TUALATIN VALLEY
WATER DISTRICT

“Rock-In” Pipe: Why Experience Matters When Installing Water Pipelines

Nicholas Augustus, PE, PMP

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AGENDA

- TVWD Overview
- Background / Project Overview
- Addressing Challenges
- Specifications
- Experience Matters
- Questions



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ABOUT TVWD

- Provides more than 222,100 residents and businesses with reliable, safe, high quality drinking water to parts of Washington County, Oregon.
- We deliver 22 million gallons of water daily through more than 765 miles of pipes.
- At TVWD, our customers come first—today, tomorrow, and every day. We consider it a privilege to provide this essential service to our community.



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ABOUT TVWD



Our Mission: Providing quality water and service to our community



Our Vision: Our water sustains thriving communities—every day for everyone.



Our Values:

Respect

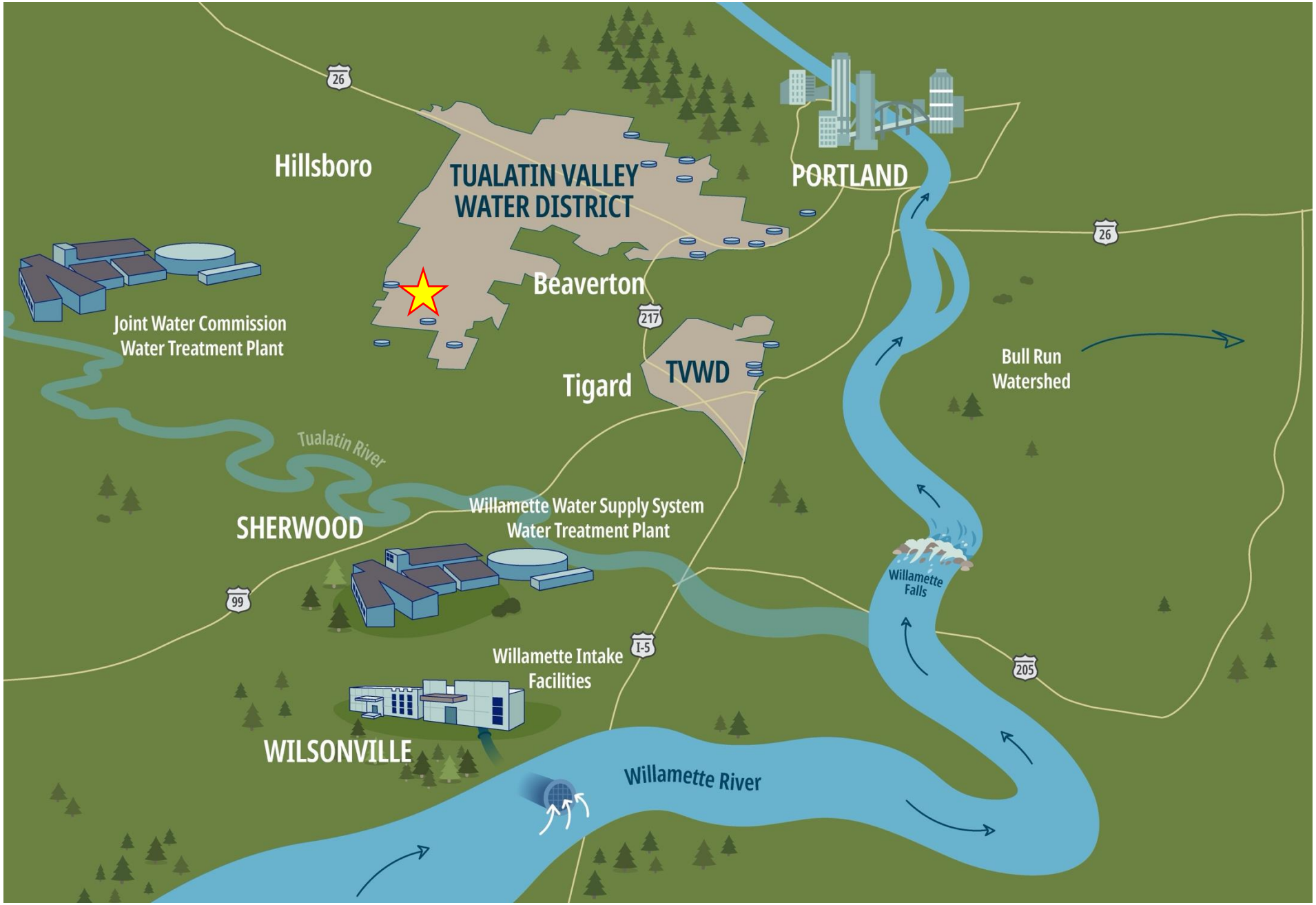
Integrity

Service

Equity

Safety

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"Rock-In" Pipe

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BACKGROUND / PROJECT OVERVIEW

