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Water System O&M Training

- May 25 – Medora
- May 26 – Stanley
- May 27 – Rugby
- June 22 – Lincoln
- June 23 – Mapleton
- June 24 – Park River
- July 20 – Beulah
- July 21 – Harvey
- July 22 – Mayville

Watch your mail or visit www.ndrw.org for more info!

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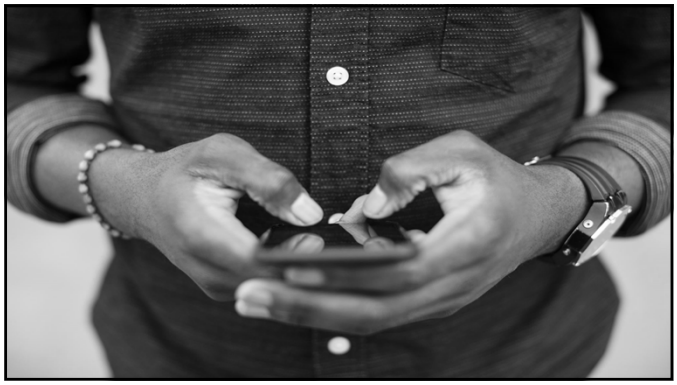

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35th Annual Water Systems EXPO

February 1-3, 2022
Delta by Marriott-Fargo

4

SUSTAINABLY MANAGING INFRASTRUCTURE

ND Rural Water
May 18 & 20

5

Topics to be Covered Today

- System Sustainability
- Asset Management
- Utility Rates

6

Common WW O&M Issues

- Overall Age (Tired)
- Lift Station Corrosion
- Replacement & Repair of Deteriorated Pipe
- Off Set Joints
- Protruding Service Lines
- Roots
- Dips/Low Areas
- Inflow & Infiltration
- Riprap Protection
- Control of Vegetation
- Infrequent Removal of Primary Lagoon Biosolids (Sludge)
- Seasonal Odors

7

National Wastewater Overview

16,000 WW Treatment Plants in the U.S.	800,000 miles of Public Sewers	500,000 miles of Lateral Sewers
$3B in 2019, $18/customer to replace 4,700 miles of pipe	Infrastructure Gap is $81B	Water & WW Gap by 2029 will be $434B

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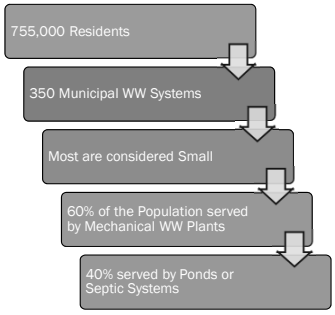

ND Wastewater Overview

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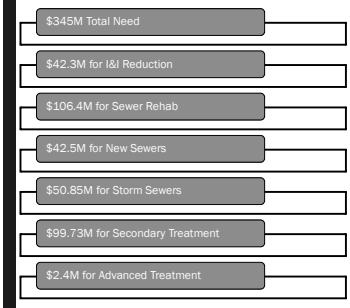

ND Project Priority List

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Wastewater Infrastructure Grades from the ASCE Report Card

- Nationwide = D+
- North Dakota = C-

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Recommendations to Raise the Grade:

- Systems should strive to develop **asset management plans.**
- Systems should ensure their rates cover the **full cost of service** including O&M, and capital needs; clearly **communicate** rate increases to the public; and balance local issues with **affordability**.

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Drinking Water Overview

- 1M miles of pipe across the USA
- 240,000 water main breaks per year
- 2 Trillion gallons of DW wasted
- $1 Trillion needed to maintain and expand service to meet demand in the next 25 years.
- 0.5% replacement rate = 200 years

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Drinking Water Overview

- Consumption has declined by 5% this decade.
- 1st time in 40 years
- EPA sets legal limits for over 90 contaminants.
- ASCE Infrastructure Report Card **C-**

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Let's Take a Poll!

What Size of Community do you Represent?

Less than 500
500-1,000
1,000-3,300
3,300-10,000
Greater than 10,000

16

How many have a Dollar General?

17

Do you have any Old, Aging, Broken, Not Working Efficiently, Well Past its Useful Life, Never Really Worked Right in the First Place, Can't Get Parts For Anymore or Duck Taped Infrastructure?

18

19

20

21

AWWA's *Buried No Longer* draws the following conclusions:

1. Utility bills will increase.
2. Utilities need investment year after year for decades, and delaying investment makes the problem worse.
3. Investment needs will fall mostly heavily on small systems.
4. Slow or negative growth complicates investment for some Midwestern systems.

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Sustainable Systems & Effective Utility Management

23

Effective Utility Management

- 360° look at your utility and sets priorities
- Moves you from reacting to the "hot priorities" of the day to proactively planning for the future
- Engages your staff in the process of assessing and charting your own course for the future
- It is simple, actionable, affordable, and scalable to meet the needs of all utilities

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The Ten Areas

- Product Quality
- Customer Satisfaction
- Infrastructure Stability
- Community Sustainability & Economic Development
- Stakeholder Understanding and Support
- Employee Leadership and Development
- Operational Optimization – Energy and Water Efficiency
- Operational Resiliency
- Water Resource Adequacy
- Financial Viability

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The Ten Areas

- Provide a clear set of reference points
  - *Measurable*
  - *"You can't improve what you don't measure"*

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Product Quality

- Clean and safe water
- Produce potable water, treated effluent, and process residuals:
  - *Full compliance with regulatory and reliability requirements*
  - *Consistent with customer, public health, and ecological needs*
  - *Consistent with local economic development and business needs*

