**Committee Request for Board Action:** None

**Attendees:** Aaron Johnson (DSRSD); Dana Lawson, Neil Meyer, PJ Turnham, Ian Morales (Central San); Andy Hall (City of Livermore); Robin Gamble Holley (Napa San)

<table>
<thead>
<tr>
<th>Introductions</th>
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<td>▪ See Above</td>
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<thead>
<tr>
<th>Announcements</th>
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<tr>
<td>▪ BayWork is hosting an Asset Management Workshop on May 30 at the Napa Marriot. Robin Gamble Holley and Dana Lawson are both presenting.</td>
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<td>▪ Robin said that new NPDES permits are including language regarding asset management plans.</td>
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<th>Presentations</th>
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<td>▪ Ian Morales (GIS Analyst) gave a presentation on Central San’s implementation of Cityworks Asset Management System (AMS), which was also presented at the Cityworks conference in Salt Lake City May 9-11. The presentation covered the challenges, successes, and goals for the Treatment Plant’s asset management program.</td>
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<th>Discussion</th>
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<td>▪ Asset replacement lifecycle cost table</td>
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<td>▪ Ideas to engage more members? Future presentation or discussion topics? Aaron and Dana will discuss later and may create a survey to poll the membership.</td>
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<th>Future Meetings</th>
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<tr>
<td>▪ 2018 Meeting Schedule: August 15, November 14</td>
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<tr>
<td>▪ Please e-mail <a href="mailto:dlawson@centralsan.org">dlawson@centralsan.org</a> or <a href="mailto:johnson@dsrsd.com">johnson@dsrsd.com</a> if you can present at either meeting.</td>
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**Next BACWA Asset Management InfoShare Group Meeting:** August 15 at City of Livermore
ASSET MANAGEMENT IN THE VERTICAL WORLD
IMPLEMENTING CITYWORKS AT A TREATMENT PLANT

Ian Morales, GIS Analyst
Central Contra Costa Sanitary District
PRESENTATION OUTLINE

• Share our experience with Cityworks from the perspective of a Waste Water Treatment Plant
  • Who we are
  • Our Implementation
  • Additional needs and solutions
  • How we were successful
WHERE ARE WE?

San Francisco
WHO WE ARE

• Central Contra Costa Sanitary District (Central San)
  • Special District Established in 1946
  • Waste water collection
    • More than 1500 miles of pipe
    • 18 Pump Stations
  • Waste Water Treatment
    • Avg. 44 million gallons per day (MGD)
    • Furnaces incinerate 200 tons of sludge per day
  • Recycled Water Processing and Distribution
    • ~1.5-2 MGD
  • Lab
    • Over 15,000 test per year
      • Some measure in parts-per-quadrillion
WHO WE ARE

- Household Hazardous Waste Collection Facility
  - Collect ~2 million pounds per year
    - ~90% is reused or recycled

- Fleet Shop
  - Repairs and Maintains over 200 vehicles and other equipment
    - From Honda Civics to trailers to a 33 ton Hydrovac truck
WHERE DID WE COME FROM?
CENTRAL SAN AND CITYWORKS
NEW ASSET MANAGEMENT SYSTEM
CITYWORKS

• Collection Systems Operations CMMS no longer vendor supported
  • Software customization = Stuck in old version
• Decrease CMMS software/databases/asset Registries used at Central San
• Treatment Plant needs are more complex
  • More complex systems and assets
  • More complex procedures
  • More complex regulations
  • More complex regulations
  • More custom integrations with other software
    • Supervisory control and data acquisition (SCADA) - Dynac
    • Enterprise Resource Planning (ERP) – SunGard
COMPLEXITY IN PHOTOS
COMPLEXITY IN PHOTOS
COMPLEXITY IN PHOTOS
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COMPLEXITY IN PHOTOS
COMPLEXITY IN PHOTOS
OUR IMPLEMENTATION
TREATMENT PLANT
OUR IMPLEMENTATION

- Project Kick-off:
  - July 2015
- Go-live:
  - January 2017
- Implementation partner:
  - Woolpert
- Shops using Cityworks:
  - Mechanic, Electrical, Instrumentation, Machine, Building and Grounds, Control Systems
    - Operations, Lab, Engineering
OUR IMPLEMENTATION

EXAMPLE: WORK ORDER
1: QA Panel
2: UCFs
3: Predefined Comments
4: Base/Custom XML modification
5: Template Documents
6: Custom Fields
OUR IMPLEMENTATION
OUR CURRENT DATABASE AND SERVERS
ADDITIONAL NEEDS AND SOLUTIONS FOR OUR CITYWORKS IMPLEMENTATION
ADDITIONAL NEEDS

• Functionality:
  • Easily search for assets
  • Asset info not visible in Inbox

• Infrastructure Enhancement:
  • Asset type consolidation
  • Updating asset attributes
  • Improved asset and work order mapping

• Integrations:
  • Integrating with SCADA and ERP
  • Some assets move…SCADA doesn’t know

• Brand new system = New processes.
EASILY SEARCH ASSETS

Name Plate and ID Tag
Steam System Representation in Dynac
EASILY SEARCH ASSETS

• Only search one asset type in Asset Search
  • >70 asset types
  • Not familiar with data structure
  • Previous system only has one asset type
• Staff know legacy equipment numbers semi-intelligent
  • Number in SCADA, Drawings, Lockouts
• Previous system had “fake” assets
• Not using map – too slow to search
Solution:

- Exploit the Entity Lookup Tool
  - FME - Populate the ENTITYIDENTIFIER table weekly
  - Only In-service, spare assets
  - Java Script to modify tool buttons
    - Disable “Create WO” until search
    - Remove “Create INS”
Asset Name Not Visible in Inbox

- Asset Name/Info not in Inbox
  - Asset info not visible in WO search
- Staff very familiar with Legacy number and name
- Location Details insufficient

- Many assets have same location
- Map insufficient for the vertical assets
Solution:

- Populate asset’s “Address” field with “Legacy ID”
  - Legacy number and name
- Update XML
  - Change “WO Address” label to “Legacy ID”
- Include field in WO saved search
ASSET TYPE CONSOLIDATION

• Previous system all assets in one asset type
• At Go-live >90 asset types
  • Woolpert recommended 40 asset types
• Plant Staff focused on discrete function rather than generalized function
  • Ex: HVAC Heater, HVAC AC, HVAC Chiller, HVAC Coil, HVAC Equipment
  • Ex: 11 asset types for Instruments
  • Did not fully utilize the “Type” field
• More assets types = more administration in Cityworks and in GIS
ASSET TYPE CONSOLIDATION

Solution:

- Facilitate meetings to discuss advantages of consolidation
- Use FME to consolidate to ~70 asset types
  - Including work order templates, custom fields, relationship classes
  - Update all existing WOs to add the consolidated asset types
- Simplified asset registry. Easier to search assets.
  - Decrease site and DB administration
ASSET ATTRIBUTE UPDATES

• Updating asset attributes takes a week or more
  • GIS QA/QC
  • Rotating asset’s data (location) not adjusted in real-time
• Data edits not communicated effectively
• No ability for Plant Staff to manage own asset data
  • GIS infrastructure and QA/QC tools lacking
ASSET ATTRIBUTE UPDATES

Solution:

• Version GIS database
  • Give proper rights
  • Republish map service
• Enable asset attribute editing in Cityworks
  • Allow real-time attribute edits by stewards
  • Inspection forms
  • Asset Viewer
INTEGRATING WITH OUR ERP

- All treatment plant materials managed by warehouse
  - Warehouse not using Cityworks Storeroom
  - SunGard HTE – Our financial system
- Staff request parts, warehouse staff enters “issue ticket”
  - Enters work order with ticket
INTEGRATING WITH OUR ERP

Solution:

- Script runs nightly looking at SunGard material transactions
- Populates Cityworks MATERIALCOSTACT table

MATERIALCOSTACT Table
INTEGRATING WITH SCADA

- Readings in control system tracked by physical position, named by the asset “legacy” number
  - SCADA receives reading from PLC, which tracks location by “PointId”
- Asset readings in Cityworks on EUID
INTEGRATING WITH SCADA

Solution:

• Use Metrics API
• Create intermediate table with both the legacy number and EUID
• Nightly script takes value from SCADA, finds corresponding EUID, populates ASSETREADING table
• However, Cityworks can only track on unit of measure for readings
Some Assets Move... SCADA Doesn’t Know

- Rotating assets – Spare equipment
- SCADA tracks runtime based on position (remember that legacy number?), not discrete asset
  - Asset reading based on EUID
  - Rotated-in asset would have previous asset’s hours
- WO generated from Asset Readings module not correct
SOME ASSETS MOVE…SCADA DOESN’T KNOW

Position A

Asset 1
(143 hrs)

(143 hrs)

Pre-Rotation
Rotation

Position A

Asset 1

Spare

Asset 2
(0 hrs)

Post-Rotation

Position A

Asset 2
(0 hrs)

(143 hrs)
Some Assets Move...SCADA Doesn’t Know

Solution:

• Remove/Install WO
  • GIS Update (a UCF)

• Real-time attribute editing
  • Remove/Update Legacy number

• GIS QA/QC process

• “Wizard” to reset SCADA integration runtime hours table
  • In development
VISUALIZING ASSETS AND WORK ORDERS ON MAP

- Most assets as Objects
- Related asset WO show at center of Parent Feature
  - Might be several levels “up”
- Staff not using the map
  - Selecting related assets slow
  - Not accustomed to using a map
  - Doesn’t show actual location of asset

Solids Conditioning Building (SCB) has 100s of Assets related to it.
VISUALIZING ASSETS AND WORK ORDERS ON MAP

Solution:

• Convert all object tables to feature classes
  • Used FME and Python
  • Move assets to correct geographical location
• Relationships still exist/work
• Map more useful
NEW SYSTEM AND PROCESSES

• New software
  • Many staff resistant to using software and computers

• New processes
  • No more paper
  • No admins to enter in notes and hours

• New Terminology
• Who’s the champion? Decision Maker?
• Skeptical Staff
NEW SYSTEM AND PROCESSES

Solution (on going):

• Get site ready for use
  • Ex. Set up inboxes

• Training

• Critical workflows for users
  • Day 1, what is necessary
    • Ex. Add labor, but not how to add labor date
      • Transaction date satisfactory because labor is entered each day minimum
  • Document workflows so staff can refer to them

• Be there day one, and two, and three of “Go-Live”
HOW WE WERE SUCCESSFUL

• Did not take staff and new processes for granted
  • Software might not be a strong user skill
  • Changes disrupt long established practices and culture

• Training. Training. Training.
  • Formal and Informal

• User group meetings

• Available. Consistently present. Patient.

• Empower users

• Did not set it and forget it
  • Poor habits
  • Bad data
  • Cityworks not being used…at all
THANK YOU
QUESTIONS?

Ian Morales
imorales@centralsan.org