



CITY OF MORRO BAY PUBLIC WORKS ADVISORY BOARD AGENDA

The City of Morro Bay provides essential public services and infrastructure to maintain a safe, clean and healthy place for residents and visitors to live, work and play.

**Regular Meeting - Wednesday, November 20, 2019
Veterans' Memorial Hall - 5:30 P.M.
209 Surf Street, Morro Bay, CA**

Ric Deschler, Chair
Christian Erlendson

Janith Goldman, Vice-Chair
John Erwin

Torrey Byles
Steven Shively

ESTABLISH QUORUM AND CALL TO ORDER
MOMENT OF SILENCE
PLEDGE OF ALLEGIANCE
BOARD MEMBERS ANNOUNCEMENTS AND PRESENTATIONS

PUBLIC COMMENT PERIOD

Members of the audience wishing to address the Board on City business matters not on the agenda may do so at this time. For those desiring to speak on items on the agenda, but unable to stay for the item, may also address the Board at this time.

Public comment is an opportunity for members of the public to provide input to the advisory body. To increase the effectiveness of the Public Comment Period, the City respectfully requests the following guidelines and expectations be followed. When recognized by the Chair, please come forward to the podium to speak. Though not required, it is helpful if you state your name, city of residence and whether you represent a business or group. Unless otherwise established by the Chair, comments are to be limited to three minutes.

- All remarks should be addressed to Board, as a whole, and not to any individual member thereof.
- The Board respectfully requests that you refrain from making slanderous, profane or personal remarks against any elected official, commission and/or staff.
- Please refrain from public displays or outbursts such as unsolicited applause, comments or cheering.
- Any disruptive activities that substantially interfere with the ability of the Board to carry out its meeting will not be permitted, and offenders will be requested to leave the meeting.
- Your participation in Board meetings is welcome and your courtesy will be appreciated.
- The Board in turn agrees to abide by its best practices of civility and civil discourse according to Resolution No. 07-19.

A. CONSENT CALENDAR

- A-1 Approval of Minutes for the September 25, 2019 Public Works Advisory Board Special Meeting
- A-2 Approval of Minutes for the October 16, 2019 Public Works Advisory Board Regular Meeting

B. BUSINESS ITEMS

- B-1 Directors Report - Informational summary of current Public Works Activities

Recommendation: Information item for discussion, no action needed.

- B-2 Review of the City's 2019 Water Loss Audit

Recommendation: Review of the American Water Works Association (AWWA) Water Loss Audit and provide any comments to staff.

C. FUTURE AGENDA ITEMS

D. ADJOURNMENT

This agenda is subject to amendment up to 72 hours prior to the date and time set for the meeting. Please refer to the agenda posted at the Public Works Department, 955 Shasta Avenue, for any revisions or call the department at 772-6262 for further information. Materials related to an item on this Agenda submitted to the Public Works Advisory Board after distribution of the agenda packet are available for public inspection at the Public Works office located at 955 Shasta Avenue and Morro Bay Library located at 625 Harbor Street during normal business hours. In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Public Works Department at (805) 772-6262 at least 24 hours prior to the meeting to insure reasonable arrangements can be made to provide accessibility to the meeting.

PRESENT:	Ric Deschler Steve Shively John Erwin Torrey Byles	Chair Board Member Board Member Board Member
ABSENT:	Janith Goldman Chris Erlendson	Vice Chair Board Member
STAFF:	Rob Livick Janeen Burlingame	Public Works Director Management Analyst

ESTABLISH QUORUM, CALL TO ORDER
MOMENT OF SILENCE
PLEDGE OF ALLEGIANCE

The meeting was called to order at 5:31 p.m. A quorum was present.

ANNOUNCEMENTS

Ric Deschler thanked Stu Skiff for his service on the Public Works Advisory Board after his resignation at the last meeting and encouraged those who are interested, to keep an eye out for when the City recruits to fill this vacancy.

John Erwin asked for a moment of silence for the CalTrans engineer and his family that were involved in an accident resulting in the death of his wife, noting this is a reminder that driving safely is a responsibility we share and to remain vigilant while exercising that responsibility.

PRESENTATIONS – None

PUBLIC COMMENT

<https://youtu.be/10O69YlsvxI?t=155>

The public comment period was opened, and seeing none, the public comment period was closed.

