

The Mystery Check Valve That was Never Installed

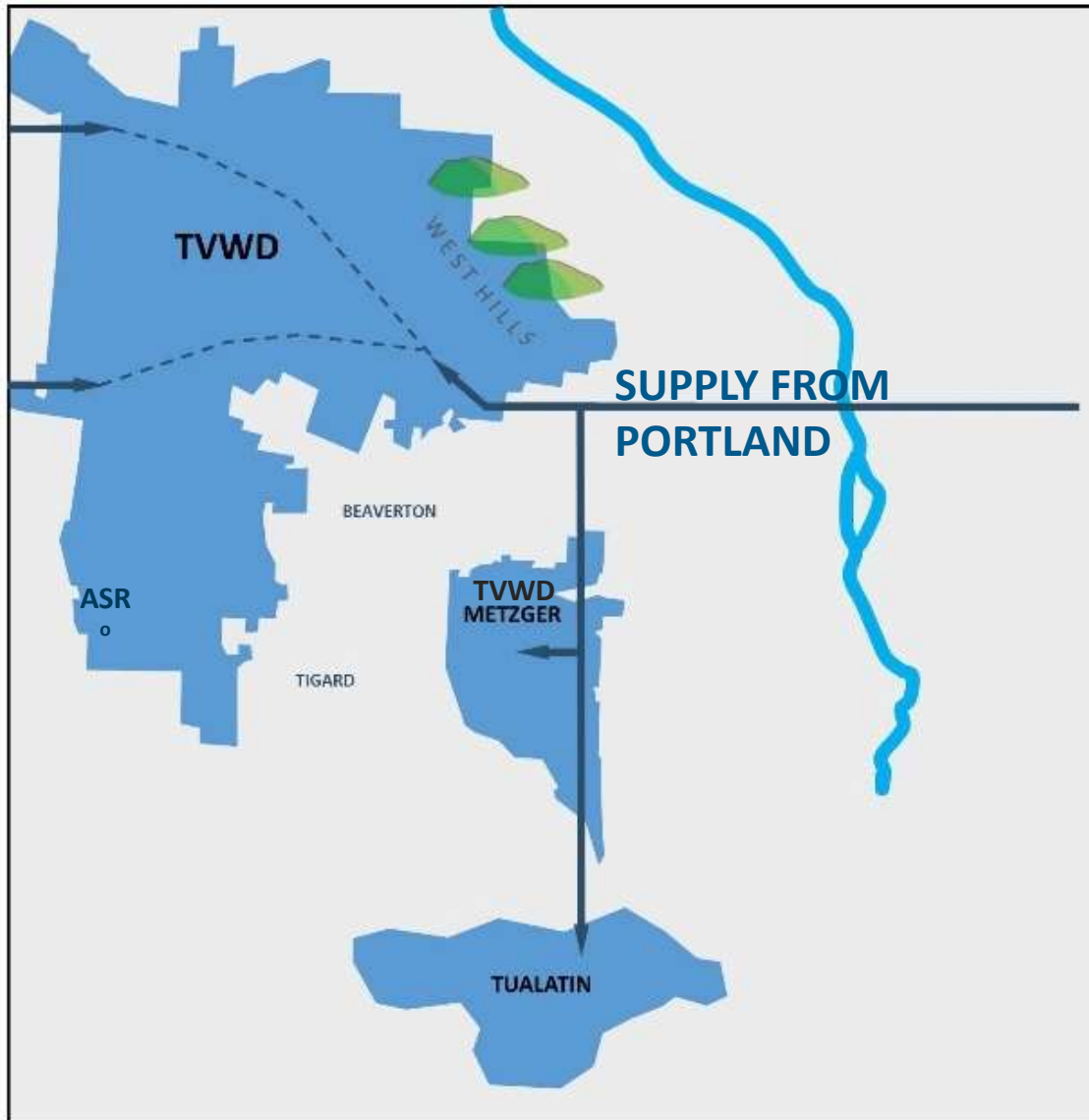
*How a Large Diameter Pipeline Suddenly
Began to Only Flow Water in One Direction*