- 189th Pump Station
  - Constructed in late 1980's
  - Site included 2 MG reservoir at 350 elev. and supply well
  - Pump failures and resilience concerns
- Goyak Pump Station:
  - Constructed in 1973, expanded in 1992.
  - Issues with water intrusion, confined space, and seismic resilience
  - Site included 1 MG reservoir. Issues with drain and seismic resilience.
- Construction Issues:
  - Space constraints – small sites, adjacent development, compressed schedule
  - Single-source facilities



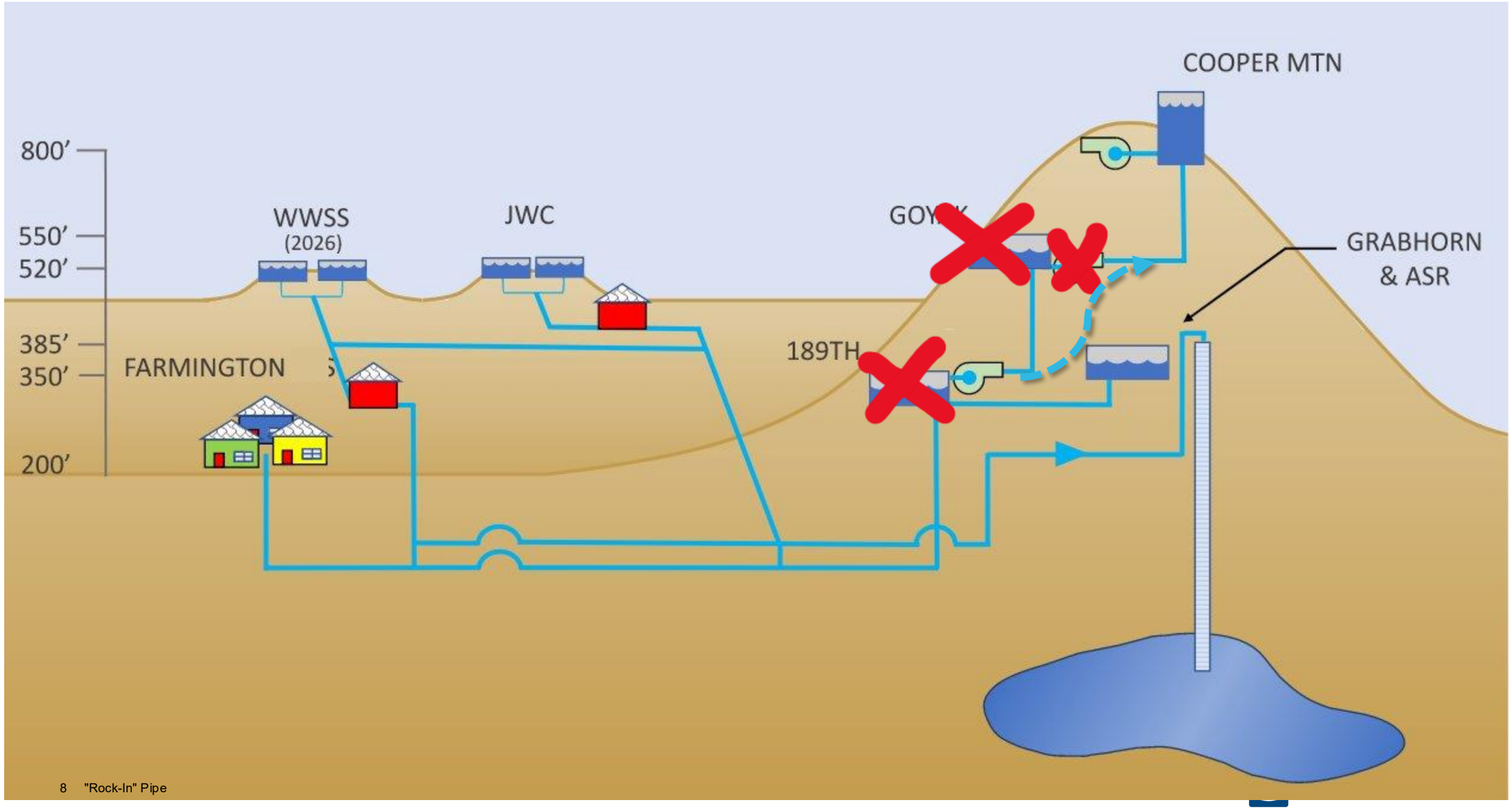
Old 189th Pump Station &
Portable Standby Generator