A. CONSENT AGENDA

<https://youtu.be/10O69YlsvxI?t=180>

A-1 Approval of Minutes for the August 21, 2019 Public Works Advisory Board Regular Meeting

MOTION: Steve Shively moved to approve Item A-1. The motion was seconded by Torrey Byles and carried 4-0-0 unanimously.

B. BUSINESS ITEMS

B-1 Directors Report

<https://youtu.be/10O69YlsvxI?t=213>

Rob Livick presented the Directors Report.

B-2 Short Range Transit Plan

<https://youtu.be/10O69YlsvxI?t=2764>

Janeen Burlingame presented the staff report.

Discussion, comments and questions amongst Board members and staff.

The public comment period was opened, and seeing none, the public comment period was closed.

Discussion, comments and questions continued amongst Board members and staff.

MOTION: Steve Shively moved to recommend the City Council adopt the Short Range Transit Plan. The motion was seconded by Torrey Byles and carried 4-0 unanimously.

FUTURE AGENDA ITEMS

None identified at this time.

ADJOURNMENT

The meeting adjourned at 6:46 P.M.

Recorded by:

Janeen Burlingame
Management Analyst

PRESENT:	Ric Deschler Janith Goldman Torrey Byles Chris Erlendson Steve Shively	Chair Vice Chair Board Member Board Member Board Member
ABSENT:	John Erwin	Board Member
STAFF:	Rob Livick Janeen Burlingame Damaris Hanson Joe Mueller Mike Wilcox	Public Works Director Management Analyst Environmental Program Manager Utilities Division Manager Consolidated Maintenance Superintendent

ESTABLISH QUORUM, CALL TO ORDER
MOMENT OF SILENCE
PLEDGE OF ALLEGIANCE

The meeting was called to order at 5:30 p.m. A quorum was present.

ANNOUNCEMENTS

Ric Deschler announced there is a vacancy on the Board noting the City Council has put out a notice indicating it is accepting applications for the position. He encouraged those interested to submit an application to City Hall.

PRESENTATIONS – None

PUBLIC COMMENT

<https://youtu.be/WTX2I2tLvH0?t=59>

The public comment period was opened, and seeing none, the public comment period was closed.

A. CONSENT AGENDA – None

B. BUSINESS ITEMS

B-1 Directors Report

<https://youtu.be/WTX2I2tLvH0?t=79>

Rob Livick presented the Directors Report.

FUTURE AGENDA ITEMS

Rob Livick stated results of the Water loss audit would come to the Board at a future meeting.

ADJOURNMENT

The meeting adjourned at 5:55 P.M.

Recorded by:

Janeen Burlingame
Management Analyst



AGENDA NO: B-1

MEETING DATE: November 20, 2019

MEMORANDUM

TO: Public Works Advisory Board
CC: City Manager
DATE: November 13, 2019
FROM: Rob Livick, PE/PLS - Public Works Director/City Engineer
SUBJECT: Director's Report / Information Items

Please contact the individual staff members prior to the meeting, if possible, for more detailed information.

Notify Me: Sign up for Notify Me on the City's Website www.morrobayca.gov/notifyme to be notified by email when Council, Board's and Commission's agendas and minutes are posted on the website.

Service Requests: Citizens can report a concern to the City for predetermined issues without the need to phone the City during business hours (for example: reporting a pothole) by using a feature on the City's website, Service Requests www.morrobayca.gov/905/Service-Requests, or the mobile App (available on both Android and IOS operating systems).

Staff can also add Service Requests for someone over the phone or in the office if they do not have access to a computer. Each category in Service Requests is assigned to the appropriate staff member to handle so citizens don't have to figure out what department to contact for an issue they need to report on.