Pete Boone

Water Operations Division Manager

TVWD Water Supplies

SUPPLY FROM
JOINT WATER
COMMISSION



SUPPLY FROM
PORTLAND

TVWD

WEST HILLS

ASR

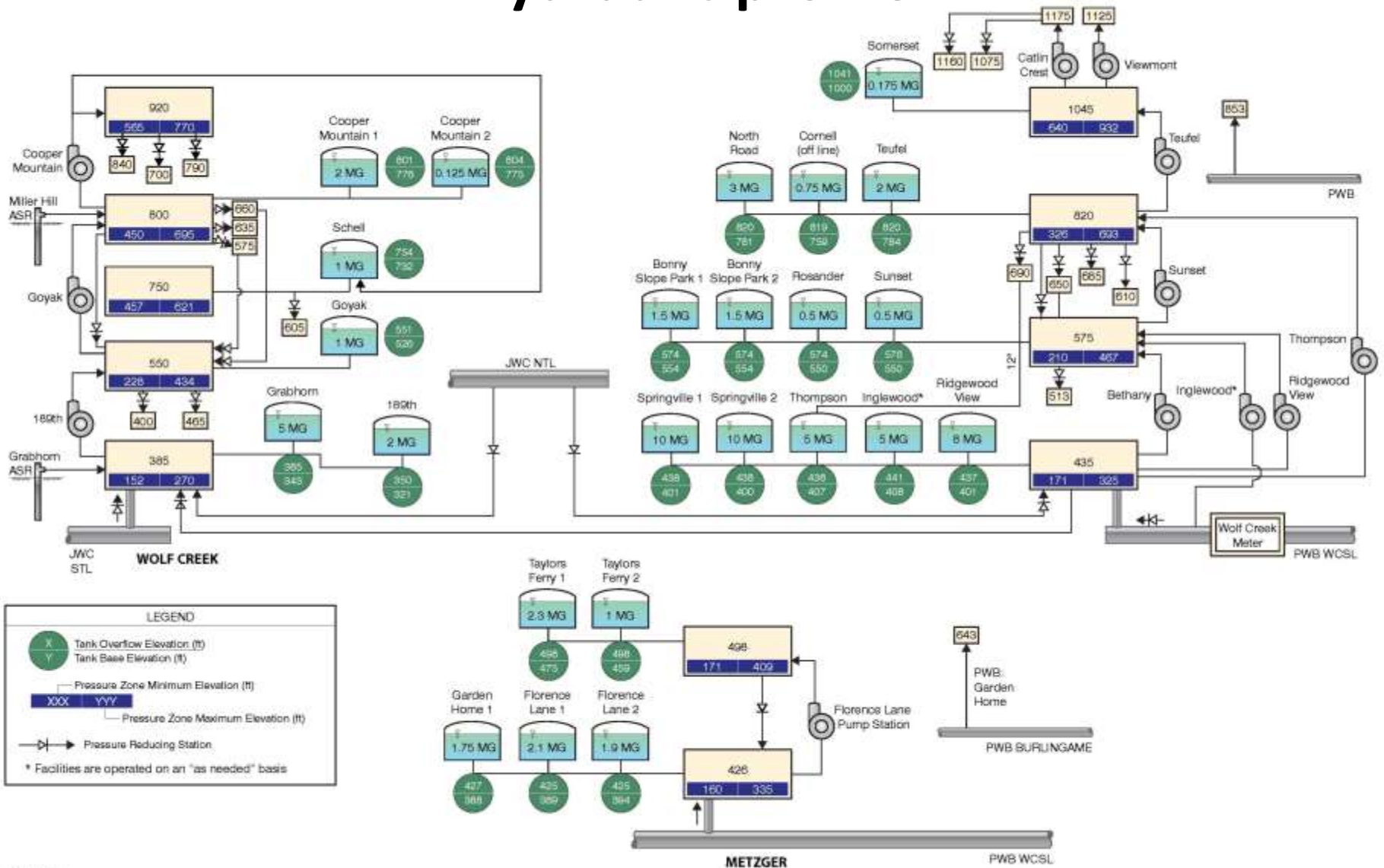
BEAVERTON

TIGARD

TVWD
METZGER

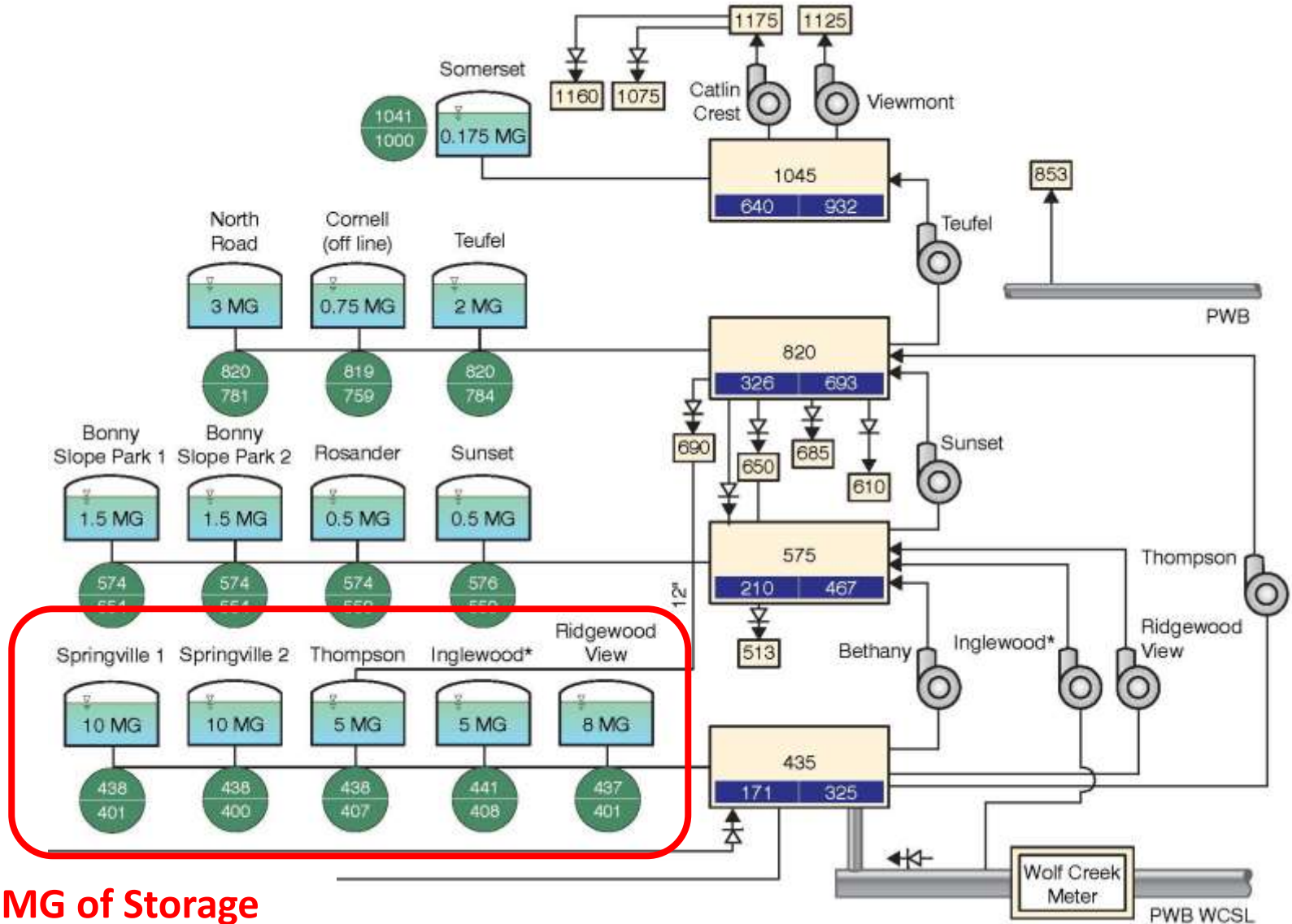
TUALATIN

