

**RCAP Asset Management Webinar Series**  
**Completing an Asset Inventory**

**Presented by**

**Sherry Loos, GISP, GIS Coordinator**

**Joseph Lawrie, Sr. Rural Development Specialist**



# Your Speakers Today



***Sherry Loos***



***Joe Lawrie***

**Today's Class is sponsored by**



*Division of Drinking &  
Ground Waters*

*Today's session is being recorded.*

# Participant Instructions

- Please submit questions using the webinar chat box in the lower left hand corner of your screen.
- Please call or text 330-413-4161 if you are having any technical difficulty.
- If you wish to receive 1.0 operator contact hour (water or sewer), please email [tafishbaugh@wsos.org](mailto:tafishbaugh@wsos.org) if you did not include your core operator ID on the registration form.
- To receive credit for a contact hour, you must be logged in the entire time and participate in the polls during the training.
- If you are at a site with multiple people watching on one computer, and one or more attendees wish to receive a contact hour, please designate one person as the room monitor, and use the sign-in sheet provided with the reminder email this morning.

**Please complete the evaluation form at the end!**



# RCAP Asset Management Webinar Series



**Sept 8**

**Completing an Asset Inventory**

**Sept 15**

**Completing a Condition Assessment**

**Sept 22**

**Completing a Capital Improvement Plan**

**Sept 27**

**Completing a Preventative & Predictive  
Maintenance Plan**

**Sept 29**

**Budgeting for P&P, CIPs & Sustainability**

Each webinar is from 10 AM – 11 AM.

Please register for the other webinars at [www.ohiorcap.org](http://www.ohiorcap.org).



*"Improving the quality of life in rural communities"*

## Ohio Rural Community Assistance Program



*Ohio RCAP provides technical assistance to communities for infrastructure and community development. Often, those under 10,000 population can receive free assistance under our grant funded programs. We assist with project planning, development and funding. Often, we work with communities to evaluate their rate structures and financial capacity. In addition to helping individual communities, we offer several utility management classes each year to local officials and operators. RCAP also has a GIS Team and operates a GIS Cooperative for communities.*

# Let's try a poll!

Have you been involved in preparing an inventory?

- a. Yes
- b. No
- c. Locating & Marking only
- d. Sort of
- e. Pulled information for a few things
- f. We got started and gave up!
- g. Not applicable to me

# What we'll discuss today...



- What is Asset Management?
- An inventory and map are the foundation of an Asset Management program for water utilities.
- Plan before starting an asset inventory!
  - How will you categorize and organize it.
  - What will you collect?
  - How will you name/ID assets in it?
  - Who will collect it?
  - How will you record, store, access and share it?
  - How will you keep it up-to-date?
- We'll share ideas, examples and strategies for going about this.

## The Big Picture

# What is Asset Management?

*Asset management is a process water and wastewater utilities can use to make sure that planned maintenance can be conducted and capital assets (pumps, motors, pipes, etc.) can be repaired, replaced, or upgraded on time and that there is enough money to pay for it.*

*(AND)*

*It is the practice of managing infrastructure capital assets to minimize the total cost of owning and operating these assets while delivering the desired service levels.*

# What is an Asset Management Plan?



- A planning process that ensures you get the most value from each asset, and are prepared to have the financial resources to rehabilitate and replace them when necessary.
- The resulting Asset Management Plan is used to determine reserve fund requirements that should be included in the annual operating budget.
- The plan provides an estimated schedule of repairs and replacement for facilities and equipment.
- The plan should be updated at least annually.



# Oldies but Goodies

The EPA Step Series Guides for Asset Management provide 'step-by-step' instructions for simple planning.



**Strategic Planning:  
A Handbook for Small Water Systems**

One of the Simple Tools for Effective Performance (STEP) Guide Series



**Taking Stock of Your Water System  
A Simple Asset Inventory for Very Small Drinking Water Systems**



**Asset Management:  
A Handbook for Small Water Systems**

One of the Simple Tools for Effective Performance (STEP) Guide Series



*The lessons laid out in the EPA's STEP Series Guides still apply today! This series of handbooks first published in 2004 can be accessed on-line from the USEPA Drinking Water Capacity – Asset Management Resources webpage.*

A photograph showing a surveying instrument, possibly a total station or theodolite, mounted on a black tripod. The tripod is set up on a forest floor covered with fallen leaves. The instrument has a black main body and a vertical rod with a red section. The background consists of trees and foliage, suggesting an outdoor field setting.

