

# Asset Management for Wastewater Utilities

Module 2  
Conducting  
Asset Inventories  
of Wastewater  
Facilities

**Slide 2-1 Module 2: Conducting Asset Inventories of Wastewater Facilities**  
Introductory Slide

**Slide 2-2 At the conclusion of this module. . .**

A good asset inventory is the base upon which the asset management program is built.

**Slide 2-3 Benefits of Asset Inventory**

Ask leading questions to have class come up with benefits.

- A good inventory will establish the “replacement cost” of the utility’s assets, thereby giving management a tool for justifying budgetary needs.
- By determining where in its lifecycle a particular asset is, good planning for its maintenance frequency or replacement can be established.

# Asset Management for Wastewater Utilities



Module 2  
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## At the conclusion of this module, the participant will be able to:

- List the benefits of maintaining good asset inventories
- Explain how to establish asset hierarchies
- Discuss what asset information to assemble

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## Benefits of Asset Inventory

- Lets the Utility know what it owns and where it is located
- Establishes lifecycles of all assets
- Provides the backbone of maintenance programs
- Helps establish replacement schedules

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### **Slide 2-4 Asset Inventory Questions**

Orient the class on what should be included in the inventory.

Guided discussion: These general questions are designed to start the class thinking about Asset Inventory and preparing them for the upcoming presentation.

Points for discussion are:

- What do we have? The general answer is “all assets owned by the utility.” The problem is: how detailed should the listing be.
- How do we capture the information?
- A great deal of information may be available, but in different Departments such as: Finance, Engineering, Operation & Maintenance, etc. The first challenge is to find existing data and enter them into a database.
- What do we include?
- There is a great deal of information that can be gathered –the process will be ongoing but it must be organized so that we can continue to build on it as the program develops. The instructor should guide the discussion toward the concept of Asset Hierarchies, which will be discussed later in this module.
- How do we compile the data?

Guide the discussion toward what level of information may be recorded and where it will be stored

Refer to slide notes for additional information

### **Slide 2-5 What Assets Should Be Included?**

Assist class in determining what assets to include in the inventory.

Use these considerations to fuel a guided discussion about what assets would be required in an asset inventory by having the class come up with some assets that might apply to each bulleted statement. Not all assets need be included initially. These questions will help decide where to begin (These points do not need to be quantified at this stage, but will be identified during the ensuing steps).

### **Slide 2-6 The Information Audit**

List locations where inventory data may be found.

Guide discussion with class toward what inventories might be found in some of the listed departments.

Most utilities already have inventories established but not centralized. The audit attempts to capture the needed information from different sources and combine it into a single database Some of those sources are:

- Finance: Fixed asset inventories (buildings, treatment facilities, etc)
- Operation & Maintenance: Equipment, utility infrastructure, vehicles, etc.
- Engineering – Geographic Information Systems (GIS), As-built drawings
- Planning – As-built drawings, Master plan

The gap analysis will determine the additional data needed. It should identify the critical data needed and what effort will be needed to enhance the initial inventory.

## Asset Inventory Questions

- What assets do we have and where are they located?
- How do we capture the information?
- What do we include?
- How do we compile the data?

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## What Assets Should Be Included?

- When deciding to include an asset consider the following:
  - The cost to repair/replace the asset
  - How would the asset's failure impact the goals of the utility?
  - Will failure affect health & safety?
  - Will failure affect regulatory requirements?
  - How will failure affect public relations?

**These points do not need to be quantified at this stage, but will be identified during the ensuing steps**

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## The Information Audit

- Gather inventory data from various departments
- Look for existing inventories in
  - Finance
  - O&M
  - Engineering
  - Planning
- Perform a “gap analysis” to determine what else is needed

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### **Slide 2-7 How to Organize the Inventory**

Lecture with question & answer

Putting together the inventory requires organization of assets and decisions regarding what level of asset should be included. For example:

- Small, inexpensive assets are not included because the cost to maintain them in the initial inventory may be higher than their value.
- If the inventory is organized in a logical manner, these assets could be included in the future if needed.

### **Slide 2-8 Examples of Asset Categories**

Introduce the class to Asset Hierarchies

These categories allow related items to be combined and organized in a logical hierarchy.

### **Slide 2-9 Plant Asset Hierarchy: Headworks**

Introduce an asset hierarchy for the headworks.

Using this and the following slides, reveal a typical asset hierarchy.

Ask questions about how much detail you could include.

This and the next slide give an example of an asset hierarchy for a wastewater treatment system.

This structure allows for any level of detail required, and is capable of including a great deal of information about the assets.

KEY POINTS:

- Organize the inventory from large groups down to small units
- Gather information from the initial audit and insert into the appropriate categories

After basic hierarchy is established, additional information can be added as it is obtained.

## How do we Organize the Inventory?

- Allow for additions in future
- Assets should be organized in a “hierarchy”
- Asset hierarchy uses categories to link similar assets

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## Examples of Asset Categories

- Headworks
- Pump Stations
- Preliminary Treatment
- Equipment
- Building and Grounds
- Panels – Alarm/Electrical
- Collection Basin
- Collection Pipe
- Collection Pump Station
- Unit processes

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## Plant Asset Hierarchy Headworks

- Building
  - Structure
  - HVAC
  - Plumbing
- Screening
  - Bar Screens
  - Screens
- Grit Removal
  - Blower
  - Auger
  - Grit Pumps
  - Pipes/Valves
- Electrical
  - Motor Control

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**Slide 2-10 Plant Asset Hierarchy : Raw Sewage Pumping**  
Introduce an asset hierarchy for Raw Sewage Pumping.