CONSOLIDATED MAINTENANCE COMPLETED SERVICE REQUESTS AND WORK ORDERS 10/9/2019 TO 11/12/2019

Staff Contact: Mike Wilcox

Service Requests Completed		Work Orders Completed	
Curb Painting Request	1	Facilities	
Curb Repair	1	ADA Work	1
Custodial Request	2	Appliance Repair	1
Graffiti	1	Core Duties	1
Maintenance Request	7	Custodial	1
Other - Street Lights	1	Electrical System	2
Pavement Repair or Replace	3	General Maintenance	3
Pothole/Sinkhole	3	General Repair	1
Public Time Clock Issue	1	Painting	1
Sidewalk Issue	2	Plumbing	3
Sign or Banner Missing/Damaged	2	Fleet	
Street Light Out or Missing	1	Body Work	1
Tree Evaluation	1	Brake System	1
Tree Pruning/Trimming	8	Cooling System	2
Tree Removal Request	6	Electrical System	7
		Engine Other	1
Service Request Total	40	Engine Service	3
		Fuel System	2
		Oil Change/Lube	12
		Shop Inspection	2
		Smog Inspection	11
		Transmission Drivetrain	2
		Vehicle Inspection	10
		Furniture	
		Install	1
		Landscape Areas	
		Other	2
		Parking Lots	
		ADA Work	1
		General Maintenance	1
		Restrooms and Trash	
		Graffiti Removal	1
		Maintenance	2
		Repair	1
		ROW-Sidewalks-Paths	
		Graffiti Removal	1
		Grind	1
		Mark Lifts	1
		Other	1
		Repair	2
		Parks	
		Haul Debris	1
		Irrigation Repair	2
		Other	5
		Plumbing	1
		Tree Hazard Reduction	2
		Weed Abatement	1
		Stormwater	
		Repair	1
		Street Trees	
		Evaluation	3
		Hazard Reduction	22
		Removal	6
		Streets	
		Berm Repair	2
		Dig Out	1
		HMA Patch	6
		Install	1
		Other	2
		Repair	1
		Replace Sign	3
		Replace Sign	21
		Righ of Way Obstruction	1
		Sweeping/Cleaning	1
		USA	1
		Weed Abatement	5
		Work Order Total	172



CONSOLIDATED MAINTENANCE PROJECT PICTURES

Staff Contact: Mike Wilcox

- Staff continues to perform street digouts around the City. We are currently installing about 4 tons of hot mix asphalt (HMA) every week.
- This digout on Whidbey was completed in conjunction with the adjacent property owner who had just completed right of way improvements along a badly degraded section of road.

CONSOLIDATED MAINTENANCE PROJECT PICTURES

Staff Contact: Mike Wilcox

- Staff repaired a storm inlet drain on Embarcadero that had been run over by something heavier than it could carry.
- Additional reinforcing steel was added to help prevent future damage.





CONSOLIDATED MAINTENANCE PROJECT PICTURES

Staff Contact: Mike Wilcox

- FlexiBollards were install in the parking lot outside of GAFCO to delineate ADA parking stalls.
- This location has a history of signs being knocked over by parking cars.
- FlexiBollards resist impact when hit and spring back in place when the cars back away.

CONSOLIDATED MAINTENANCE PROJECT PICTURES

Staff Contact: Mike Wilcox

- Staff has completed the installation of 38 street name signs in the North Eastern section of town.
- The new signs are coated with 3M High Intensity Grade Prismatic Retroreflective Sheeting.
- This part of an ongoing project to improve sign visibility and public safety.



WATER – OPERATIONS

Staff contacts: Joe Mueller
Damaris Hanson

Operations and Maintenance October 2019:

Distribution

- Exercised 155 water valves throughout the city.
- Responded to five after-hour callouts:
 - Water leak at 380 Tahiti.
 - Water leak at 655 Vista.
 - Broken meter lid at Monterey and Morro Bay Blvd.
 - Communications loss at Blanca water tanks.
 - Standing water across from Bayside Café.
- Responded to 3 minor water leaks, located and repaired as needed. All leaks and corrective action taken is logged and tracked through the CityWorks, Asset Management/Work Order/Permitting, software and database.
- Performed 50 water service turn-offs and 72 water service turn-ons.
- Located and marked 55 Underground Service Alerts.
- Investigated 25 distribution issues ranging from meter re-reads, meter high reads, pressure issues, and water quality concerns.
- Emergency response to a hit fire hydrant at Highway 41 and Main Street, reinstalled the hydrant.
- Numbered Blanca water tanks for chlorine residual testing.
- Upsized booster pump at the Kings water tanks eyewash station.
- Replaced pressure gauges at all booster stations.
- Performed UCMR4 sampling for unregulated contaminants.
- Lowered distribution tank levels to prepare for State Water Shutdown.

