InfoShare Asset Management – Report to BACWA Board

InfoShare Asset Management Committee meeting on: <u>02/21/18</u>
Executive Board Meeting Date: <u>03/ /18</u>
Committee Chairs: <u>Dana Lawson and Aaron Johnson</u>

Committee Request for Board Action: None

Attendees: Dana Lawson, Neil Meyer, PJ Turnham (Central San); Rebecca Overacre (EBMUD), Anthony Smith, Andy Hall, Nga Huynh (City of Livermore); Aaron Johnson (DSRSD); Jeff Greer (MVSD); TiLiAnne Tanner (SCWA); Jon Boitano (HDR)

Introductions
▪ See Above
Announcements
▪ Aaron Johnson (DSRSD) is our new co-chair
o If there is a topic you would like to hear about at a future meeting, please e-mail Aaron (johnson@dsrsd.com) or Dana (dlawson@centralsan.org)
▪ BayWorks is hosting an Asset Management Workshop on May 23, which will most likely be held in Vallejo. If you are interested in presenting, you can contact Aaron or Levi Fuller who is organizing it.
Presentations
▪ Standardized asset tagging for all departments and business systems (TiLiAnne Tanner, Sonoma County Water Agency)
▪ Using the asset register as a tool to identify and prioritize CIP projects (Andy Hall, City of Livermore)
Future Meetings
• 2018 Meeting Schedule: May 16, August 15, November 14
• Please e-mail dlawson@centralsan.org or johnson@dsrsd.com
Next BACWA Asset Management InfoShare Group Meeting: May 16 at DSRSD in Pleasanton

Slide 1

Asset Tagging Convention

Standardize and Synchronize to Optimize

SONOMA COUNTY WATER AGENCY

www.sonomacountywater.org

Slide 2

MANY CAUSES OF CONFUSION

Unique Identifiers

Semi-Smart: MTR#GE_G

Location: Caisson 6 Motor 12

Nickname: "Queen Bee"

System Requirements

Alpha Numeric

Generic: 08CAP13

Function: Largest Water Pump

Position: 12

Asset Manufacturer: Gen Elec Motor

Slide 3

CURRENT CULTURE – MANY NAMES

The place where brine mixes with reclaimed water and discharges into the bay…

CMMS
"SALT MARSH"

GIS
"THE DONUT"

Engineering
"MIXING CHAMBER"

Accounting
"No. 08CAP13"

Slide 4

SOLUTION – TAGGING CONVENTION

Defined Lists

AREA	PROCESS	SYSTEM	GROUPING	NUMBER	ASSET	NUMBER
PTAQ	AERBASIN	MICC6	CRN	98	DVLV	998
RRTP	BLDGGRND	METR	HTRS	99	EPNL	990
SNSO	CI2SYSTM	PSTS	LEAKD	01	MSV	001
SVTP	CLRFSYS	RAS	PST	02	MOTR	002
TRLR	CONT&SVR	SHOP	SCALES	03	PDSU	003
WFACI	CTTUBLDG	SPLTBX	VFD	04	PMP	004

| EXAMPLE LETTER GENERATED ASSET TAG |
|---|
| SCWA-WW-SVCSD-SECCLRF-RAS-PST2-MOTR002 |

EXAMPLE NUMBER GENERATED ASSET TAG
SCWA.150.045.632.912.3298.9287.002

**ROTATING ASSETS, FOR EXAMPLE: VEHICLES, MAY BE RECOGNIZED THROUGH AN ENTITY'S UNIQUE IDENTIFIER SYSTEM AND NOT BE TIED TO ONE LOCATION
G123 (with the logo on the vehicle, and the license plate)

Slide 5

PROBLEM – INFORMATION GATHERING

Slide 6
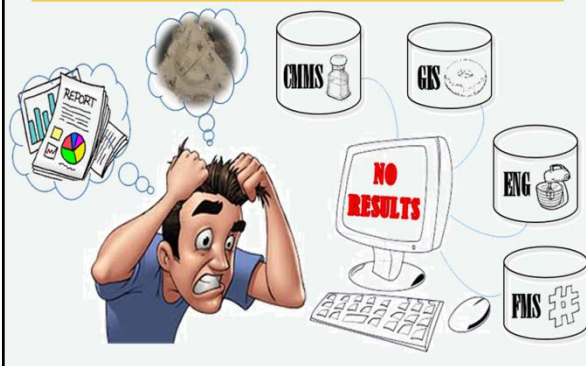
SOLUTION – GREAT RESULTS!