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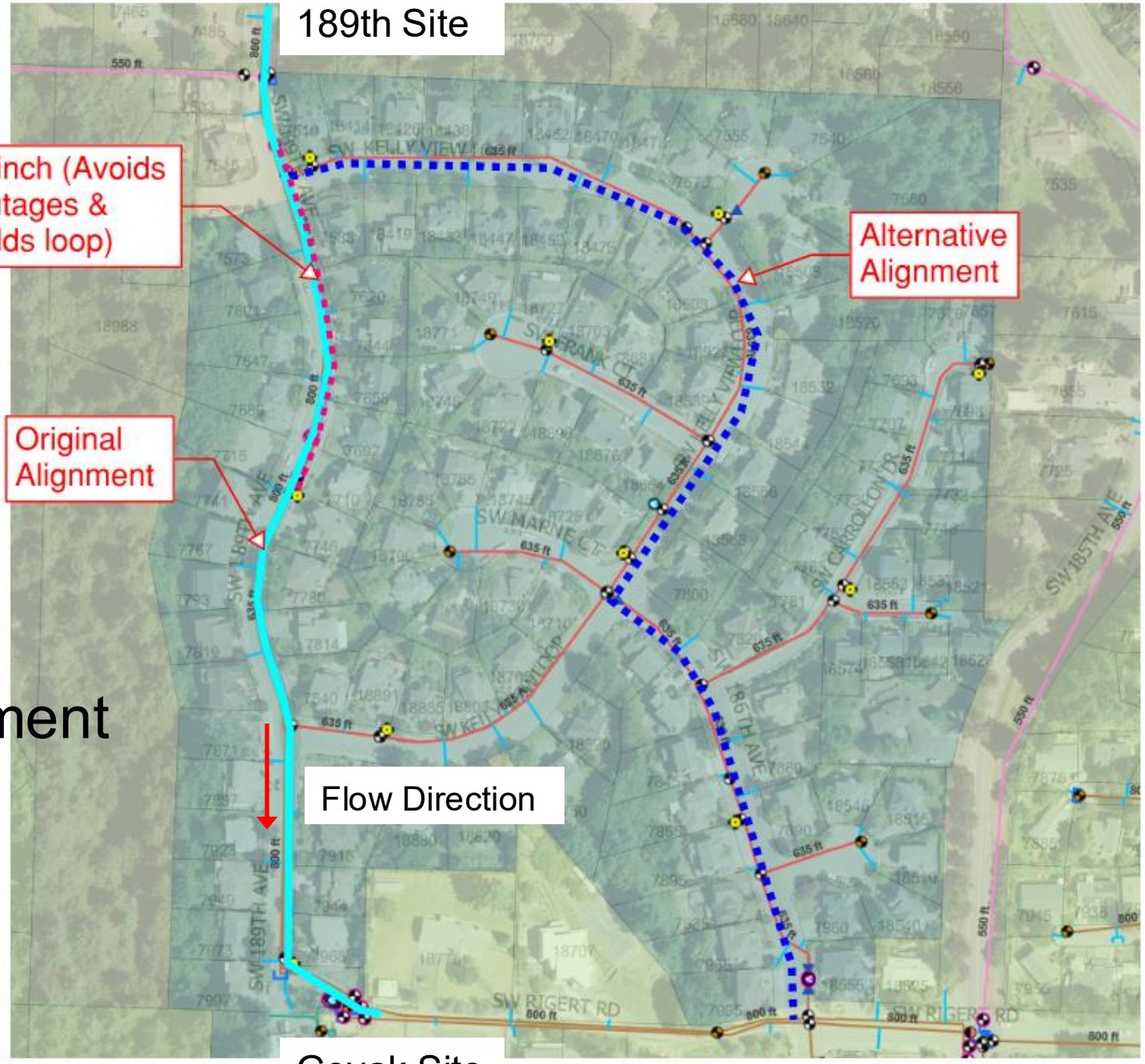


189th Reservoir & Pump Station – Aerial View - Preconstruction

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COOPER MTN
800’
550’
520’
385’
350’
200’
WWSS
(2026)
JWC
GOY
GRABHORN
& ASR
189TH
FARMINGTON

- Routing Study
  - Existing sewer
  - Rock excavation (upper end)
  - Existing connections
  - Additional 8-inch
- Option 1: Replace in same footprint
- Option 2: Alternative alignment



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BACKGROUND / PROJECT OVERVIEW

- Final Pipeline Route
  - Time of year constraints
  - PRV (added value)
  - 8-inch distribution (added value)
  - Removed existing 16-inch (added value)



