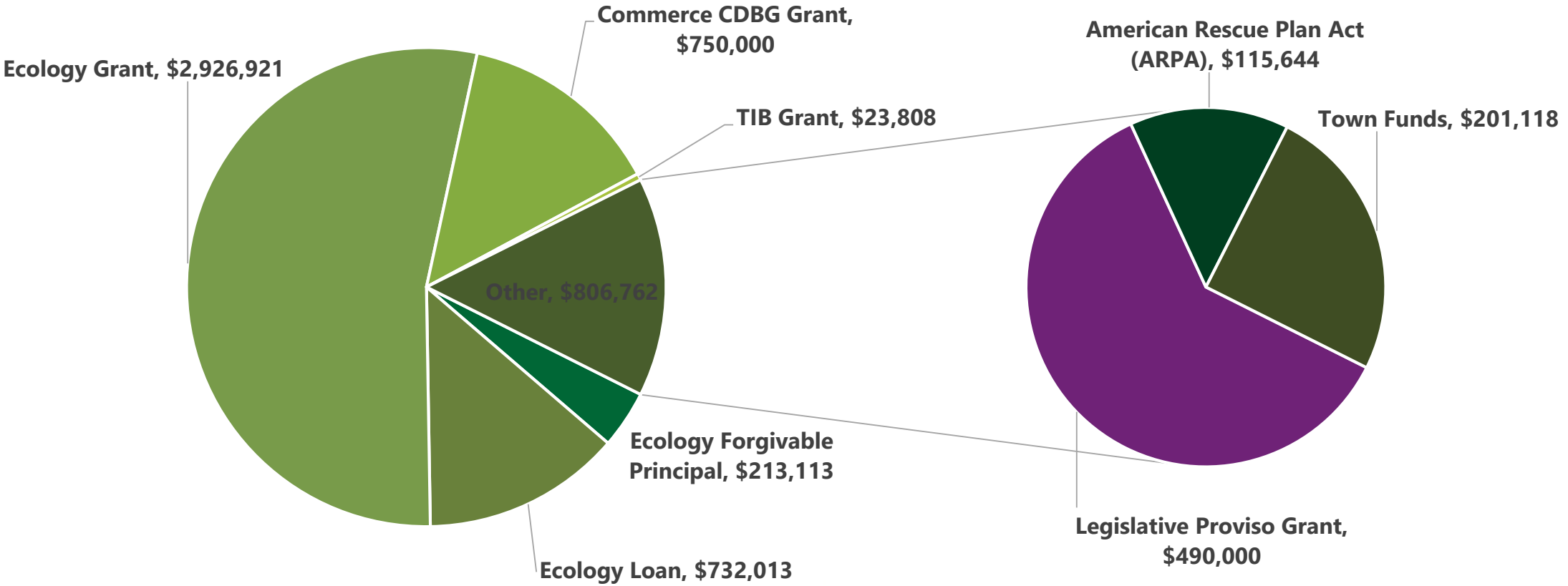
CCTV INSPECTION



TIMELINE

	2017	2018	2019	2020	2021	2022
Update General Sewer Plan	Approved, Fall 2017					
Environmental Review	Completed 2017					
Funding Applications	CDBG 2017 Ecology 2017		Legislative Proviso 2019			
Community Outreach and Education	Public Hearing	Public Meeting			Four posters	
Design & GIS Mapping		Design	Design	Design	GIS Mapping	
Bid & Construction			Fairview & Ninth	Sewer Phase 1	Sewer Phase 2	Sewer Phase 2
Closeout			CDBG			Ecology

FUNDING PARTNERS



TECH TEAMS AT IACC!!

COMMUNITY OUTREACH AND EDUCATION

Meeting Outline 1

- Welcome and Introduction
- Condition of Water and Sewer System (page 2)
- List of Water and Sewer Improvements Projects (pages 3-4)
- Discussion of Current Funding Offers (page 5)
- Water and Sewer Rates Breakdown (page 6)
- Improvement Packages
  - #1 – Minimum Improvements (page 7)
  - #2 – Proceed with Modified Funding Offers (page 8)
  - #3 – Pro
  - #4 – Add
  - #5 – Add
- Summary of Imp
- Notes (page 14)
- Public Commen

Notes and Disclaimer:

Funding offers discussed final determination of th other factors.

Project priorities and sco documentation for the w community, and Town st community feedback pro change before the propo

Information has been pr
Layne Merritt, lmerritt@
Samuel Mineer, smineer

Feedback and comment feedback can help docu consider.
If you need more time t sheet and return the co

Town of Rosalia: Water

Condition of Water and Sewer System

Water System Component	Condition/Observations
327 Service Connections	• Some leaky service connections to h responsible for replacing leaky servic
31,000 feet Water Distribution Pipe	• Leaky mains and lead joints through • Undersized mains in upper and lowe need upsizing for growth and fire pr
2 Groundwater Wells	• Emergency power needed. • Pumps in need of replacement. • New well source away from current redundancy to supply, emergency w
2 Reservoirs • 300,000 gallon (Upper Zone) • 300,000 gallon (Lower Zone)	• Susceptible to overflow, water loss a • Needs rehabilitation to reduce leaks contamination.
1 Booster Pump Station (Upper Zone)	• Needs to be relocated from ground ground building. • Emergency power needed.
Sewer System Components	**Condition/Observations**
299 Service Connections	• Sewer service connections to homes replacement in future.
30,000 feet of Sewer Collection Pipe	• 12,000 feet of system in need of imn replacement or rehabilitation. • Most manholes are OK, some leaky. • Infiltration and inflow in collection s reducing useful life of Lagoon Treatment System.
2 Lift Stations • Town Park • Headworks for Wastewater Lagoons	• Town Park lift station needs repair. • Headworks Lift Station was updated in 2012.
2 Cell Lagoon Treatment System and Disinfection System	• Updated in 2011/2012, but will require future upgrades.

