

What are Water and Wastewater Owner's Top Concerns in 2022



Melissa Elliott,
AWWA Past President

"We know water customers are more supportive of what utility professionals do every day when we help them appreciate the wonder that is high-quality, safe drinking water that flows on demand from their tap. They trust us more when we proactively and strategically communicate with them and engage with the community as we develop solutions to infrastructure and funding challenges."



**American Water Works
Association**

Dedicated to the World's Most Important Resource®

State of the
Water Industry '22

Top 20 Concerning Issues per AWWA

Table 1.
Ranking of Issues Facing the Water Sector in 2022

- | | |
|--|--|
| 1 Renewal and replacement of aging water infrastructure | 11 Talent attraction and retention |
| 2 Financing for capital improvement | 12 Compliance with current regulations |
| 3 Long-term drinking water supply availability | 13 Drought or periodic water shortages |
| 4 Aging workforce/anticipated retirements | 14 Cost recovery |
| 5 Public understanding of the value of water systems/services | 15 Compliance with future regulations |
| 6 Emergency preparedness | 16 Water conservation/efficiency |
| 7 Watershed/source water protection | 17 Asset management |
| 8 Public understanding of the value of water resources | 18 Data management |
| 9 Groundwater | 19 Energy use/efficiency and cost |
| 10 Cybersecurity issues | 20 Improving customer, constituent, and community relationships |

The Five O'clock News

The Odessa water outage underscores a growing problem: Aging pipes in Texas cities are getting more fragile

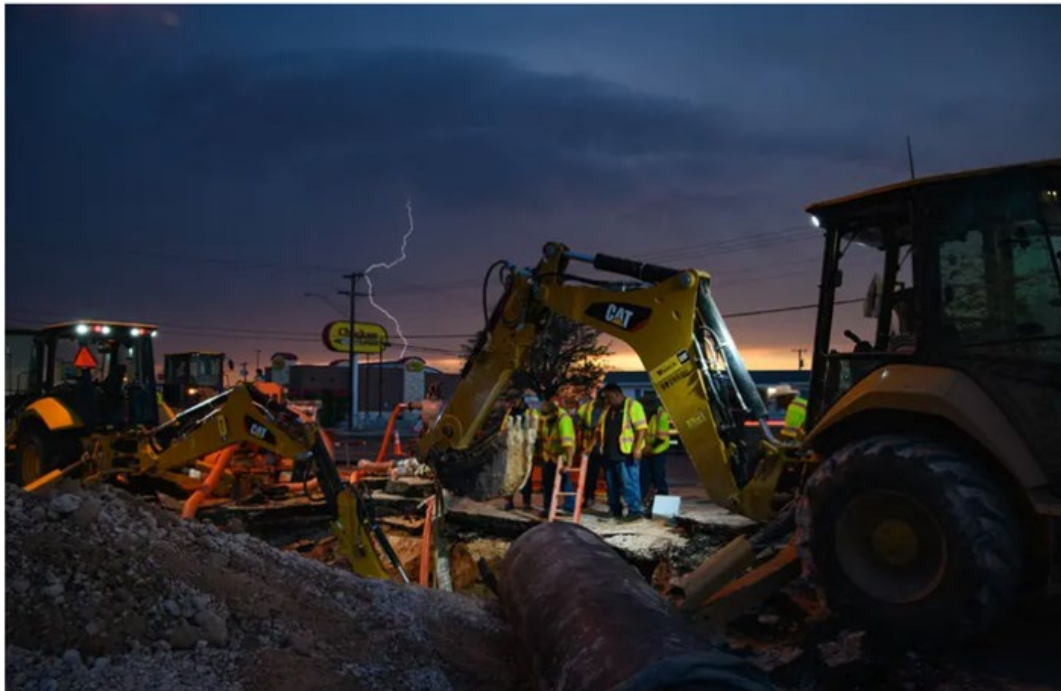
Texas had 3,866 water boil notices in 2021, the most in the last decade. Aging water systems threaten water supply and quality — and for many small towns across the state, they won't be cheap to repair.

BY JAYME LOZANO AND ARIANA PEREZ-CASTELLS JULY 8, 2022 5 AM CENTRAL



COPY LINK

REPUBLIC



While it's likely that Odessa has replaced some of its old pipes in the past, Rainwater said it's to be expected that cities with older infrastructure will be surprised now and then with breaks and failures. Ken Rainwater TT University

“We’ve learned that cast iron pipes have lives of about 50 years, so [Odessa] got past 60 years,” he said. “But it’s like you deciding, ‘How long am I going to wait to change the tires on my car?’ DPW Odessa

How Much Mileage Should I Expect To Get From A Set Of Tires?

New tires can be a costly replacement item, so owners rightfully expect a certain lifespan from them. But how much mileage can reasonably be expected? This article addresses driving style and maintenance factors, which can shorten or lengthen tires' life expectancy.



by Richard R
Product Training Director



Federal Government regulates tire wear

Federal law in the U.S. requires all passenger tires to carry a Uniform Tire Quality Grade (UTQG) rating, which rates tires for Treadwear, Traction, and Temperature. The Treadwear Rating is the first part of the UTQG, expressed as a number (Traction and Temperature Ratings are indicated by letters). The Treadwear Rating is a relative number, based on how the tire to be rated wears compared to a baseline tire always rated at 100. more details on - <https://www.carid.com/articles/how-much-mileage-should-i-expect-to-get-from-set-of-tires.html>

Reference the UTQG column and you see that these BFGoodrich tires' treadwear ratings are 600 or 660, meaning, 6 or 6.6 times 'better' than the base tire's wear of 100.