Hydraulic profile



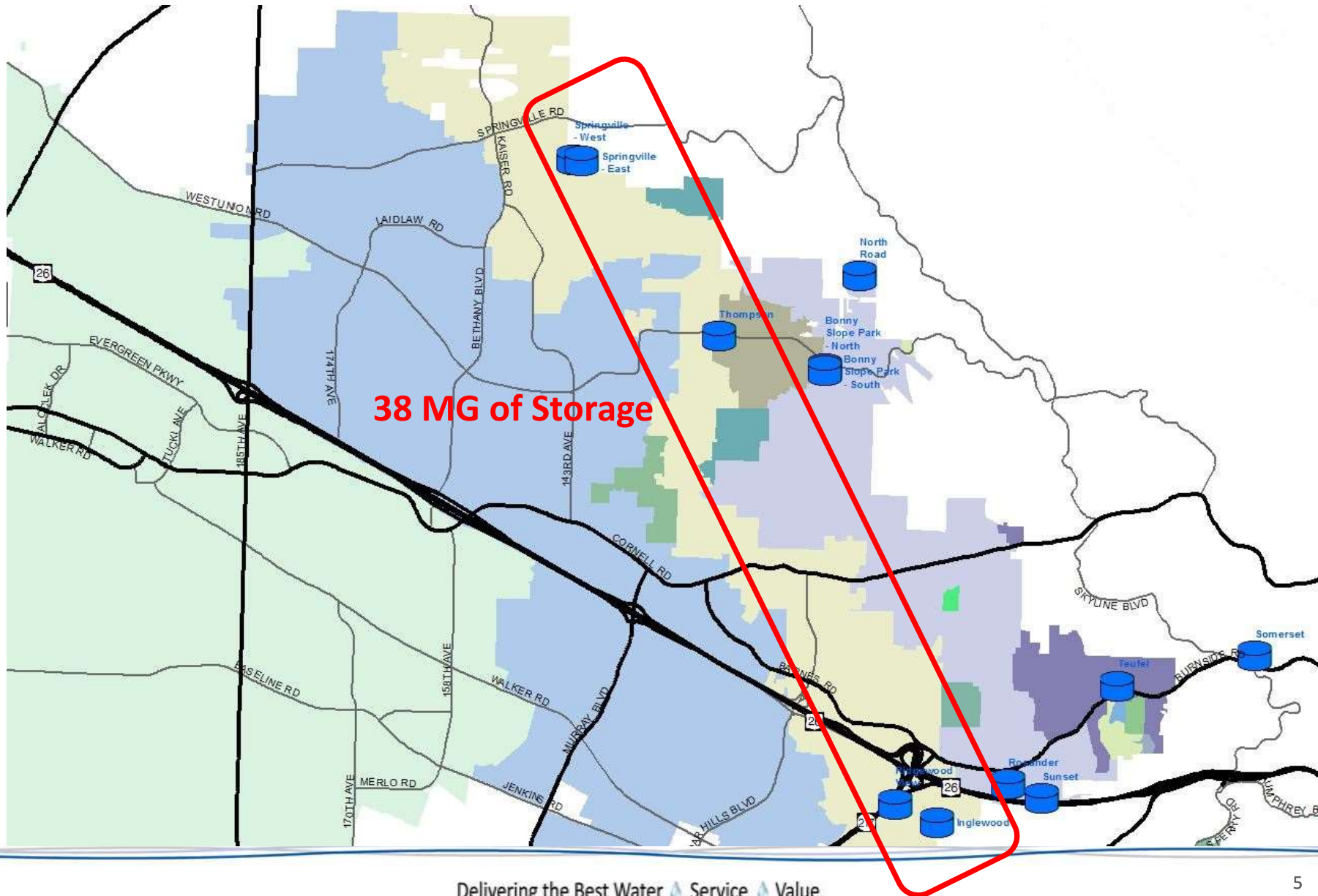
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Hydraulic profile



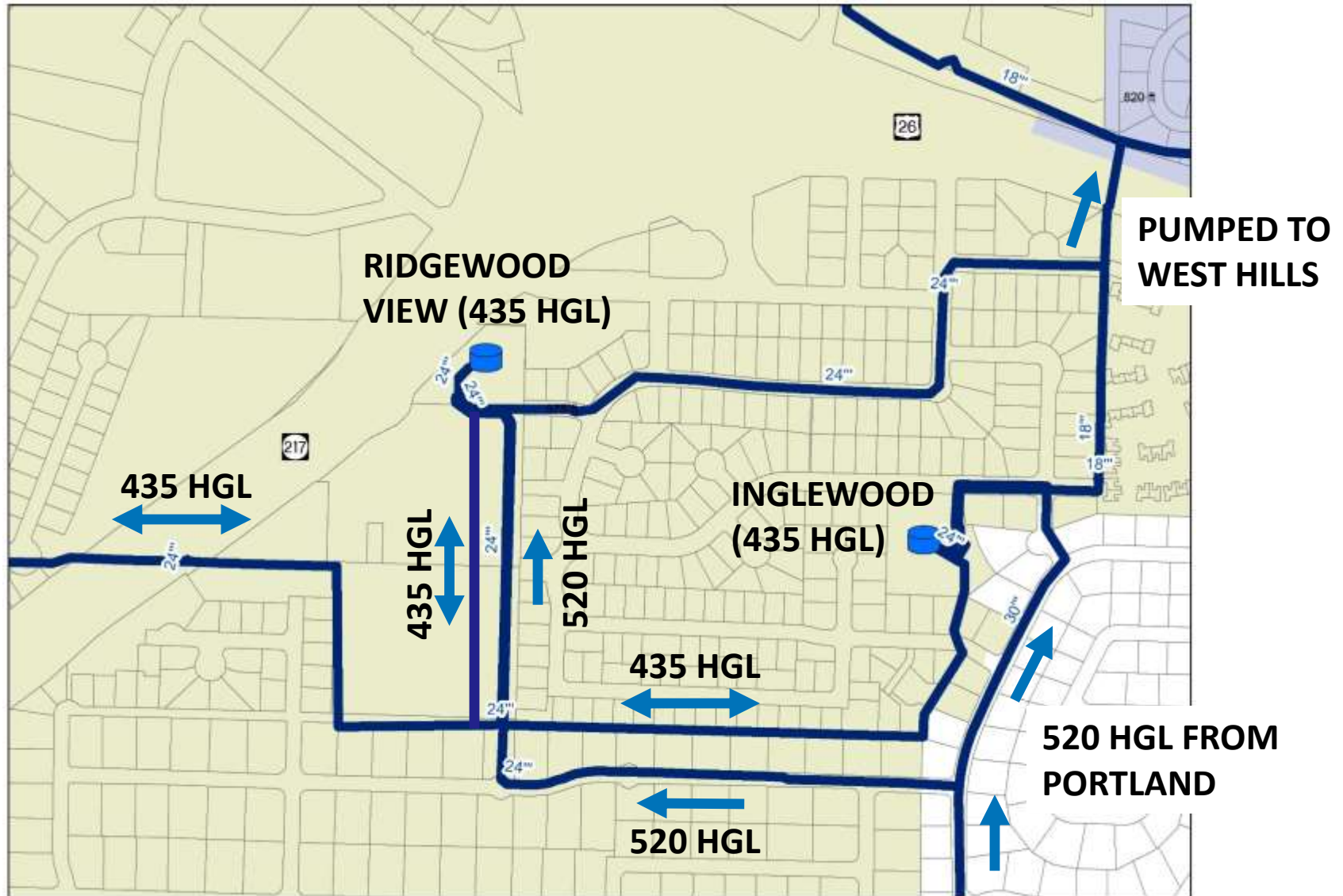
38 MG of Storage

Water System





Inglewood and Ridgewood View



April of 2015...



April of 2015...