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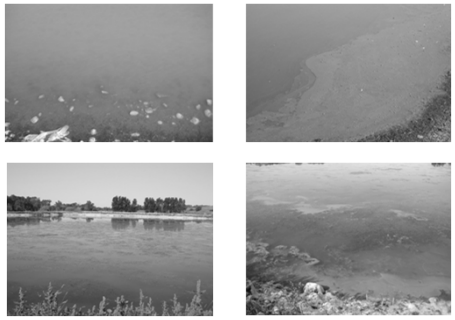

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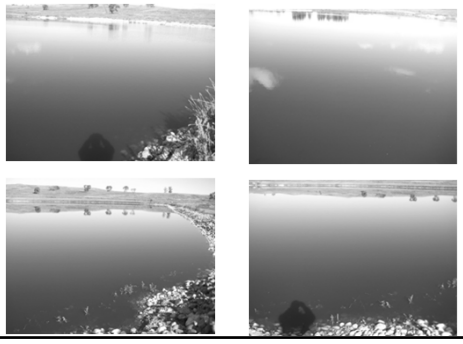

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Customer Satisfaction

- Know what your customers expect in service, water quality, and rates
- Set goals to meet these expectations
- Help your customers understand the value of water
- Develop a way to gather feedback from your customers, review the feedback, and then act on it

31

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Employee Leadership and Development

- Enable a workforce that is competent, motivated, adaptive, and safe working
- Ensure employee institutional knowledge is retained and improved on over time
- Create opportunities for professional and leadership development

33

Operational Optimization

- Ensure on-going, timely, cost-effective, and reliable performance improvements in all facets of operations (i.e., continual improvement culture)
- Minimize resource use, loss, and impacts from day-to-day operations (e.g., energy and chemical use, water loss)
- Maintain awareness of information and operational technology developments to anticipate and support timely adoption of improvements

34

Financial Viability

- Ensure revenues adequate to recover costs, fund timely maintenance, repair, and replacement of assets, and provide for reserves
- Establish predictable rates, consistent with community expectations and acceptability – discuss rate requirements with customers, board members, and other key stakeholders

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Infrastructure Stability

- Understand **costs** and **condition** for each system component
- Understand operational performance factors (e.g., pressure)
- Plan for system component repair and replacement over the long-term at the lowest possible cost
- Coordinate asset repair, rehabilitation, and replacement within the community to minimize disruptions and other negative consequences

36

Operational Resiliency

- Identify threats to the system (legal, financial, non-compliance, environmental, safety, security, and natural disaster) – conduct all hazards vulnerability assessment
- Establish acceptable **risk levels that support** system reliability goals
- Identify how you will manage risks and plan response actions – prepare all-hazards emergency response plan

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Wing Freeze up 2019

38

Community Sustainability & Economic Development

- Be active in your community
  - *Be aware of, or participate in, discussions of community and economic development*
  - *Get to know local business needs and be aware of opportunities for new residential or business customers*
- Align Utility Goals: to be attentive to the impacts utility decisions will have on current and future community and watershed health
- Align Utility Goals: to promote community economic vitality and overall improvement

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Water Resource Adequacy

- Ensure water availability consistent with current and future customer needs:
  - *Long-term resource supply and demand analysis*
  - *Conservation*
  - *Public education*
- Understand the system role in water availability
- Manage operations to provide for long-term aquifer and surface water sustainability and replenishment

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Stakeholder Understanding and Support

- Create understanding and support from oversight bodies, community and watershed interests, and regulatory bodies:
  - *Service levels*
  - *Rate structures*
  - *Operating budgets*
  - *Capital improvement programs*
  - *Risk management decisions*
- Actively engage with the community and customers:
  - *Understand needs and interests*
  - *Promote the value of clean and safe water*

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SYSTEM IMPROVEMENT PRIORITIES: SELF ASSESSMENT

Time to Go to Work!

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Getting Started

- Step 1: RATE your system's level of achievement (practice and performance) for each management area
- Step 2: RANK the importance of each area
- Step 3: PLOT the results
- Step 4: IMPROVE by exploring high achievement-related practices

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Step 1: RATING Areas

Scale from Low to High Achievement

- Select **Low** if your system has no workable practices in place for addressing this area – very low capacity and performance.
- Select **Medium** if your system has some workable practices in place with moderate achievement, but could improve – some capacity in place.
- Select **High** if your system has effective, standardized, and accepted practices in place. It either usually or consistently achieves goals – capacity is high and in need of very little or no further development.

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Step 2: RANKING Areas

Scale from Low to High Priority

- Current or expected challenges
- Customer or stakeholder impact: reliability; quality; timeliness
- Consequences of not improving: compliance; cost; credibility; health; safety
- Urgency – near or long term need
- Community priorities

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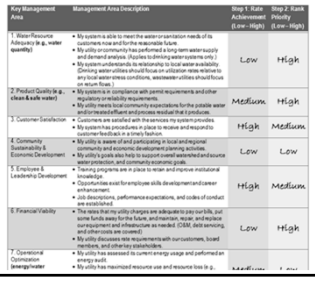
Steps 2 & 3: RATING and RANKING Areas