**Early in the AM planning process is the big task of preparing an inventory.**

***Before assets can be managed, you need to know what you have and where they are found!***

# Steps to Creating a Basic Inventory

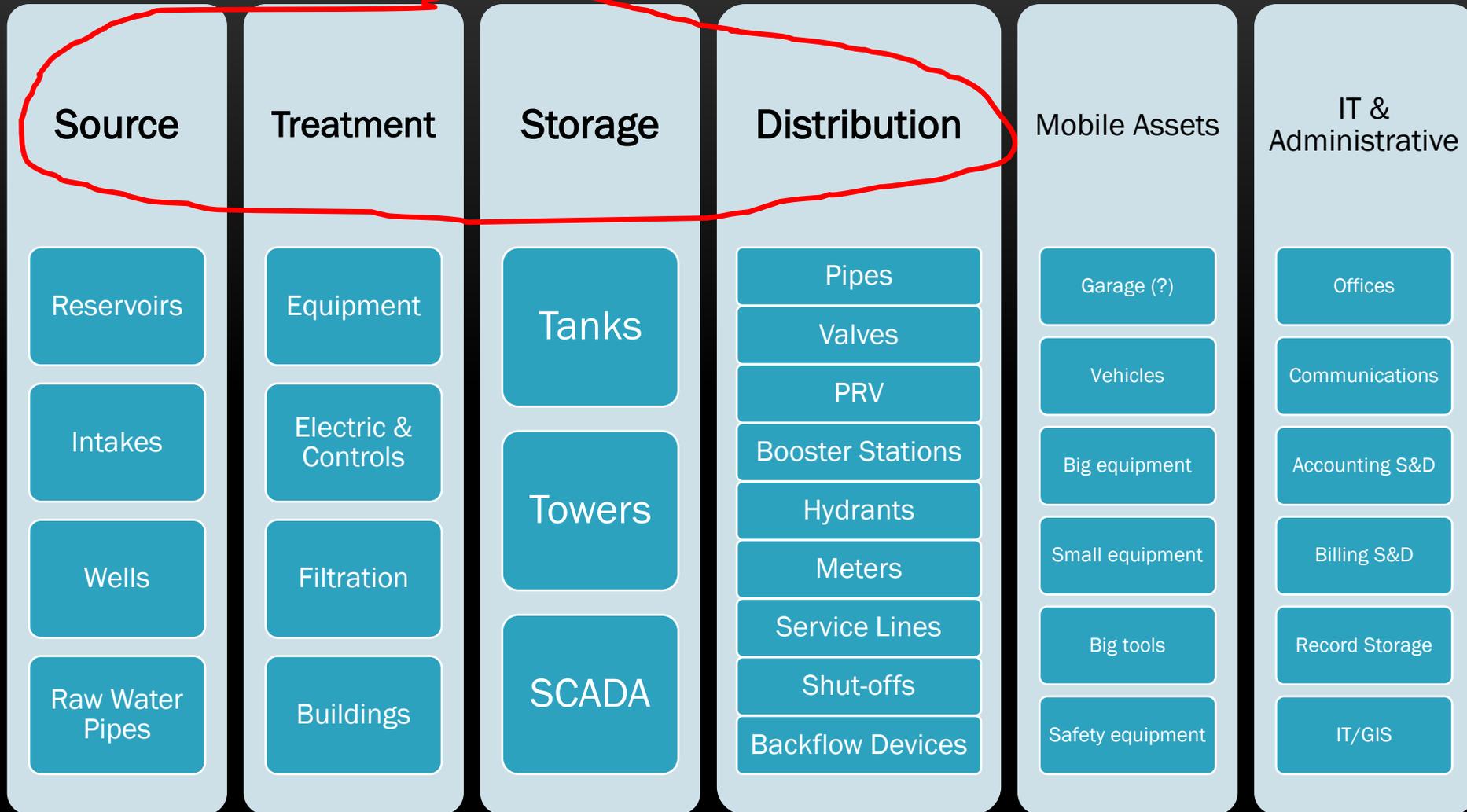
1. Identify and categorize your asset types.
2. Identify the basic information you will collect and input when gathering your inventory.
3. Identify your sources of information.
4. Decide the method(s) for recording and storing information.
5. Figure out who will collect what, and provide training and support.
6. Do it!
7. Create and follow a plan for maintaining and updating the inventory at least annually.



# Identify & Organize By Asset Category

<u>Source</u>	<u>Treatment</u>	<u>Pumping</u>	<u>Storage</u>	<u>Distribution</u>	<u>Transmission</u>	<u>Other</u>
Spring	Disinfection Only	Raw Water	Clearwell Storage	Attitude Valve	Raw Water	SCADA Controls
Vertical Well	Filtration Plant	Booster Pump	Standpipe Tank	PRV Valve	Treated Water	Lab Equipment
Ranney Collector	Ion Exchange	In-line Pump	Leg Tank	System Valve		Light Duty Truck
Surface Water Intake	Lime Soda Softening		Pedestal Tank	Hydrant Valve		Maintenance Equipment
Upland Reservoir	Membrane		Glass Lined Tank	Fire Hydrant		Emergency Power
Drainage Reservoir			Hydropneumatic Tank	Flush Hydrant		GIS Equipment
				Distribution Main		CMMS Software
				Service Line		Billing & Office Equipment
				Backflow Prevention		
				Meter		

# There is more than one way to do this!



*Other assets, like a laboratory, may or may not warrant their own categories depending on what you own.*