So why don't we look at much higher ticket items the same way?

A closer look at the top 10 concerns for all respondents shows that renewal and replacement of aging water and wastewater infrastructure ranked as the most pressing issue facing water utilities.

2022 is the 10th year that aging infrastructure replacement and financing for capital improvements have been ranked one and two.

What solutions could you offer the top water and wastewater professions regarding their top two concerns



What keeps you up at night as a water/wastewater professional?

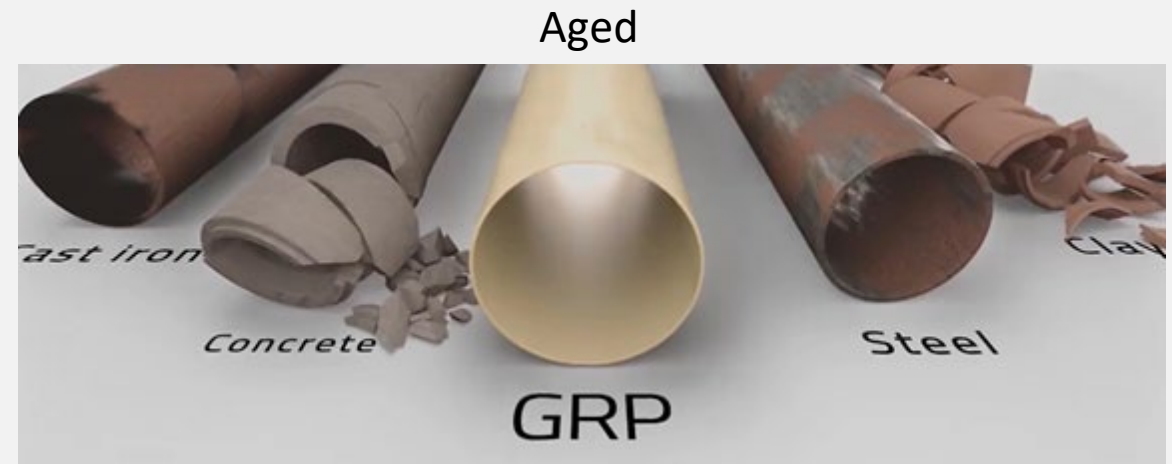


- Pipeline failure
 - Corrosion, leakage, wire breaks
- Making the 5 O'clock news
- Aging system at the end of its 50-year design life

What is this going to cost me?



It isn't if, but When



Time, moisture, chemicals and external hot soils take their toll on materials not inherently resistant to corrosion