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ADDRESSING CHALLENGES

Challenges Addressed via Progressive Design-Build

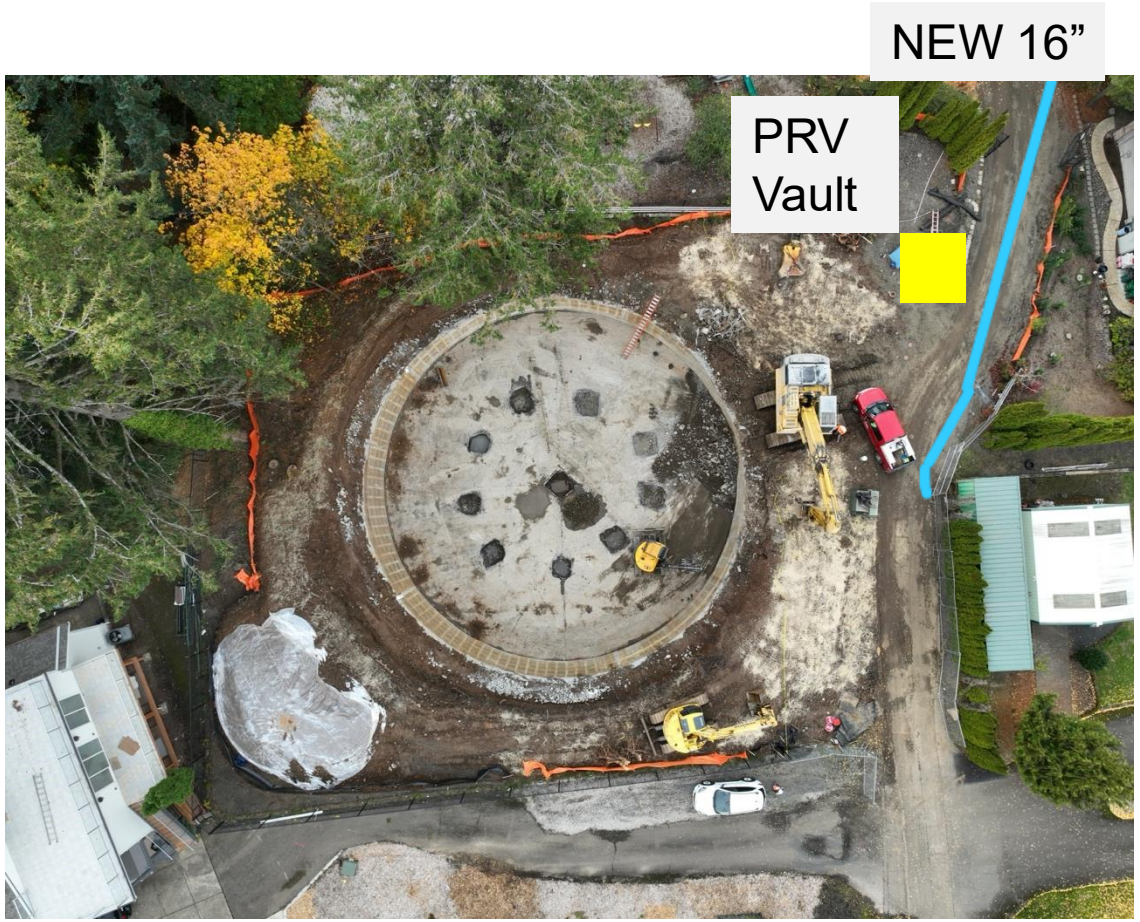
- Working around existing facilities
- Schedule!!
  - Pumps failing
  - Supply chain
- Single-source, timing for piping connections
- Owner control over design and phasing
- Timing of Kemmer Rd project to coordinate
- Highly qualified bidders based on both qualifications and cost
- Appropriate risk allocation



New 189th Pump Station

ADDRESSING CHALLENGES

- Pipeline Delivery
  - Mitigated supply chain issues
    - Early Material acquisition
  - Pricing
    - Bid out to qualified bidders under PDB
    - Received 3 bids, 2 within $13k ($1,606,400 low bid)
  - Strict timelines for construction – Winter demands
  - Multiple tie-in connections
    - Understanding site conditions & operations
  - Design Improvements
    - Removal of Goyak meter
    - Relocate PRV vault – pre-purchased vault
    - Wye connection



Aerial Image of Goyak Reservoir Demolition – October 30, 2025

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SPECIFICATIONS

- Existing pipe condition – Discovery
- TVWD Standards
  - Class 52 DIP
  - Zinc-coated
  - Polyethylene Encasement w/ biologic protection
- Cathodic protection approach
  - 100-year design life
  - Bare DIP w/ bonded joints
  - Added anodes every 80-ft



Potholing & Condition Assessment

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SPECIFICATIONS

- Addressing discharge pressures – test to 325 psi max
  - Joint type –
    - HDSS or Flex ring
    - Some flexibility
    - Protect from corrosion
  - Fitting type
    - MJ fittings
    - Blue-coated bolts (verify strength)
    - Stainless or wax tape
    - Tandem megalugs – Brand matters
  - Appurtenances – Avoid added leak points (blow-offs rather than CARVs)



