CITY OF GALLUP

Drinking Water Distribution Assessment

For

Gallup City Council

Jan 22, 2019

AGENDA

- Purpose
- Predicted impacts of current pipe scales in Gallup distribution system with San Juan River water
- Identify best suited water quality parameters that will have least impact on Gallup distribution water mains
- Recommendations for transition to new water quality

WATER INTEGRATION

PURPOSE OF STUDY

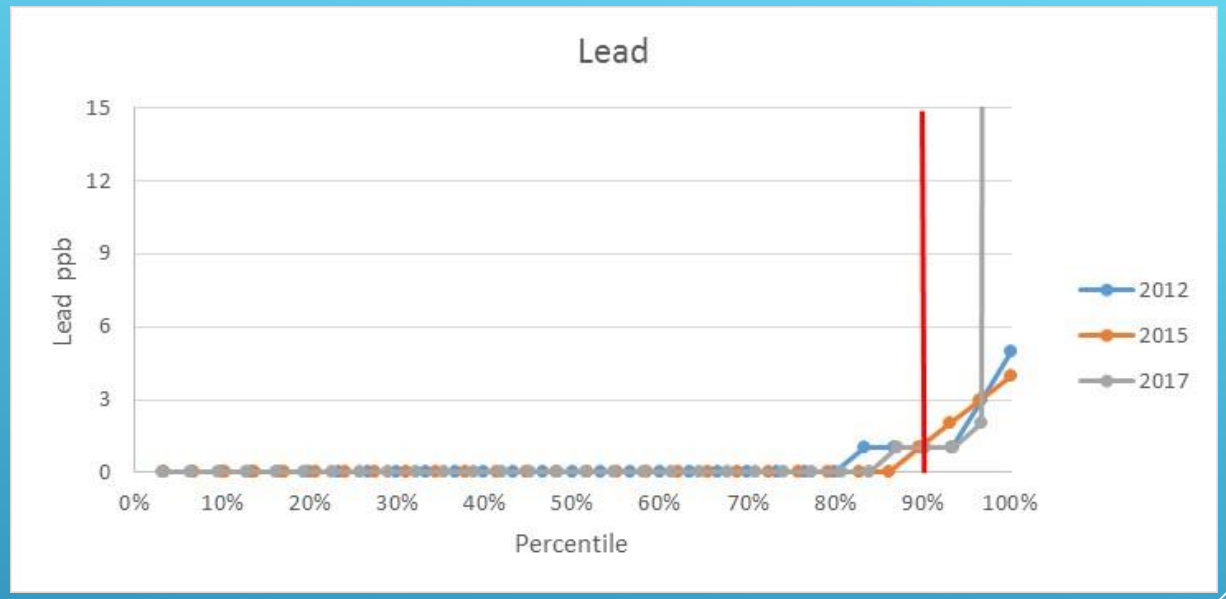
- Identify the nature of the current scales on water mains
- Provide a general assessment of water quality degradation as the water travels from the water treatment plants.
- Compares compatibility of the San Juan River water quality, based upon United States Geologic Survey(USGS) data, to the current water quality at the Santa Fe and Yah-Te-Hey entry points,
- Attempt to establish recommended water quality parameter ranges at the new San Juan Lateral entry point to minimize destabilization of current pipe-scales.