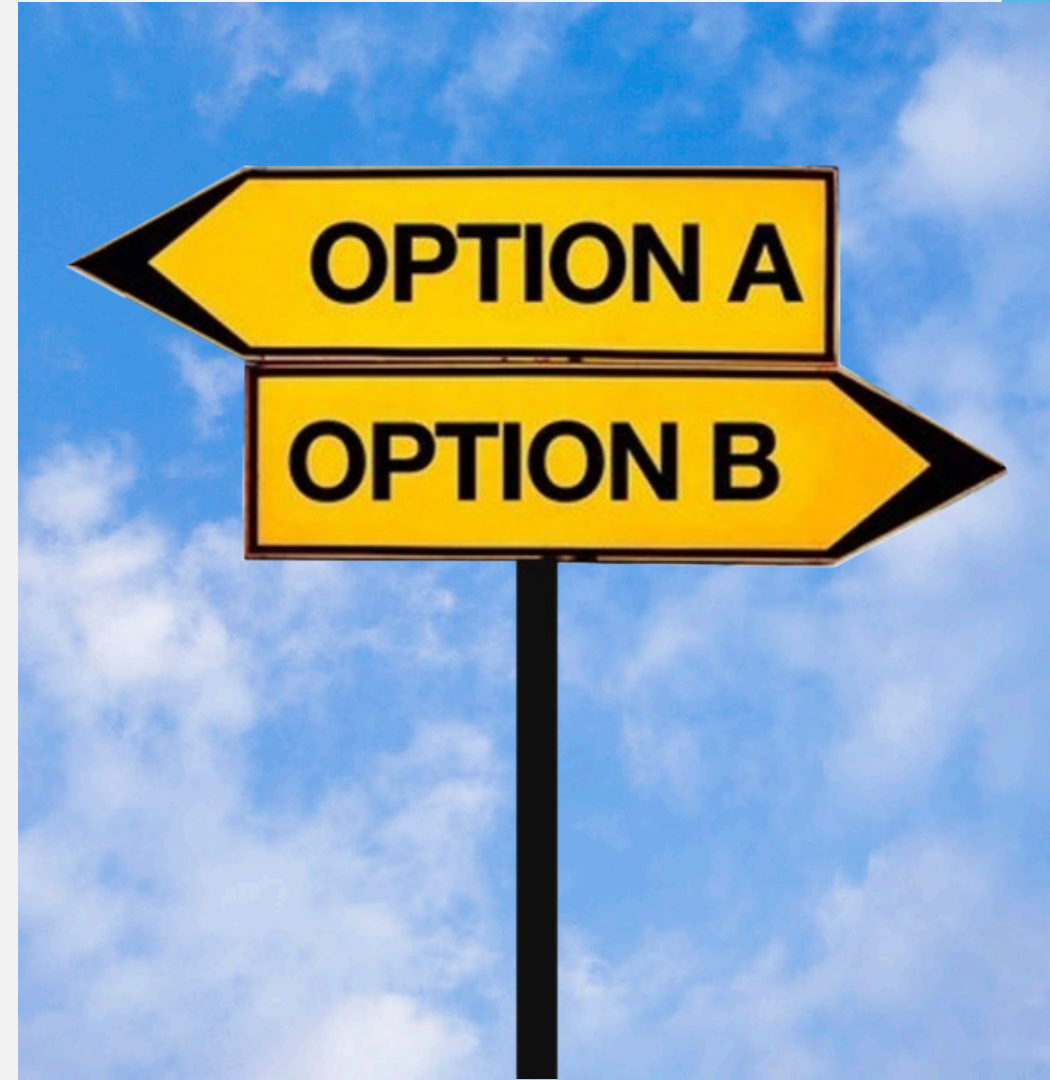
Two Choices to Beat Corrosion

Option A

- Keep doing the same thing and expect a different result

Option B

- Get beyond corrosion with FRP





Break out the Corrosion Cycle



Use a pipe material that does not corrode



HOBAS FRP Water and Wastewater Pipe 150 Year Design Life

Ensuring today's solutions do not become tomorrow's problems while providing peace of mind for future generations through safe, reliable green infrastructure.





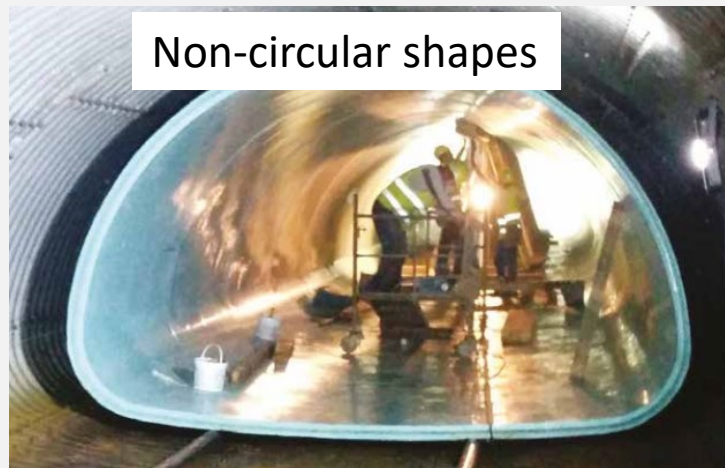
HOBAS' Long Term Corrosion Solutions

Operating pressures up to 450 psi

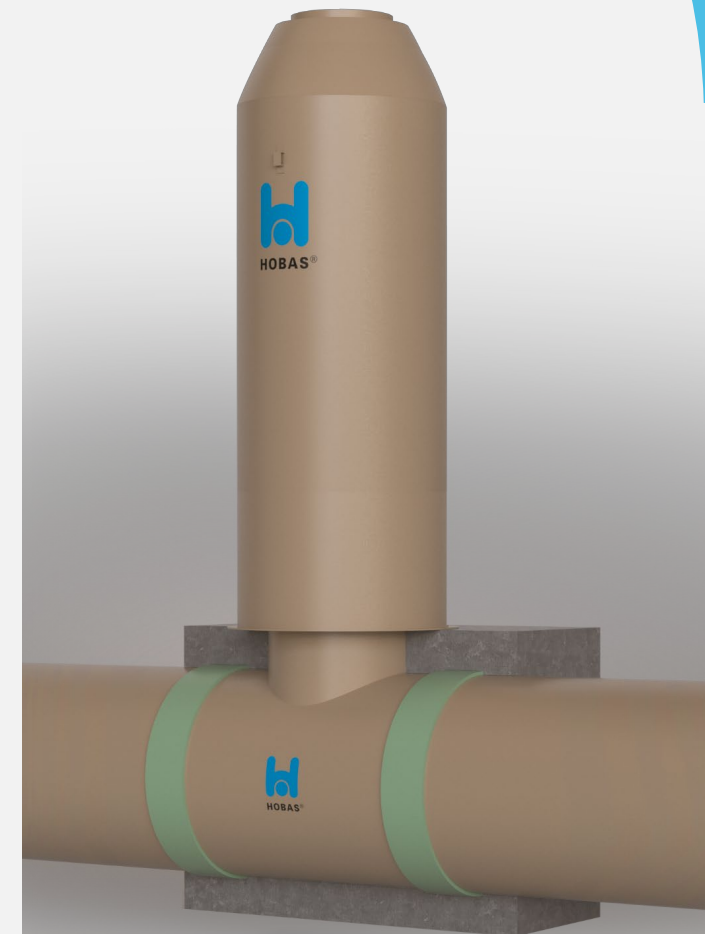


- Extend your system's useful life well beyond the industry's standard 50-year life
- Provide Zero Leakage pipe and couplings
- Increase flows and reduce pumping costs