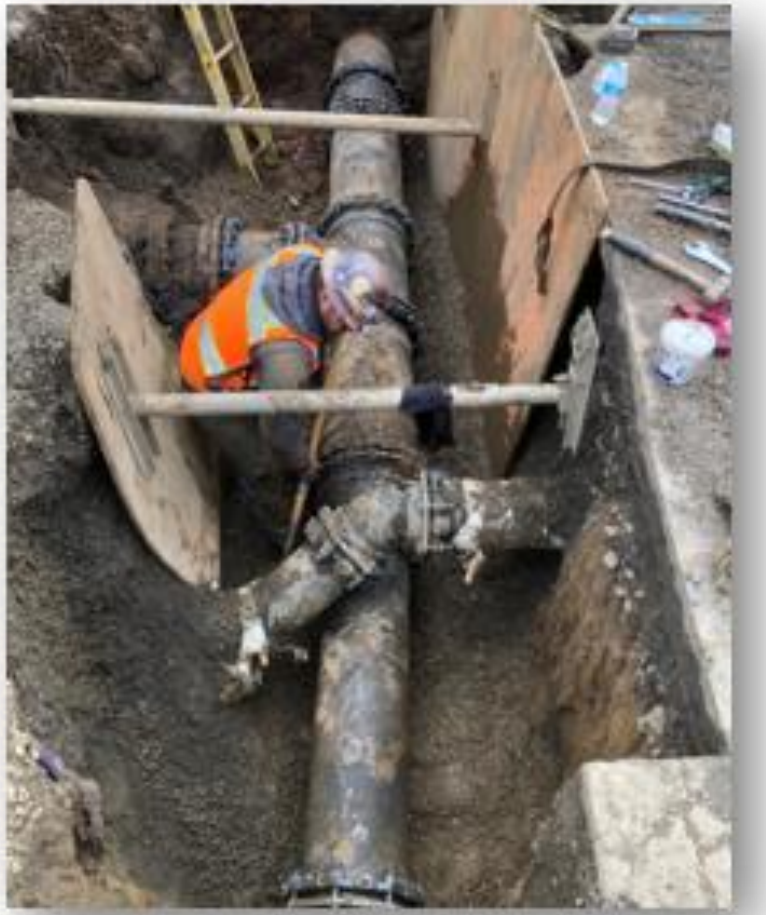
Tandem Megalugs & Joint Bonding

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EXPERIENCE MATTERS

- Installation procedures
  - Audience: What is something important to remember to do during installation?

1. Excavate to line and grade
2. Prepare bedding
3. Install pipe, keeping pipe interior clean!
4. Set pipe to correct slope
5. Clean spigot and bell groove thoroughly
6. Install gasket
7. Apply approved pipe lubricant
8. Push spigot fully into bell, fully homed, not deflected
9. Insert locking segments & rubber retainer
10. Deflect as necessary and backfill



Tee 550 Zone Connection – 8" conflict was re-routed prior to this connection

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EXPERIENCE MATTERS

- Pressure Testing Issues
  - Leaking at HDSS joints
  - Challenging repairs - depth
  - Multiple days to correct
  - Re-pressure test
  - Lack of excess materials
  - Off-brand tandem restraints
  - Leaky valves in need of repair
- Balancing demands
  - Approaching summer demands due to leak repairs



Joint Repair – Sleeve & Tandem Restraints

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EXPERIENCE MATTERS

- Final tie-in
  - Pressure tested
  - Bac-T tested
  - Multiple-connections planned
  - Water drained, but air locked



Valve Cracked Open Due to Tie-In



End Cap Open

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EXPERIENCE MATTERS



Removed Cap, Pipeline "Burped"