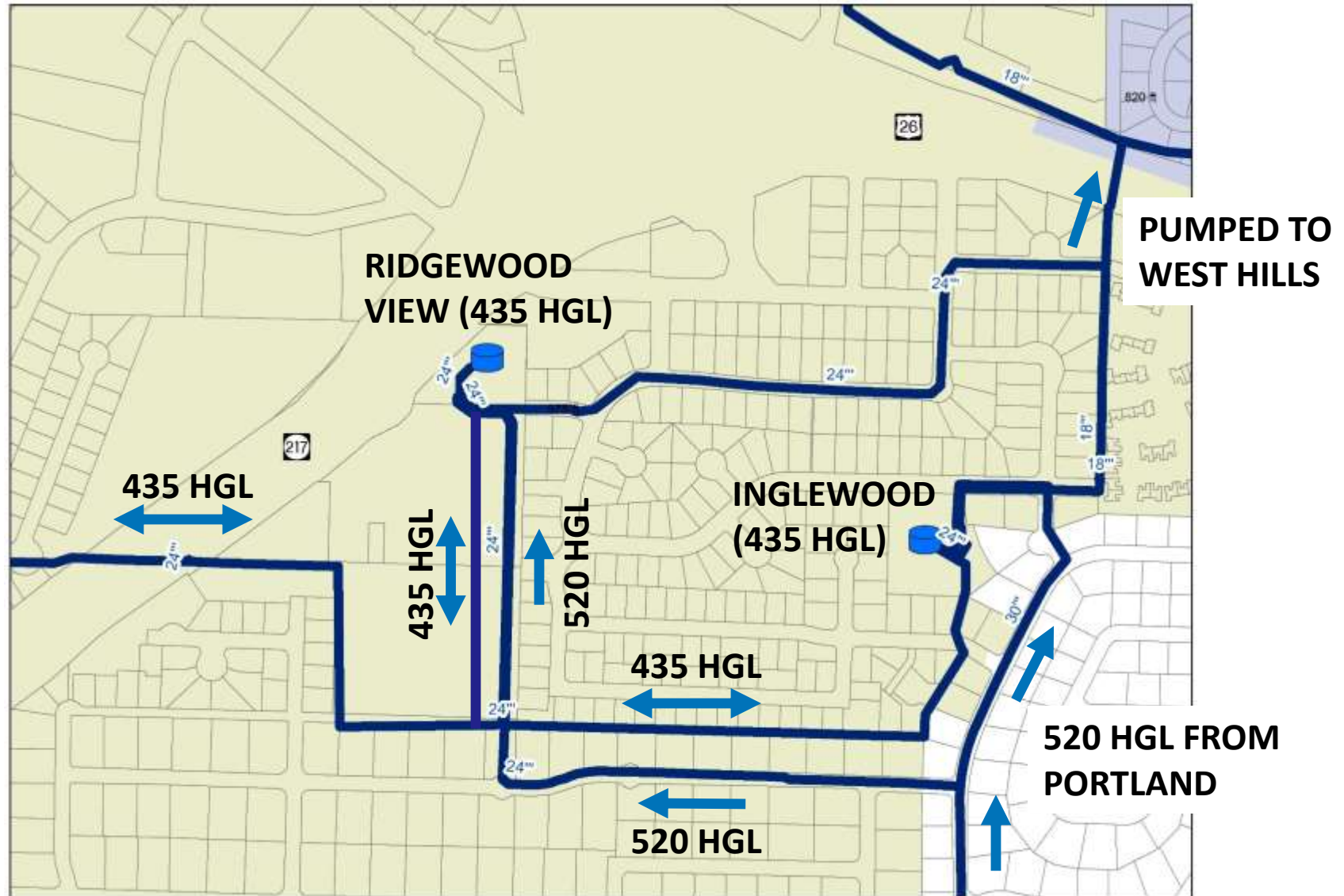
April of 2015...



April of 2015...