Non-circular shapes



Manholes



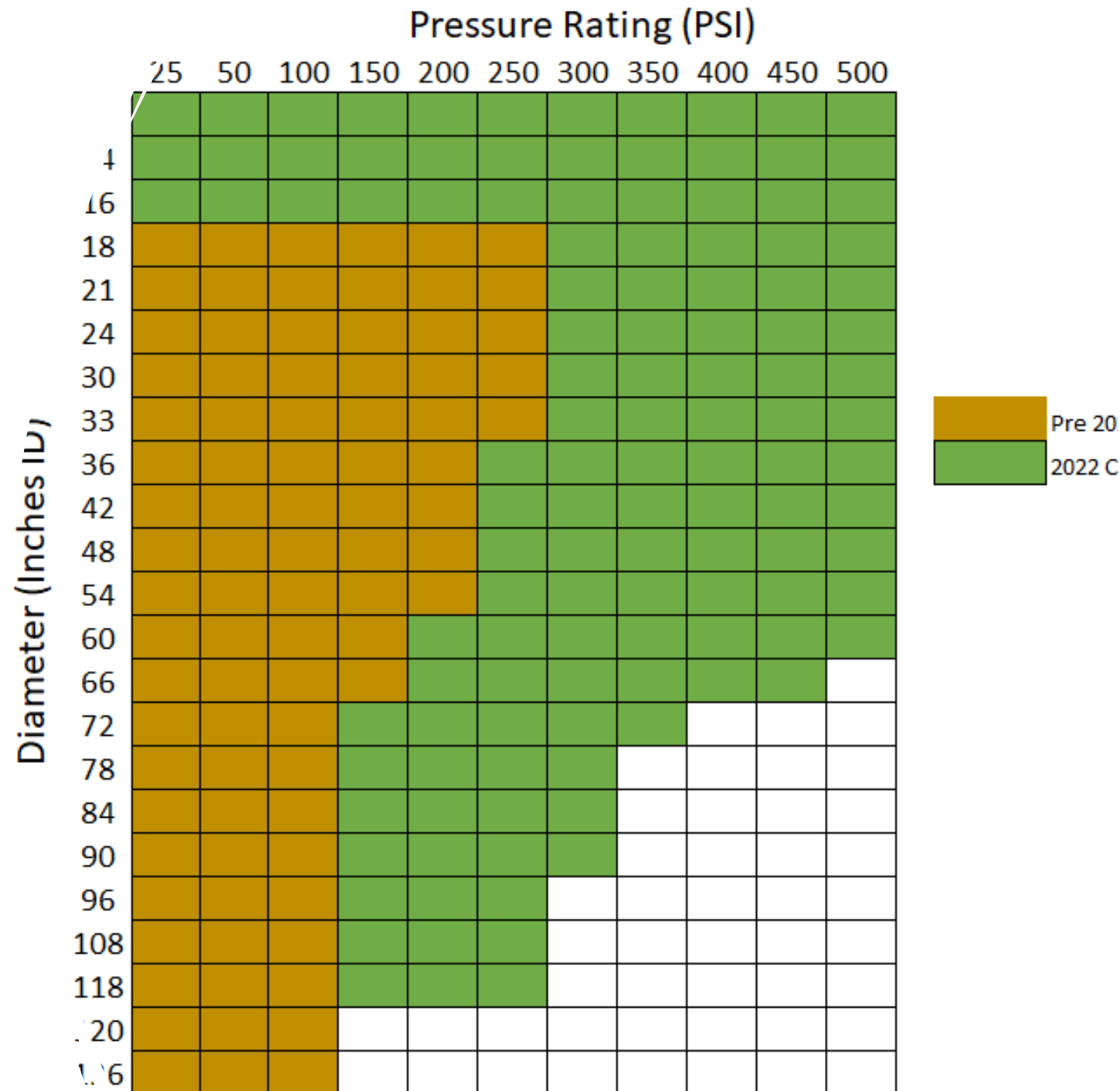
\$60M Plant Expansion

Growing to meet demand





- 1,000,000 LF of Pressure Pipe installed and operating (50-250 PSI)
 - Earliest Pressure Water Pipe in the US installed in 1986
- 12 – 126-inch diameter range
- Pressure Applications
 - Water Mains
 - Force Mains
 - Raw Water Transmission
 - Industrial Effluent/Process
 - Hydro Penstocks
 - Cooling Water
 - Pneumatic



New SOTA Efficient Filament Winding Technology



TOPFIBRA EFW

- Reduce costs and waste
- Dynamic sensors
- Smart feedback algorithms integrated into EFW® Lines
- Data driven EFW® Methodology
- Accurately track, anticipate and control all risk factors
- Avoids Downtime to production
- Improve and increase production flow and final technical specifications

Peace of mind for future generations through producing reliable and sustainable infrastructure