Self Assessment Demonstration



Key Management Area	Management Area Description	Step 1: Rate Achievement (Low – High)	Step 2: Rank Priority (Low – High)
1. Water Resource Adequacy (e.g., water quantity)	• My system is able to meet the water or sanitation needs of its customers now and for the reasonable future. • My utility or community has performed a long-term water supply and demand analysis. (Applies to drinking water systems only.) • My system understands its relationship to local water availability. (Drinking water utilities should focus on utilization rates relative to any local water stress conditions; wastewater utilities should focus on return flows.)	Low	High
2. Product Quality (e.g., clean & safe water)	• My system is in compliance with permit requirements and other regulatory or reliability requirements. • My utility meets local community expectations for the potable water and/or treated effluent and process residual that it produces.	Medium	High
3. Customer Satisfaction	• Customers are satisfied with the services my system provides. • My system has procedures in place to receive and respond to customer feedback in a timely fashion.	High	Medium
4. Community Sustainability & Economic Development	• My utility is aware of and participating in local and regional community and economic development planning activities. • My utility's goals also help to support overall watershed and source water protection, and community economic goals.	Low	Low
5. Employee & Leadership Development	• Training programs are in place to retain and improve institutional knowledge. • Opportunities exist for employee skills development and career enhancement. • Job descriptions, performance expectations, and codes of conduct are established.	High	Medium
6. Financial Viability	• The rates that my utility charges are adequate to pay our bills, put some funds away for the future, and maintain, repair, and replace our equipment and infrastructure as needed. (O&M, debt servicing, and other costs are covered.) • My utility discusses rate requirements with our customers, board members, and other key stakeholders.	Low	High
7. Operational Optimization (energy/water	• My utility has assessed its current energy usage and performed an energy audit. • My utility has maximized resource use and resource loss in (e.g.,	Medium	Low

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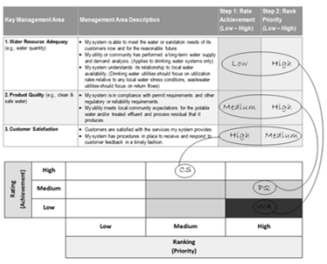
Step 4: PLOTTING Results

Self Assessment Demonstration



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3. Customer Satisfaction	• Customers are satisfied with the services my system provides. • My system has procedures in place to receive and respond to customer feedback in a timely fashion.	High	Medium

Rating (Achievement)	Low	Medium	High
High		CS	
Medium			PQ
Low			WA

Ranking (Priority)

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Steps 4 & 5: PLOTTING Results and FOCUSING Attention

Self Assessment Demonstration

WA	Water Resource Adequacy	FV	Financial Viability
PQ	Product Quality	OO	Operational Optimization
CS	Customer Satisfaction	IS	Infrastructure Stability
CE	Community Sustainability & Economic Development	OR	Operational Resiliency
ED	Employee & Leadership Development	SS	Stakeholder Understanding & Support

Rating (Achievement)	Low	Medium	High
High		CS, ED	
Medium	OO		PQ
Low	CE		WA, FV

Ranking (Priority)

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Self Assessment Discussion Questions

- Where is your utility strong? Why?
- Where is there the most room for improvement? Why?
- What are your areas of focus?
  - *Why are they a priority?*
  - *Why is performance low?*
    - Technical capacity?
    - Financial capacity?
    - Managerial capacity?
- What are the commonalities and differences among table participants?

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ASSET MANAGEMENT

50

Simple Definition of an "*Asset*"

- A valuable person or thing
- Property owned by a person or company, regarded as having value

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Challenges faced by Utilities

- Determining the best (or optimal) time to rehabilitate/repair/replace aging assets.
- Increasing Demand for services or Decreasing demand
- Overcoming resistance to rate increases.
- Diminishing resources.
- Rising service expectations of customers.
- Increasingly stringent regulatory requirements.
- Responding to emergencies as a result of asset failures.
- Protecting assets.

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Asset Management Definition

- Maintaining a desired level of service for what you want your assets to provide at the lowest life cycle cost.
- Lowest life cycle cost refers to the best appropriate cost for rehabilitating, repairing or replacing an asset.

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Repair, Rehabilitate or Replace?

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Systems need Asset Management to:

- Address aging infrastructure assets before they **fail**.
- Keep assets productive, and not allow them to become **disruptive liabilities**.
- Treat all decisions as investment decisions to **maximize limited financial** resources.
- Make **costs transparent** to support financial decisions.

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5-step Asset Management Process

1. **Conducting** a thorough asset inventory.
2. **Prioritizing** the rehabilitation and replacement of your assets.
3. **Developing** an annual estimate of needed reserves and an annual budget.
4. **Implementing** the asset management plan.
5. **Reviewing** and **Revising** the asset management plan.

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What is the current state of my system's assets?

- What do I own?
- Where is it?
- What is its condition?
- What is its useful life?
- What is its value?

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Example **System Inventory Worksheet**

Date Worksheet Completed/Updated: 8/14/02

Asset	Expected Useful Life	Condition	Service History	Adjusted Useful Life	Age	Remaining Useful Life
Well-1 (1993)	30	Good		30	9	21
Well-1 pump	10	Good	Rehab (1996)	10	9	1
Well-2 (1993)	30	Good		30	9	21
Well-2 pump	10	Good	Rehab (1998)	10	9	1
Pumphouse (1993)	30	Good		30	9	21
Electrical components	10	Some corrosion	Rehab (1994)	10	9	1
Chlorinator (1993)	10	Good	Rehab (1998)	5	3	2
Storage tank-1 (1993)	40	Good	Rehab (2000) - $17,000	40	9	31
Storage tank-2 (1993)	40	Good	Rehab (2000) - $17,000	40	9	31
Storage tank-3 (2000)	40	Almost new		40	2	38
Distribution System:						
Hydrants (15)	40	Unknown		40	9	11
Valves (95)	40	Unknown	6 valves don't work	40	9	11
6-inch (PVC)	60	Unknown		60	9	51
4-inch (PVC)	60	Unknown		60	9	51
2-inch (PVC)	60	Unknown	Repair breaks (2/year)	60	9	51

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Estimated Useful Lives

Asset	Expected Useful Life (in years)
Intake Structures	35-45
Wells and Springs	25-35
Galleries and Tunnels	30-40
Chlorination Equipment	10-15
Other Treatment Equipment	10-15
Storage Tanks	30-60
Pumps	10-15
Buildings	30-60
Electrical Systems	7-10
Transmission Mains	35-40
Distribution Pipes	35-40
Valves	35-40
Blow-off Valves	35-40
Backflow Prevention	35-40
Meters	10-15
Service Lines	30-50
Hydrants	40-60
Lab/Monitoring Equipment	5-7
Tools and Shop Equipment	10-15
Landscaping/Grading	40-60
Office Furniture/Supplies	10
Computers	5
Transportation Equipment	10

60

How Do I Prioritize My Assets?