HAPPY DANCE

PATHWAY STEP 1 – BUY IN REASONS

Example Tagging Section Draft

PATHWAY STEP 2 – DECISIONS

PATHWAY STEP 3 – BUSINESS SYSTEMS

Example Tagging Section Draft

PATHWAY STEP 4 - IMPLEMENTING

PATHWAY STEP 5 – RETURN ON INVESTMENT

DATA ENTRY AND DUPLICATION REDUCTION SAVES $

MORE RELIABLE INFO
Asset Health
RCM
KPI
TRACK MOST CRITICAL ASSETS

Track Depreciation and Budget for R & R
10 20 30 40 Years

JUSTIFY
PRiCE 5% VALUE
RATE INCREASES AND R&R PRIORITY

Asset Tagging Convention

QUESTIONS?
COMMENTS?
CONCERNS?

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SONOMA
COUNTY
WATER
AGENCY

www.sonomacountywater.org

Asset Tagging Convention DRAFT

This chart gives standardized examples for creating a tagging system for a complex system with eight levels of information. Some of the mid levels may not be applicable and can be omitted. A few branches of a complex system may not need as many levels. Using or omitting levels is acceptable with attention to consistancy throughout the entire entity's tagging system. This is key to an understandable asset tagging system. Asset tagging should have enough levels to be able to roll up costs in various accounting needs. Reducing duplicate letter or number combinations throughout the tagging is key to successful comprehension to those using the system.
** Rotating assets may simply have an unique identifier.

			Example of Asset Tagging at Sample Valley County Sanitation District		
				ALPHA CODE EXAMPLE:	NUMERIC CODE EXAMPLE:
AGENCY CODE*			**THE ENTITY**		
This is the first level of the asset tagging convention. It identifies the asset as an entity's asset. This is especially needed in places where other entities have assets. For example; where a customer ties into a wholesaler's pipeline there may be a field of valves, each owned by one entity or the other. Another example is a pipeline going through someone's property. An appurtenance should be tagged with the entity that owns and maintains it.	PUBLICLY RECOGNIZED CHARACTERS		SAMPLE COUNTY WATER AGENCY	SCWA	ONLY IF PUBLICLY RECOGNIZED AS ENTITY
GENERAL SERVICE AREA CODES			**GENERAL SERVICE AREA**	**SERVICE**	**SERVICE**
This level represents the most general services, or financially separate areas that an entity maintains. For example; the general services in a water agency may include water transmission, wastewater, facilities, flood control, fisheries, information technology, solar, river monitoring, SCADA, service center, operations and maintenance, hydro electric, among other general services.	TWO TO THREE CHARACTERS		WASTEWATER	WW	150
AREA CODE			**SPECIFIC AREAS**	**AREA**	**AREA**
This level represents various areas under a general service. This may include districts, facilities, treatment plants, locations or buildings. For example; wastewater may have lift stations, treatment plants, and reclamation. Fleet service center may group assets by size of off road equipment, trailers, size of trucks, and/or load capacity of vehicles.	TWO TO SIX CHARACTERS		SAMPLE VALLEY COUNTY SANITATION DISTRICT	SVCSD	045
PROCESS CODE			**PROCESSES OR SITES**	**PROCESS/SITE**	**PROCESS/SITE**
This level represents various processes. For example, a waste water treatment plant may have aeration basins, air system, buildings and grounds, chlorination systems, secondary clarification, processing center, effluent, emergency generators, equalization basins, flow control, grit systems, influent, lift stations, reclamation, sludge dewatering, sludge thickeners, a tertiary filter system, and/or a UV system. Other general services areas may be broken into site locations, zones, or other functions.	TWO TO EIGHT CHARACTERS		SECONDARY CLARIFICATION PROCESS	SECCLRF	632
SYSTEM CODE			**SYSTEM**	**SYSTEM**	**SYSTEM**
This level represents the systems under processes. In the example of a secondary clarifier, it may have clarifiers, motor control center, return activated sludge pump sets, splitter box, and waste activated sludge pump sets. Each area may need the ability to roll up costs of a type of system within a process.	TWO TO FOUR CHARACTERS		RETURN ACTIVATED SLUDGE SYSTEM	RAS	912
GROUPING CODE			**GROUPING**	**GROUPING**	**GROUPING**
This level represents a grouping of intricately related assets for a system and better deciphers the actual location of assets. For example, the secondary clarifier return activated sludge system may have three pump sets. Each pump set would have their own location name to associate their assets. Assets may include a check valve, discharge valve, inlet valve, motor, pump, and a variable frequency drive. Each similar set at this level is numbered. (See numbers explanation below.)	TWO TO SIX CHARACTERS		PUMP SET GROUPING (2 OF 3)	PST2	3298
ASSET CODE			**ASSET TYPE**	**ASSET**	**ASSET**
This level represents the type of asset. On some occasions there will be another asset directly related to a mobile asset, for example, the fleet trucks are an asset, and may have a crane or radio attached to the truck. The attached asset will have the truck's number in its own tagging.	TWO TO SIX CHARACTERS		MOTOR	MOTR	9487
NUMBER			**NUMBER**	**NUMBER**	**NUMBER**
Numbers are used for multiples or possible multiples of any location or asset. If there will never be more than 9, then the number may be one digit. If there cannot be more than 99, the number will be two digits. If no more than 999, then three digits are used, etc. In the case of the RAS pump sets, there will never be more than 9, therefore only one digit is used.	TWO TO SIX CHARACTERS		USE LEADER ZEROS WHEN APPLICABLE	002	002