- Extended pressure and ring bending tests continue for a minimum of 10,000 hours
- Safe operating limits are established by following appropriate AWWA and ASTM standards

| <u>Deflection</u> | <u>Life, years</u> |
|-------------------|--------------------|
| • 2% | 681 Trillion |
| • 3% | 247 Billion |
| • 4% | 895 Million |
| • 5% | 11 Million |
| • 6% | 325 Thousand |
| • 7% | 16 Thousand |
| • 8% | 1 Thousand |
| • 9% | 118 |



Built with core materials that resist corrosion over time

Thrust Restraint

- SGH providing methodology for adoption into ASTM and AWWA for the axial concrete thrust restraint system used for the past 30 years with Hobas
- Better value in restraining the pipe rather than just the joints
- Applicable to all diameter ranges up to and including 126-inch pipe
- Restrains the thrust loads AND bending at the fitting during pressure cycles (belt and suspenders 150- year design)

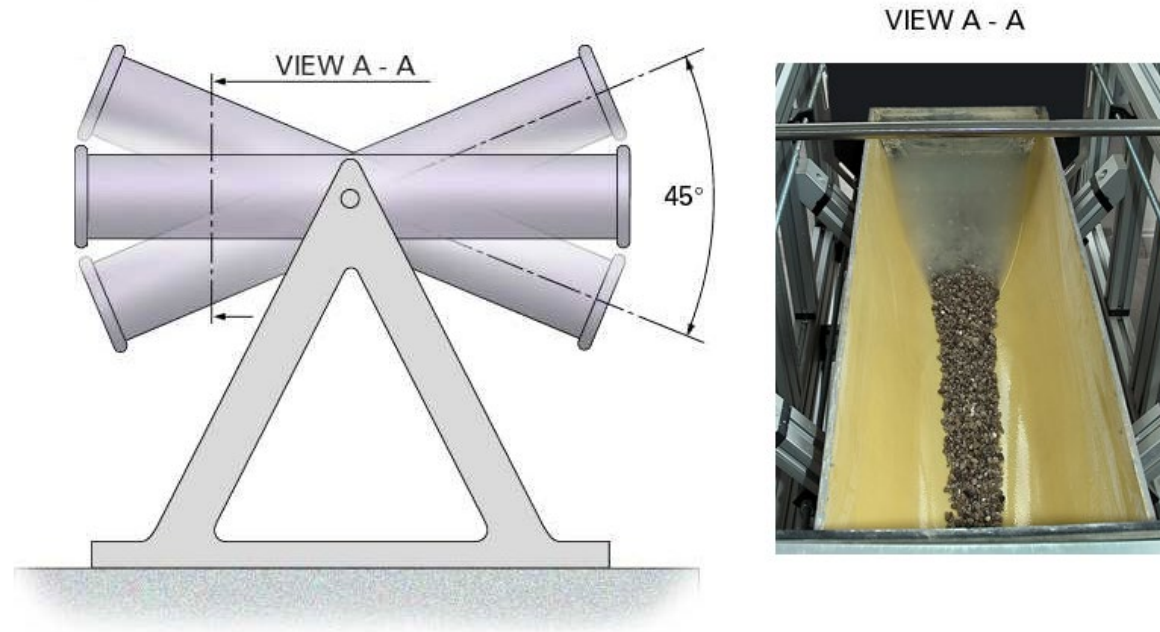
| Summary of Project Information | | | | |
|--------------------------------|---------------------------------|--|--|--|
| Job Name: | WRA Grimes Connector-Contract 3 | | | |
| Location: | Grimes | | | |
| Installation: | Direct Bury | | | |
| Contractor: | Rognes Corporation | | | |
| Owner: | City of Grimes | | | |

| Summary of Project Conditions | | | | |
|-------------------------------|---------|--|--|--|
| Nominal Pipe Diameter, D_n | 36 in. | | | |
| Minimum Pipe Stiffness, PS | 72 psi | | | |
| Pipe Pressure Class, PP | 75 psi | | | |
| Max Pressure of System, P | 110 psi | | | |
| Concrete Thickness, t_{min} | 1.0 ft | | | |
| Elbow Angle, θ | 90 deg | | | |

*Calculations performed to estimate the concrete volume. Actual design to be done by others.