Treatment

- Operated the Reverse Osmosis (RO) facility producing 868,976 gallons into the distribution system.
- Trained additional staff on the operation, sampling and testing at the RO treatment plant in preparation for the annual state water shutdown which began November 1st.
- Add a backup antiscalant pump at RO plant.
- Replaced 8 membrane seals on RO train number two.
- Performed Outfall sampling for the BWRO



RO plant seal replacement



BWRO outfall annual sampling



Booster pump install



Hydrant repair after accident



Installation of the backup antiscalant pump

WASTEWATER – COLLECTIONS

Staff Contacts: Joe Mueller
John Gunderlock

Operation & Maintenance October 2019

- Tested Lift Station alarms and performed monthly maintenance
- Hydro cleaned approximately 34,011 feet of city main line.
- Video inspected (CCTV) 1,028 feet of gravity main.
- On-Call staff received no afterhours call-outs.
- Received and completed two service request to investigate possible partial line blockages both ended up as problems in the private lateral line.
- Performed seven Fats, Oils, and Grease source control inspections.
- Reported No Sewer Overflows for the month of October to California Integrated Water Quality System (CIWQS)
- Inspect seven lateral tie-into the gravity main line on Main street between Morro Bay Blvd and Harbor street.
- Early morning Main line Hydro cleaning and video inspection during low flow hours. Cleared debris from gravity main line and identified the causes of the partial blockage occurring on Main Street between Avalon and Hill Streets.
- Performed Lift Station maintenance, repainting exposed piping and replaced batteries at Lift Station #3 emergency generator.
- Sampled pH levels from Mission Linen.
- Hydro clean and vacuumed the Storm Drain system at the Corporation Yard and the Wastewater Treatment Facility to meet stormwater requirements.



Gravity main line extension, and new laterals install on Main street



WASTEWATER – TREATMENT

Staff Contacts: Joe Mueller
John Gunderlock

Operation & Maintenance October 2019

- Flow for the month of October averaged 0.966 Million Gallons per Day (MGD) and totaled 29.936 million gallons.
- <0.01 inches of precipitation was recorded during the month of October.
- Responded to four after hour callouts for plant chlorine adjustments.
- Staff created two new Standard Operating Procedures (SOP's): daily truck inspection and plant power shut down.
- Tested all plant alarms.
- Tested emergency generator and automatic switch gear under full load.
- San Luis Powerhouse performed quarterly maintenance on the emergency generator.
- Clean plant storm water system, exercise creek outfall flapper valve and sweep streets around plant.
- Filled 2 pallets of sandbags for winter storm preparation.
- Changed hot water recirculation pump on digester #3.
- Drained headworks screening channel and performed yearly maintenance and minor adjustments on screening unit #2.
- Replaced broken shear pin on north side of chlorine contact chamber flights.
- Moved sludge from drying beds to sludge storage area.
- Installed influent pump #1 after warranty work was performed on mechanical seal.
- Treated rust and painted lower sections of the front-end loader.
- Drove sludge solar drying beds with the front-end loader to speed drying time.
- Morro Bay High School's Applied Chemistry classes toured the plant.
- Staff spoke at the Morro Bay High School Applied Chemistry classes about careers in wastewater treatment and how the field is advancing.
- Bakersfield Liberty High School's Environmental Sustainability class toured the plant



Electrical controls and troubleshooting class

Utilities Staff attended the following training:

- Safety Data Sheet (SDS) in-house safety tailgate meeting
- Process Instrumentation and Design Drawing
- Harassment at the workplace
- Trench excavation safety
- Forklift refresher training
- Injury Illness and Prevention Program
- Electrical controls and troubleshooting

Submitted reports to the State, [electronically](#):

- September 2019 Monthly Discharge-Monitoring Report (eDMR)
- September 2019 Monthly Self-Monitoring Report (eSMR)
- Third Quarter Effluent Bacteria Report
- Third Quarter Receiving Water Sampling Report
- 2019 Annual Sampling Report



Hosted regional hazmat rescue training event



Morro Bay High School's science class tour



ENGINEERING/CAPITAL PROJECTS

Staff contact: Rob Livick

Highway 41/Main/Highway 1 – No Change

- Project construction is still financially constrained
- Processing a Contract with GHD formerly Omni-Means to complete Pre Design and Design Work
- Working with the City's funding partners the San Luis Obispo Council of Governments (SLOCOG) and Caltrans on funding and design options