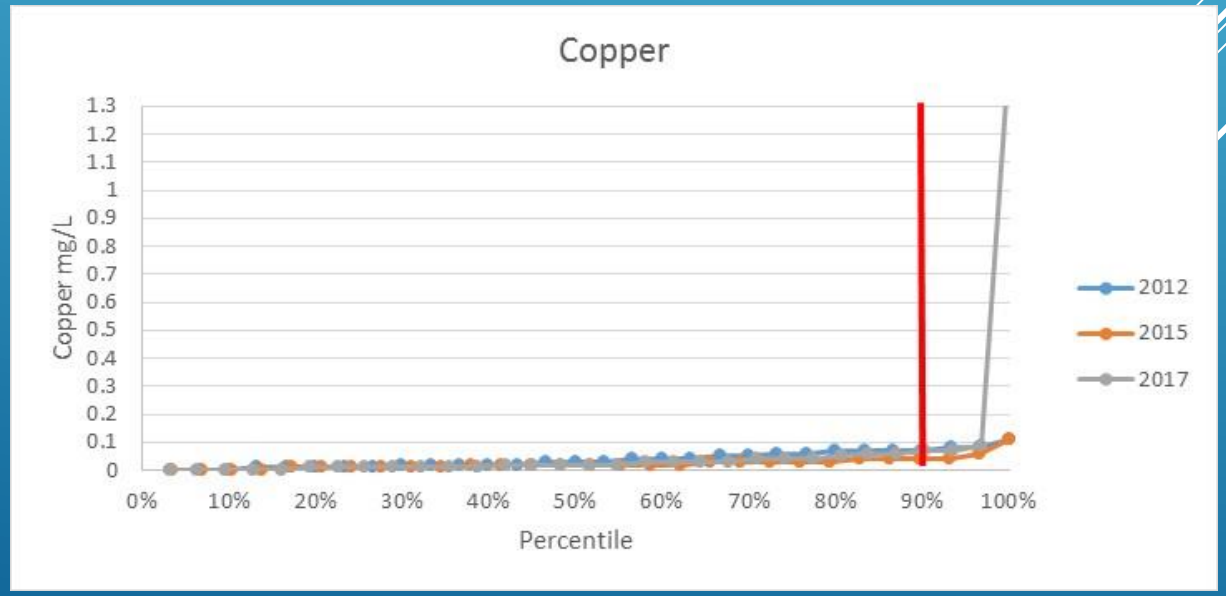
- 170 miles of mains
- PVC/C900 – 35%
- Asbestos cement – 32%
- Cast iron – 12%
- Ductile iron (Lined) – 13%
- 2-inch galvanized iron pipe – 1%
- Copper – 1%
- Steel – 0.5%
- Unknown – 5%