## Example of Asset Categories and Types in USEPA CUPSS for Wastewater Systems

<b>Asset Category</b>			
<input type="checkbox"/> Pumping Facility <input type="checkbox"/> Treatment <input type="checkbox"/> Storage <input type="checkbox"/> Collection <input type="checkbox"/> Other			
<b>Asset Type</b>			
<input type="checkbox"/> Pumping Equipment <input type="checkbox"/> Disinfection Equipment <input type="checkbox"/> Concrete & Metal Storage Tanks <input type="checkbox"/> Transmission Mains <input type="checkbox"/> Valves <input type="checkbox"/> Computer Equipment/ Software	<input type="checkbox"/> Transformers/ Switchgears/ Wiring <input type="checkbox"/> Motor Controls/Drives <input type="checkbox"/> Sensors <input type="checkbox"/> Buildings <input type="checkbox"/> Service Lines <input type="checkbox"/> Treatment Equipment <input type="checkbox"/> Distribution/ Collection Mains	<input type="checkbox"/> Lab/ Monitoring Equipment <input type="checkbox"/> Tools and Shop Equipment <input type="checkbox"/> Transportation Equipment <input type="checkbox"/> Security Equipment <input type="checkbox"/> Land <input type="checkbox"/> Sewers <input type="checkbox"/> Pressure Pipework	<input type="checkbox"/> Galleries and Tunnels <input type="checkbox"/> Meters <input type="checkbox"/> Generators <input type="checkbox"/> Liquid Waste Handling & Disposal <input type="checkbox"/> Solid Waste Handling & Disposal <input type="checkbox"/> Digester <input type="checkbox"/> Other
<b>Asset Status</b>			
<input type="checkbox"/> Active <input type="checkbox"/> Not in Use – Abandoned <input type="checkbox"/> Not in Use – Back Up <input type="checkbox"/> Future Investment			
Can this Asset be Repaired? <input type="checkbox"/> Yes <input type="checkbox"/> No		Can this Asset be Rehabilitated? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Asset Replaced (optional):		Show asset in schematic? <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Condition</b>			
<input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair (Average) <input type="checkbox"/> Poor <input type="checkbox"/> Very Poor			
Is the asset maintained according to manufacturer's recommendations? <input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>Capacity</b>			
<input type="checkbox"/> Full sized <input type="checkbox"/> Oversized <input type="checkbox"/> Undersized			
<b>Consequence of Failure</b>			
<input type="checkbox"/> Insignificant – CoF of 2 <input type="checkbox"/> Minor – CoF of 4 <input type="checkbox"/> Moderate – CoF of 6 <input type="checkbox"/> Major – CoF of 8 <input type="checkbox"/> Catastrophic – CoF of 10			
<b>Redundancy</b>			
<input type="checkbox"/> 0% Backup <input type="checkbox"/> 50% Backup <input type="checkbox"/> 100% Backup <input type="checkbox"/> 200% Secondary Backup			
<b>Installation Date</b>		<b>Original Cost</b>	



# What data do we need about each asset?

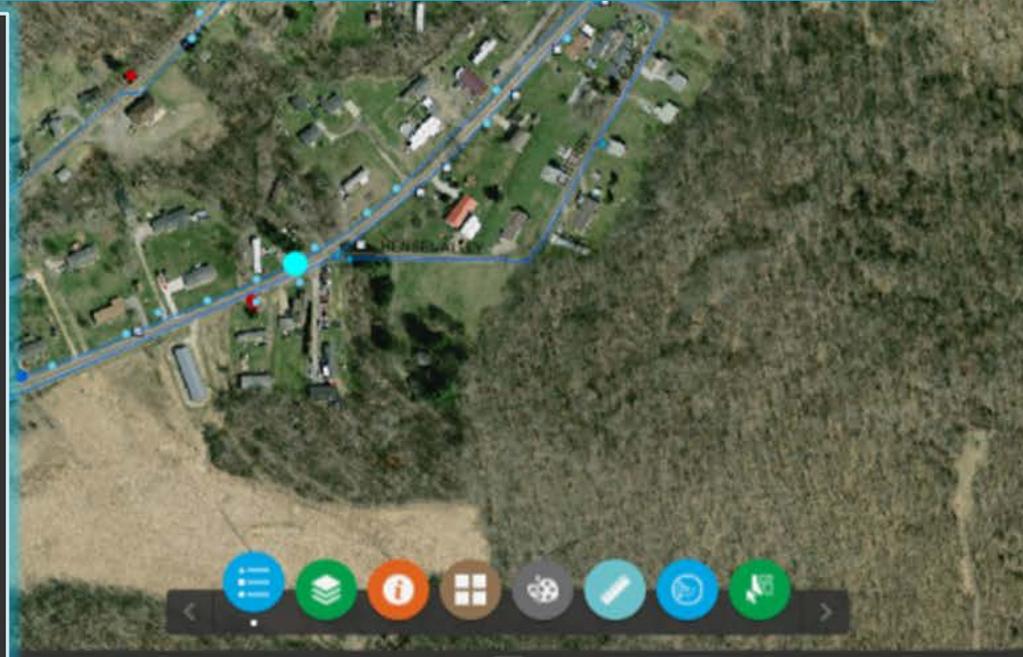


- Basics – What, where, size, material, manufacturer, model
- Operational Info – Operable or Inoperable, which way to turn, how many turns, fittings, pressures, flow direction, performance curves, instructions
- AM Info – Condition, Redundancy, Criticality, Expected Useful Life, History of Maintenance and Inspections, Remaining Useful Life, Replacement Cost.

# Why Maps Matter

Even relatively small water and sewer systems manage assets dispersed across a wide area, including miles of pipe networks.

Readily finding assets is important both for daily operations and emergency repairs, as well as planning for preventative maintenance and replacement projects.



Water Network Structures   Water Curb Stop Valves   Water Misc Points   Water Missing Points   Water Abandoned Points   **Water System Valves**   Water Hydrants   Water Mains