Pavement Management

- 2018/19 Work complete
- FY 19/20 program includes a complete revision to Plan to incorporate sealing techniques not anticipated with 2011 Pavement Management Plan
- Two Proposals for Professional Services to Update Pavement Management plan including a reassessment of the Pavement Condition Index were received, Staff is evaluating.
- Work to be performed in the Spring of 2020 to take advantage of better weather and new Rubberized Asphalt Grant Cycle

Water System Improvements – Nutmeg Pressure Zone Fire Flow Improvements

- Addressed in the OneWater – Water System Capital Improvement Plan
- Request for proposal for preliminary design and environmental review being prepared

Collection System Repairs – Beachcomber, Main Street and Atascadero Road Sewer Main R/R

- Addressed in the OneWater – Wastewater Collection System Capital Improvement Plan
- Request for proposal for preliminary design and environmental review being prepared

Misc. Small CIPs

- North Point Parking Lot: Project is out for quotes for lighting and access control improvements
- Boat Rinse Off WQ/Pocket Park: Bids 1.5 to 3 x Engineer's Opinion; Rejected all bids. Modifying project.
- Bocce Ball/Greenhouse on Shasta and Dunes: No bids received, reassessing project as a potential "Volunteer Project"

Cloisters Landscaping Improvements – Concept Plan

- Concept plan approved by City Council on October 22
- Project(s) require a budget amendment for appropriations

Operating and Capital Improvement Program is online at:

http://www.morro-bay.ca.us/DocumentCenter/View/13292/Proposed-FY-2019_20-Operating-and-Capital--Budget

Engineering/Development Review

Staff contact: Rob Livick

Staff is working on the following projects:

- Power Plant Site Battery Project: Planning Review
- 405 Atascadero, 35 unit multi-family low income housing: Planning Review
- 535 Atascadero, Parcel Map (MB 15-0103) with Public Improvements: In Plan and Map Check
- Harborview Hotel/Commercial: Planning Review
- Dollar Store (at old Cookie Crook location): Plan Check
- Hotel Development – NW corner Atascadero Road West and Highway 1: Planning Review
- Sonic Restaurant – Main and Highway 41: Plancheck – Waiting for resubmittal from applicant (Permit Extension Granted)
- Harbor Hut Docks: In Plancheck
- Rose's Landing Upstairs Hotel - Plancheck
- US Coast Guard Addition: In Plancheck
- Morro Bay Landing: Under Construction
- Residential remodels and construction: ~50 Projects in various stages of review
- Encroachment Permits Issued: 13 in October

WASTEWATER – NEW WRF

Staff contact: Rob Livick

- 60-Percent Complete Plans Received on both the WRF Facility and Conveyance System and will be received and filed by WRFAC November 20.
- City Received the Coastal Development Permit from the Coastal Commission on November 12.
- Work continues in accordance with City Council direction.
- Additional Information at www.morrobaywrf.com and www.morrobayca.gov

Staff Report

TO: Public Works Advisory Board **DATE:** November 4, 2019
FROM: Damaris Hanson – Environmental Programs Manager
SUBJECT: Review of the City’s 2019 Water Loss Audit

RECOMMENDATION

Review of the American Water Works Association (AWWA) Water Loss Audit and provide any comments to staff.

BACKGROUND

Beginning in 2017, California Senate Bill No. 555 required as codified in California Water Code Section 10608.34, all California water suppliers to submit a water loss audit to the California Department of Water Resources (DWR). The legislation also requires validation and confirmation of data accuracy. Water audits are a valuable tool in identifying and prioritizing distribution system leaks, when addressed can improve the efficiency of water production and delivery for all water suppliers by reducing losses. Water loss audits are due on or before October 1st of each year and audits must be completed and validated for the previous calendar year or previous fiscal year.

The American Water Works Association (AWWA) developed a Water Audit Software for all urban water suppliers to use to conduct their annual water loss audit. This water loss audit software is based on the AWWA Water Audit and Loss Control Programs Manual M36.

SUMMARY

What is the AWWA water audit? The water audit is an accounting practice that is conceptually similar to a financial audit. Whereas a financial audit tracks all sources and uses of funds for an organization, a water audit tracks all sources and uses of water within a water system over a specific period.