Inglewood and Ridgewood View





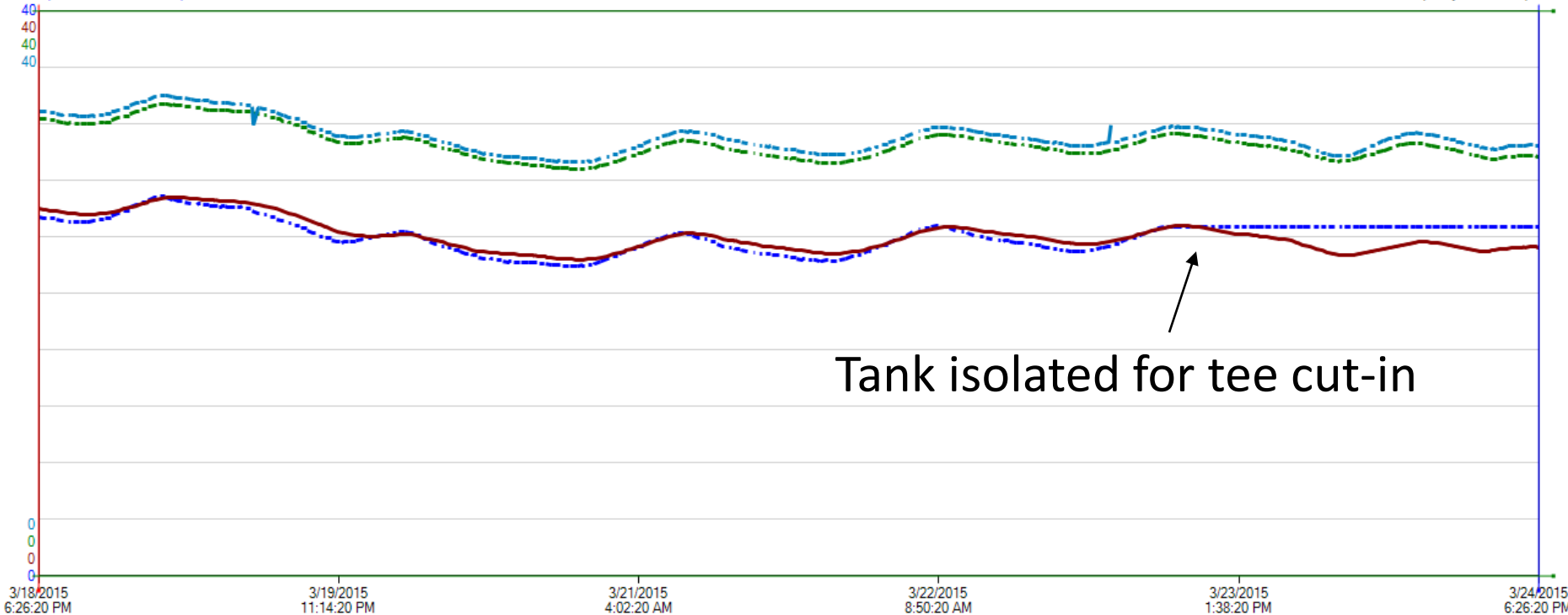


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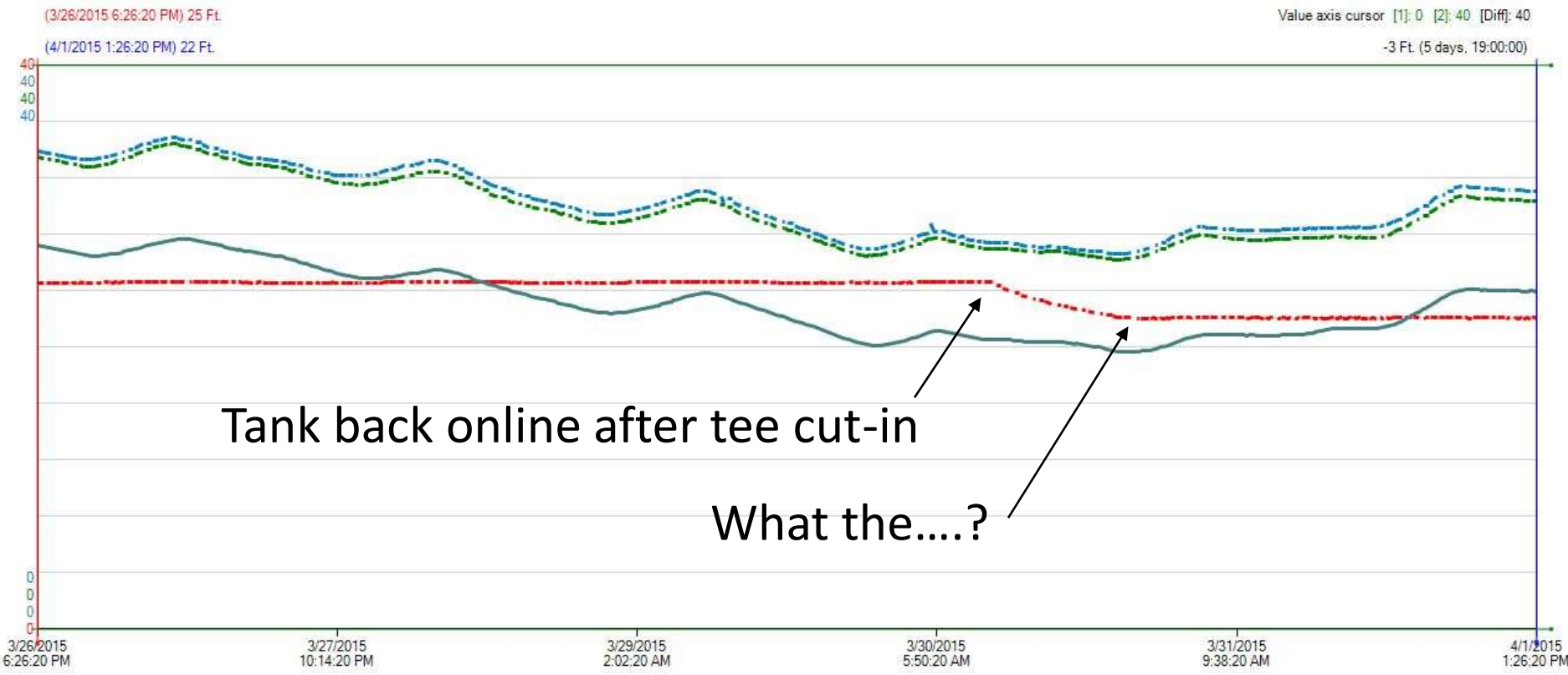
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-1 Ft. (6 days, 00:00:00)



Tank isolated for tee cut-in



What do you think?

How do we test these theories?

What tests do we run on the system?

What info do we gather?

Let's check some valve positions



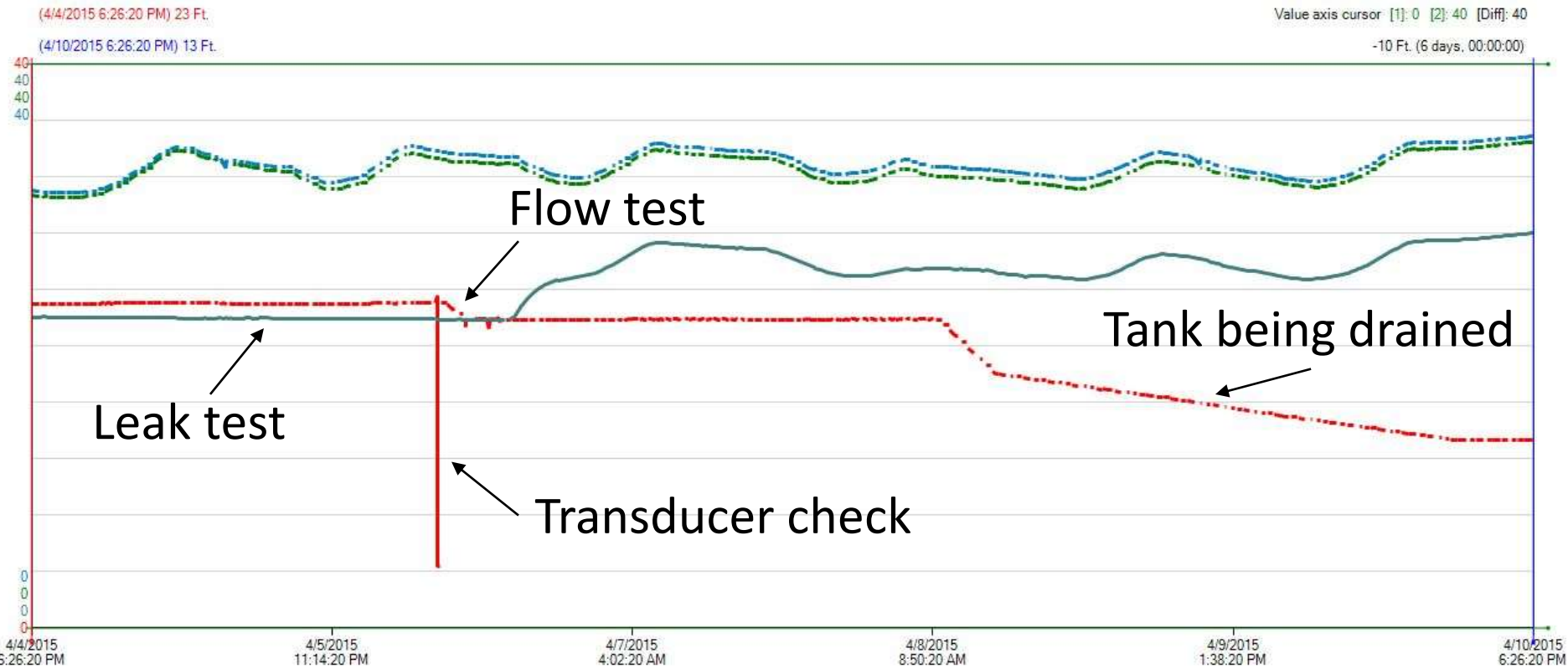
Let's check pressures along the 24" pipe



Let's try to flow some water and check head loss



At ~1500 gpm, we saw 7 ft of head loss. The math told us we'd see less than 0.5 ft



Now what do you think?

What do we know?

