

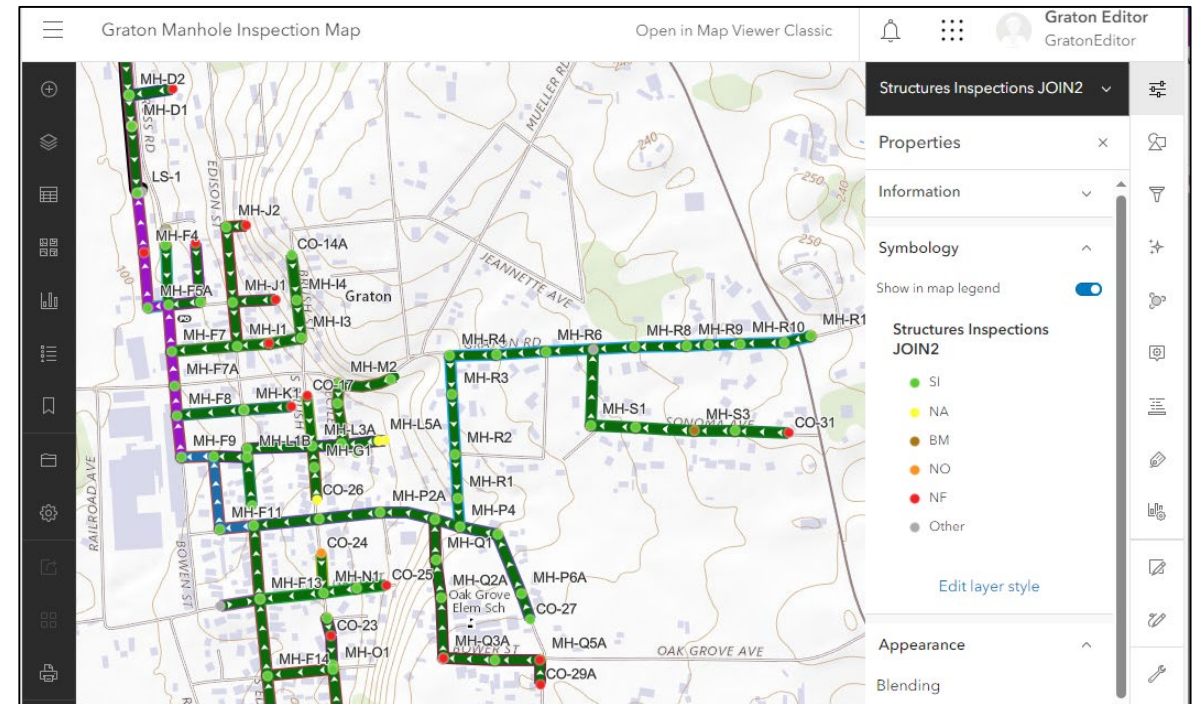
# Graton CSD

Collection System Condition Assessment – Preliminary Results

December 2023

# Work Completed To-Date

- Digitized PDF (1976) asbuilts
- Performed Lift Station condition inspection
- Located manholes and performed visual inspection
- Performed gravity pipeline condition inspection via CCTV
- Assessed condition (pipes, MHs, pump stations)
- Developed preliminary rehabilitation and replacement recommendations



# Summary of Preliminary Results

## Gravity Pipelines

- 51% of system (by length) assessed
  - 7% of length assessed requires replacement (7 pipes)
  - 28% of length assessed requires rehabilitation (34 pipes)

## Manholes

- 69% of manholes assessed (80 manholes)
  - 5% of manholes assessed require replacement (6 manholes)
  - 2% of manhole require rehabilitation (2 manholes)

## Lift Stations

- Lift Station 1
  - **Priority Replacements:** Pump 1; pump guide rails; wet well lid; discharge piping in wet well; 6-inch plug valves (2); 6-inch check valves (2); generator; all electrical, instrumentation, and controls assets/systems.
  - **Consider replacing:** hoist, fencing/gate, and generator/electrical building
- Lift Station 2
  - **Priority Replacements:** all electrical, instrumentation, and controls assets/systems; install pulley system for pump access.
  - If the District is looking to hand over this facility to others for ownership and management, consider replacing entire lift station with a package system (pumps and controls) that vendor can maintain; equip with cellular (not dial-up); and consider alarm package appropriate for residential management.