See Attached Water and Sewer Maps for system layout and proposed improvements.

Town of Rosalia: Water and Sewer Projects and Funding Discussion 2/15/2018

List of Water and Sewer Improvement Projects 3

WATER PROJECTS Project Description-- Purpose	Total Construction Phase Costs	Total Design Phase Costs	GRAND TOTAL	Priority
Water Main Replacement Project (Fairview/9th/North)-- Replace 2,760 feet of leaking water mains, lead components, improvements to lower zone alarm systems (reduce overflow and water loss)	$676,765.00	$57,900.00	$734,665.00	Higher
Replace well pumps-- Replace aged well pumps, protect water supply for Town	$67,500.00	$6,180.00	$73,680.00	Higher
New generators at wells and booster station (or one mobile generator)-- Emergency power supply for water and booster pump features	$112,500.00	$10,300.00	$122,800.00	Higher
Line/rehabilitate existing lower zone reservoir-- Protect water supply from foundation washouts and prevent small animal contamination	$196,875.00	$18,025.00	$214,900.00	Higher
HIGHER PRIORITY TOTAL	**$1,053,640.00**	**$92,405.00**	**$1,146,045.00**	
Relocate booster station pumps above ground, new building-- Flooding hazard in ground vault	$267,800.00	$57,900.00	$325,700.00	Moderate
Drill a new well not adjacent to existing wells-- Redundant well source, protection if primary well source contaminated	$506,250.00	$46,350.00	$552,600.00	Moderate
Construct second reservoir (low zone), approximate 400,000 gallons-- Increase fire/standby storage. Redundant reservoir for water storage and service.	$1,237,500.00	$113,300.00	$1,350,800.00	Moderate
MODERATE PRIORITY TOTAL	**$2,011,550.00**	**$217,550.00**	**$2,229,100.00**	
Water Main Replacement (replace small mains in upper zone)-- Increase capacity (fire flow)	$393,750.00	$36,050.00	$429,800.00	Lower
Water Main Replacement (replace small mains in lower zone)-- Increase capacity (fire flow)	$900,000.00	$82,400.00	$982,400.00	Lower
Install New Water Mains				
Install New Water Mains homes. Eliminate long se				
LOWER PRIORITY TOTAL				
ALL PRIORITY TOTAL				

Construction and Design C other unforeseen factors.

Town of Rosalia: Water ar

List of Water and Sewer Improvement Projects

SEWER PROJECTS Project Description-- Purpose	Total Construction Phase Costs	Total Design Phase Costs	GRAND TOTAL	Priority
Community Outreach and Education-- Identify potential storm inflow sources. Remove extraneous storm inflow into sewer system. Public outreach to reduce inflow and debris in system.	$0.00	$15,000.00	$15,000.00	Higher
Sewer Mapping and Inventory-- Locate and quantify sewer system assets. Generate inventory and system database for sewer system. Improve maintenance and upkeep records.	$0.00	$40,000.00	$40,000.00	Higher
Category 1 - Replace Sewer, I/I (one-half pavement repair costs)-- Replace structurally damaged pipe and manholes; address sources of inflow and infiltration.	$2,253,434.00	$205,400.00	$2,458,834.00	Higher
Category 2 – CIPP* Sewer, I/I-- Rehabilitate aged pipes and manholes; address sources of inflow and infiltration.	$1,053,210.00	$96,000.00	$1,149,210.00	Higher
HIGHER PRIORITY TOTAL	**$3,306,644.00**	**$356,400.00**	**$3,663,044.00**	
Category 3 - Undersized, Aged (one-half pavement repair costs)-- Repair or rehabilitate aged and undersized pipe and manholes.	$3,261,530.00	$270,000.00	$3,531,530.00	Lower
ALL PRIORITY TOTAL	**$6,268,174.00**	**$626,400.00**	**$6,894,574.00**	

*CIPP = Cure-In-Place Pipe, a trenchless rehabilitation method to repair existing pipelines.

Construction and Design Costs presented are estimates and could be affected by change in project scope, inflation in the construction market or other unforeseen factors.

Town of Rosalia: Water and Sewer Projects and Funding Discussion 2/15/2018

Current and Potential Funding Offers 5

Current Funding Offers (Requires Action Soon to Take Advantage of Offers)

CURRENT OFFERS TO ROSALIA Agency/Program—Project Description (Design or Construction)	Grant/Forgivable Amount	Loan Amount	Loan Interest Rate	Loan Term, Years
Washington Department of Health (DOH)-- Small System Preconstruction Activities (Design only)	$0.00	$300,000.00	2.00%	20
Community Development Block Grant (CDBG)-- Water and Sewer Improvements (Fairview, 9th, North) (Design and Construction)	$734,665.00	$0.00	N/A	N/A
FY2019 Department of Ecology (DOE) Water Quality*-- Wastewater Collection System Improvements (Design and Construction)	$3,238,221.00	$3,656,353.00	1.80%	20

*Ecology grant and loan awarded because full loan would cause rate hardship (over $65.34 for sewer).

Potential Funding Avenues (Not secured, would need to

POTENTIAL FUNDING SOURCES Agency/Program—Project Description (Design or Construction)	Grant/Fo Amo
United States Department of Agriculture Rural Development (USDA RD)**—Water or Sewer System Improvements (Design and Construction)	Varie (40% of when hards
DOH—Water System Improvements (Construction)	Var
Legislative Line Item (Letter Writing Campaign)—Water or Sewer System Improvements (Design and Construction)	Var
Transportation Improvement Board (TIB)—Help fund road and surface improvements during water and sewer improvements	Var

**USDA RD loan must be spend before accessing grant m
***USDA RD grant money available after hardship levels

Hardship is calculated as a percentage of the median hou hardship qualifications may vary from different funding ag

Town of Rosalia: Water and Sewer Projects and Funding

Water and Sewer Rates Breakdown 6

Explanation of Rates	
Base Rate (Water/Sewer)	Covers expenses for maintaining system, minor system repairs and upkeep, laboratory testing, equipment maintenance, staff wages and benefits, etc.
Utility Tax (Water/Sewer)	Generates funds for utility repair and upkeep. 10% of other rate elements combined.
Capital Improvements (Water/Sewer)	Generate funds to repair/replace critical components of the system.
Short Lived Asset Replacement (Water)	Funds used to address water system components needing replacement.
Ecology Loan Repayment	Loan from Wastewater Lagoon and Headworks Improvements Project.