- How soon will you have to replace an asset (its remaining useful life).
- Existing threat to public health, safety, or environment;
- Potential public health, safety, or environmental concern;
- Internal safety concern or public nuisance;
- Improved system operations & maintenance (O&M) efficiency; and
- It would be nice to have…

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EXAMPLE **Prioritization Worksheet**

Date Worksheet Completed/Updated: 8/14/02

Asset	Remaining Useful Life	Importance	Redundancy	Priority (1 is high)
Well 1 (1993)	21	Needed for service	Other well, but need backup	6
Well 1 pump	1	Needed for service	Other well, but need backup	3
Well 2 (1993)	21	Needed for service	Other well, but need backup	6
Well 2 pump	1	Needed for service	Other well, but need backup	3
Pumphouse (1993)	21	Needed for service	Other well, but need backup	6
Electrical components	1	Needed for control	No redundancy - corrosion	2
Chlorinator (1993)	2	Mandatory	No redundancy - need backup	1
Storage tank 1 (1993)	31	Need for fire flow and demand	Other tanks	6
Storage tank 2 (1993)	31	Need for fire flow and demand	Other tanks	6
Storage tank 3 (2000)	38	Need for fire flow and demand	Other tanks	6
Distribution System:				
Hydrants (15)	11	Needed for public safety	Other hydrants	5
Valves (45)	11	Needed for isolation	Other valves, but some are out of service	4
6 inch (PVC)	51	Needed for delivery	No redundancy	6
4 inch (PVC)	51	Needed for delivery	No redundancy	6
2 inch (PVC)	51	Needed for delivery	No redundancy	6

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How Do I Plan for the Future?

- Determine how much it will cost to rehabilitate and replace your assets as they deteriorate.

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EXAMPLE **Required Reserve Worksheet[1]**

Date Worksheet Completed/Updated: 8/15/02

Asset (list from highest to lowest priority)	Activity	Years until action needed	Cost ($)	Reserve required current year
1. Chlorinator	Replace	2	$3,000	
	Purchase redundant unit	1	$3,000	
2. Pumphouse - Electrical	Replace with controller			$2,000
3. Well Pumps	Replace Well 1 pump	1	$5,000	$5,000
	Replace Well 2 pump	1	$5,000	$5,000
	Next Replacements (2 x $5,000 each)	10	$10,000	$1,000
4. Valves	Replacement	11	$22,500	$726
	(45 valves)			
	(3 valves)			
5. Hydrants	Replacement	11	$60,000	$1,935
	(15 hydrants at $2,000 each)			
6. Pipes	6 inch (4500 ft. at $20/ft.)	51	$302,000	$5,922
	4 inch (2500 ft. at $20/ft. - replace 4 inch with 6 inch)			
	2 inch (2000 ft. at $20/ft. - replace 2 inch with 6 inch)			
	(Total is 15,100 ft. at $20/ft.)			
7. Storage Tanks	Rehabilitate 3 tanks	5	$30,000	$10,000
	(1 every 8 years; 1993 and 2000 tanks)			
	Replace - 2 tanks (1993 tanks)	31	$80,000	$1,290
	1 tank (2000 tank)	38	$20,000	$526
			Total reserve in the current year	$36,399

Don't Forget Inflation!

64

How Do I Carry Out This Plan?

- Preparing a financial forecast (next 5 years) will help you determine if you will need to supplement your revenues to carry out your asset management plan.

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Budgeting Worksheet

- Your system's annual **revenues** from fees, loans and grants, interest from any accounts, and other sources of income.
- Your annual **expenditures** on maintenance, utilities, salaries and benefits, office supplies, professional services, taxes, and loan payments.
- Your **net** income.
- How much **additional** funding you will need to continue to operate and maintain your system and replace and repair your assets.

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EXAMPLE **Budgeting Worksheet**

Date Worksheet Completed/Updated: 8/14/02

Revenues		Expenses		Net Income	
Service Fees:	$249,971	Maintenance:	$54,320	Total Revenues:	$255,430
Fees and Service Charges (late fee, connection fee, fire fee, etc.)	$5,284	Utilities (power, telephone)	$3,992	Total Expenses:	$245,072
Impact Fees (demand fee, system development fee, etc.)	$175	Salaries and Benefits:	$76,689	Net Income (Revenue - Expenses):	$10,358
Secured Funding:		Equipment Cost:	$1,371		
Interest:		Chemicals:	$40,512		
Other:		Monitoring and Testing:	$8,096		
		Rent or Mortgage:			
		Insurance:	$1,453		
		Professional Services (legal, accounting, engineering, etc.)	$400		
		Training Costs:	$1,000		
		Billing Costs:	$2,500		
		Fees (state PWS fee,franchise fee, conservation fee, etc.)	$500	Additional Reserves Needed	
		Security:	$609	Total Required Reserves:	$34,625
		Other (debt payments, taxes, miscellaneous, etc.)	$53,630	Net Income:	$10,358
				Additional Reserves Needed (Income - Required Reserves):	-$24,267
Total Revenues:	$255,430	Total Expenses:	$245,072		

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What is my best long-term funding strategy?

- Do we have enough funding to maintain our assets for our required level of service?
- Revising the rate structure.
- Funding a dedicated reserve from current revenues (i.e., creating an asset annuity).
- Financing asset rehabilitation, repair, and replacement through borrowing or other financial assistance.

68

Making the Commitment

- Asset management requires an investment in time and resources.
- Asset management is not a 1-year project, or even a 5-year project.
- It is a continual, fundamental change in the way infrastructure assets are managed.