# Remaining Work

- Locate newly discovered manholes (28)
  - Perform condition inspection
- Perform remaining pipeline condition inspection – CCTV (approximately 5,000 LF)
  - Condition assessment
  - Rehabilitation or replacement recommendations
- Complete Technical Memo

# Preliminary Results – Gravity Pipelines

## Work Completed:

- Cleaning and CCTV inspection
- Most pipes not cleaned for years
- Condition assessment from CCTV inspection – NASSCO PACP Standard

## *Inspection Status Summary:*

Table 1. Pipeline CCTV Inspection Status				
Inspection Status	Count of Pipelines	Length of Pipelines, ft	Length of Pipelines, miles	Percent of System
Complete Inspection	73	18,924	3.6	58%
No Inspection Possible	3	540	0.1	2%
Not Yet Inspected/Assessed	60	13,040	2.5	40%
<b>Total</b>	<b>136</b>	<b>32,504</b>	<b>6.2</b>	<b>100%</b>

# Preliminary Results - Gravity Pipelines

## Condition Assessment Results:

- Using PACP Standard, identified defects from:
  - Grade 1 (minor) to Grade 5 (worst), for both Structural and O&M categories

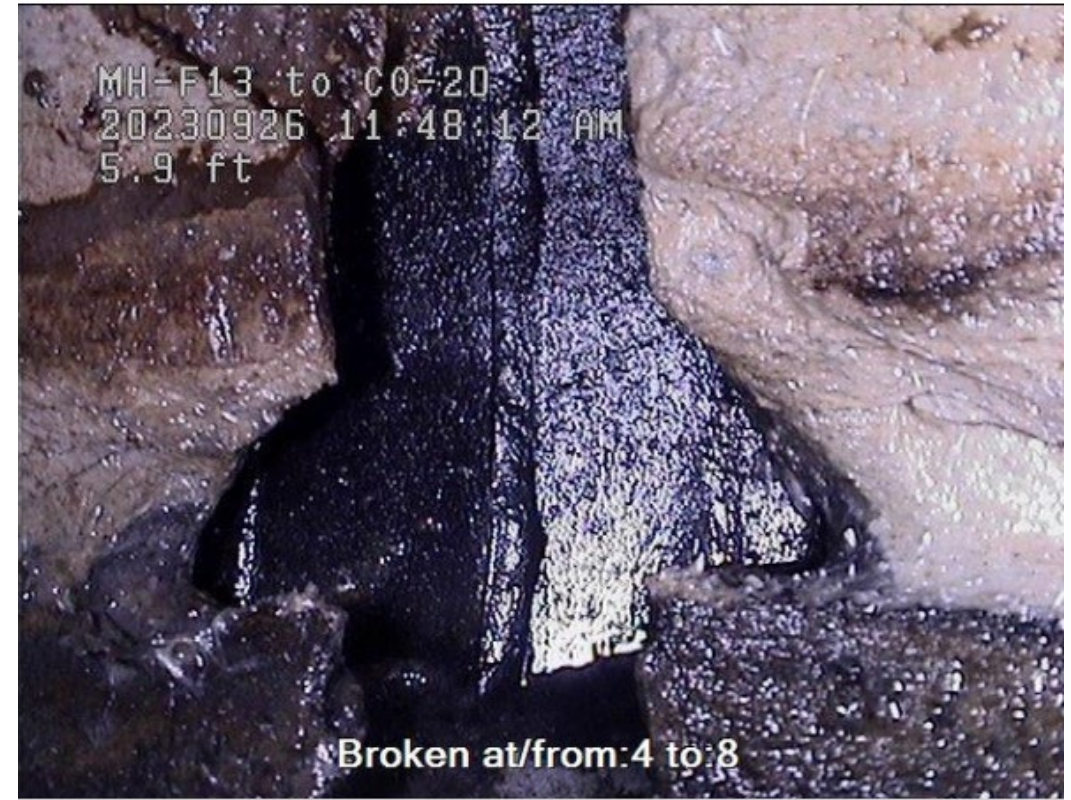
## *Condition Assessment Summary (Structural Defects):*