For Rosalia, "hardship funding" may become available when water or sewer rates exceed $60 each utility as a result of proposed improvement projects, depending on the funding agency.

Town of Rosalia has current resolution (#16-10) in place to raise water and sewer base rates annually by 6% to cover the increasing maintenance costs for repairing an older system and to generate funds to handle projects in the future.

Town of Rosalia: Water and Sewer Projects and Funding Discussion 2/15/2018

COMMUNITY OUTREACH AND EDUCATION

POSTER #1

J-U-B ENGINEERS

ESTD 1954 70TH ANNIVERSARY

Helping Each Other Create Better Communities

The Sewer Series

Protecting Rosalia's Water Quality

Rosalia uses an aerated lagoon wastewater treatment system. Treating wastewater improves water quality so that it can be returned to the environment as a nonharmful substance.

Over 300 houses and businesses are connected to and supported by Rosalia's wastewater system.

What is water quality and why is it important?

- Water quality is measured by observing waste products and biproducts (such as ammonia and bacteria) and the treatments (such as oxygen levels and temperature control) used to counterbalance harmful elements.
- There are standard water quality levels that must be maintained in a sewer treatment system. These are set by state and federal programs such as the Environmental Protection Agency (EPA).
- If the wastewater system becomes biologically imbalanced or overburdened by too much flow water quality may drop impacting not only Rosalia's residents, but the surrounding region!

What happens if water quality drops?

- Overflow may end up in Pine Creek, posing a risk to public health, recreation, and biological habitats.
- Washington State Ecology or other environmental advocate groups may serve Rosalia with an official violation. This puts the Town at risk of fines, lawsuits, and other official consequences.
- To repair violations, mandatory rate increases may be imposed.

How do we keep it clean?

Improvements to the sewer collection system can help increase efficiency and effectiveness of the system, keep water quality high, and reduce the risks of a violation.

Small actions can help Rosalia's water quality and reduce impacts on the sewer collection system, such as:

- Only flush items down the toilet that are biodegradable
- Never put oil or synthetic materials down your sink, toilet, or garbage disposal

Trivia!

- What is the main type of organic or inorganic treatment used in Rosalia's lagoon system?
- What do you call a sewer expert?

Stay in the know!

Check back each month to learn more about Rosalia's wastewater system.

Contact: **Eljay Sanders**, Town of Rosalia Public Works Department • maintenance@rosaliatown.org • (509) 879-3150
Hannah Anderson, Public Involvement Specialist • handerson@langdongroupinc.com • (208) 770-0500
Sam Mineer, EIT, J-U-B Engineers, Inc. • smineer@jub.com • (509) 458-3727