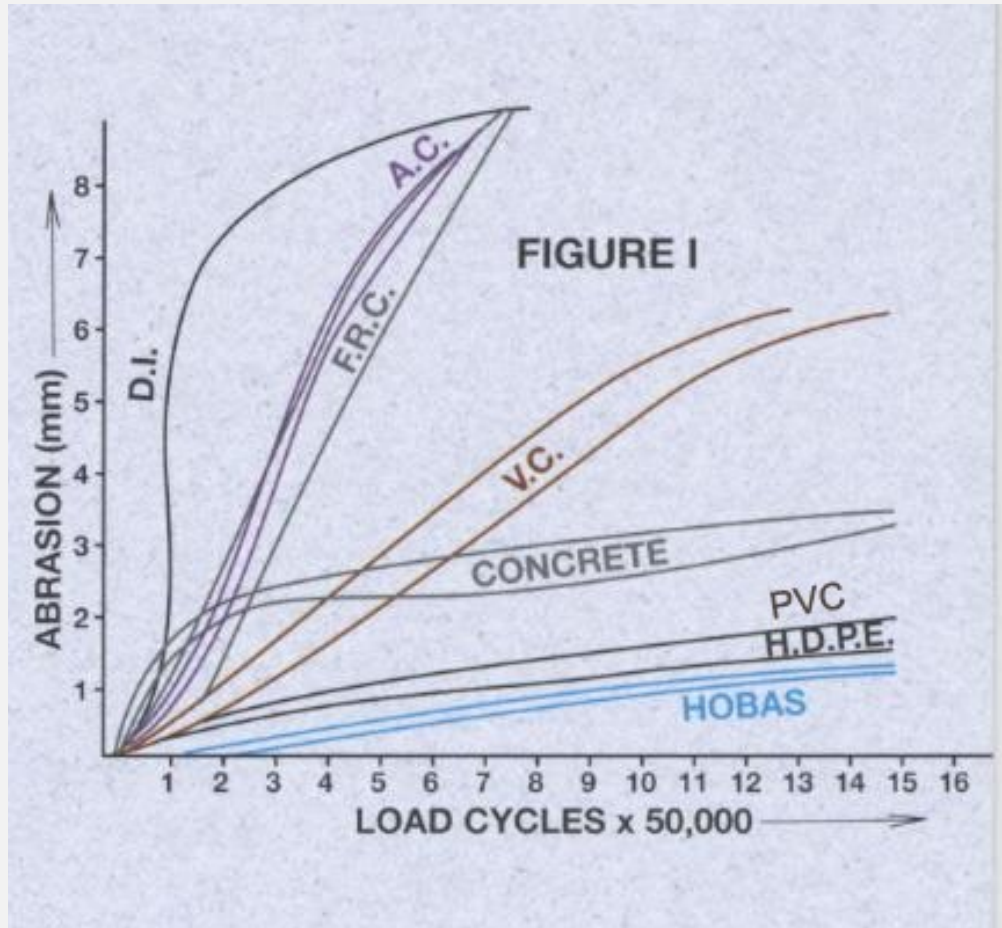


Darmstadt Abrasion Test: Internal wear



Cyclic Grit Chamber – Replicating Effects of Abrasion in Pipeline

CCFRPM versus Conventional Pipe Materials



Hobas' abrasion resistance is better than all the other pipes in the Darmstadt testing.

50% elongation to break inner resin is extremely resistant to abrasion

Production Capacity

How soon can I get pipe?



Nine CCFRPM Mold Bays, One EFW Machine today room for second EFW
Plant is capable of manufacturing 12 different diameters of pipe at any one time
Made locally in the United States of America

When is your pipe \$Free\$ - Pumping Energy Cost



Example Calculation

| Pipe Materials | PCCP | HOBAS |
|------------------------|--------------------|-------|
| Nominal diameter | 48" | 48" |
| ID | 48" | 48.5" |
| | 4.00' | 4.04' |
| Flow volume (F) | [50,000 gpm] | |
| (Q) | [111.40 cfs] | |
| Flow velocity (ft/sec) | 8.86 | 8.68 |
| Hazen Williams (C) | 120 | 155 |
| Pipeline length | [16,000 ft.] | |
| Fluid | [Water (SG=1.0)] | |
| Power Cost (\$/KWH) | [\$0.07 / KWH] | |
| Discount rate | [8%] | |
| Inflation rate | [0%] | |
| Study period | [30 years] | |