What is water loss? Water losses in utilities include the physical escape of water from the pressurized piping system as leakage. These losses are considered real losses. Losses also occur due to inaccurate metering of customers consumption, theft, and billing and accounting practices. These types of losses are known as apparent losses. Non-revenue water losses include real losses and apparent losses along with unbilled authorized consumption, such as water used in miscellaneous activities such as firefighting. In other words, non-revenue water comprises the volume utilities lose from their water supply infrastructure and any unbilled volumes associated with lost revenue from a portion of the supply

that reaches the customer, plus the authorized unbilled usage.

A water audit evaluates the quality and efficiency of operations. It helps to answer questions such as:

- How much water fails to generate revenue?
- How much revenue is lost as a result?
- What are the volumes of the various components of non-revenue water – how much is attributable to leakage, customer meter error, unbilled consumption and data handling errors?
- How much leakage does your system experience and how does that compare to other utilities?

AWWA water audit software inputs and results assist the City in providing a water balance.

AWWA Free Water Audit Software: <u>Water Balance</u>						WAS v5.0
Water Audit Report for: City of Morro Bay (4010011)						American Water Works Association. Copyright © 2014. All Rights Reserved.
Reporting Year: 2018						1/2018 - 12/2018
Data Validity Score: 60						
Own Sources (Adjusted for known errors) 92.630	Water Exported 0.000	Authorized Consumption 1,011.280	Billed Authorized Consumption 1,008.650	Billed Water Exported	Revenue Water 1,008.650	
	Water Supplied 1,052.970		Billed Authorized Consumption 1,008.650	Billed Metered Consumption (water exported is removed) 1,008.650		Billed Metered Consumption (water exported is removed) 1,008.650
				Billed Unmetered Consumption 0.000	Billed Unmetered Consumption 0.000	
			Water Losses 41.690	Unbilled Authorized Consumption 2.630	Unbilled Metered Consumption 0.000	Unbilled Metered Consumption 0.000
		Unbilled Unmetered Consumption 2.630			Unbilled Unmetered Consumption 2.630	
		Apparent Losses 15.342		Unauthorized Consumption 2.632	Unauthorized Consumption 2.632	
				Customer Metering Inaccuracies 10.188	Customer Metering Inaccuracies 10.188	
	Water Imported 960.340	Real Losses 26.347	Systematic Data Handling Errors 2.522	Systematic Data Handling Errors 2.522		
			Leakage on Transmission and/or Distribution Mains <i>Not broken down</i>	Leakage on Transmission and/or Distribution Mains <i>Not broken down</i>		
			Leakage and Overflows at Utility's Storage Tanks <i>Not broken down</i>	Leakage and Overflows at Utility's Storage Tanks <i>Not broken down</i>		
		Leakage on Service Connections <i>Not broken down</i>	Leakage on Service Connections <i>Not broken down</i>			

The software also provides various performance indicators. These indicators help to put a relevant number to these values.

WAS v5.0
American Water Works Association
Copyright © 2014, All Rights Reserved.

**AWWA Free Water Audit Software:
System Attributes and Performance Indicators**

Water Audit Report for: **City of Morro Bay (4010011)**
Reporting Year: **2018** | **1/2018 - 12/2018**

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 60 out of 100 ***

System Attributes:

	Apparent Losses:	15.342	acre-ft/yr	
	+	Real Losses:	26.347	acre-ft/yr
	=	Water Losses:	41.690	acre-ft/yr
	?	Unavoidable Annual Real Losses (UARL):	90.42	acre-ft/yr
		Annual cost of Apparent Losses:	\$102,319	
		Annual cost of Real Losses:	\$57,166	Valued at Variable Production Cost <small>Return to Reporting Worksheet to change this assumption</small>

Performance Indicators:

Financial:	{	Non-revenue water as percent by volume of Water Supplied:	4.2%	Real Losses valued at Variable Production Cost
		Non-revenue water as percent by cost of operating system:	3.0%	
Operational Efficiency:	{	Apparent Losses per service connection per day:	2.49	gallons/connection/day
		Real Losses per service connection per day:	4.28	gallons/connection/day
		Real Losses per length of main per day*:	N/A	
		Real Losses per service connection per day per psi pressure:	0.07	gallons/connection/day/psi
		From Above, Real Losses = Current Annual Real Losses (CARL):	26.35	acre-feet/year
	?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	0.29	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

SUMMARY FINDINGS

The AWWA water loss audit provides the City with more than a percent of water loss but also relates the amount of water lost to a financial cost and operational efficiency. Overall Morro Bay has a very low loss percentage, 4.2%. The non-revenue water as a percent by cost if operating system is only at 3%. Typical water loss for water utilities range from 5-15%.