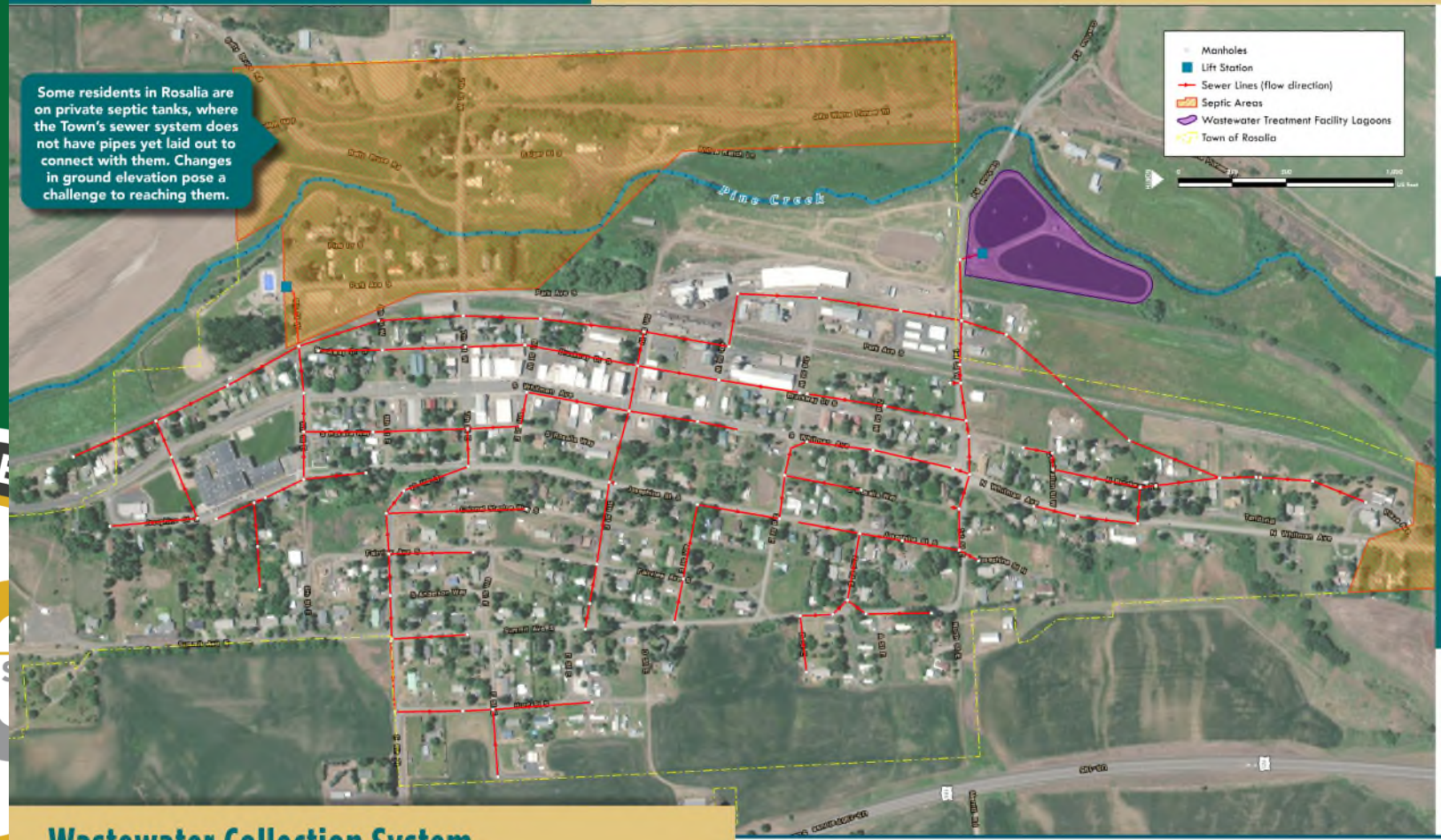
POSTER #2

Helping Each Other Cre

The Sewer Series

Overview of Rosalia's Collection System

The sewer collection system was originally constructed of brick manholes and clay tile pipe in the 1940's and 1950's. Flow was collected to a large septic tank until the 1960's when the lift station and two cell facultative lagoons were constructed. Over the years, different portions of the collection system have been updated by either cured-in-place-pipe, trenchless rehabilitation, or total replacement. Brick lined manholes were also replaced with precast concrete manholes. There are some portions of the system which are still clay tile pipe and brick lined manholes.



Wastewater Collection System

This is a map of the Town of Rosalia's sewer collection system, which is made up of a series of gravity sewer **pipes** and **manholes**. Manhole covers are used to access the system for repair and maintenance. Two **lift stations** are used to move flow from a lower to a higher elevation.

*This map is based on available field data. If you have more updated information, please contact the Town or J-U-B Engineers.

Stay in the know!

This poster is part of a series. Check back each month to learn more about Rosalia's wastewater system, and to get the answer to last month's trivia questions!

Joke

Why don't bacteria gamble in Las Vegas?

Trivia

If you lined them all up, how many total miles would the pipes in Rosalia's sewer system be?

See below for answers from last month

What is the main type of organic or inorganic treatment used in Rosalia's lagoon system? Answer: *Chlorination/Dechlorination*

What do you call a sewer expert? Answer: *A connoissewer.*

Questions? Contact:

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POSTER #3

Helping Each Other Cre

The Sewer Series
Think Before You Flush

Stay in the know!
This poster is part of a series. Check back each month to learn more about Rosalia's wastewater system, and to get the answer to last month's trivia questions!

Joke
Why did the soldier flush the toilet?

Trivia
On average, how many gallons of wastewater is produced by a single Rosalia resident per day? (Through cooking, pooping, showering, laundry, etc.)

Last month's answers:

- If you lined them all up, how many total miles would the pipes in Rosalia's sewer system be? Answer: Approximately 28,078 linear feet
- Why don't bacteria gamble in Las Vegas? Answer: Because they believe a good flush always beats a full house.

Why it Matters
All of the Town's wastewater flows by gravity to the wastewater plant lift station. There is a basket in the lift station wet well to catch solids and debris to protect the pump from damage.

If a blockage occurs at the lift station or the pumps are damaged by debris, Rosalia's entire sewer system can be impacted.

The only safe items to flush are:

- Water
- Human Waste
- Toilet Paper

Flushing any other items may:

- Create a blockage in your home
- Create a blockage in the sewer main (affecting you and your neighbors)
- Cause damage to the pumps at the treatment facility lift station

Don't Forget
Your kitchen sink is also connected to the sewer system. Don't pour these items in your sink or toilet!

- Solid Food Waste
- Cooking Oil*
- Oils*

* these harden when they cool and can cause a blockage

Throw Away, Don't Flush Away
These items belong in the trash! (even if they are labeled flushable)

- Hair
- Hard Objects
- Tissues, Paper Towels or Napkins
- Personal or Feminine Products
- Diapers
- T-shirts, Rags, or Cotton Cloth
- Wipes or "Flushable" Wipes (including baby, facial, or household cleaning wipes)
- Dental Floss, Q-Tips, or Band-Aids
- Medication or Medical Needles
- Fish

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POSTER #4

Helping Each Other Cre

The Sewer Series

Help Us Keep Rainwater Out of the Sewer

Stay in the know! This poster is part of a series. Check back each month to learn more about Rosalia's wastewater system, and to get the answer to last month's trivia questions!