"Clean" rock-in pipe



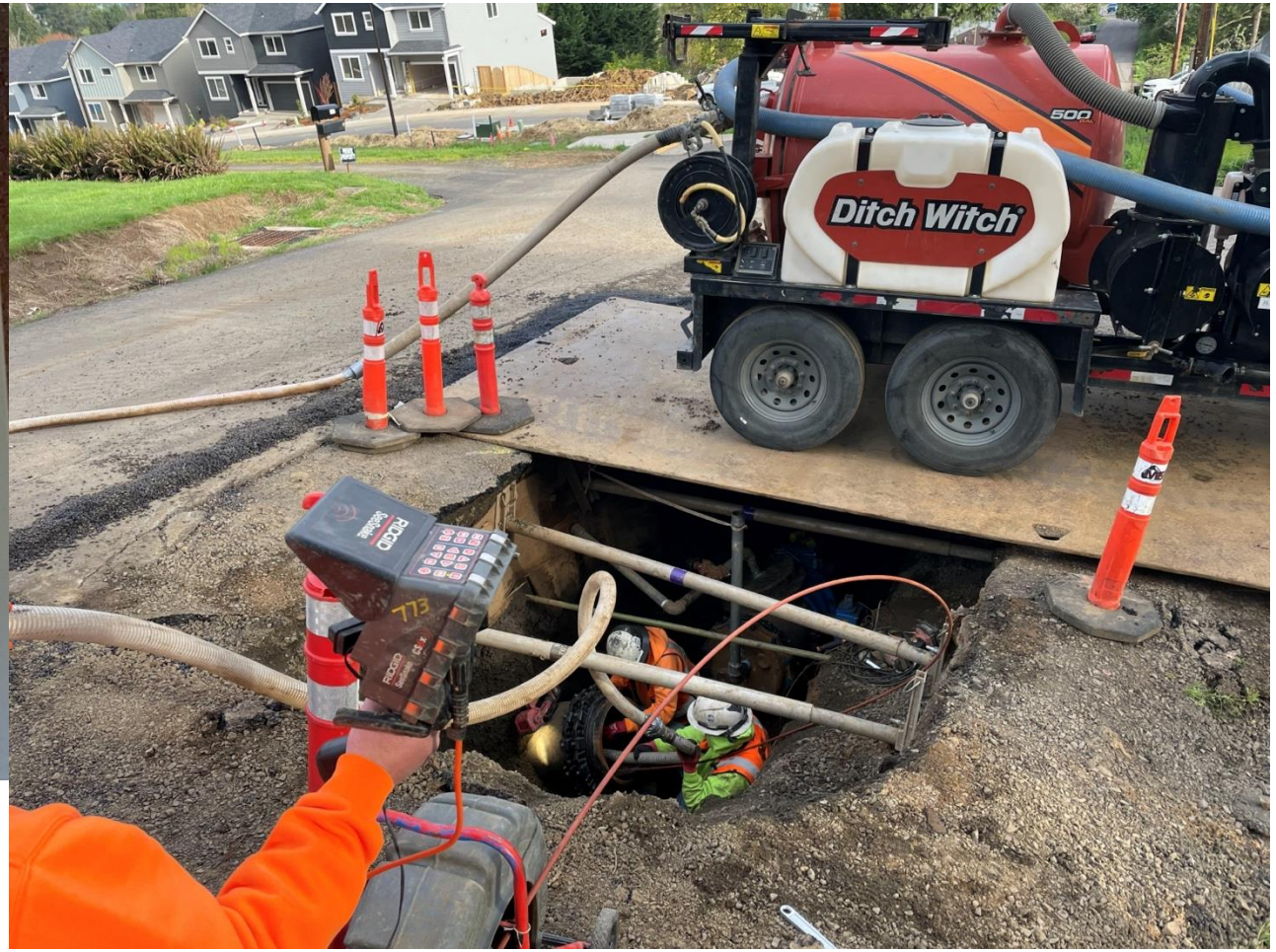
Rechlorinate 12-inch

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ALL HANDS ON DECK! REACTING TO CHALLENGES



Video Inspection – Debris Discovered



Removing Rock & Debris

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ALL HANDS ON DECK! REACTING TO CHALLENGES



Baker Tank Used for Flushing – 189th Site



Interior of Baker Tank – Monitoring Levels

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FLUSHING VELOCITY TIMING

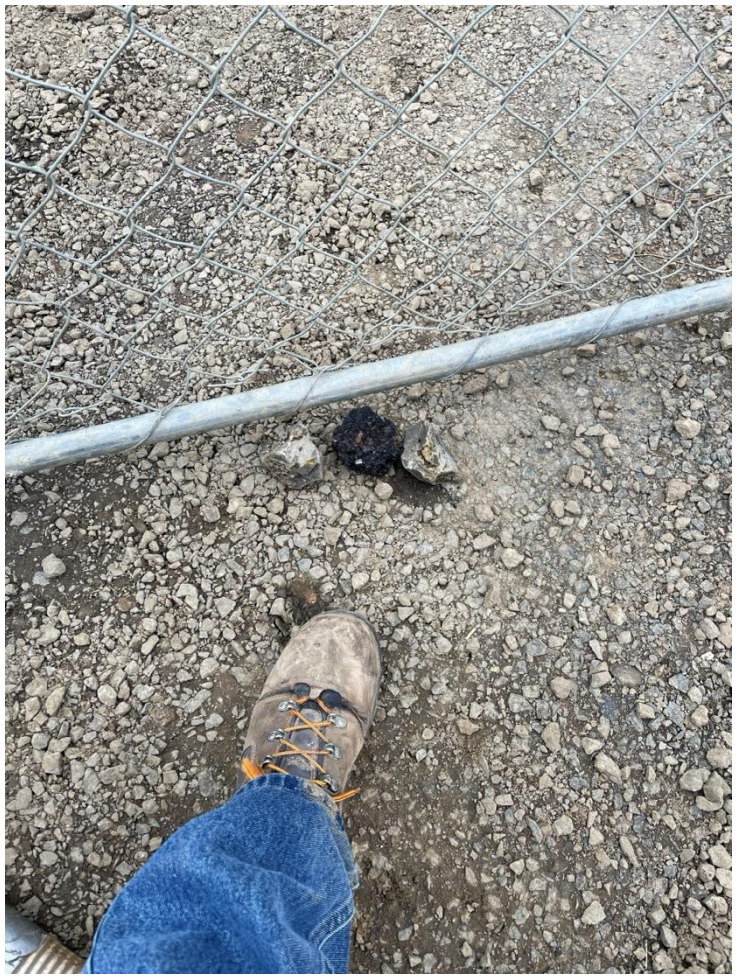




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Size of Debris Removed with Flushing



