

Validator Provided

Audit Information:

Utility: City of San Luis Obispo Utilities PWS ID: CA4010009
System Type: Potable Audit Period: Calendar 2017
Utility Representation: Mychal Boerman (Water Resources), Marcus Henderson (Distribution), Dean Furukawa, Jason Meeks
(Production), Cheryl Blair (Finance), Miguel Barcenas (Engineer)
Validation Date: 9/12/2018 Call Time: 15:00 Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 45 Data Validity Band (Level): Level II (26-50)
ILI: 1.96 Real Loss: 32.65 (gal/conn/day) Apparent Loss: 12.62 (gal/conn/day)
Non-revenue water as percent of cost of operating system: 3.3

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

Validator Information:

Water Audit Validator: Bryan Chen Validator Qualifications: AWWA California Water Audit Validator

Water Supplier Name: City of San Luis Obispo Utilities **Water Supplier ID Number:** CA4010009 **Water Audit Period:** Calendar 2017

Water Audit & Water Loss Improvement Steps:

Utility to provide steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

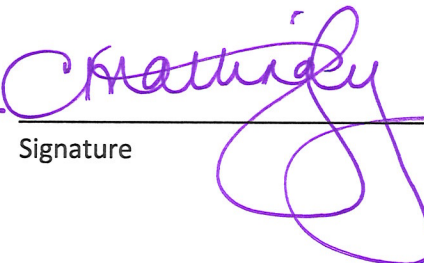
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- Instituted a proactive large meter testing program.
 - Standardized meter purchases and replacements to ultrasonic meters for 2" and small meters.
 - Initiated a large-scale meter replacement program.
 - Performed a proactive limited small meter testing.
 - Developed methodology to better account for water delivered to Cal Poly that has been sent to agricultural ponds.
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Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audit and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

CARRIE MATTINGLY
Executive Name (Print)

UTILITIES DIRECTOR
Executive Position


Signature

09.24.18
Date

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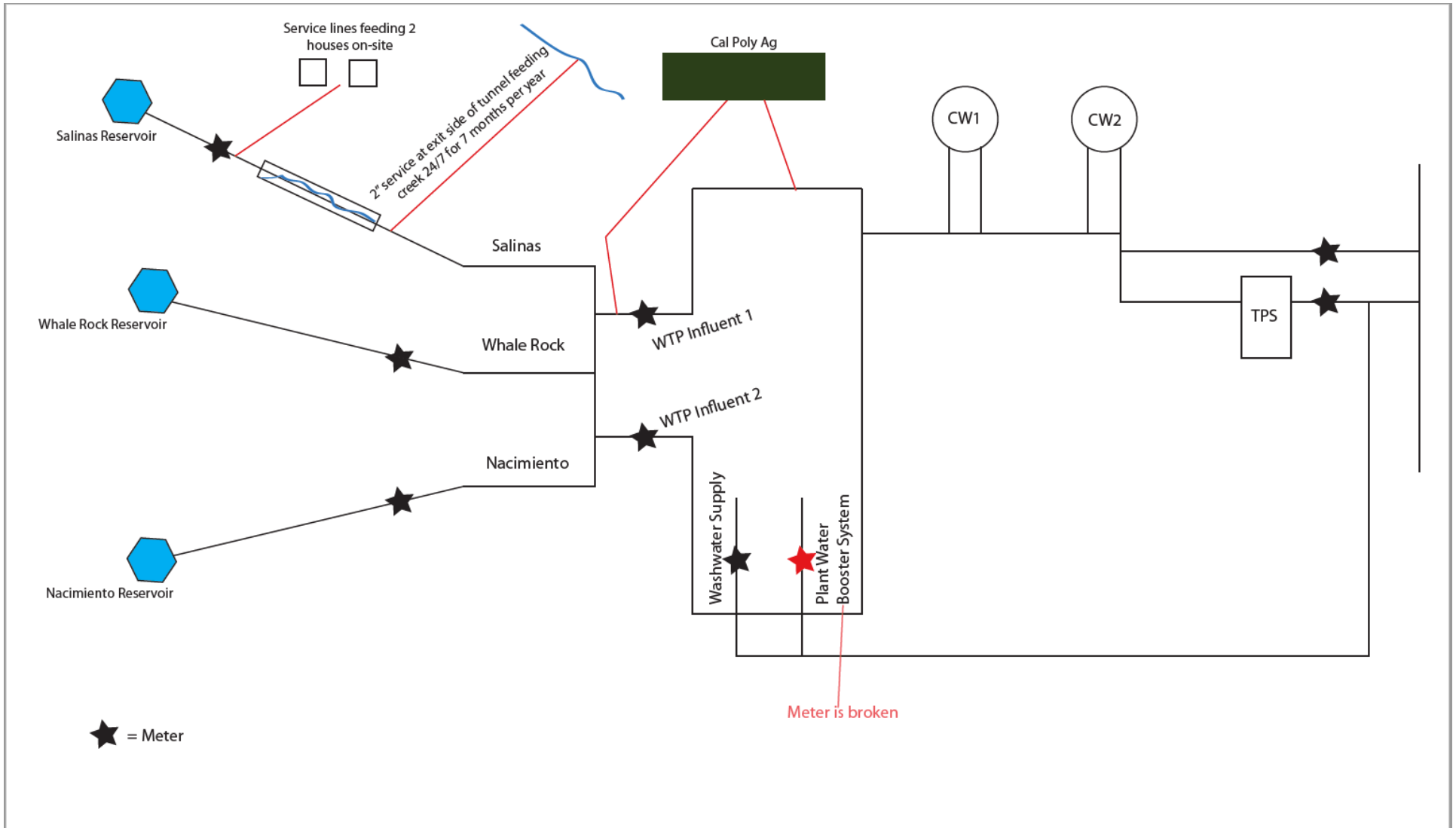
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Validator Information:

Water Audit Validator: Bryan Chen

Validator Qualifications: AWWA California Water Audit Validator



#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
1	Volume from Own Sources	VOS	3	<p>Supply meter profile: Whale Rock, Salinas, Nacimiento, groundwater per supporting documents. Influent meters used. Not</p> <p>VOS input derived from: SCADA reads from production meters</p> <p>Comments: Supporting documents confirm input. Potable only.</p>	<p>Percent of own supply metered: 99.9~</p> <p>Signal calibration frequency: No current data</p> <p>Volumetric testing frequency: None</p> <p>Volumetric testing method: N/A</p> <p>Percent of own supply volumetrically tested: N/A</p> <p>Comments:</p>
2	VOS Master Meter & Supply Error Adjustment	VOS MMSEA	3	<p>Input derivation: No test data, left blank.</p> <p>Net storage change included in MMSEA input: No</p> <p>Comments:</p>	<p>Supply meter read frequency: Hourly</p> <p>Supply meter read method: Manual and automatic logging.</p> <p>Frequency of data review for trends & anomalies: Each business day</p> <p>Storage levels monitored in real-time: Majority of storage is tied to SCADA, not fully automated but reviewed manually daily.</p> <p>Comments: Meters on SCADA with hourly logging. Comparing dailies & monthlies for qa/qc. No annual storage change log.</p>
3	Water Imported	WI	n/a	Comments: No connections exist that could export water.	
4	WI Master Meter & Supply Error Adjustment	WI MMSEA	n/a		
5	Water Exported	WE	3	<p>Export meter profile: 8 Meters to Cal Poly, no testing or calibration info.</p> <p>Comments: Supporting documents confirm input. Potable only. Not included in BMAC.</p>	<p>Percent of export supply metered:100</p> <p>Signal calibration frequency: None</p> <p>Volumetric testing frequency: None</p> <p>Volumetric testing method: N/A</p> <p>Percent of export supply volumetrically tested: N/A</p> <p>Comments:</p>