Table 2. Pipeline Condition Assessment Summary – Structural Defects			
Maximum Structural Defect Grade in Pipe	Count of Pipelines	Length of Pipelines, feet	Percent by Length
Grade 5	4	1,080	3%
Grade 4	13	3,689	11%
Grade 3	23	6,538	20%
Grade 2	2	317	1%
Grade 1	0	0	0%
No Structural Defects	32	7,590	23%
Not Yet Inspected/Assessed	59	12,750	39%
No Inspection Possible	3	540	2%
<b>Total</b>	<b>136</b>	<b>32,504</b>	<b>100%</b>

# Preliminary Results - Gravity Pipelines

## Condition Assessment Results:

- Examples of Grade 5 Structural Defects



# Preliminary Results - Gravity Pipelines

## Condition Assessment Results:

- Examples of Grade 4 & 5 Structural Defects

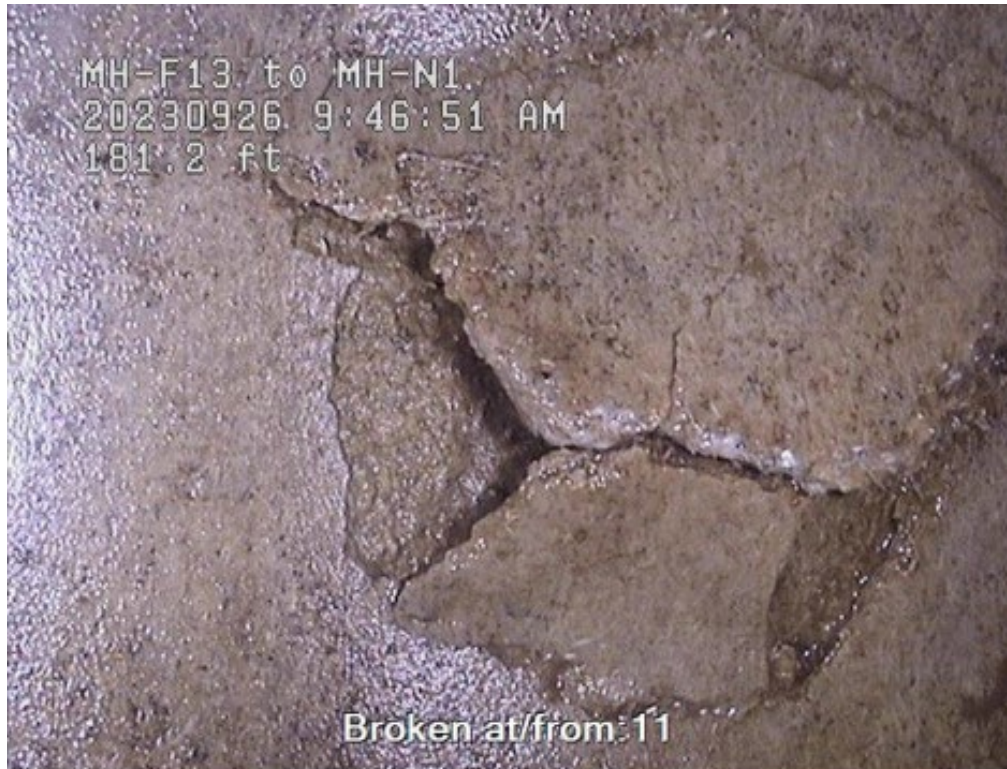




# Preliminary Results - Gravity Pipelines

## Condition Assessment Results:

- Examples of Grade 4 & 5 Structural Defects



# Preliminary Results - Gravity Pipelines

## Repair and Rehabilitation Recommendations:

- Assumed rehabilitation for pipelines with Grade 3 or worse Structural defects
- Assumed replacement for pipelines with >50% by length required to be rehabilitated

## *Rehab and Replacement Recommendations:*

Table 3. Pipeline R&R Recommendations			
R&R Recommendation	Count of Pipelines	Length of Pipelines, feet	Percent by Length
Replacement	7	2,289	7%
Rehabilitation (Method to be determined in detailed design)	34	9,167	28%
Maintenance (root-debris-grease removal)	5	1,446	4%
Unknown (Not Found or Not Accessible)	3	540	2%
No R&R Required	28	6,312	19%
Not Yet Inspected/Assessed	59	12,750	39%
<b>Total</b>	<b>136</b>	<b>32,504</b>	<b>100%</b>

# Preliminary Results - Manholes

- Located manholes
- Many very difficult to open (slurry sealed over, pick holes filled, not opened for years)
- Inspected for condition (by component – frame, cover, walls, bench, etc.)