Amount of Rock & Debris Removed with Flushing

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“100 bad days make 100 good stories…”



Valve Seal – Reasons for Not Passing



Valve Inability to Close

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Goyak Site Restoration



189th Site Construction

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Attempted Pressure Jetting



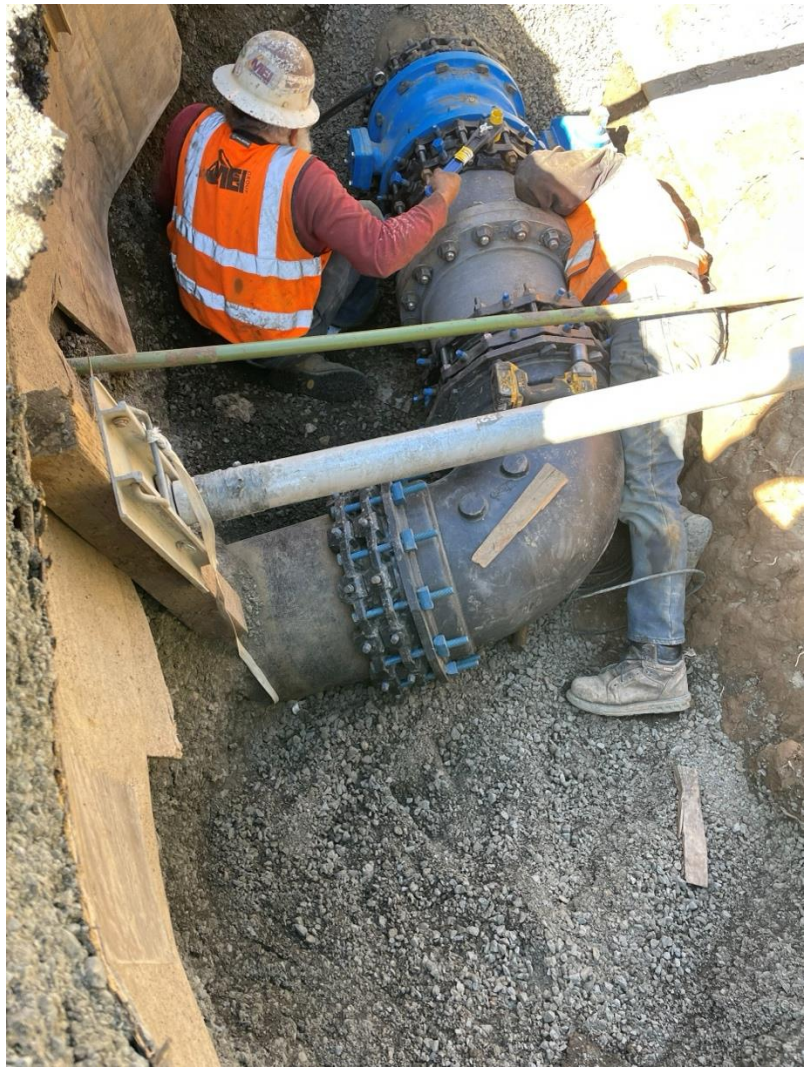
Removed 90-deg fitting –
Not fully inserted…

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EXPERIENCED CREW TO CORRECT ERRORS



Debris Shown on Video Removed



The Connection that Started It ALL!
Final Bolt-Up

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ENSURING CLEANLINESS & LONGEVITY



Nearly there…



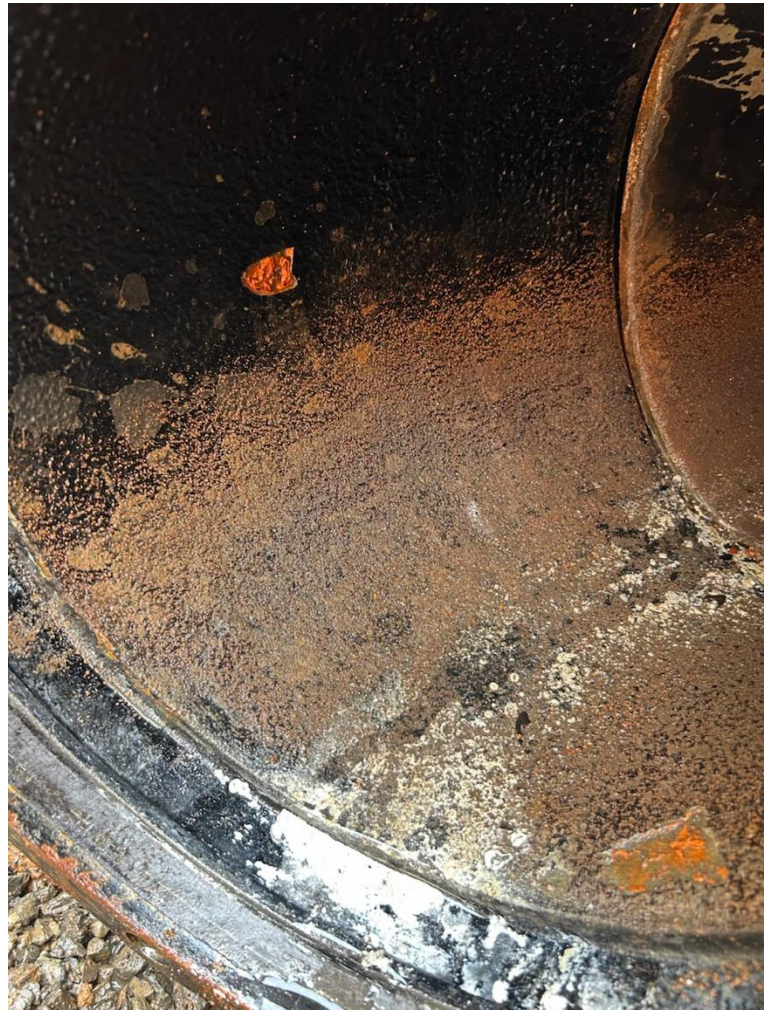
Clean after final jetting – Follow manufacturer recommendations when jetting