**Slide 2-11 Typical Collection System Asset Categories**  
Introduction of an asset hierarchy for a collection system.

These categories allow for related items to be combined and organized in a logical hierarchy.

**Slide 2-12 Typical Collection System Hierarchy**  
Continued discussion of a collection system hierarchy.  
This slide gives an example of the asset hierarchy for a wastewater collection system.

**KEY POINTS:**

- Organize the inventory from large groups down to small units
  - Gather information from the initial audit and insert into the appropriate categories
- After basic hierarchy is established, additional information can be added as it is obtained.

## Plant Asset Hierarchy Raw Sewage Pumping

- Building
  - Structure
  - HVAC
  - Plumbing
- Pumps
  - Pump #1
  - Pump #2
  - Pipes / Valves
- Instrumentation
  - Flow Meter
  - Level Sensors
- Electrical
  - Motor Control Center
  - Generator

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## Typical Collection System Asset Categories

- Collection Structure
- Collection Pipe
- Collection Pump Station

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## Collection System Hierarchy (Example)

- Collection Structure
  - Manhole
    - Grinder Pump
- Collection Pipe
- Pump Station
  - Building
    - Structure, HVAC, Plumbing, Lighting
  - Pumps
    - Pump 1, 2, 3 etc
    - Valve and Piping
  - Instrumentation
    - Flowmeter
  - Electrical
    - Motor Control
    - Standby generator

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### **Slide 2-13 The Line Segment**

Introduction of the collection system line segment.

- Every pipe in a collection system will terminate with an upstream and downstream structure – usually a manhole. This is commonly referred to as a “line segment.”
- Manhole and structure numbers are critical to gathering collection system inventory information.
- The pipeline terminates at an upstream and downstream structure.
- Initial pipeline numbering can be accomplished by using the upstream and downstream structure numbers
- Number sequence is not critical if using computerized inventory, but if assigning numbers manually, sequence from downstream to upstream.

### **Slide 2-14 What Asset Data Should Be Collected?**

- For data management purposes, it is critical that each asset have a unique identifying number.
- The list shown is primarily a starting point. Greater detail may be required based on the utility’s needs.

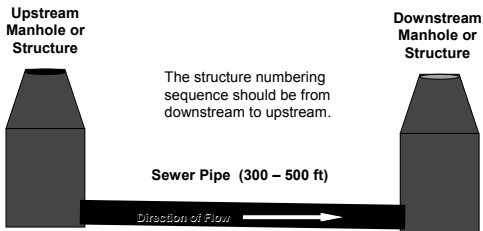
### **Slide 2-15 Data Management**

Introduction to inventory database requirements.

Guided discussion: Ask the students what experience they may have with inventory databases and problems that may arise.

- The software should use a basic format that allows the information to be easily imported from, or exported to, other programs. **TEAMS** is ideal for this application
- It should be able to incorporate GIS x-y-z coordinates for asset locating.
- It should be able to produce reports that can assist the user in developing replacement/rehabilitation, capital improvement and preventative maintenance programs, and financing decisions.

## The Line Segment (Building Block of the System)



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## What Asset Data Should Be Collected?

- Name and Location
- Functional purpose
- Size/Capacity/Length (pipes)
- Construction materials
- Construction / Installation date
- Condition\*
- Manufacturer
- Service life

\* noted for use under condition assessment

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## Data Management

- Inventory data should be entered into a computerized program with the ability to:
  - Organize the assets
  - Value the assets
  - Store condition/criticality information
  - Provide maintenance management functions
  - Incorporate GIS information
  - Import data from other sources
  - Produce useful reports for decision-making

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### **Slide 2-16 TEAMS Asset Management Software**

Familiarize students with some databases commonly used for inventory management.

Guided discussion: Discuss with students some of the other software with which they have been exposed.

**TEAMS** is an open source software package for small to medium sized utilities. Additionally TEAMS can be used without buying licenses or entering into service or consulting contracts.

The commercial software has many capabilities that are directly related to their cost.

### **Slide 2-17 Advantages Of TEAMS**

Lecture with Q&A session.

Discussion of "One Asset At a Time".

Program runs after entering data for just one asset. Enter data at your own pace. Make data entry and updates part of the work routine.

Full integration of AM Principles

Real-time valuation of all assets

Stand-alone Maintenance Management Program

Decision matrix for renewal / replacement

Predictive tool for life-cycle planning, capital improvements, O&M budgeting, rate setting

Logical scheduling and allocation of funds

### **Slide 2-18 Section Review**

Module Summary

Lecture, question and answer.

Provide a quick review of each of the major points from this module.

## TEAMS - AM Software

Microsoft Office® 97/2000/2003  
Software uses MS Access®  
Export to Excel for financial analyses  
Linked Help files in Word

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## Advantages of TEAMS

- Cost effective
- Level of effort for start-up is flexible

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## Advantages of TEAMS

*“One asset at a time”*

- Gets smarter with use
- Meets CMOM & GASB requirements

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**Slide 2-19 Questions**

Ask for any questions on the section.

# Questions

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