## *Inspection Status Summary:*

<b>Inspection Status</b>	<b>Count of Manholes</b>	<b>Percent of System</b>
Complete Inspection	80	69%
Incomplete – Not Found	7	6%
Incomplete – Not Accessible	1	<1%
Needs Inspection (New Manhole discovered during CCTV work)	28	24%
<b>Total</b>	<b>116</b>	<b>100%</b>

# Preliminary Results - Manholes

- Assigned condition of each of 7 components (broken, corroded, defective, sound)

## *Condition Assessment Summary:*

Table 4. Manhole Condition Assessment Summary		
Component Condition and Quantity	Count of Manholes	Percent of Total Manholes
Broken or Cracked	0	0%
Defective or Corroded: Greater than 3 Components	6	5%
Defective or Corroded: 3 Components	2	2%
Defective or Corroded: 1 to 2 Components	16	14%
Sound (No Defects)	56	48%
No Inspection Possible (Not Found or Not Accessible)	8	7%
Needs Inspection (New Manhole discovered during CCTV work)	28	24%
<b>Total</b>	<b>116</b>	<b>100%</b>

# Preliminary Results - Manholes

- Assumed replacement for manholes with >3 defective components
- Assumed rehabilitation for manholes with 3 defective components
- Manholes with 1-2 defective components can be rehabilitated, if desired

## *Rehab and Replacement Recommendations:*

<b>R&amp;R Recommendation</b>	<b>Count of Manholes</b>	<b>Percent of Total Manholes</b>
Replacement	6	5%
Rehabilitation (Method to be determined in detailed design)	2	2%
Unknown (Not Found or Not Accessible)	8	7%
No R&R Required	72	62%
Not Yet Inspected/Assessed	28	24%
<b>Total</b>	<b>116</b>	<b>100%</b>

# Preliminary Results – Lift Stations

- Inspected during August site visit
- Lift station assets rated on a 1-5 scale (1 best to 5 worst) for both condition and performance

## *Recommendations:*

- Lift Station 1 (see detail slides)
  - **Priority Replacements:** Pump 1; pump guide rails; wet well lid; discharge piping in wet well; 6-inch plug valves (2); 6-inch check valves (2); generator; all electrical, instrumentation, and controls assets/systems.
  - **Consider replacing:** hoist, fencing/gate, and generator/electrical building
- Lift Station 2 (see detail slides)
  - **Priority Replacements:** all electrical, instrumentation, and controls assets/systems; install pulley system for pump access.
  - If the District is looking to handover this facility to others for ownership and management, consider replacing entire lift station with a package system (pumps and controls) that vendor can maintain; equip with cellular (not dial-up); and consider alarm package appropriate for residential management.