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ENSURING LONGEVITY

- Acceptance
- Satisfying concerns
- Contract & warranty
- General contractor assistance – negotiations, purchasing extra material to assist





Missing Mortar Lining Discovered

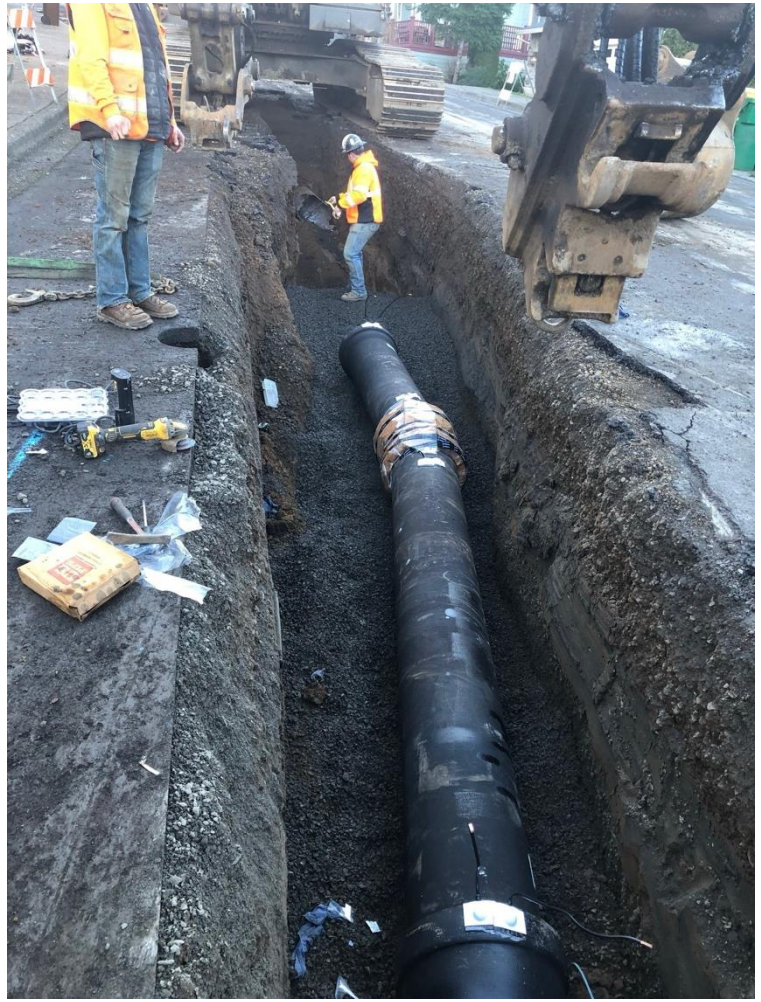
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WHAT WENT WRONG??!

- Installation procedures
  - Laying pipe, don’t scoop!
  - Pipe Lube
  - Looking inside the pipe
  - Inspection, how much is enough?
  - Training
  - If it doesn’t fit, fix the alignment! (don’t just beat the HDSS inserts into submission!



16-inch Pipe Installation



16-inch Pipe Installation

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WHAT COULD HAVE GONE WRONG?!

- Understanding restraint
  - When is it an emergency?



Exposed Pipe – Potentially Unrestrained



4’x8’x4’ Gravity Thrust Block Form

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EXPERIENCE MATTERS

- Wye Connection Challenges
- Creativity with Operations



16" Connection at Goyak – Flow meter vault, conduit, and lots of other issues



16" Connection at Goyak – Thrust Block

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EXPERIENCE MATTERS



16-inch Tee Connection – Thrust Block Removal



16-inch Tee Connection

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EXPERIENCE MATTERS



16-inch Wye Connection



16-inch Wye Connection

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QUESTIONS?

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THANK YOU!

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