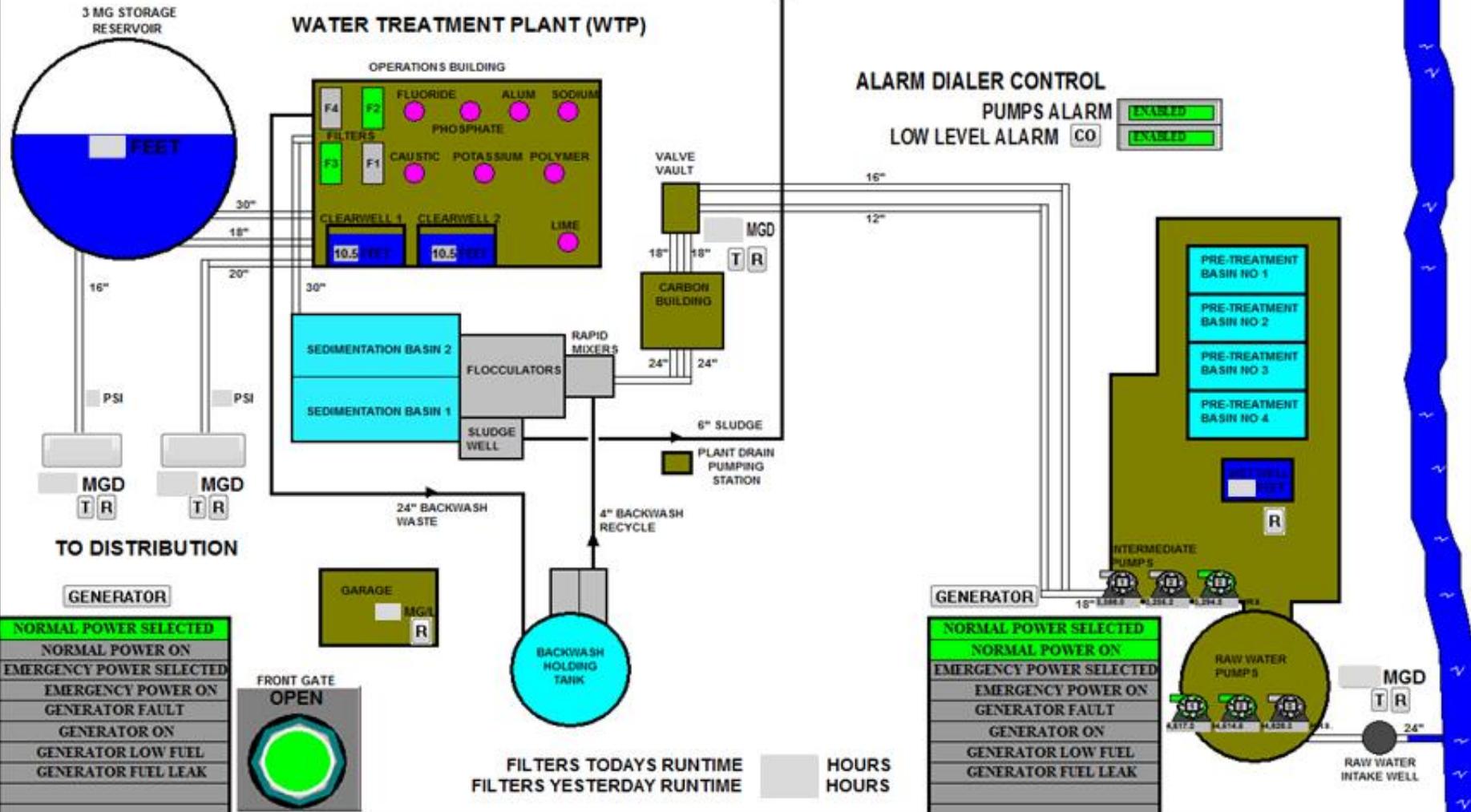
Options ▾   Filter by Map Extent   Zoom to   Clear Selection   Refresh

OBJECTID	Facility Identifier	Install Date	Rotation	Diameter	Valve Type	Bypass Valve	Clockwise To Close	Normally Open	Turns To Close	Operable	Hydrant Valve	Currently Open
----------	---------------------	--------------	----------	----------	------------	--------------	--------------------	---------------	----------------	----------	---------------	----------------

8	wSVm88			6"	Main	False	True	True		True	False	True
3	wSVm93			6"	Main	False	True	True		True	False	True
4	wSVm94			6"	Main	False	True	True		True	False	True

Features 1 selected

# WATER TREATMENT PLANT (WTP)



**GENERATOR**

NORMAL POWER SELECTED
NORMAL POWER ON
EMERGENCY POWER SELECTED
EMERGENCY POWER ON
GENERATOR FAULT
GENERATOR ON
GENERATOR LOW FUEL
GENERATOR FUEL LEAK