# Preliminary Results – Lift Station 1

Asset	Condition Rating	Performance Rating	Comments	Recommendations
Pump 1	5	5	Out of service, sent in for repairs/quote. Pumps are likely not operating at design capacity or incoming flow is greater than pumps are designed for.	Replace. New pump capacity should be based on future flow requirements. Consider adding additional (third) pump for backup.
Pump 2	3	3	Pumps are likely not operating at design capacity or incoming flow is greater than pumps are designed for.	None
Pump Guide Rails	3	3	Pumps are mounted on a bracket adapter to work with the guide rails. Guide rails are not standard width. See Photo 1 below.	Replace guide rails with standard width the next time major work is completed on pumps and wet well is taken out of service.
Wet Well	1	1	Cleaned and vactored every year. Wet well is in good structural condition. See Photo 1 below.	None
Wet Well Lid	3	1	Minor corrosion; 1 of 4 support brackets gone due to chains hanging on them; chains have since been moved. Hatch does not contain safety grate or spring assist mechanism for opening the hatch.	Replace or modify hatch to add safety grate and spring assist opening mechanism.
Discharge piping in wet well	4	3	Corrosion along entire section. See Photo 1 below.	Replace
Water Service Well	3	1	Well on site, shared ownership with neighbor	None
Valve Vault	2	1	Concrete and grates in good condition; minor build up of sediment/debris in bottom of vault.	None
6-inch Plug Valve (x2)	3	1	Minor corrosion on valve body and major corrosion on bolts. Functionality of valves is unknown; due to potential risk of damaging valves and age, recommend to replace valves.	Replace
6-inch Check Valve (x2)	3	1	Minor corrosion on valve body and major corrosion on bolts. Due to age, recommend to replace valves.	Replace
Force Main	1	1	Replaced 1,600ft of forcemain approx. 10-years ago (asbestos piping); consider additional inspection of forcemain to determine condition.	Perform condition assessment of forcemain to determine condition and rehabilitation needs.
Hoist	2	3	Rust on bolts, otherwise in good condition. Portable hoist is unstable.	Consider installing more robust and permanent hoist.
Generator	4	3	Existing generator is not efficient and is obsolete; no parts available for repair and finding someone capable of work is difficult. See Photo 2 below.	Replace
Portable Bypass Pump	1	1	-	None
Site – yard, fencing, drainage	2	1	Chain-link fencing is in good shape but missing privacy slats. Recently extended and closed back of site due to vandalism of PG&E box	None
Access	2	1	Paved, and in good condition. See Photo 3 below.	None
Security	1	2	Gate around facility; locks on wet well access hatch, main gate, and structure gate/door. See Photo 3 below.	Consider installing more secure fencing and gate.
Structure	1	1	CMU and roof in good condition. Only repairs over years have been leakproofing, retaining walls also in good shape. Structure does not provide adequate access for generator repairs, clearance from electrical panels.	Consider replacing building to provide adequate clearance and access.
Electrical & Instrumentation/Controls	3	2	General maintenance and housekeeping has been performed. Evidence of in-house modifications.  No leak alarms, or on/off. Only alarms are high, lag pump, loss of air. All electrical/controls are original.  Due to apparent age and modifications, all electrical, instrumentation, and controls assets/systems should be replaced.	Replace

# Preliminary Results – Lift Station 1

Wet well



Generator and Building



Site





# Preliminary Results – Lift Station 2

Asset	Condition Rating	Performance Rating	Comments	Recommendations
Overall	-	-	If the District is looking to handover this facility to others for ownership and management, consider replacing entire lift station with a package system (pumps and controls) that vendor can maintain; equip with cellular (not dial-up); and consider alarm package appropriate for residential management.	
Pump 1	1	1	Recently replaced	None
Pump 2	2	1	Performing fine	None
Pump Guide Rails	2	1	Good shape. Pumps are pulled by hand with a rope.	Install pulley system for pump access.
Check Valve	1	1	Recently replaced	None
1/2-inch Gate Valve (x2)	4	3	Corroded	None
Wet Well	2	1	Serves only 2 homes, takes a while to fill. See Photo 4 below.	None
Wet Well Lid	3	3	Recently DIY fabricated approx. 1 year ago; rusting.	None
Inlet MH	2	1	Rehabbed approx. 10 years ago	None
Outlet MH	4	2	Corrosion on effluent pipe elbow	None
Access	2	4	Dirt path, difficult to access with equipment due to property owner belongings. See Photo 7 below.	Improve site to allow for easier servicing and equipment access.
Security	1	1	Lock on electrical/control box	None
Meter/Control Housing	3	2	Corrosion along inside seals and bottom of box. See Photo 5 below.	None
Meter/Control Cabinet	1	1	In good shape, seals are good and no signs of corrosion. See Photo 5 below.	None
Electrical & Instrumentation/Controls	3	2	Seals on inner panel appear intact and components in acceptable condition. Outer enclosure is in corroded at bottom, potentially due to poor conduit seal from wet well instrumentation. See Photo 5 below.  Due to apparent age and modifications, all electrical, instrumentation, and controls assets/systems should be replaced.	Replace. Evaluate conduit and seals from wet well to panel for leakage before re-using.

# Preliminary Results – Lift Station 2

Access



Site



Wet Well



Control Panel