Head Loss

$$S = \left[\frac{Q}{(0.43222)(C)(D^{2.63})} \right]^{1.852}$$

$$S_{PCCP} = \left[\frac{111.4}{(0.43222)(120)(4.00)^{2.63}} \right]^{1.852}$$

$$= 0.0048125 \text{ ft/ft}$$

$$S_{HOBAS} = \left[\frac{111.4}{(0.43222)(155)(4.04)^{2.63}} \right]^{1.852}$$

$$= 0.0028541 \text{ ft/ft}$$

Head Loss Savings

$$H_{LS} = (S_{PCCP} - S_{HOBAS})L$$

$$= (0.0019584)(16000)$$

$$= 31.33 \text{ ft}$$

Horsepower Savings

$$HPS = (F)(HLS)(SG)/(3960)(EFF)$$

$$= (50000)(31.33)(1.0)/(3960)(0.8)$$

$$= 494.5 \text{ HP}$$

Annual Kilowatt-Hour Savings

$$KWH/yr. = HPS(6532)$$

$$= (494.5)(6532)$$

$$= 3,230,074 \text{ KWH/yr.}$$

Annual Power Cost Savings

$$PCS = (KWH/yr.)(PR)$$

$$= (3,230,074)(\$0.07)$$

$$= \$226,105$$

Present Value of Future Power Cost Savings

$$PV = PCS(11.258)$$

$$= (\$226,105)(11.258)$$

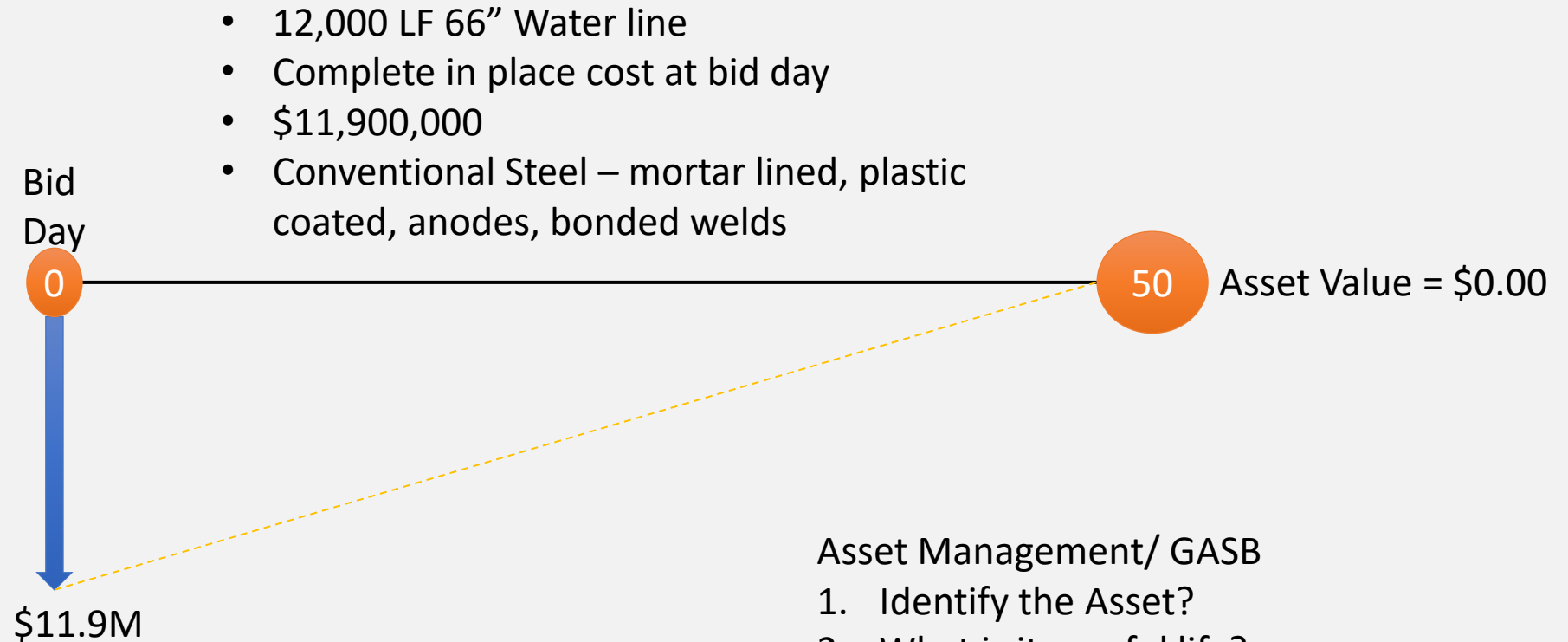
$$= \$2,545,490$$

48-Inch Hobas over 48-InchPCCP saves \$2,545,490 (2005 electricity costs) over 30 years of operation at zero inflation