**FRONT GATE**

OPEN

FILTERS TODAY'S RUNTIME  HOURS  
 FILTERS YESTERDAY RUNTIME  HOURS

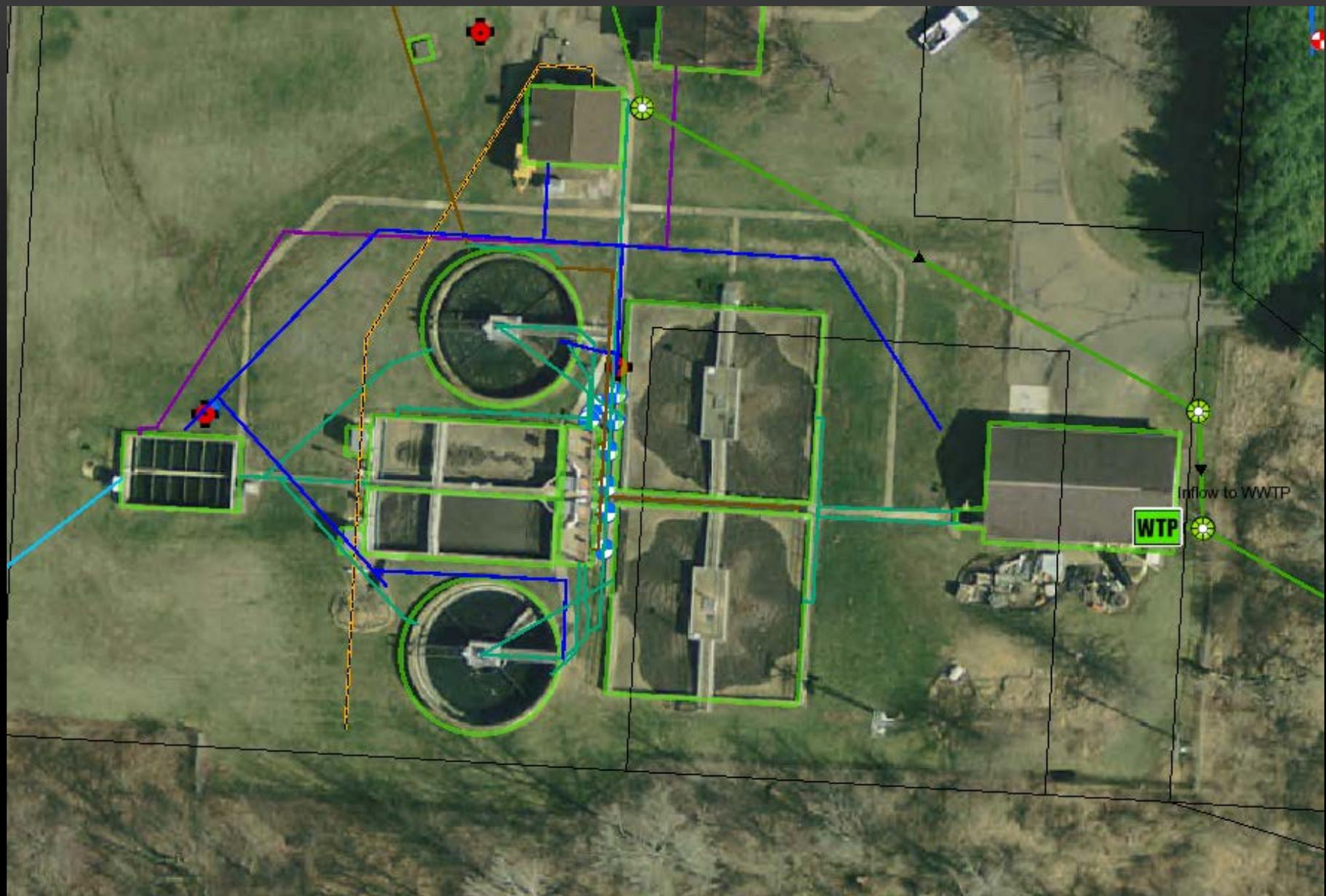
**GENERATOR**

NORMAL POWER SELECTED
NORMAL POWER ON
EMERGENCY POWER SELECTED
EMERGENCY POWER ON
GENERATOR FAULT
GENERATOR ON
GENERATOR LOW FUEL
GENERATOR FUEL LEAK

**RAW WATER PUMPS**

MGD

RAW WATER INTAKE WELL



# Identify data to collect for each asset

- The Item/Asset
- Location
- Diameter or Capacity
- Material
- Model or Construction
- Year of Installation
- Who design/installed
- Expected Useful Life
- History of major maintenance & rehab
- Last Inspection
- Current Condition
- Remaining Useful Life
- Service, inspection and repair schedule
- Replacement Cost
- Redundancy
- Risk of Failure, Consequence of Failure & Priority

**Drinking Water Source: Completed Example**

**Well Construction**

Obtain a well log or look at receipts from the time of drilling for the following information. Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Drilling Contractor	Adjusted Useful Life	Estimated Age	Remaining Useful Life
J&C Construction	25 years	8 years old	17 years

Remember that the typical useful life of wells and springs is 25 years and that the typical useful life of pumping equipment is 10 years. Use this as a basis for determining the adjusted useful life of your well or spring and pump and pump controls. In the example, the typical useful lives equal the adjusted useful lives because the well, pumps, and controls have been properly maintained.

Whom would you call to service your well? This may be the well driller.

Company/Agency	Contact	Telephone Number
J&C Construction	John Smith	(800) 555-7788

**Well Pump and Controls**

Look at receipts or records from the time of installation for the following information:

Pump Manufacturer	Well Pump Model Number (typically located on pump casing. If buried, look for information near the electrical systems.)
Peter's Pumps	ZZ-0001234

Remember that maintenance, water quality, use, and soil conditions can affect useful life. Subtract estimated age from adjusted useful life to determine remaining useful life.

Adjusted Useful Life	Estimated Age	Remaining Useful Life
10 years	5 years old	5 years

Whom would you call to service your pumps and controls? This may be the pump manufacturer or installer.

Company/Agency	Contact	Telephone Number
Peter's Pumps	Peter Williams	(800) 555-1212

Date Worksheet Completed or Revised  
8/1/04



A Ground Water System Well

# Data that is FACT vs. Data that is Inferred, Interpreted or Judged

Department Asset Man

You will need a uniform system of how this information is assigned and described.

- Condition
- Priority
- Risk of Failure
- Cost/Consequence of Failure
- Criticality
- Remaining Useful Life

Model Setup ▾ Data Inputs ▾ Analysis ▾

### Priority Assessments

Would you like to use "criticality" assessments? ⓘ  
 Yes  No

Label your "criticality" assessment levels, and provide a brief description for

1	Insignificant	Brief Description: What it means?
2	Minor	Brief Description: What it means?
3	Moderate	Brief Description: What it means?
4	Major	Brief Description: What it means?
5	Catastrophic	Brief Description: What it means?