69

Do not let the TTWWADI Syndrome Hold you back?

70

Barriers to implementing an Asset Management Program may include:

- Expecting to see immediate results.
- Changing from a focus on operations to a focus on assets.
- Reconciling a short-term focus (e.g., rate increases) with long-term view of system sustainability.

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In Summary…

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Asset management will enable your system to:

- Have more efficient and focused operations.
- Choose capital projects that meet the system's true needs.
- Base rates on sound operational decisions.
- Improve its financial health.
- Reduce environmental violations due to failed or poorly performing assets.
- Improve the security and safety of infrastructure assets.

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Role of Rate Setting

- A utility's rates provide a price signal to customers about the cost consequences of their usage decisions.
- Utilities must charge "just & reasonable prices" and they must do so in "equitable & nondiscriminatory fashion".

74

Role of Rate Setting

- All things that are done by a utility must be done in the context of how that action serves **customers and ratepayers**.
- Actions you take should serve them, or at least not be a disservice to them.

75

Utilities and Football

- Utilities serve us very well when they are both efficient and effective – Touchdown!
- They serve us pretty well if they are effective but not efficient – they win but they win ugly.
- They serve us poorly if they are efficient, but not effective – they gain lots of yards but never cross the goal line.
- Utilities can do it cheap, but if they don't satisfy our needs, they have failed us.

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Full Cost Pricing

- Recouping the entire costs through rates, fees, charges and other revenue derived from sales
- Entire cost refers to O&M, reserves, repair, and ultimate replacement of the infrastructure
- Reinvesting in the System is KEY!

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Full Cost Pricing

- Every sustainable utility, like every other sustainable endeavor, must have adequate reserves.
- To NOT have reserves is irresponsible, but inadequate reserves can be fixed.
- Strive to "break even" and you will go ***broke***.

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Rates Basics

- Full Cost Pricing
- Future Planning: 1 – 5 – 10 – 20 years
- Self-Sufficient
- Rates have a short life span

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Rate Goals & Objectives

- Revenue Sufficiency
- Revenue Stability
- Equity & Fairness
- Easy to Understand & Administer

80

Rates are a delicate Balancing Act

- Expenses vs Income
- Proper Ratios vs Affordability

81

Cost, Price, and Value: Not the Same

- Cost
  - *Refers to the expense of collection/treatment of a unit of sewer.*
- Price
  - *Refers to the rate charged to a customer for handling that unit of sewer.*
- Value
  - *Customer's Maximum willingness to pay*

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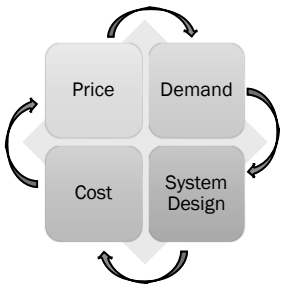

Full Cost Circle

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Full Cost Circle

- **Price & Demand:** According to the law of demand, when price increases, the amount of services demanded decreases (and vice versa).
- **Demand & System Design:** Just like electric systems, sewer systems are designed to meet demand loads.

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Full Cost Circle

- **System Design & Cost:** The design of the system affects the cost of service.
- **Cost & Price:** The costs of providing service are recovered through charging of sewer rates.

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System Capacity

- The ability to plan for, achieve, and maintain compliance with clean water standards.
- Capacity has three components
- Technical, Managerial, Financial

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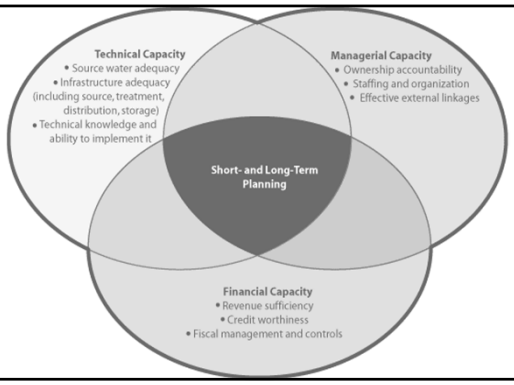

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Truths Concerning Ratepayers

1. Ratepayers need their service.
2. Ratepayers want their service relatively inexpensive.
3. Almost 100% of your ratepayers don't want to think about you or the utility at all.
4. A persistent, tiny minority of your ratepayers want to think about you all the time, and not in a good way, regardless of what you do or say.

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Ratepayers

- Some ratepayers also do not know, do not appreciate, or simply want to dismiss the fact that providing utility services costs money, their money.
- They would like to pay nothing for the service, or at least, as little as possible.

90

How can a system increase income without raising rates?

- Revise system policies
  - *Front End Charges*
    - Connection, Tap, Impact, Membership Fees
  - *Deposits/Admin Fee*
  - *Delinquent/Late Payments*
  - *Shut-off Policy*
  - *Disconnect & Reconnect Policy*
  - *Seasonal/part time users/lots with water or sewer*
  - *Renters, Apartments…*

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Sewer Policies

92

No Wipes Down the Pipes

Even if a product says it is "flushable"…

Unless it is toilet paper, it should not be flushed!

- **Diapers (including cloth, cotton, disposable, or plastic)**
- **Flushable, disposable, cleaning, or baby wipes**
- **Paper towels, cloth towels, or any type of rag**
- **Feminine hygiene products**
- **Facial Tissues**

Place the items listed above in a trash can

Putting these items down toilets may plug sewers and cause raw sewage to back up into YOUR HOME!

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What is a board's job?

- "The board's job is to keep rates down!"
- "They'd vote us out if we raised rates!"
- "We haven't raised rates in 15 years, and we're proud of it!"
- "We have a lot of folks on fixed incomes who can't afford to pay more!"
- "Government should do more with less!"