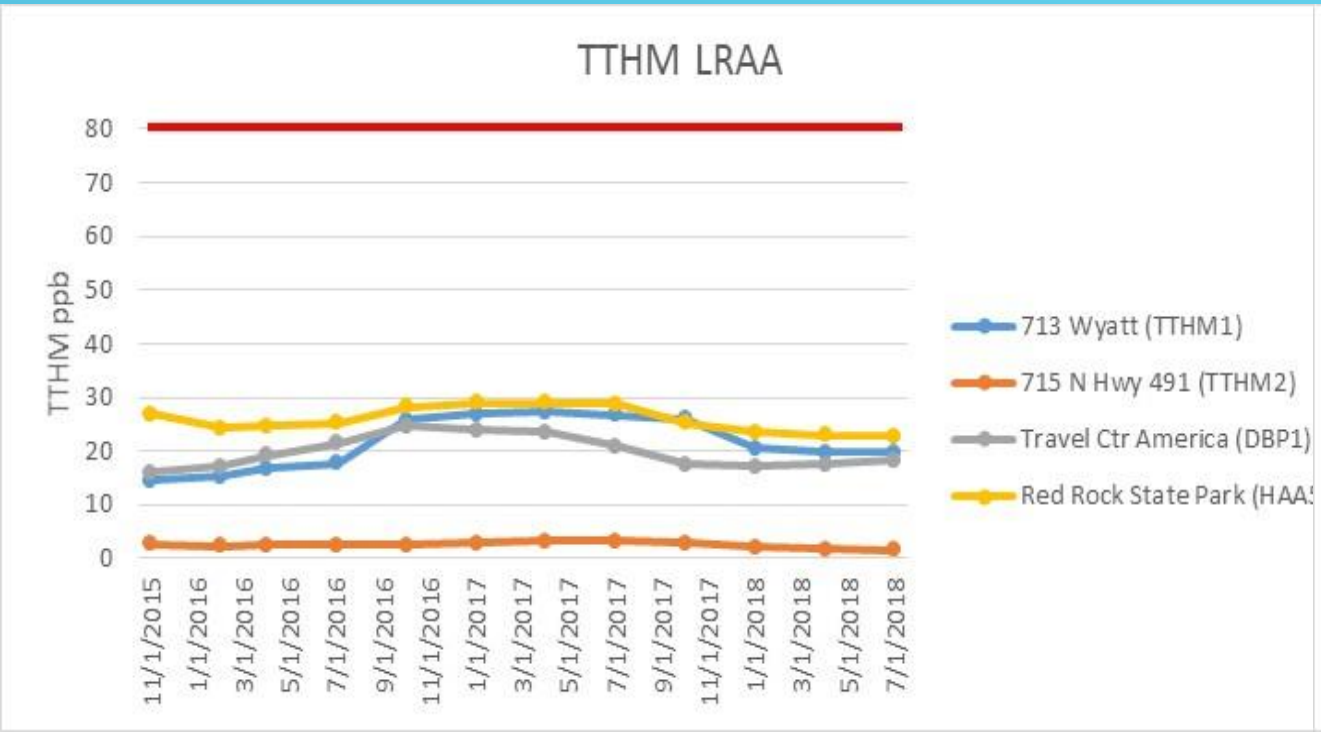
DISTRIBUTION PIPE MATERIAL

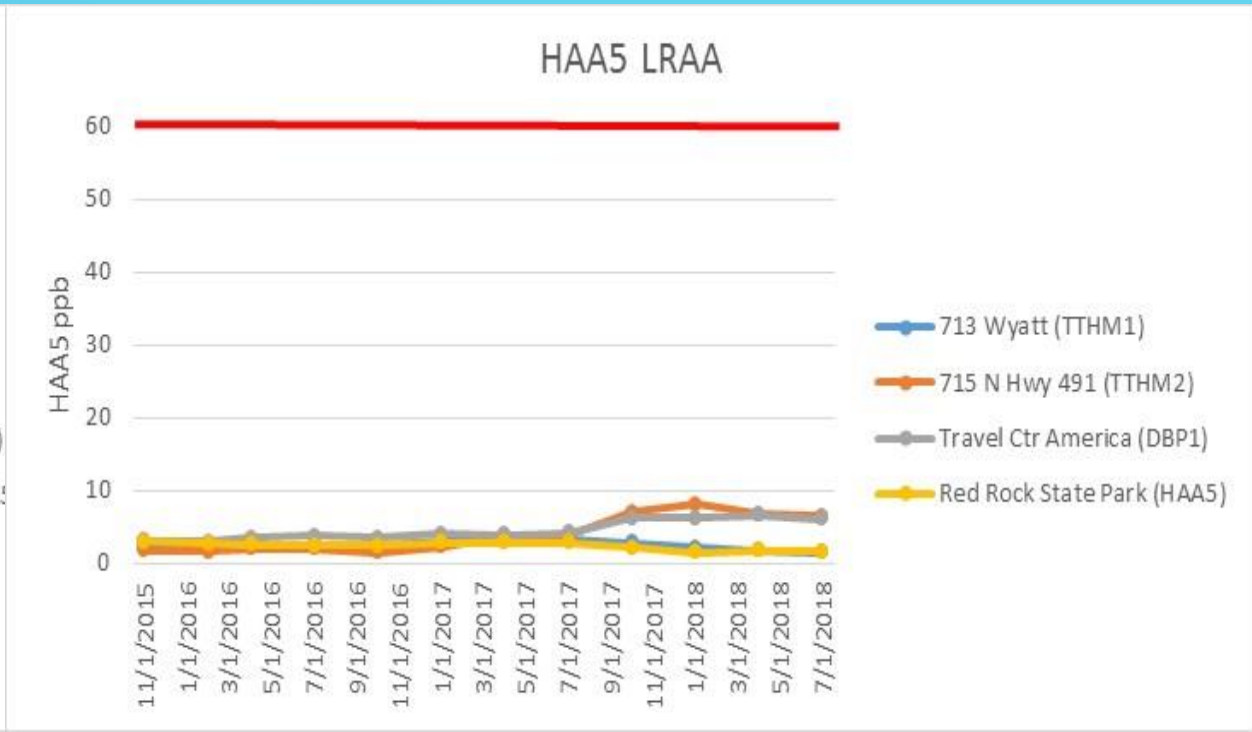
LEAD AND COPPER SUMMARY

		Gallup System	Action Level
2012	Lead, ppb	1	15
	Copper, ppb	70	1300
2015	Lead ppb	1	15
	Copper, ppb	40	1300
2017	Lead, ppb	1	15
	Copper, ppb	70	1300









DISINFECTION BY-PRODUCTS

TOTAL COLIFORM

- Only one positive coliform event in last 5 years due to a compromised sample station.