Would you like to use "condition" assessments? ⓘ  
 Yes  No

Label your "condition" assessment levels, and provide a brief description for

1	Excellent	Brief Description: What it means?
2	Good	Brief Description: What it means?



**Where will you get all of this data?**



# Data Sources for Your Inventory

- CAD files
- As-Builts
- Existing Maps/GIS
- Hand drawn maps
- Existing/Old Facility Plans
- Engineers
- Sanitary Survey Reports
- Old Inventories
- Inspection Reports
- **Field Data Collection**
- **Operators**



# Methods & Means for Data Collection

## Paper



Inventory List (Drinking Water)	
Asset Name	Location
Associated Asset	Associated Location
Asset ID (optional)	Asset Size (optional)
Asset Latitude (optional)	Asset Longitude (optional)
Storage Capacity in Days (optional)	Linear Feet (optional)
Area of Land (optional)	
Asset Category	
Asset Type	
Asset Status	
Inspection	
Consequence of Failure	
Redundancy	
Installation Date	Original Cost
Expected Useful Life	Replacement Cost
Routine Maintenance Costs	Frequency of Routine Maintenance
Optional Information	
Model Number	Manufacturer
Supplier Name	Address
City, State, Zip	Phone Number
Fax Number	Notes

Paper records are only practical for the smallest systems.

## Digital

Entry into spreadsheet, or database (including GIS)

Data collection forms on mobile devices

Data collection forms on GPS units or mobile devices paired with GPS





# Check-Up Program for Small Systems

Set-up | Switch Utility | Create User | Help | Exit

Search

My Home | My Inventory | My O & M | My Finances | My Check-up | My CUPSS Plan

Welcome Back Joe, Asset Management for Virginia Water Authority

Welcome Back Joe. What would you like to do today? [General Review]

### My Calendar

Mouse over the tasks to view information

<	August 2007	>				
S	M	T	W	T	F	S

Some Asset Management Software programs already have a system for organizing assets and provide templates (forms, spreadsheets) for inventory data collection.



Create or Update My Inventory



Enter My Finances



Print My Check-Up Reports



Work on My CUPSS Plan

### My Messages and Alerts

[Review]

Pop-Up Messages Are Off Click To Turn On

CUPSS Plan Ticker	50% ?
Tasks Past Due	7 ?
Assets Needing Update	5 ?
A Work Order Due	2 ?

# GIS-Centric Options

Collector Map with Editing



← 5 features ×

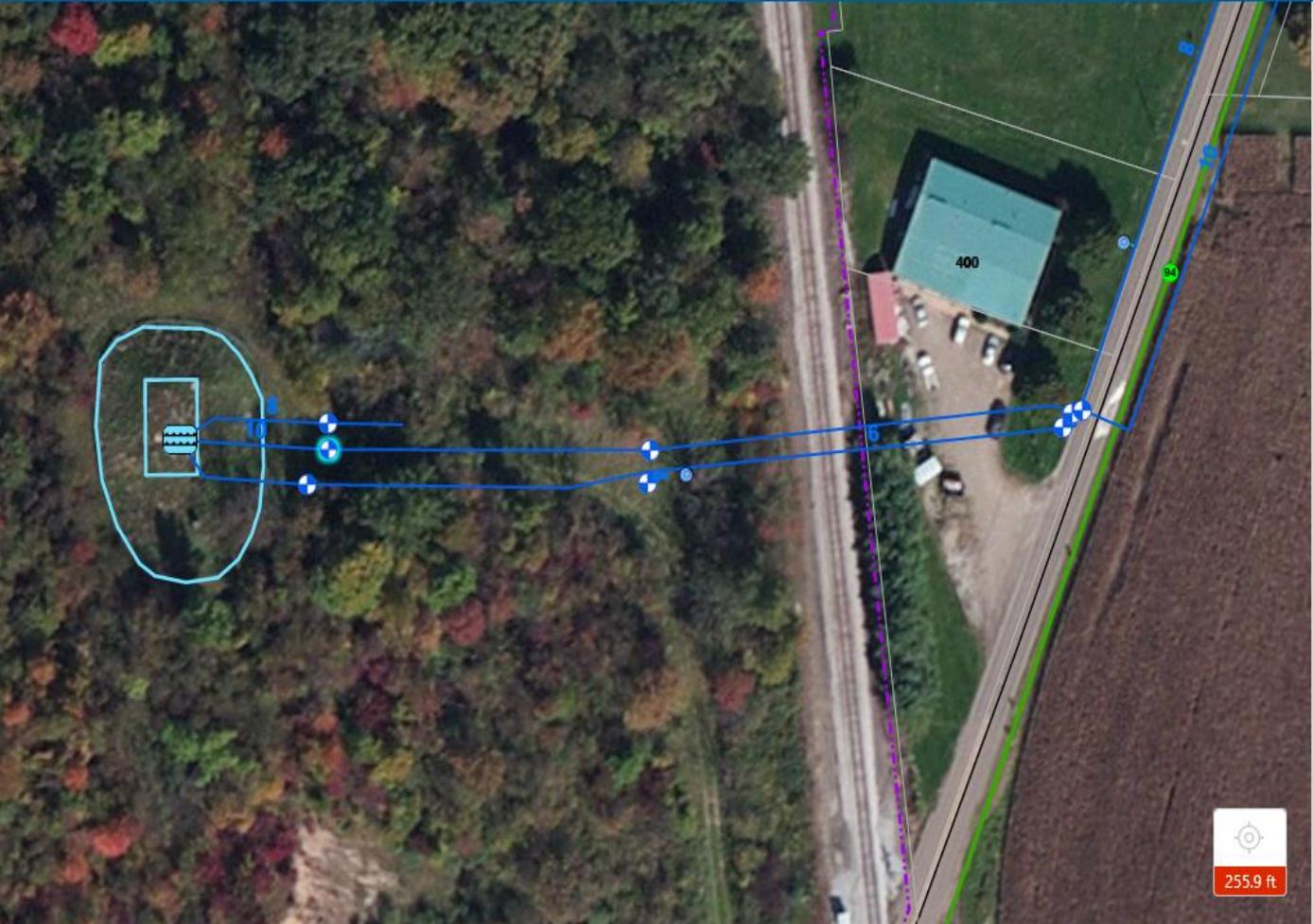
Water System Valves  
Location 40.64741382N, 81.46078003W