EXAMPLE LETTER GENERATED ASSET TAG

SCWA-WW-SVCSD-SECCLRF-RAS-PST2-MOTR002

EXAMPLE NUMBER GENERATED ASSET TAG

`SCWA.150.045.632.912.3298.9287.002`

* Best to standardize length of field for all systems at entity.

**ROTATING ASSETS, FOR EXAMPLE: VEHICLES, MAY BE RECOGNIZED THROUGH AN ENTITY'S UNIQUE IDENTIFIER SYSTEM AND NOT BE TIED TO ONE LOCATION
`G123 (with the logo on the vehicle, and the license plate)`

**City of Livermore
Water Resources**

Using the Asset Registry to help
identify and prioritize CIP

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History

- 2011 Began Implementing AM style workflows (Proactive VS Reactive)
- 2012 Developed a pilot Collections System AMP (GHD)
- 2015-2016 Developed Division wide AMP's (Kayuga)
- 2017 Used AM/AR data in the development of the Treatment Plant CIP

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Agenda

- Introduction
- Short history of WRD asset management
- Problems with our class based asset register for CIP
- Develop Location/System based hierarchy
- Incorporate Condition, Criticality, Risk at the System level
- Develop CIP

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Asset Registry

	H	I	J	K	L	M	N	X	Y	Z	AA
1	ID	Name	Class	InstallYear	Original Value	UsefulLife	StructuralCo	PoF	CoF	BRE Calc	BRE
2	11AG002	Gate; Maintenance	Access Gate	2002	4000	20	3	0.73	3	2.19	2.19
3	61AG001	Gate; Isabel Access	Access Gate	2012	4000	20	2	0.5	3	1.5	1.5
4	11AG003	Gate; West Entrance; Jack London	Access Gate	2013	4000	20	2	0.5	3	1.5	1.5
5	11AG001	Gate; Maintenance	Access Gate	2010	4000	20	3	0.73	3	2.19	2.19
6	11GT001	Gate; Main Operator	Access Gate Oper	2002	4000	10	3	0.73	3	2.19	2.19
7	61GT001	Operator; Isabel Access Gate	Access Gate Oper	2012	4000	10	2	0.5	3	1.5	1.5
8	11GT002	Operator; Gate; Vehicle; West Entranc	Access Gate Oper	2013	4000	10	2	0.5	3	1.5	1.5
9	MNT0016	Roofing - Roof Ladder	Access Ladder	1991	1200	35	3	0.73	3	2.19	2.19
10	SLD0005	Roofing - Roof Ladder	Access Ladder	2003	1400	35	3	0.73	3	2.19	2.19
11	TER0004	Roofing - Roof Ladder	Access Ladder	2010	1500	35	3	0.73	3	2.19	2.19

Original definition of an asset:
- Useful life > 1 yr.
- Cost > $5000
- "Critical"

Current definition of an asset is a maintenance managed item (everything in the CMMS)