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3 Main Questions to Ask

- Where are we?
- Where do we want to be?
- How do we get there?

97

More Questions?

- Do our rates cover current costs?
- Will our rates cover future costs?
- Are our rates fair to our customers?
- Are we fully funding reserve accounts?
- Are we going to apply for grants and loans?
- What if the economy, inflation and interest rates change?
- Is our population growing or declining?
- Do operating revenues meet or exceed operating cost?

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Initial Rate Adjustments

- Generally, you should do an initial rate adjustment. Follow that with across the board increases each year for several years. Eventually, do a new initial rate adjustment, restarting the cycle.

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Rates in the Simplest Form

- True and Full Sewer System Expenses
- # of Customers
- # of Gallons Entering the Sewer System
- 12 Months in a year
- Rough Repair & Replacement Schedule
- Current Rates
- Collection % and Amounts
- System Demand Data
- Socioeconomic Conditions

100

Rates Background

- Monthly Minimum
  - *This should account for your fixed cost*
  - *Does not depend on the amount of service a customer receives*
  - *Covers non-production costs*
- "Availability Cost"
  - *Customers being able to access the sewer system*
  - *Billed to all customers equally*
  - *Guarantees Revenue*

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Fixed Cost Examples

- Insurance
- Admin Time
- Billing
- Accounting
- Legal
- Contracts
- Debt

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Rates Background

- Usage Charge (per 1000 gallons)
  - *Should cover the variable costs*
  - *Variable costs occur because the system gets used*
- The more volume a customer uses the more variable costs they should pay
- Assessed on each 1000 gallons of sewer usage as a unit charge

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Variable Cost Examples

- Salaries & Benefits for O&M Staff
- Chemicals
- Electricity
- Purchased Water
- Operating Supplies & Equipment
- Regular Maintenance & Repairs

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Reserve Accounts

- Emergency Operating Reserve
- Debt Service Reserve
- Planned Repair/Replacement Reserve
- Capital Improvement Reserve

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Emergency Operating Reserve

- Unexpected expenses
- Amount varies from system to system
- Typically 10-15% of the operating expenses
- Sometimes called the Working Capital Goal

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Debt Service Reserve

- Required by Lenders
- Allows systems to continue making debt payments should other funds be unavailable
- 1.20 for SRF, 1.90 for Bonds
- 20% or 1.20 additional revenue than expenses

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Planned R&R Reserve

- Planned repair, rehab, or replacement of short-lived assets.

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Year Ending In	Replacement Item Description	Cost per Item in Current Dollars	# Items	Inflation Factor	Future Cost per Item	Yearly Total R & R Cost	Interest Earned (or Paid)	End of Year R & R Account Balance	Minimum Desired End of Year Balance
2014	Repair Elm St. line leaks	$13,000	1	1.00	$13,000	$13,000	$319	$4,314	$5,642
2015				1.04	$0	$0	$237	$13,913	$5,868
2016	Rebuild Main St. pump	$23,000	1	1.08	$24,877	$24,877	$875	$3,274	$6,102
2017				1.12	$0	$0	$180	$14,816	$6,346
2018	Replace flow meter	$2,500	3	1.17	$2,925	$8,774	$815	$18,219	$6,606
2019	Repair line leaks	$15,000	1	1.22	$18,250	$18,250	$1,002	$12,333	$6,864
2020				1.27	$0	$0	$678	$24,373	$7,139
2021	Replace drive unit	$1,500	2	1.32	$1,974	$3,948	$1,341	$33,128	$7,424
2022				1.37	$0	$0	$1,822	$46,312	$7,721
2023	Replace flow meter	$2,500	2	1.42	$3,558	$7,117	$2,547	$53,104	$8,030
2024	Repair line leaks	$15,000	1	1.48	$22,204	$22,204	$2,921	$45,184	$8,352
2025				1.54	$0	$0	$2,485	$59,031	$8,686
2026				1.60	$0	$0	$3,347	$73,639	$9,033
2027				1.67	$0	$0	$4,050	$89,051	$9,394
2028	Replace chemical feed system, flow meter, 2 high service pumps	$42,000	1	1.73	$72,730	$72,730	$4,898	$32,581	$9,770
2029	Rebuild clarifier, replace drive unit	$28,000	1	1.80	$50,426	$50,426	$1,792	($4,052)	$10,161
2030	Repair line leaks	$15,000	1	1.87	$28,095	$28,095	($446)	($21,870)	$10,567
2031				1.95	$0	$0	($2,078)	($12,586)	$10,990
2032				2.03	$0	$0	($1,190)	($2,420)	$11,430
2033	Replace flow meter	$2,500	2	2.11	$5,267	$10,534	($236)	($1,822)	$11,887

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Capital Improvement Reserve

- Dedicated to the payment of LARGE, future capital projects.
- Upgrades or New Construction
- Often only a part of the cost is included
- The other part is financed

110

How often should a system adjust rates?

- When an Analysis/Review shows it is time
- When circumstances occur
- Before you start losing money
- Rate Indexing to at least keep up with inflation

111

Inflation Definition

- A general and progressive increase in prices; “with inflation, everything gets more valuable except money”.
- The inflation rate is calculated from the difference between Current Consumer Price Index and the Consumer Price Index a year ago.

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Consumer Price Index

- The Consumer Price Index, or CPI, is a monthly/yearly measurement of inflation.
- It reports on the price changes of 80,000 items that represent a cross-section of goods and services purchased by urban households.
- These metropolitan consumers represent 87% of the U.S. population.