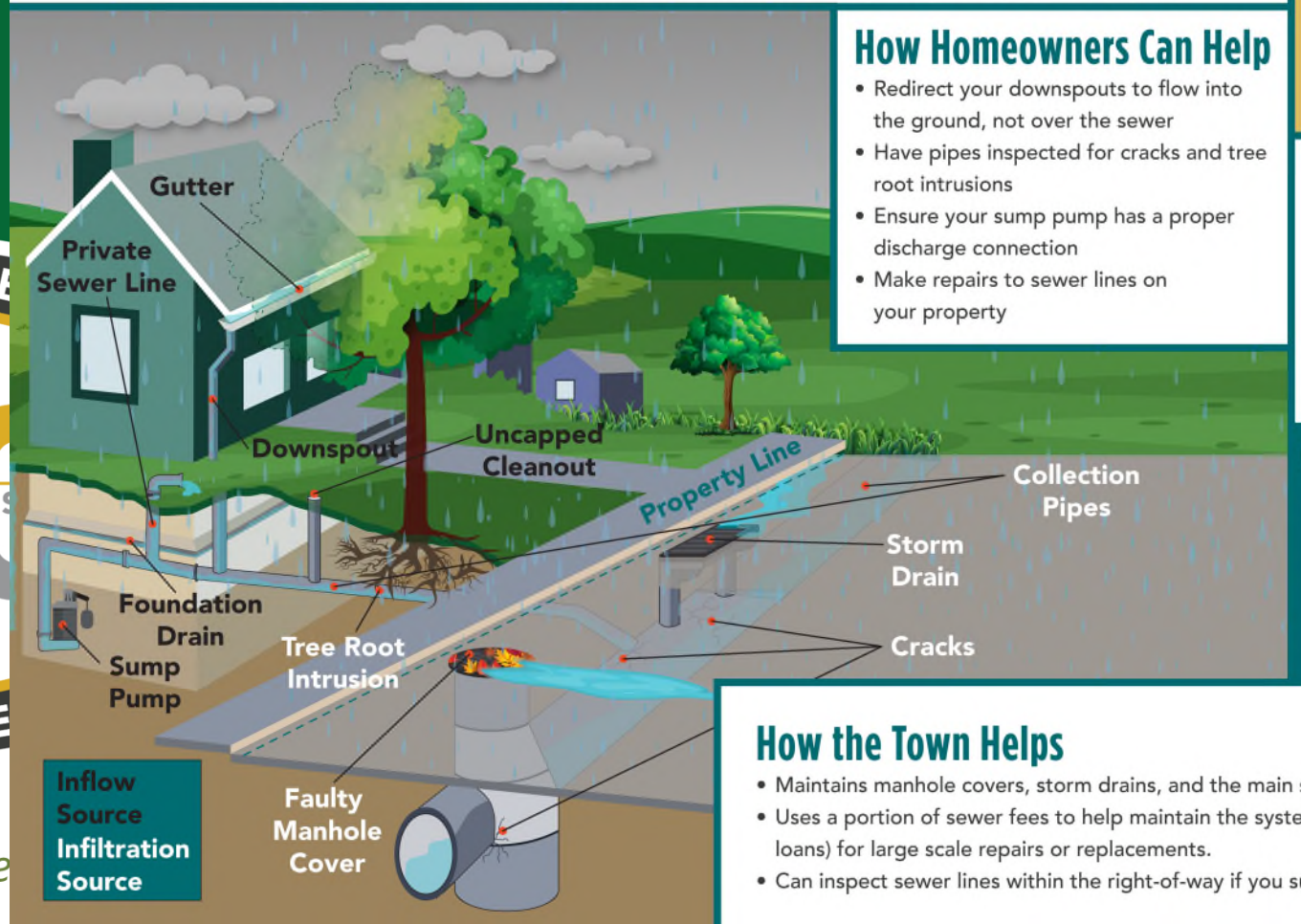
What is Inflow and Infiltration?

Inflow and infiltration (I/I) is when excess water enters the sewer system. I/I can impact the facility's ability to properly treat the Town's wastewater before entering Pine Creek. Most I/I is caused by old or broken infrastructure that needs to be fixed or replaced, and commonly occurs during or after high rain or snow melt events.

Joke What animals love to live in the sewer?

Trivia Treated wastewater discharges into Pine Creek during the winter months (December 1st through April 30th). To what water body is Pine Creek a tributary?

Answers from last month: TRIVIA: Q: On average, how many gallons of wastewater is produced by a single resident per day? A: 75-90 gallons per day. JOKE: Q: Why did the soldier flush the toilet? A: Because it was his duty.



How Homeowners Can Help

- Redirect your downspouts to flow into the ground, not over the sewer
- Have pipes inspected for cracks and tree root intrusions
- Ensure your sump pump has a proper discharge connection
- Make repairs to sewer lines on your property

Inflow

Occurs from surface runoff that enters a sewer system through manhole covers, exposed broken pipes and defective pipe joints, cross connections between storm sewers, and illegal connection of roof leaders, cellar drains, yard drains, or catch basins.

Infiltration

Occurs when groundwater enters a sewer system through broken pipes, defective pipe joints or illegal connections of foundation drains.*

*EPA, Office of Municipal Pollution Control. (1985). I/I Analysis and Project Certification. Ecology Publication, 97(03).