SUMMARY OF DISTRIBUTION WQ ASSESSMENT

66% of samples contained elevated iron and manganese

Samples that had elevated iron contained elevated manganese

Cast iron pipes had highest concentrations of iron and manganese

Cast iron pipes from 1920s – 1930s had most sensitive scales (due to physical disruption

Iron and manganese both major sources for discolored water complaints

Calcium scale exists in small pockets

01

Monthly average target pH – 8.0 to 8.3 pH units

02

Alkalinity concentration - > 100 mg/L

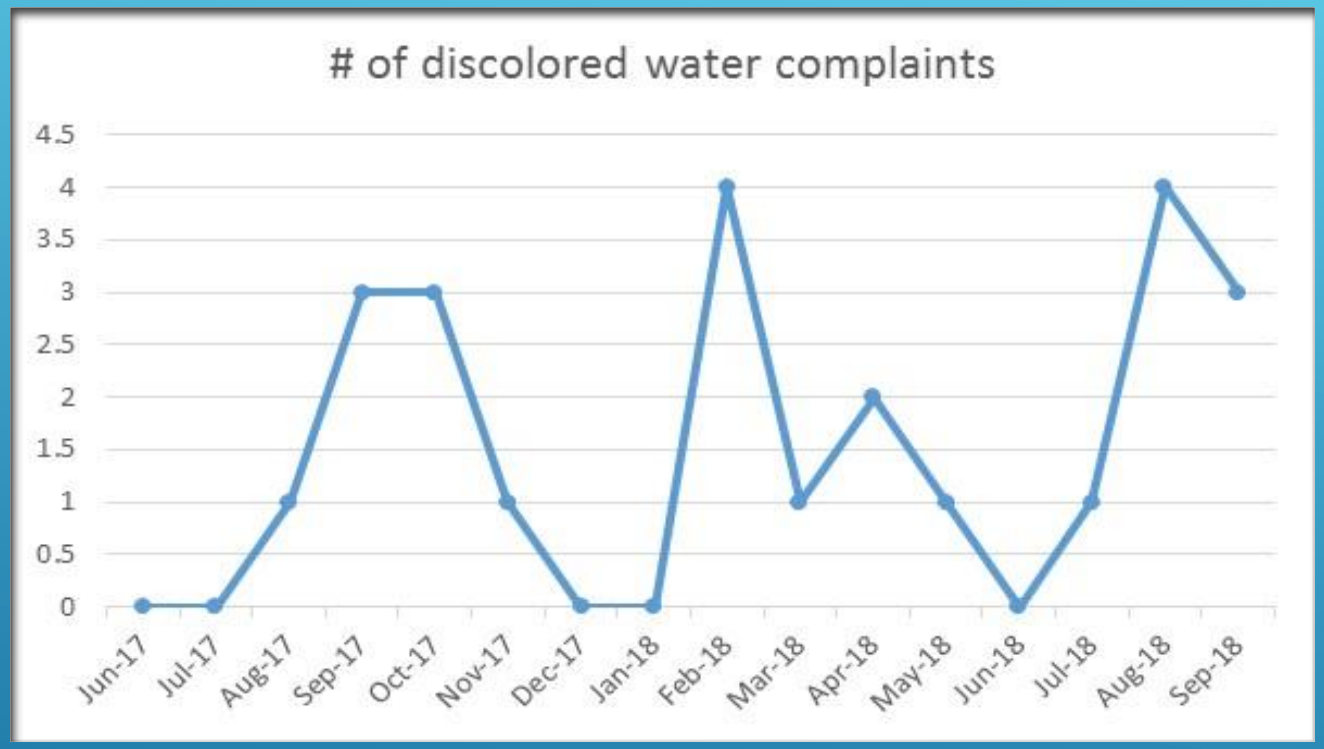
03

Calcium Carbonate Precipitation Potential (CCPP) monthly average target - 4 to 10 mg/L as $CaCO_3$

04

Monthly average free chlorine residual – 2.1 $\pm$ 0.2 mg/L

RECOMMENDED FUTURE WATER QUALITY PARAMETERS (BASED ON SAN JUAN RIVER WQ)



- The average number of monthly discolored water complaints over the past two years is 1.5.
- Based on 5900 service connections, the rate of discolored water complaints is 0.025%.
  - On par for stable distribution system

DISCOLORED WATER COMPLAINTS

ADDITIONAL RECOMMENDATIONS

01

Conduct pipe-scale analysis on a couple of old cast iron pipes (prior to 1940)