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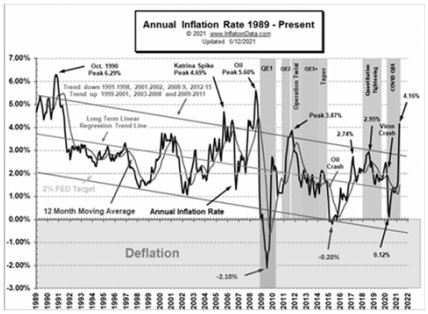

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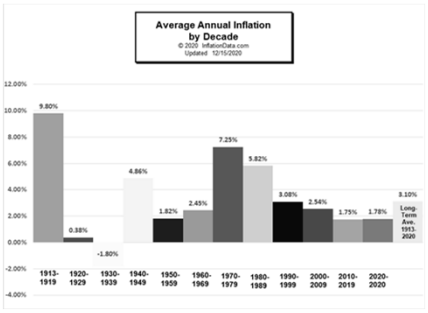

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Inflation

- Average annual inflation rate is 3.10%.
- That doesn't sound too bad until we realize that at that prices will double every 23.2 years.
- **Current Inflation Rate 4.16%**

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Social Security Cost-Of-Living Adjustments (COLA)

2009	0.0%	2015	0.0%
2010	0.0%	2016	0.3%
2011	3.6%	2017	2.0%
2012	1.7%	2018	2.8%
2013	1.5%	2019	1.6%
2014	1.7%	2020	1.3%

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Depreciation

- Is a non-cash expense that reduces the value of an asset over time.
- Due to obsolescence or use

119

Utility Asset Depreciation

- Each time you operate a piece of equipment, you subject it to wear and tear, thereby reducing its value.

120

Utility Asset Depreciation

- Unless you actually **deposit** the amount being depreciated into a savings account of some sort, depreciation is not real money.
- An Equipment **Replacement Reserve** is the real-world equivalent of depreciation
- Failure to contribute to that reserve fund each year is a failure to properly calculate the **"FULL" Cost** of doing business.

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Financial Indicators

- Operating Ratio
- Coverage Ratio
- Working Capital Goal
- Affordability Index

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Rate Odds and Ends

- Energy Audits
- Run Your System Like a Good Business
- Raising Revenues without Raising Rates
- Full Cost Pricing
- Plan for the Future
- Reinvest in your System
- Pull the trigger on inflationary increases every year

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Final Thoughts

- Small increases are better than large increases
- Scheduled, small increases are even better
- Rate Shocking is never fun☹

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BREAK!

125

Demos

- Sewer Camera Demo
- Smoke Testing Demo
- Sludge Testing Demo
- Aerial & Aquatic Drone Demos
- Collection System Flushing
- Lift Station O&M

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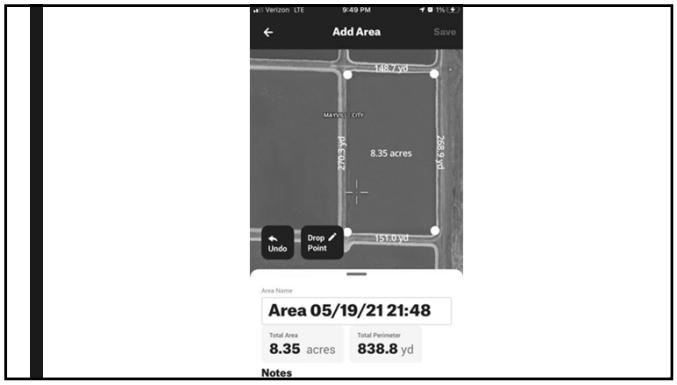

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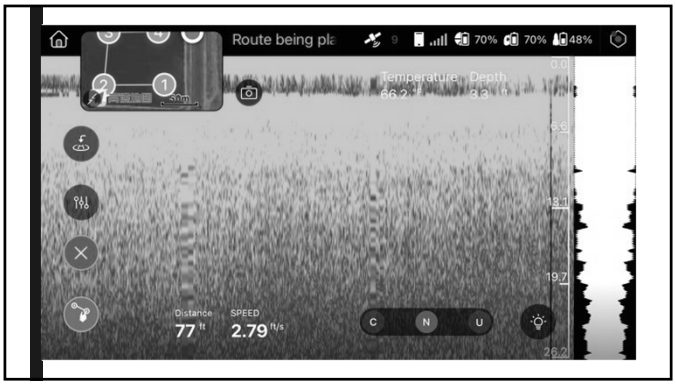

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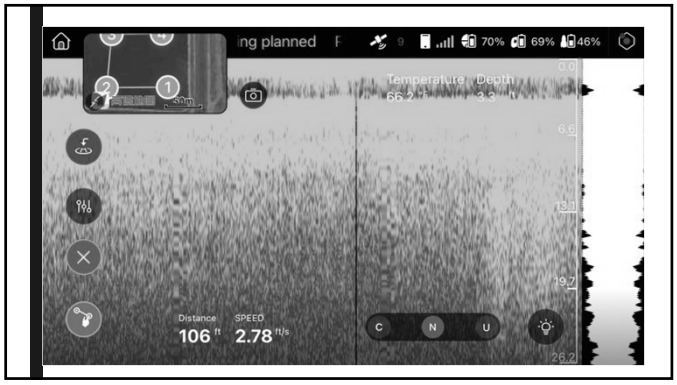

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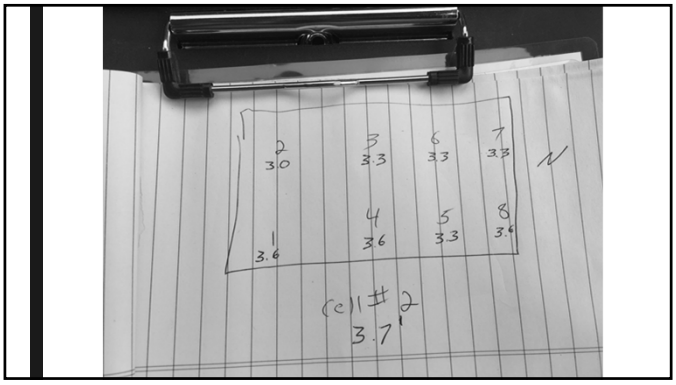