Cost – Bid Day Apples and Oranges

Time value of Investment PCCP or Steel



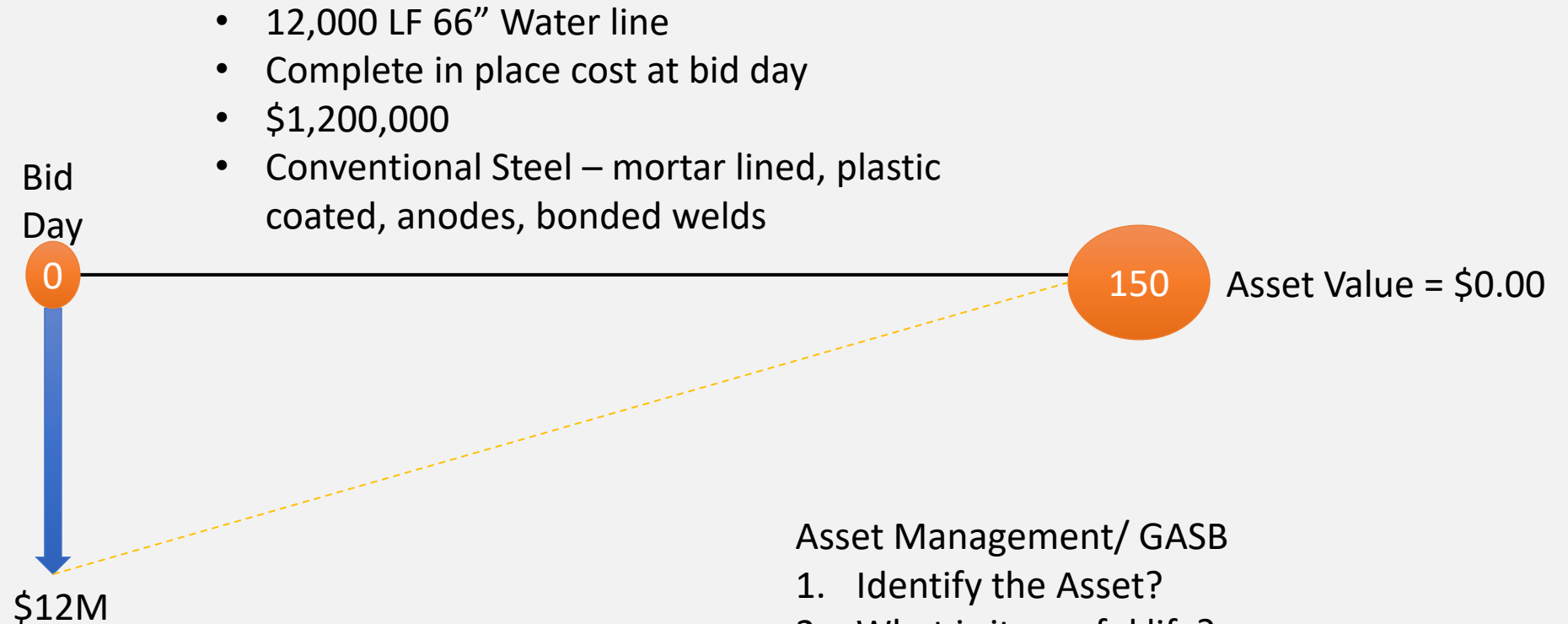
Asset Management/ GASB

1. Identify the Asset?
2. What is its useful life?
3. What is its value?



Cost – Bid Day Apples and Oranges

Time value of Investment



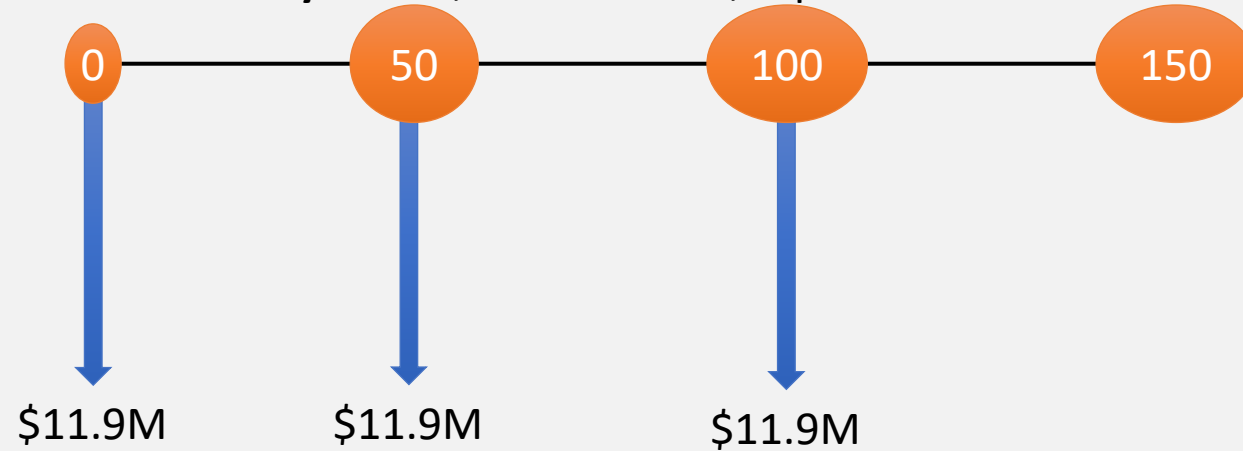
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Water Life Cycle Cost – Bid Day

The Old Way: Build, run to failure, replace



Life Cycle Cost = \$35,700,000 w/ zero inflation
LCC with 3% inflation \$660,471,232

The Hobas Way



Life Cycle Cost \$12,000,000 with/without inflation

**SPOILER
ALERT!**

It is not about the cheapest material, its about the smarter choice

How does your sustainability equation add up?

The Old Way Mortar Lined PCCP

- Bid Day Cost of **\$11.9M**
- 150 Year LCC @ 3% inflation **\$660M**
- Savings on Pumping cost **\$0.00**
- Cathodic Protection/Maintenance **???**
- Repairs to aging lines **???**

150 Year Old Way Cost **\$660M +**

The Sustainable Way

- Bid Day Cost of **\$12M**
- 150 Year LCC @ 3% inflation **\$12M**
- 150 Year Pumping cost savings **(\$627M)**
150 years of \$226,105/year savings and 3% inflation

150 Year Sustainable Cost **Break Even in 33 years**
Next 117 years of energy savings **(\$232M)**
Total Savings from Old Way **\$951M**

Insanity is doing the same thing over and over again and expecting different results
“That is the way we’ve always done it”

It is time to break the cycle of corrosion and replacement

Hobas is making sure today's solutions do not become tomorrow's problems

HOBAS®

Are you ready to make a change?



Relax and...

- ✓ Corrosion free performance
- ✓ 150 Year design life
- ✓ Reduced Pumping Cost C=155
- ✓ Drastically Lower Life Cycle Cost
- ✓ Zero Leakage Joints
- ✓ Structural Reliability
- ✓ Consistent High Quality
- ✓ High Flow Capacity