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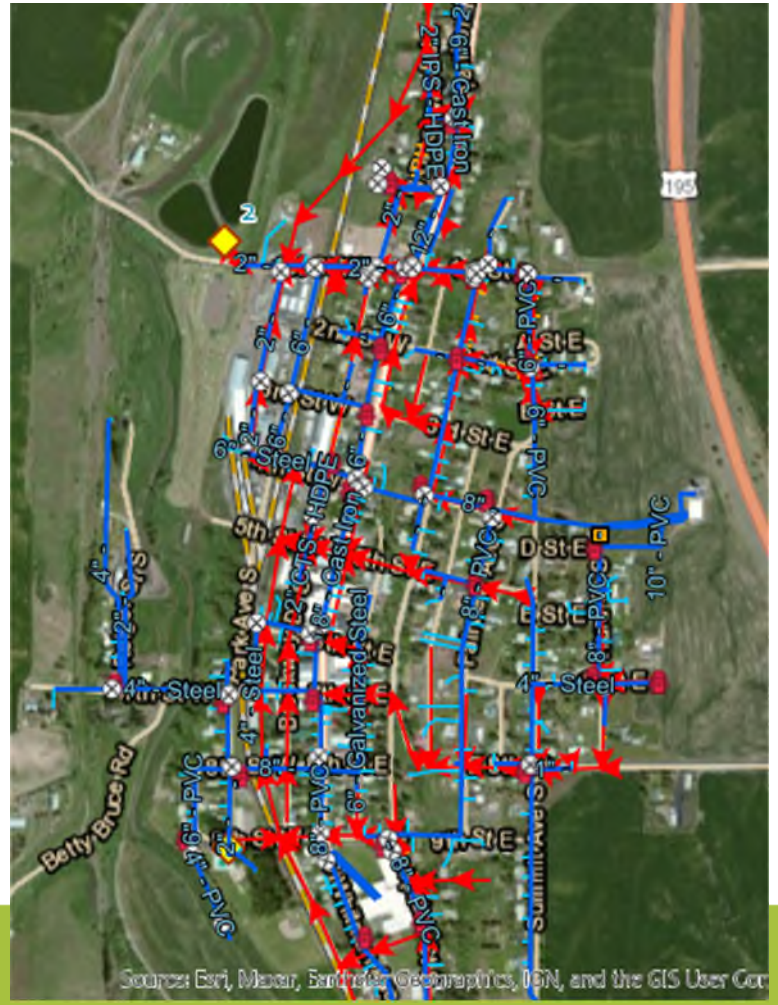
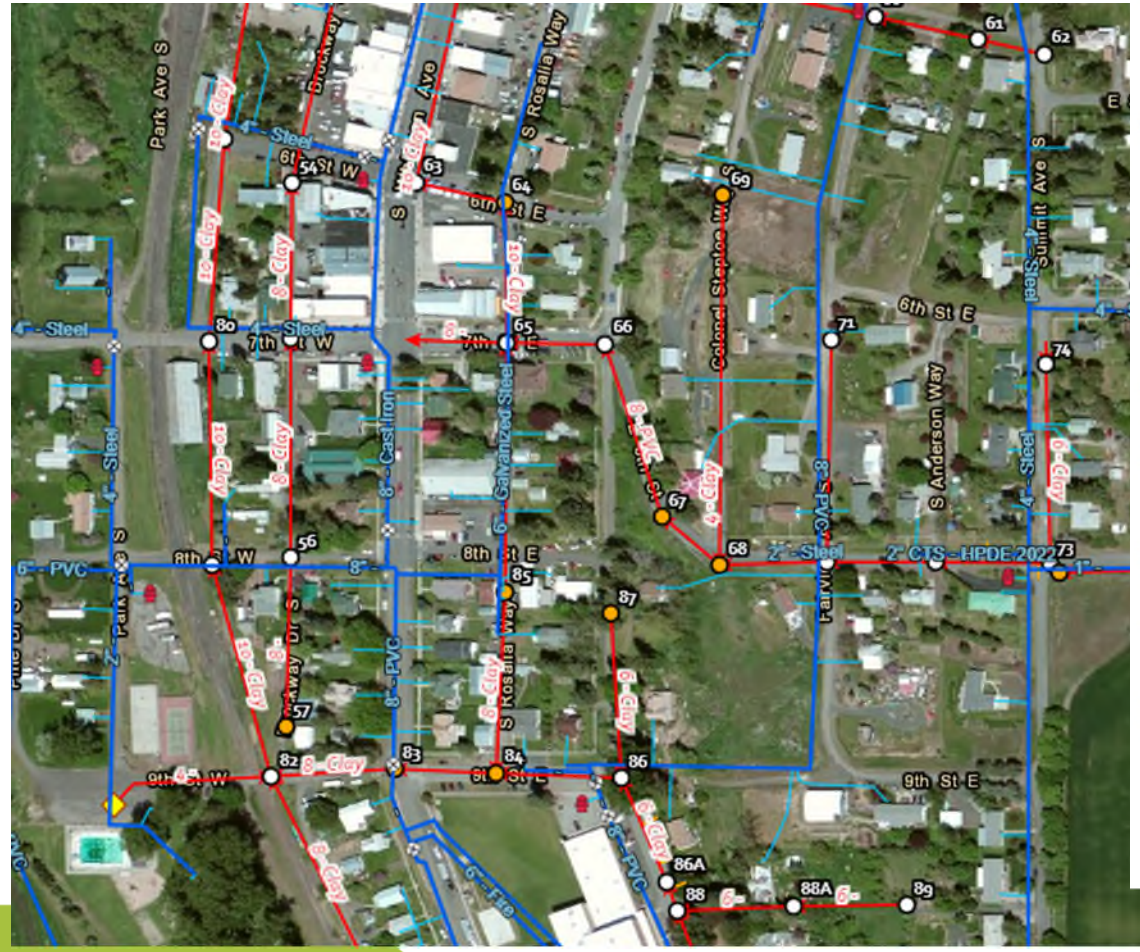
Sam Mineer — *J-U-B Engineers, Inc.*
smineer@jub.com, (509) 458-3727

How the Town Helps

- Maintains manhole covers, storm drains, and the main sewer collection pipe.
- Uses a portion of sewer fees to help maintain the system and seeks additional funding (through grants/ loans) for large scale repairs or replacements.
- Can inspect sewer lines within the right-of-way if you suspect there are blockages or broken pipes.