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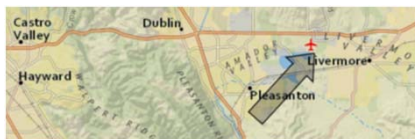
- 101 West Jack London Blvd, Livermore
- Water – Service 1/3 of the city (Calwater), Purchase water from Zone 7
- Recycled Water – Produce between 1 – 4 MGD
- Collections – Service entire city, ~300 miles of pipeline
- Wastewater treatment – Ave flow 6.5 MGD

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Location Based Hierarchy

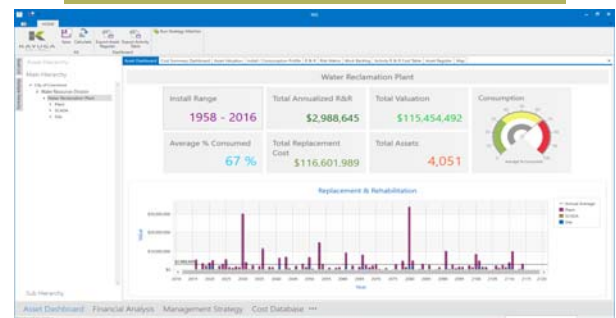| MainHierarchy_4	MainHierarchy_5	MainHierarchy_6	Asset ID	Name	Class	InstallYear	Value	UsefulLife	PoF	CoF	BRE
7 - Solids Stabilization	Digestion	Structure	71DG003	Tank; Digester #3	Digester	1993	8000000	50	0.73	3.6	2.628
7 - Solids Stabilization	Digestion	Structure	71DG001	Tank; Digester #1	Digester	1980	5600000	50	0.73	3.6	2.628
7 - Solids Stabilization	Digestion	Structure	71DG002	Tank; Digester #2	Digester	1993	5600000	50	0.73	3.6	2.628
4 - Secondary Effluent	LAVWMA	Mechanical	50SP001	Peaking Pond	Structure	1958	5000000	75	0.5	2	1
3 - Secondary Treatment	Aeration Basin	Aeration Basin 1	30AT001	Aeration Tank 1A	Tank	1965	3064500	75	0.73	4.5	3.285
3 - Secondary Treatment	Aeration Basin	Aeration Basin 1	30AT002	Aeration Tank 1B	Tank	1965	3064500	75	0.73	4.5	3.285
3 - Secondary Treatment	Aeration Basin	Aeration Basin 2	30AT003	Aeration Tank 2A	Tank	1980	3064500	75	0.88	4.5	3.96
3 - Secondary Treatment	Aeration Basin	Aeration Basin 2	30AT004	Aeration Tank 2B	Tank	1980	3064500	75	0.88	4.5	3.96
3 - Secondary Treatment	Secondaries	Secondary Clarifier #2	40SC002	Secondary Clarifier #2	Clarifier	1980	3000000	75	1	4.5	4.5
5 - Tertiary Treatment	Tertiary Tunnel	Structure	60TT001	Tertiary Tunnel	Structure	1974	3000000	100	0.73	4	2.92
3 - Secondary Treatment	Secondaries	Secondary Clarifier #1	40SC001	Secondary Clarifier #1	Clarifier	1965	2931000	75	0.5	4.5	2.25
3 - Secondary Treatment	Secondaries	Secondary Clarifier #3	40SC003	Secondary Clarifier #3	Clarifier	1991	2931000	75	0.5	4.5	2.25
5 - Tertiary Treatment	Filtration	Structure	52FT001	Filter; Tertiary	Tank	1974	2500000	50	0.73	4.5	3.285
5 - Tertiary Treatment	Filtration	Structure	52FT002	Filter; Tertiary	Tank	1974	2500000	50	0.73	4.5	3.285
5 - Tertiary Treatment	Filtration	Structure	52FT003	Filter; Tertiary	Tank	1974	2500000	50	0.73	4.5	3.285
5 - Tertiary Treatment	Filtration	Structure	52FT004	Filter; Tertiary	Tank	1974	2500000	50	0.73	4.5	3.285

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Problems

- Individual asset based list
- Cannot differentiate between O&M and CIP
- Useful life is the only factor considered
- Shortcoming of both the application and the hierarchy

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Location Based Hierarchy

Process Level
Plant
1 - Influent
2 - Primary Treatment
3 - Secondary Treatment
4 - Secondary Effluent
5 - Tertiary Treatment
6 - Solids Handling
7 - Solids Stabilization
Buildings
MCC
PLC
SCADA
Telemetry

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Our Current Solution?