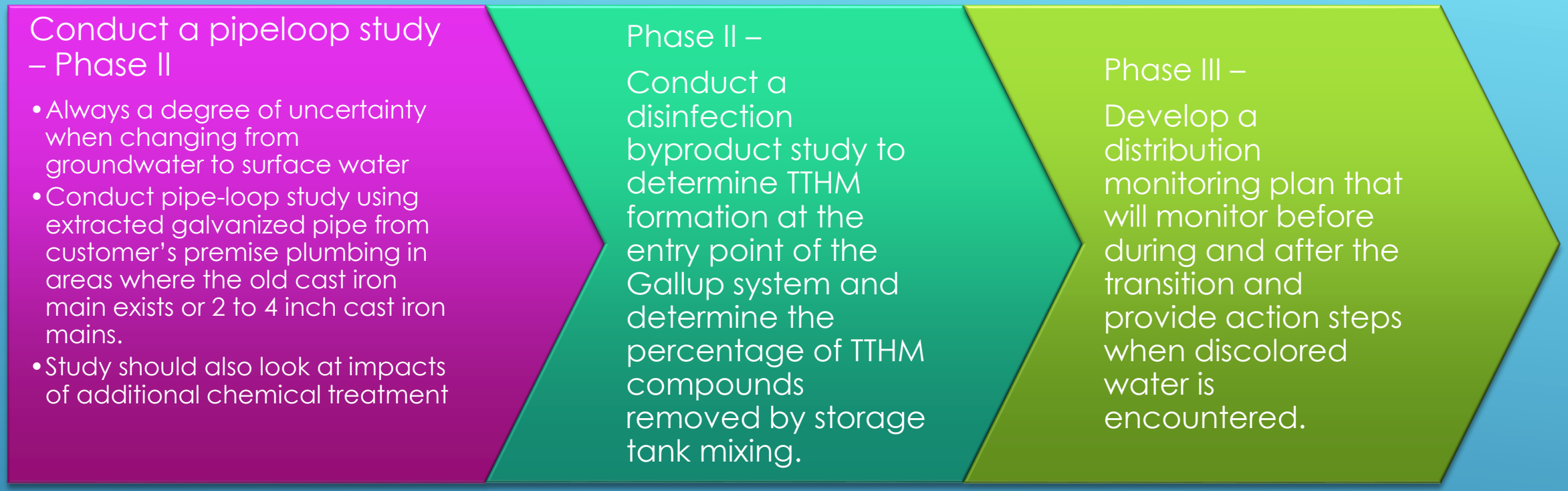
02

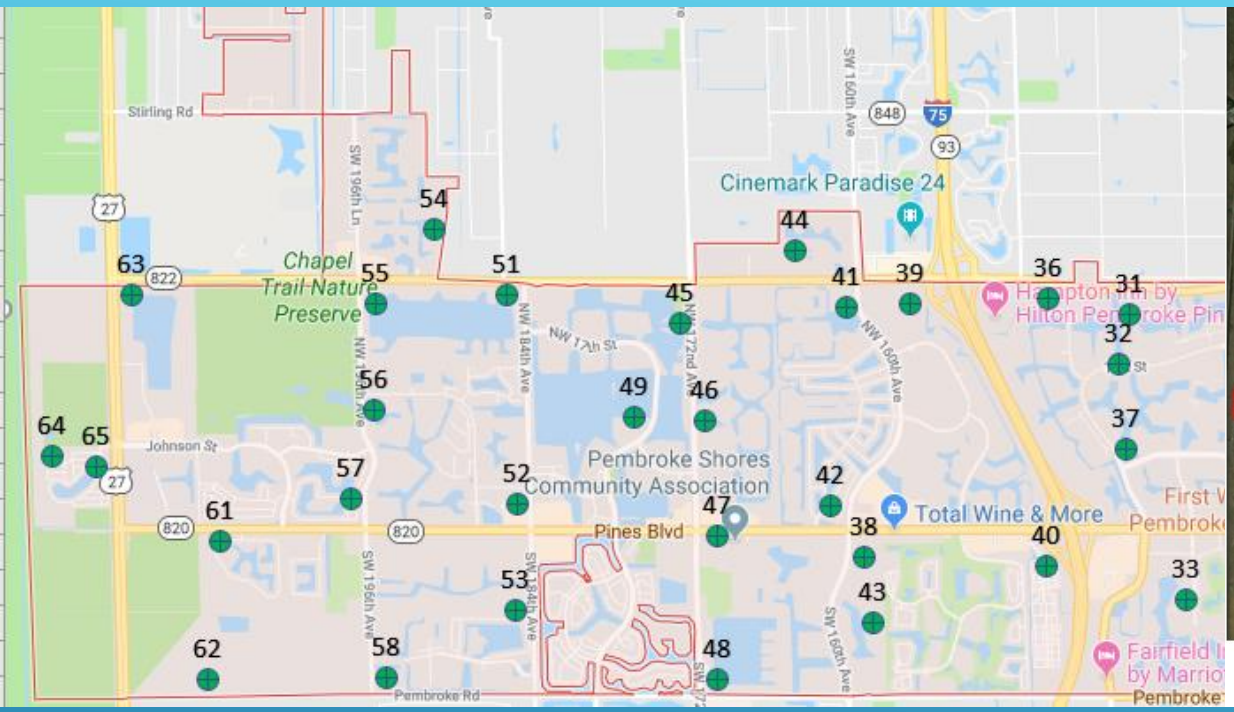
Conduct velocity tests to determine optimal flushing velocities to remove iron and manganese out of cast iron mains without breaking too many tubercles causing a bleeding effect.