GIS MAPPING





Storm Pipe

Booster Station

Well

Water Valve

Hydrant

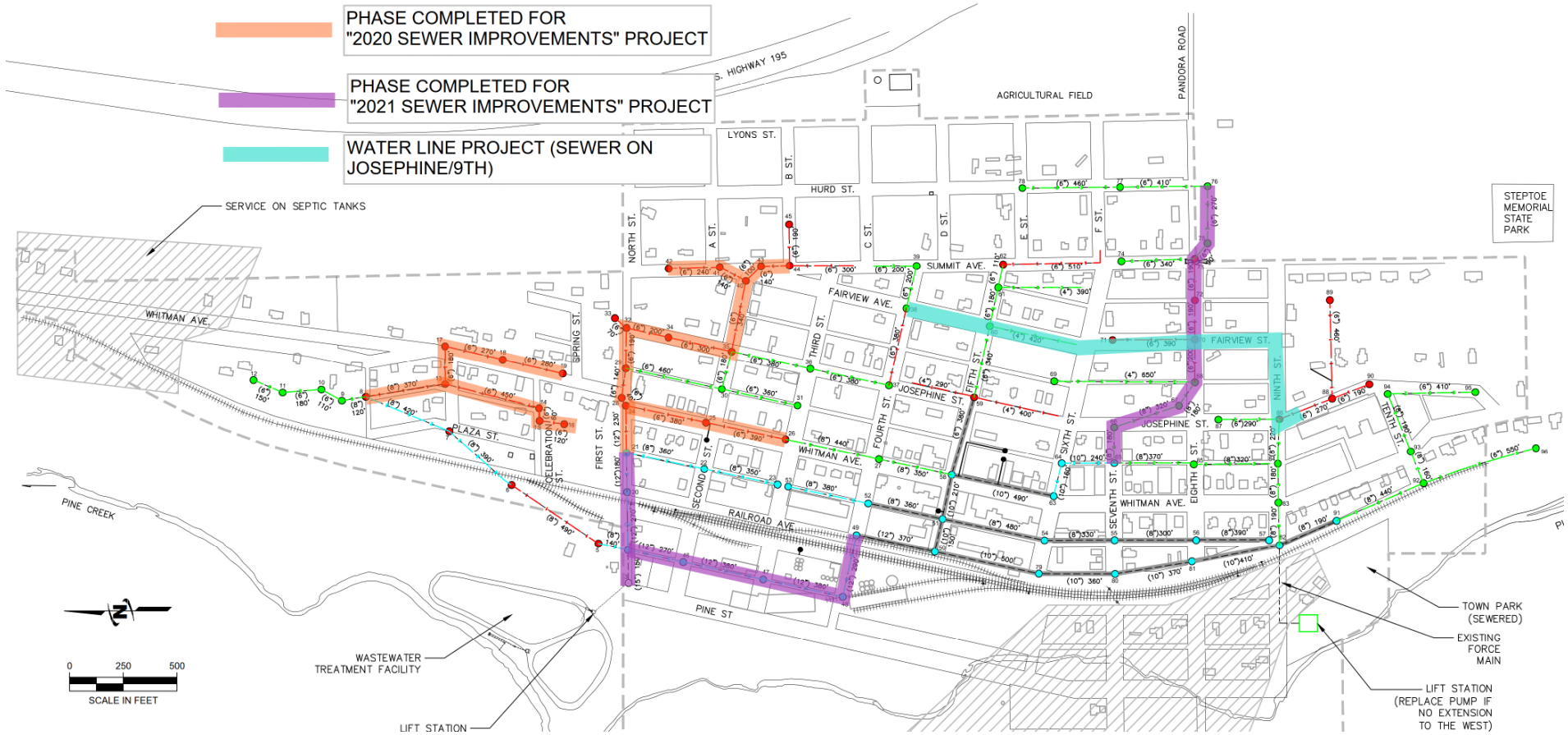
Water Lines

Service Lines

Manholes (ID)