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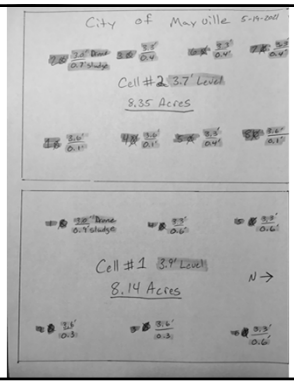

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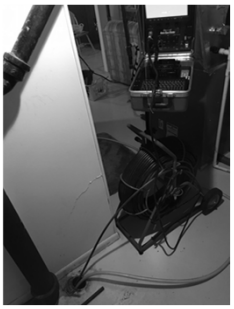

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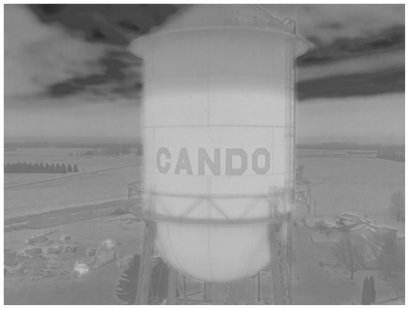

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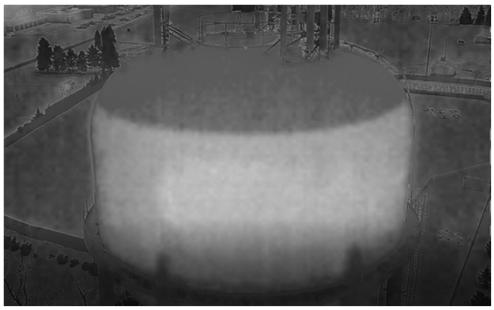

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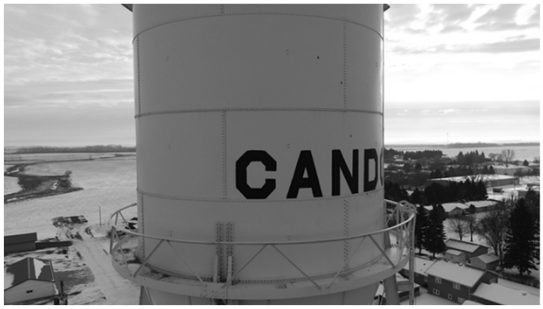

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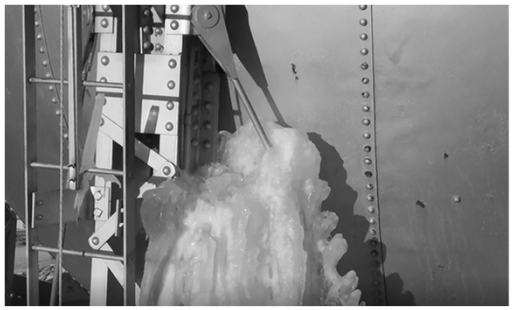

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Any Burning Questions?

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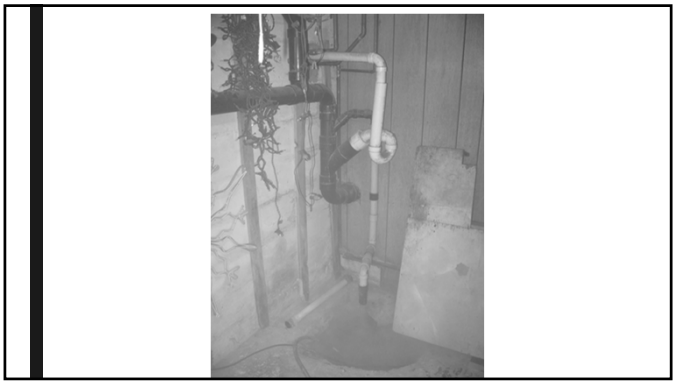

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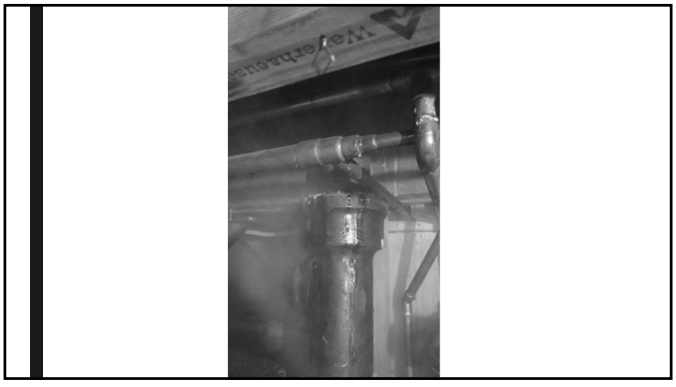

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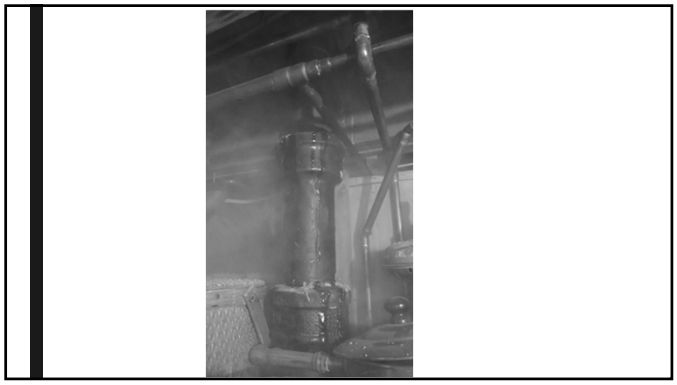

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