- Line was drained
- A tee with butterfly valves was installed
- Tank won't fill like the other tanks
- Tank will draw down
- Greater than expected headloss through 24" pipe

What is our next move?

- How can we determine if any valves are malfunctioning?
(new valves or existing valves)
- Is there a foreign object in the pipe?
- How can we get into the pipe to investigate?
- Are there existing valves that we don't know about?

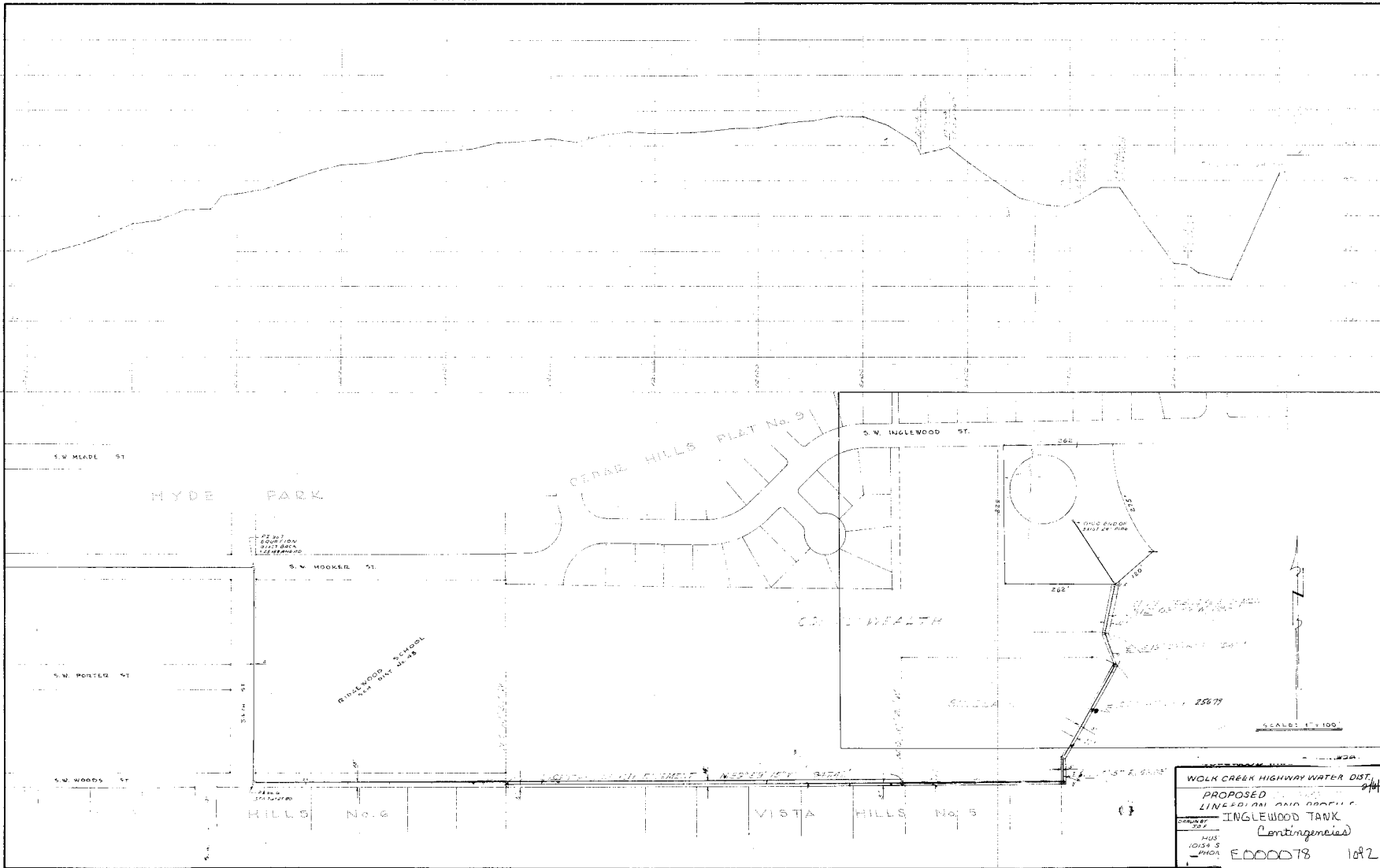




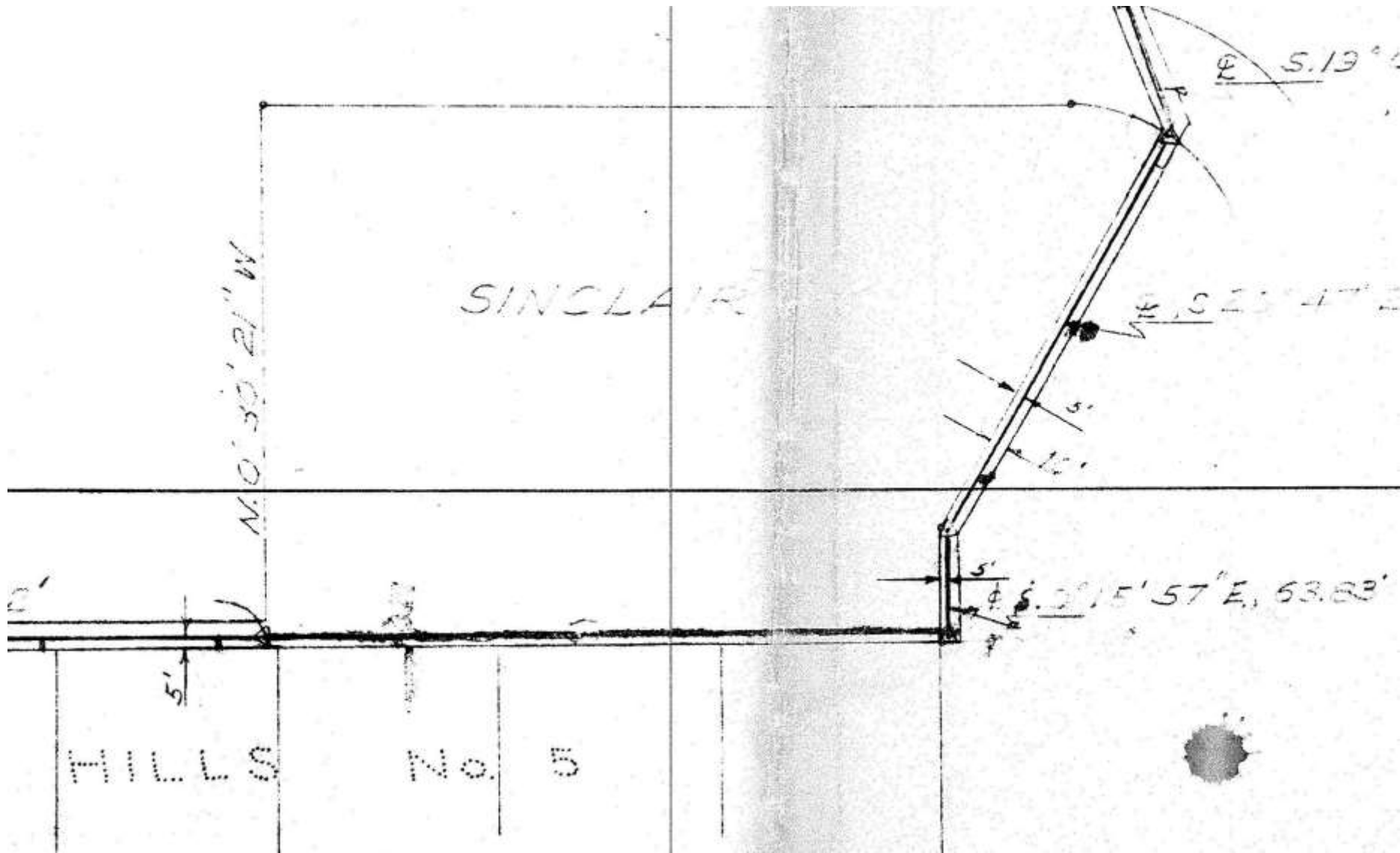


Pipe access...



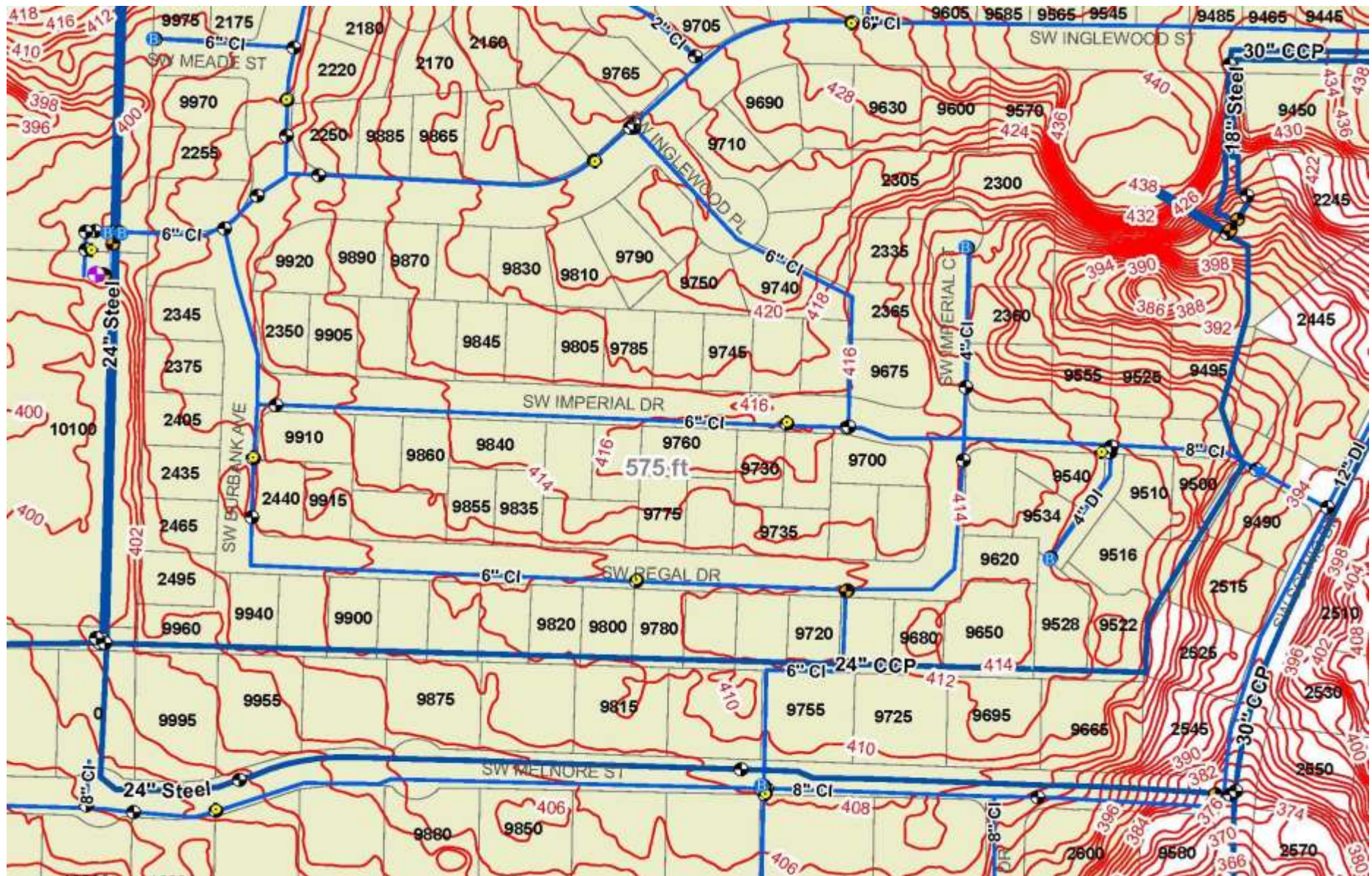


WOLK CREEK HIGHWAY WATER DIST.
 PROPOSED
 LINE PLAN AND
 INGLEWOOD TANK
 (Contingencies)
 E000078 10/2



General topography is fairly flat





Tualatin Valley Water District



Delivering the Best Water Service Value

Happy Customer
555 SW Melnore St
Portland, OR 97225

April 8, 2015

Subject: Backyard access for utility locating of a buried water line

Dear TVWD Customer:

Tualatin Valley Water District has a buried waterline in an easement near the rear lot line of your property and we need to gain access to this line through your yard to determine its physical location. Please contact me at your earliest convenience to arrange a time that we can access your backyard. Thank you in advance for your understanding and cooperation.

I can be reached at the office at (503) 848-3054, on my cell at (541) 760-1404, or by email at peter.boone@tvwd.org.

Sincerely,

Peter D. Boone, PE, PLS
TVWD Senior Engineer



Let's go look for an ARV...