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
6	WE Master Meter & Supply Error Adjustment	WE MMSEA	1	Input derivation: No test data Comments:	Export meter read frequency: Monthly Export meter read method: Manual Frequency of data review for trends & anomalies: Monthly Comments:
7	Billed metered	BMAC	3	Customer meter profile: Age profile: About 50% of meters are > 20 years old. Reading system: Manual Read frequency: Monthly Comments: Lag-time correction is not employed in input derivation. Supporting documents confirm input. Potable only.	Percent of customers metered: 100 Small meter testing policy: None Number of small meters tested/year: 0. Replace upon failure Large meter testing policy: None Number of large meters tested/year: 0. Replace upon failure Meter replacement policy: Replaced upon failure and meter age. CIP to replace meters beginning 2018. Number of replacements/year: Data not requested Billing data auditing: Standard billing QC, Volumes are reviewed by account type/class. Financial auditor performs sampling review on select accounts each year. Comments:
8	Billed unmetered	BUAC	n/a		
9	Unbilled metered	UMAC	5	Profile: Input derivation: Meter readings, monthly reads Comments: Confirmed by supporting documents.	Policy for billing exemptions: Legacy accounts. Policy is to not add any new accounts to this category. Accounts existed prior to development their policy. Comments:

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10	Unbilled unmetered	UUAC	5	Profile: Fire department usage, operational flushing Comments:	Comments: Default grade applied
11	Unauthorized consumption	UC	5	Comments: Default input applied	Comments: Default grade applied
12	Customer metering inaccuracies	CMI	3	Input derivation: Estimated Comments: Based on age	Characterization of meter testing: Upon request and consumption flag. Characterization of meter replacement: Upon failure Comments:
13	Systematic data handling errors	SDHE	5	Comments: Default input applied	Comments: Default grade applied
14	Length of mains	Lm	8	Input derivation: GIS based Hydrant leads included: Yes Comments:	Mapping format: Digital Asset management database: In place and integrated with GIS Map updates & field validation: Routine through work orders Comments:
15	Number of service connections	Ns	1	Input derivation: Basis for database query: Meter serial Comments: Based on # of meters, not service connections. Multiple meters exist on connections. Around 11,000 actual service connections.	CIS updates & field validation: Meter reading Estimated error of total count within: Unknown/unsure Comments:
16	Ave length of cust. service line	Lp	10	Comments: Default input and grade applied, as customer meters are typically located at the property boundary.	

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
17	Average operating pressure	AOP	3	<p>Number of zones, general profile: 16 or 17 pressure zones. The average pressure is 70 psi under peak hour demand (PHD), and 78 psi under average day demand (ADD). Typical pressure range: 30-130 psi. Input derivation: Information gathered by engineer from hydraulic model Comments:</p>	<p>Extent of static pressure data collection: Hydrant pressures taken during routine system flushing and/or hydrant testing. Characterization of real-time pressure data collection: Not sure if SCADA is in place. Hydraulic model: In place and calibrated within the last 5 years. Comments:</p>
18	Total annual operating cost	TAOC	10	<p>Input derivation: Financial reports Comments: Water only, water debt included.</p>	<p>Frequency of internal auditing: Annually Frequency of third-party CPA auditing: Annually Comments:</p>
19	Customer retail unit cost	CRUC	8	<p>Input derivation: Total consumptive revenue divided by Billed Metered Authorized Consumption. Sewer charges are based on water usage and not included in calculation. Comments:</p>	<p>Characterization of calculation: Weighted average composite of all rates. Input calculations have not been reviewed by an M36 water loss expert. Comments:</p>
20	Variable production cost	VPC	4	<p>Supply profile: Own sources Primary costs included: Electric, treatment chemicals Secondary costs included: Not included Comments:</p>	<p>Characterization of calculation: Primary costs only. Input calculations have not been reviewed by an M36 water loss expert. Comments:</p>

Key Audit Metrics

(~) VALIDITY Data Validity Score: 45 Data Validity Band (Level): Band II (26-50)
(#) VOLUME ILI: 1.96 Real Loss: 32.65 (gal/conn/day) Apparent Loss: 12.62 (gal/conn/day)
(\$) VALUE Annual Cost of Real Losses: \$107,572 Annual Cost of Apparent Losses: \$552,257