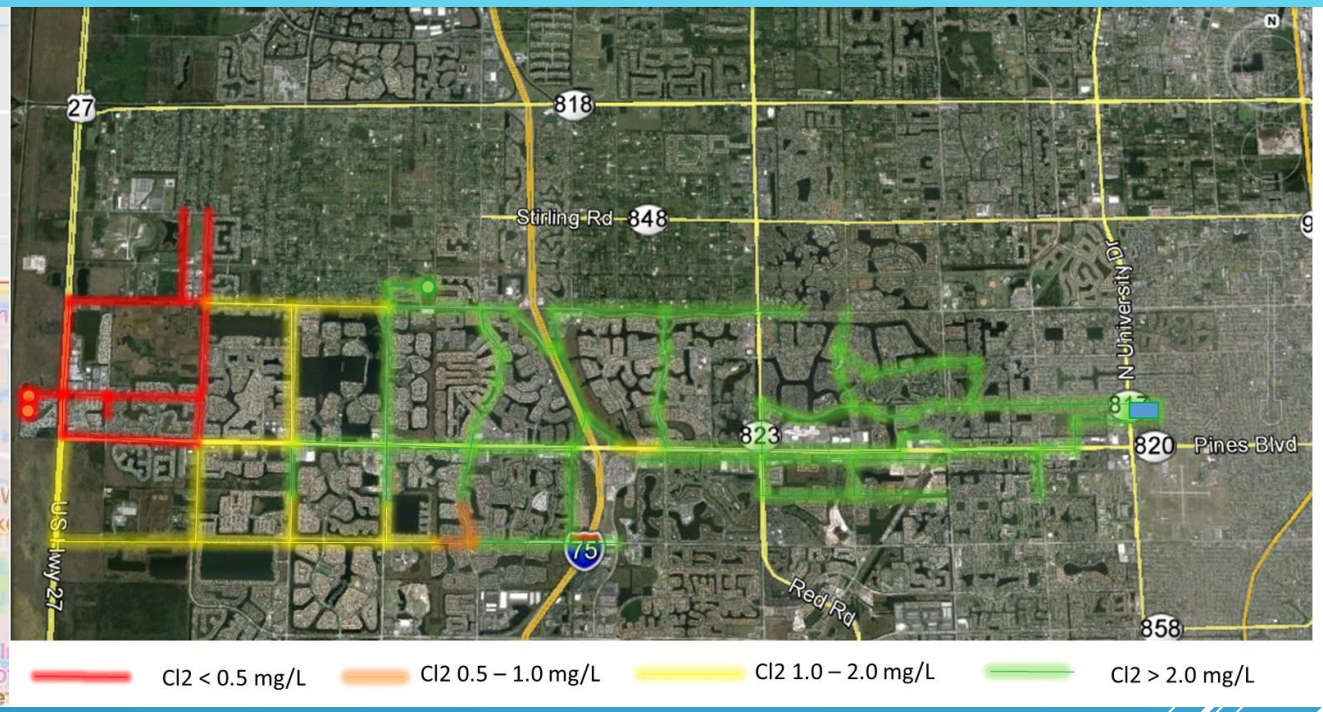
03

Based on velocity tests, develop a unidirectional flushing plan/program. – Phase II

ADDITIONAL RECOMMENDATIONS







ELECTRONIC MONITORING PROGRAM