- Configure the Asset Registry to group assets in a CIP friendly manner (Systems)
- Incorporate condition, criticality, and risk at the System level
- Work top down to identify projects
- Work bottom up to prioritize projects

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Location Based Hierarchy

System Level
Plant
1 - Influent
Barscreen
Basin Return
Headworks
2 - Primary Treatment
Ferric
Odor Control
Grit
Primaries
Primary Sludge Pumping
Scum Pumping
3 - Secondary Treatment
Aeration Basin

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Slide 1:

Location Based Hierarchy

Asset Level
Plant
1 - Influent
Barscreen
22BS001
22DR001
22DR003
22DR004
22IN001
22IN002
22IN003
22IN004
22IN005
22IN007
22IN008

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Slide 2:

Rolled Up Data Misleading

- Risk (BRE) can be skewed by many factors
- Comparing apples to oranges

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Slide 3:

Incorporate condition, criticality, and risk

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Slide 4:

PoF, CoF, or BRE as the sole driver can be misleading:

Asset ID	Install year	Useful Life	PoF	CoF	BRE	Remaining Useful Life
A1	2007	20	0.5	5	2.5	10
A2	2007	10	1	2.5	2.5	0

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Slide 5:

Pivot Table of AR

Row Labels	Average of PoF	Average of CoF	Average of BRE
UV	0.78	3.82	2.92
PEP Pumpstation	0.72	3.82	2.73
Backwash	0.58	4.54	2.72
Sodium Hypochlorite	0.84	3.22	2.70
Greenhouse Building	0.83	3.27	2.69
Applied Pumping	0.71	3.43	2.44
Barscreen	0.71	3.41	2.38
Secondaries	0.68	3.46	2.36
UV Building	0.73	3.17	2.31

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Slide 6:

Top Down Approach

System	PoF	CoF	Mitigation Score	BRE	Mitigation factors	Mitigation factors	Assumptions
PEP Pumpstation	1	5	0.8	4	Temporary, portable pumps (maybe)		System failure
Backwash	1	5	1	5	None	No backwash. No reclaim	Mainline failure
Caustic	0.9	0	0.1	0	OOS		System failure
Barscreen	0.88	5	0.5	2.2	Muffin monster	manual screen	System failure
PAT	0.88	3	0.8	2.112	One tank required for operation	bypass tanks and send flow to primarys	Structure failure
Sodium Hypochlorite	0.86	4	0.5	1.72	Dose directly with totes	Temp Tanks	System failure
Secondary#2	0.83	5	0.5	2.075	Can process handle two secondaries in operation?		Secondary failure
Headworks	0.8	5	0.8	3.2	Temporary, portable pumps		System failure
Tertiary Building	0.78	2	1	1.56	None		
UV	0.78	5	0.1	0.39	Permit dependent- Hypo	provide potable	System failure
RAS	0.77	5	1	3.85	None		System failure

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Top Down Approach

|	Sum of Value	StructuralCondition	Replacement Year
PEP Pumpstation	$1,282,357.01	3.08	2026
Primary Effluent Wet Well	$500,000.00	5.00	2017
Underground Valve	$160,000.00		2041
PEP Flow Meter Vault	$148,000.00	2.00	2043
Pipe	$67,357.01	2.83	2030
Primary Effluent Pump #2	$45,000.00	4.00	2022
Primary Effluent Pump #3	$45,000.00	4.00	2022
Primary Effluent Pump #1	$45,000.00	4.00	2022
PEP Flow Meter	$30,000.00	3.00	2023
PEP Pump VFD Unit #1	$30,000.00	3.00	2020
PEP Pump VFD Unit #3	$30,000.00	3.00	2020
PEP Pump VFD Unit #2	$30,000.00	3.00	2020
Check PEP Pump #3 Valve	$20,000.00	3.00	2030

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Next Steps

- Confirm CIP ranking methodology
- Continue to improve data quality
- Continue to improve Condition Assessment

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Project Development
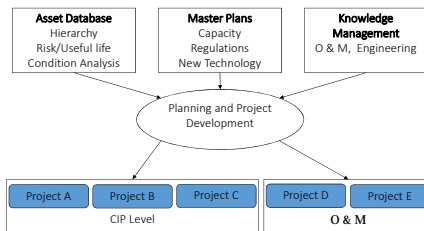
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Summary

- Added Location attributes to the AR
- Created System/Project level groups
- Assigned PoF, CoF, BRE to the System level
- Worked Top Down to prioritize projects
- Worked Bottom up to confirm priorities

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