Diameter  
10"

Valve Type  
Main

Bypass Valve  
0

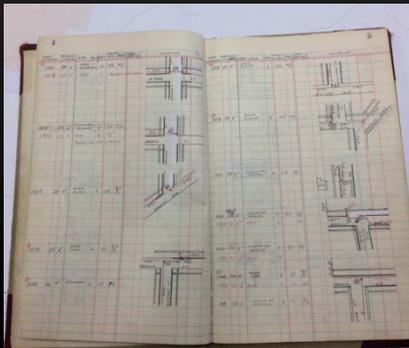
Clockwise



255.9 ft

# Methods & Means for Record Keeping

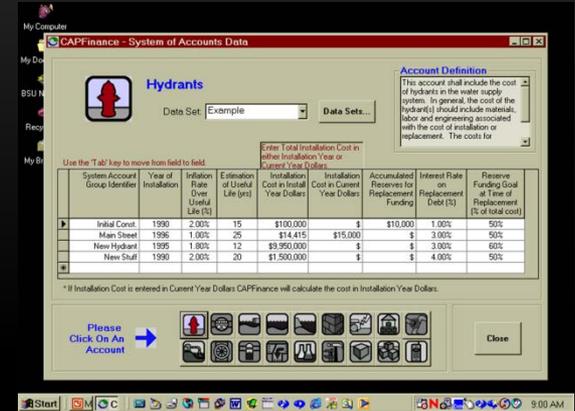
Paper



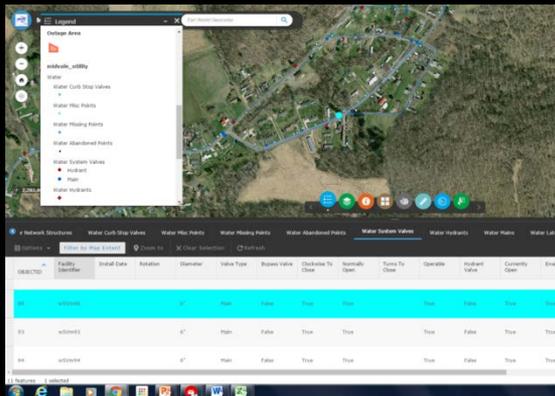
Spreadsheet

2016 - Task and Condition Notes															
Location	Hydrant	Critical	Maintenance	Install	Year	R/L	Age	Field	Condition	Top	Water	Flush	Task	2016	
	Asset	Asset	Task	Year			Cond		Notes	Thread	Quality	Cap	Paint	Due	
Elm @ 1st St	MHO.001	Flushing	2000	14	Good		Good		Tight	Clear	OK	Good	20	Good	
Elm @ 2nd St	MHO.002	Flushing	1992	18	Good		Good		Leaky	Clear	OK	Good	1	Good	
Ash @ 1st St	MHO.003	Flushing	1970	4	Very Poor		Inoperable		Shut	Clear	OK	Good	1	Good	
Ash @ 2nd St	MHO.004	Flushing	1980	14	Fair		Good		Leaky	Clear	OK	Good	8 2/3/2016	Good	
Main St	MHO.005	Flushing	1950	18	Very Poor		Good		Leaky	Clear	OK	Good	1	Good	
Main St	MHO.006	Flushing	1950	18	Very Poor		Good		Leaky	Clear	OK	Good	1	Good	
Main St	MHO.007	Flushing	1970	4	Very Poor		Good		Leaky	Clear	OK	Good	1	Good	
Main St	MHO.008	Flushing	1980	14	Fair		Good		Tight	Clear	OK	Good	1	Good	
Main St	MHO.009	Flushing	1950	18	Very Poor		Good		Leaky	Clear	OK	Good	1	Good	
Main St	MHO.010	Critical	Flushing	1970	4	Very Poor		Good		Leaky	Clear	OK	Good	11 2/3/2016	Good
Cherry St	MHO.011	Flushing	1980	14	Fair		Good		Leaky	Clear	OK	Good	1	Good	
Cherry St	MHO.012	Flushing	1950	18	Very Poor		Inoperable		Shut	Clear	OK	Good	1	Good	
Cherry St	MHO.013	Flushing	1970	4	Very Poor		Good		Tight	Clear	OK	Good	1	Good	
Cherry St	MHO.014	Flushing	1980	14	Fair		Inoperable		Shut	Clear	OK	Good	1	Good	
Cherry St	MHO.015	Critical	Flushing	1950	18	Very Poor		Good		Leaky	Clear	OK	Good	11 2/3/2016	Good
Cherry St	MHO.016	Flushing	1970	4	Very Poor		Good		Leaky	Clear	OK	Good	1	Good	
Cherry St	MHO.017	Flushing	1980	14	Fair		Good		Leaky	Clear	OK	Good	1	Good	
Cherry St	MHO.018	Flushing	1950	18	Very Poor		Good		Tight	Clear	OK	Good	15 10/16/16	Good	
North St	MHO.019	Flushing	1970	4	Very Poor		Good		Tight	Clear	OK	Good	1	Good	
North St	MHO.020	Flushing	1980	14	Fair		Good		Leaky	Clear	OK	Good	1	Good	
North St	MHO.021	Flushing	1980	14	Fair		Good		Leaky	Clear	OK	Good	1	Good	
North St	MHO.022	Flushing	1970	4	Very Poor		Good		Leaky	Clear	OK	Good	1	Good	
North St	MHO.023	Flushing	1980	14	Fair		Good		Leaky	Clear	OK	Good	1	Good	
West Drive	MHO.024	Flushing	1970	4	Very Poor		Inoperable		Shut	Clear	OK	Good	None	Good	
West Drive	MHO.025	Critical	Flushing	1980	14	Fair		Good		Leaky	Clear	OK	Good	1	Good
West Drive	MHO.026	Flushing	1980	14	Fair		Good		Tight	Clear	OK	Good	1	Good	
West Drive	MHO.027	Flushing	1950	18	Very Poor		Good		Tight	Clear	OK	Good	1	Good	
West Drive	MHO.028	Flushing	1970	4	Very Poor		Good		Leaky	Clear	OK	Good	1	Good	
West Drive	MHO.029	Flushing	1980	14	Fair		Good		Leaky	Clear	OK	Good	1	Good	
Total Assets				29					Completed	6	21%	Remaining	23		
Critical Assets				4					Average	100%			Goal = 100%/yr	21%	
				13					Goal	100%			21%	Remaining	
				16					Nearly Maint Cost to date	76%	22	Good			
				13					% of conditions carry to Asset/CIP	17%	5	Inoperable			
				16						93%	27	Assets Reviewed			