- Manhole (surveyed)
- Approximated Location

CONSTRUCTION HIGHLIGHTS



CONSTRUCTION HIGHLIGHTS

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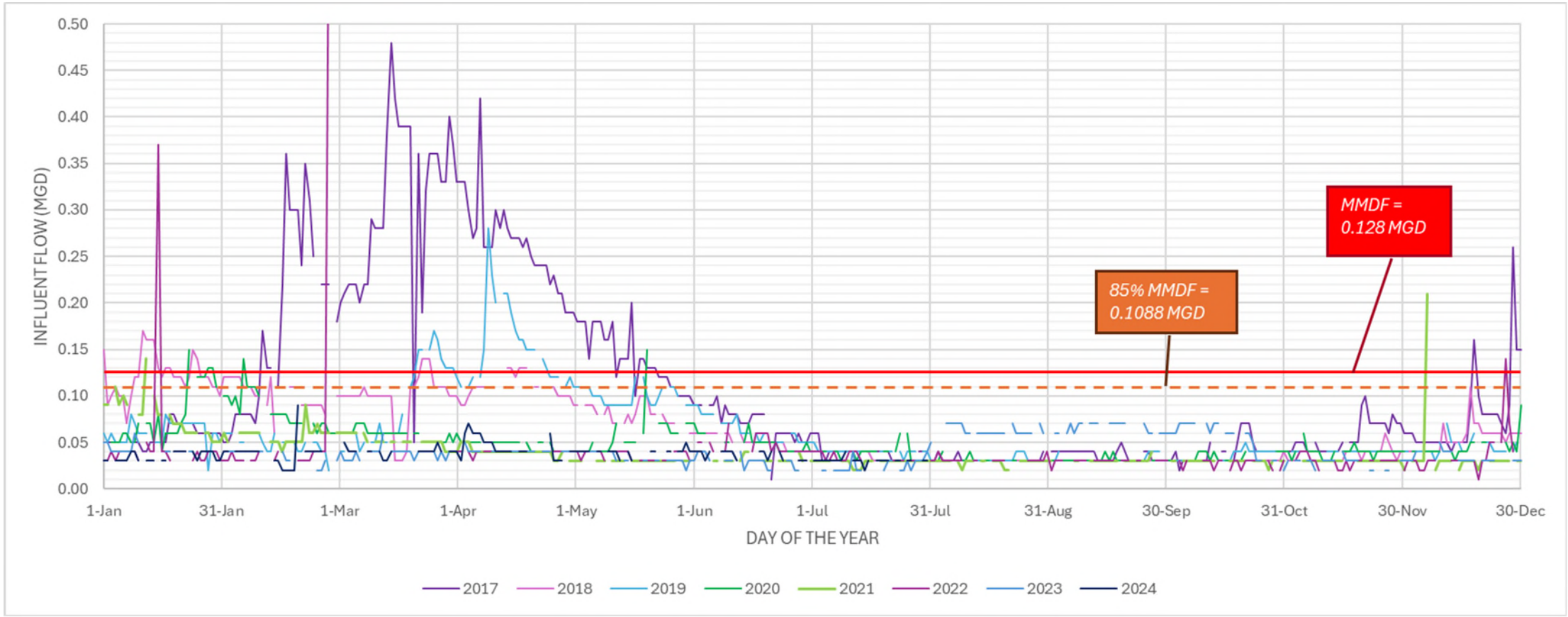
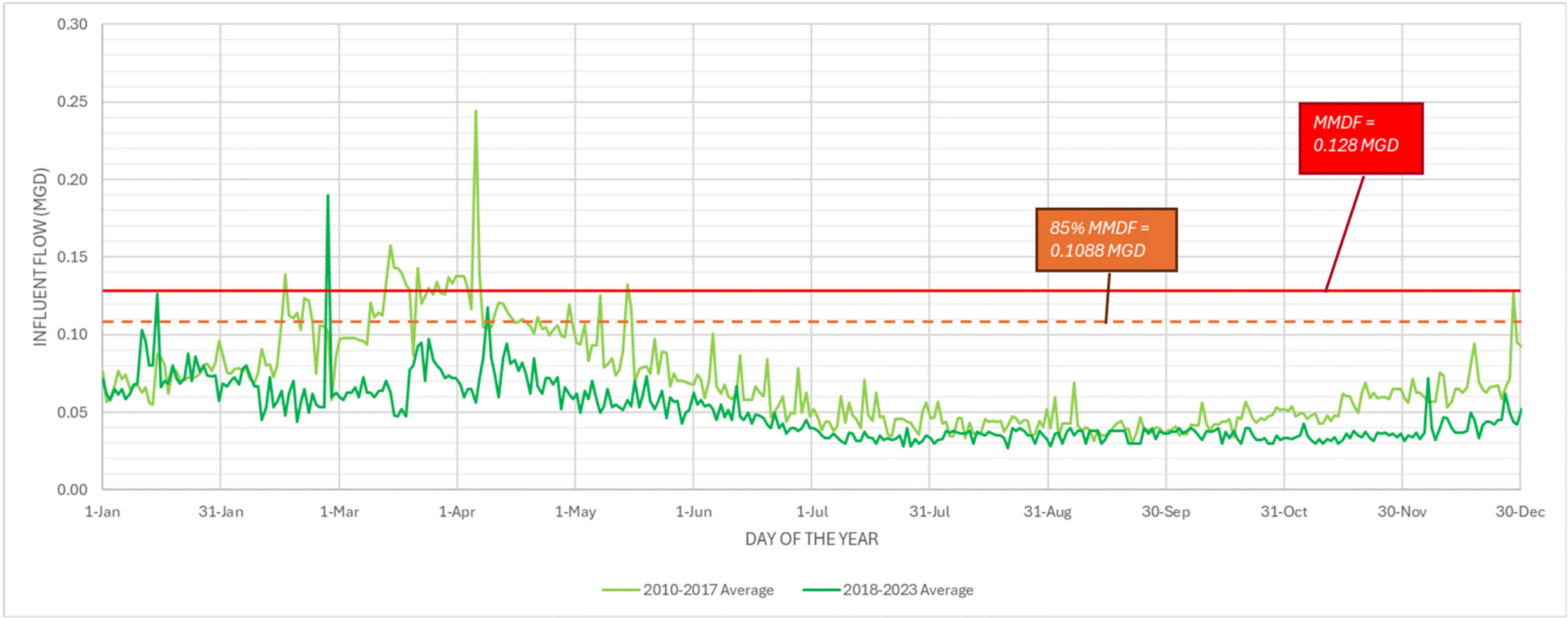
CONSTRUCTION HIGHLIGHTS

WATER QUALITY IMPROVEMENTS



WATER QUALITY IMPROVEMENTS



WATER QUALITY IMPROVEMENTS

Influent Period	Cumulative Influent (MG)	Annual Precipitation (in.)
Jan 2016 – Dec 2016	15.83	22.27
Jan 2017 – Dec 2017	37.75	29.23
Jan 2018 – Dec 2018	21.33	17.51
Jan 2019 – Dec 2019	19.36	21.51
Jan 2020 – Dec 2020	14.98	19.76
Jan 2021 – Dec 2021	11.81	14.50
Jan 2022 – Dec 2022	10.07	21.00
Jan 2023 – Dec 2023	10.78	14.28

Discharge Season	Cumulative Discharge (MG)
Dec 2016 - Mar 2017	12.94
Dec 2017 - Mar 2018	13.39
Dec 2018 - Mar 2019	10.52
Dec 2019 - Mar 2020	10.32
Dec 2020 - Mar 2021	11.23
Dec 2021 - Mar 2022	5.08
Dec 2022 - Mar 2023	4.22
Dec 2023 - Mar 2024	7.63

https://www.weather.gov/wrh/Climate?wfo=otx
https://apps.ecology.wa.gov/paris/DischargeMonitoringData.aspx

LESSONS LEARNED

- Review Sewer Base Rates and Plan Adjustments
- Record Drawings, Walk Throughs
- Trenchless Rehabilitation
- Storm Drainage Influence
- Water System Influence
- Community Outreach Positive Feedback
- Public Meeting Process and Feedback

NEXT STEPS

- Continue monitoring flows to wastewater treatment plant
- Monitor condition of remaining clay tile pipe (video inspection and cleaning)
- Lift station improvements
- Other system needs related to growth
- Monitor water distribution system leakage

QUESTIONS?

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PLEASE COMPLETE THE POST-CONFERENCE SURVEY