**Couldn't find an
ARV, so lets at least
try to find the pipe...**











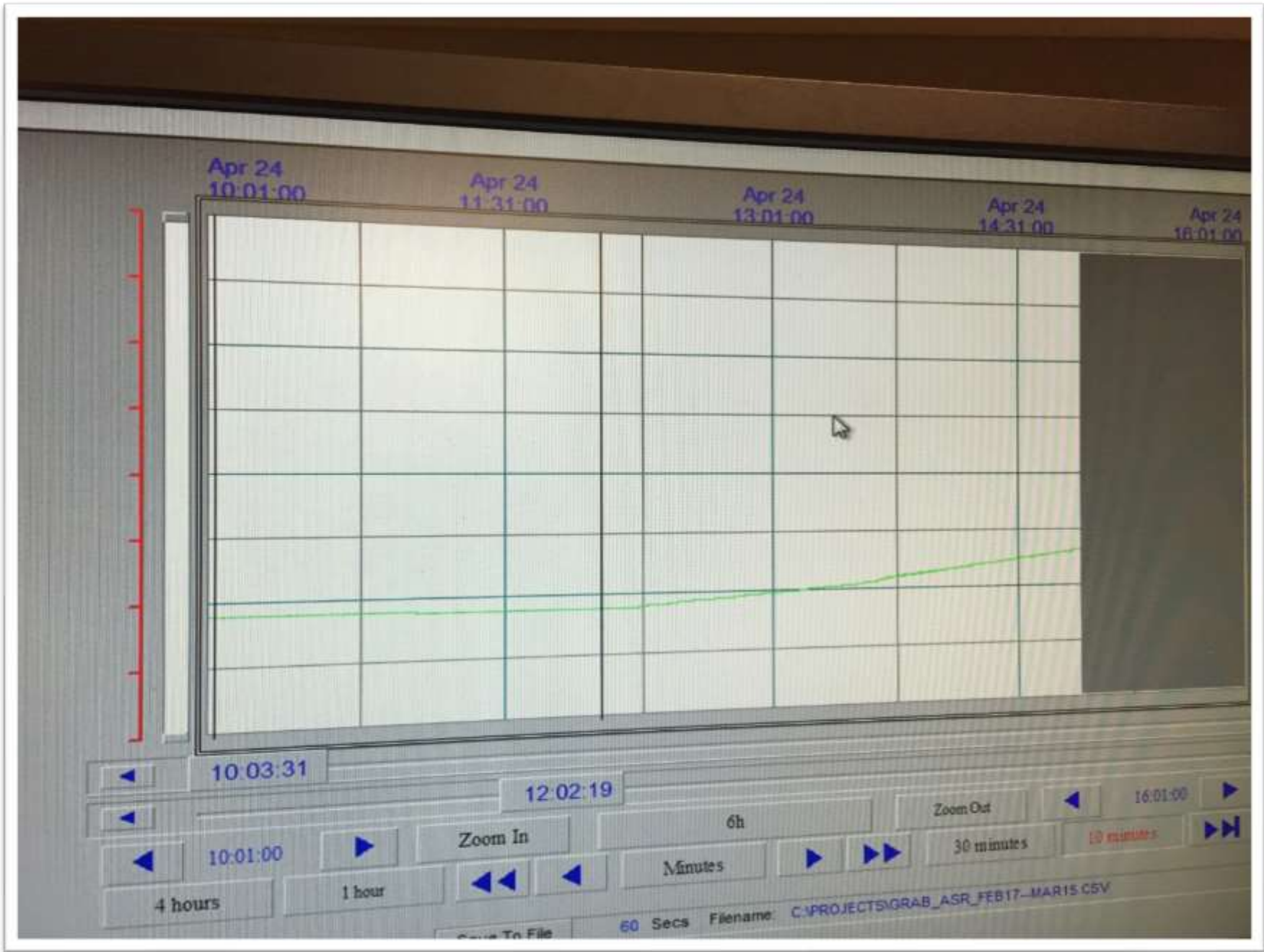












(4/20/2015 6:26:20 PM) 8 Ft.

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(4/30/2015 6:26:20 PM) 21 Ft.

14 Ft. (10 days, 00:00:00)

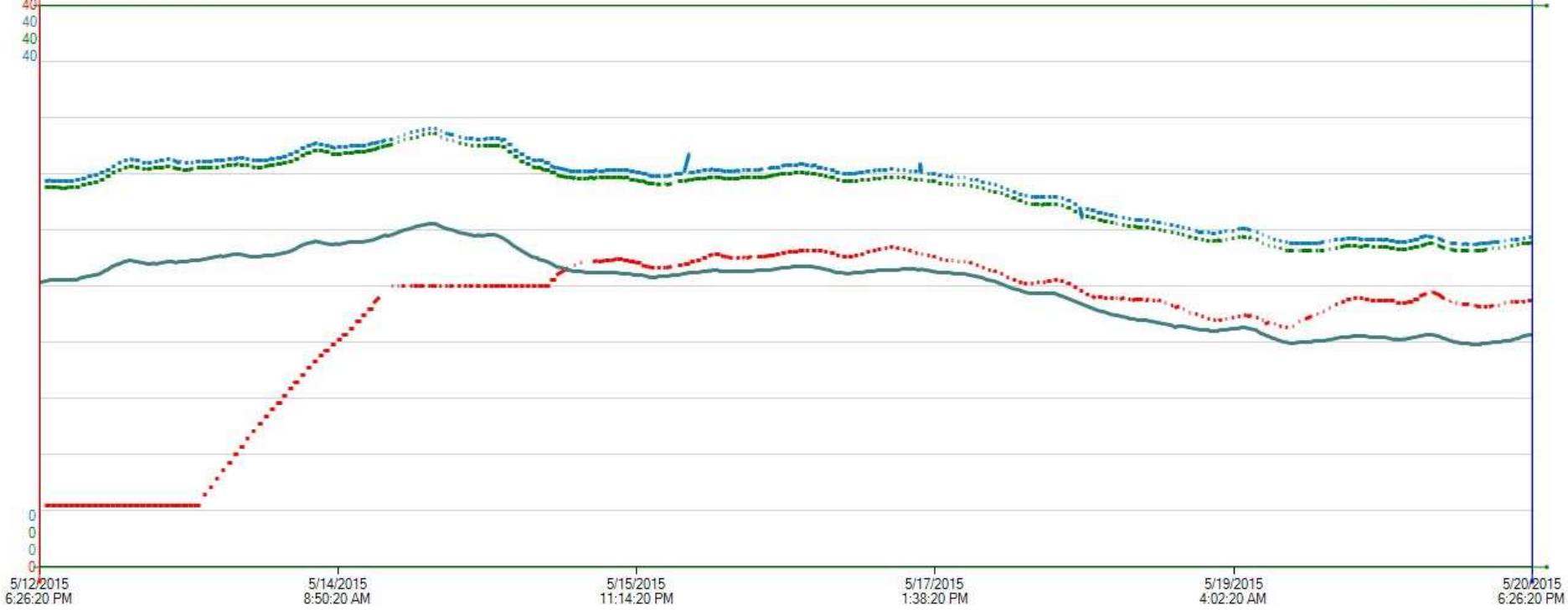


(5/12/2015 6:26:20 PM) 4 Ft.

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(5/20/2015 6:26:20 PM) 19 Ft.

15 Ft. (8 days, 00:00:00)



Lessons learned

Air in pipes can make them do funny things

As-builts and knowing where your assets are is critical

Backyard pipe alignments can be challenging

Collaboration is the only way to solve problems!