Database Program



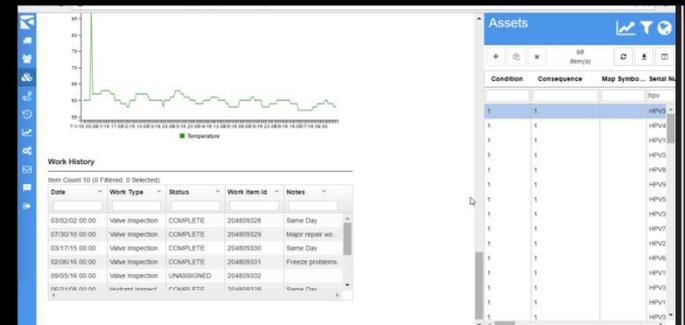
GIS



CMMS



AM Software



**Who will collect and enter all of this data?**

...And who will use it, analyze it and maintain it?





# Why collect data in the field with GPS?



*A raw waterline actually crosses through this farm field.*

- In most cases, existing drawings are not adequate enough to digitize everything.
- End up with a very accurate representation of the system.
- Enables operators to navigate back to hidden manholes and curb stops.
- Operators realize what they didn't know by going through the process – they find all sorts of things!

# Tips for Taking Inventories



- Get the most out of field work! It's expensive to go back and revisit assets.
- If you do not have a system map to start with, use a basic street map to start planning where you will go and track where you have been. The map will be created in the process.
- Prioritize, especially if manpower is very limited! *Ex. Don't spend a hour looking for a curb stop.*
- Note conditions that may influence the useful life (for example, rust or broken parts, poor installation, accessibility issues).
- Be sure to note items that are obsolete or abandoned if they haven't been removed yet.

# Meaningful Names

- Each asset must have a unique identifier.
- A name can say something about the type of asset it represents.
- Often times existing naming or numbering systems can be incorporated.

Asset:



Water distribution system  
Gate valve assembly  
Hydrant watch valve for  
Hydrant # 257

ID: wSVhv00257

An example of a best practice for data management is to set up as many defaults and dropdown selection fields as possible to minimize differences in data entry.



## Standardizing Asset Attribute Data Entry



# How old is this?

It's often difficult to come up with installation dates .

Solutions include:

- Get out the newest maps available and work backwards.
- Estimate age based on construction materials and methods.
- Get in the ballpark, even having age within a decade will aide in the planning process.
- Talk to the people who have lived there a long time!



## **POLL**

**What percentage of your system could you figure out the age of assets +/- 5 years?**

# Want to learn more?

Please register for the rest of our 5-Part AM webinar series.

Join us for our last RCAP Field Day of the summer on Sept. 21<sup>st</sup> in Cardington, Ohio!



**RCAP FIELD DAYS**  
SUMMER 2017

Join us for a great day of hands-on training and field demonstrations!  
Don't miss our last Field Day of the summer! Earn 4.5 Contact Hours.  
All operations and administrative staff, and decision-makers are invited!  
Registration is free and lunch will be provided!

**Classes and Demonstrations Include:**

- ◆ Just Added: Leak Detection
- ◆ Condition Assessments
- ◆ Revenue Water & Metering Technology
- ◆ Valve Exercising & Maintenance
- ◆ Manhole Inspection & SL-RAT Acoustical Testing
- ◆ Sewer Cleaning & CCTV
- ◆ Electro-scan Pipeline Inspections

Registration opens 8 AM. Events run 8:45 AM – 3:30 PM

**ONLY ONE MORE EVENT THIS SUMMER!**

**Cardington, Ohio**  
**September 21<sup>st</sup>**  
American Legion  
307 Park St., Cardington, Ohio

*Free Registration & Lunch is Provided!*

## Contact RCAP for help!



If you need more information about preparing a basic asset inventory, or would like information about RCAP's services to help communities with inventory development, data collection, GIS development and mapping, and the GIS Cooperative, please contact us!

Sherry Loos, GISP  
[smloos@wsos.org](mailto:smloos@wsos.org)  
330-677-3438

Joe Lawrie  
[jflawrie@wsos.org](mailto:jflawrie@wsos.org)  
330-677-3438



# Thank you!

**Please don't forget to fill out the evaluation form that will be emailed to you!**

Ohio RCAP Provides Free & Low Cost Services thanks to the generous support of the following agencies.



*Division of Drinking and Groundwaters*