DISCUSSION

Water Supplied

Completing the water audit first requires the utility to determine the amount of water supplied. The water supplied is the volume of water from own sources + water imported – water exported. Below is a clip of this section of the AWWA spreadsheet. Volume of own sources is the volume of water the City produces from the Brackish Water Reverse Osmosis plant. The water imported is the amount of State Water delivered to the City. Currently the City does not export any water. All yellow fields are calculated fields, only the white fields can be filled in.

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

WATER SUPPLIED	<----- Enter grading in column 'E' and 'J' ----->	Pcnt:	Value:
Volume from own sources:	+ ? 3	0.00%	92.630 acre-ft/yr
Water imported:	+ ? 7	0.00%	960.340 acre-ft/yr
Water exported:	+ ? n/a		0.000 acre-ft/yr
WATER SUPPLIED:			1,052.970 acre-ft/yr

Master Meter and Supply Error Adjustments
Enter negative % or value for under-registration
Enter positive % or value for over-registration

Authorized Consumption

The next step in the water audit is to determine the amount of authorized consumption, which then leads to water loss. Authorized consumption consists of billed authorized consumption and unbilled authorized consumption. Billed authorized consumption contains billed metered and billed unmetered consumption. Unbilled authorized consumption contains unbilled metered consumption and unbilled unmetered consumption.

AUTHORIZED CONSUMPTION			
Billed metered:	+ ?	3	1,008.650 acre-ft/yr
Billed unmetered:	+ ?	n/a	0.000 acre-ft/yr
Unbilled metered:	+ ?	n/a	0.000 acre-ft/yr
Unbilled unmetered:	+ ?	5	2.630 acre-ft/yr
AUTHORIZED CONSUMPTION:			1,011.280 acre-ft/yr

Click here: ? for help using option buttons below

Pcnt: Value: acre-ft/yr

Use buttons to select percentage of water supplied

Billed Metered

Billed metered is the consumption that generates revenue, this volume is determined by a water meter. To determine this amount Staff in the Finance Department provides a customer consumption report that includes all classes of potable water customers that provide revenue to the utility.

Billed Unmetered

Billed unmetered is the consumption that generates revenue but is determined by an estimation or is not known. These are typically customers that are referred to as “flat fee” or “flat rate” customers. The City does not have any of these types of customers.

Unbilled Metered

Unbilled metered is the consumption that includes all metered potable water that does not generate revenue for the utility. These types of consumption are typically metered water line and/or hydrant flushing activities, and water used for sewer line jetting.

Unbilled Unmetered

Unbilled unmetered consumption consists of the consumption that is neither metered nor revenue-generating. Because this amount of water is can be challenging to compile and accurately quantify, AWWA provides a typical default value that can be used. The typical default value equates to 0.25% of the volume of water supplied. The types of uses commonly in unbilled unmetered are from unmetered water line/hydrant flushing, water line breaks, firefighting and fire training activities, storm drain cleaning, fire flow tests, street sweeping. The City has been diligently attempting to track down these consumption volumes in order to use a known value instead of the AWWA default value.

Once this data is entered the spreadsheet provides the Authorized Consumption amount. Authorized Consumption for Morro Bay is billed metered + the estimated unbilled unmetered (0.25% of the total water supplied).

WATER LOSSES (Water Supplied - Authorized Consumption)		41.690 acre-ft/yr	
Apparent Losses			
Unauthorized consumption:	+ ?	2.632	acre-ft/yr
Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed			
Customer metering inaccuracies:	+ ? 3	10.188	acre-ft/yr
Systematic data handling errors:	+ ? 5	2.522	acre-ft/yr
Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed			
Apparent Losses:	?	15.342	acre-ft/yr
Real Losses (Current Annual Real Losses or CARL)			
Real Losses = Water Losses - Apparent Losses:	?	26.347	acre-ft/yr
WATER LOSSES:		41.690	acre-ft/yr
NON-REVENUE WATER			
NON-REVENUE WATER:	?	44.320	acre-ft/yr
= Water Losses + Unbilled Metered + Unbilled Unmetered			

Water losses

Water Loss is the total water supplied minus the authorized consumption. Unauthorized consumption is the same as unbilled unmetered (0.25% of the total water supplied).

Apparent Losses

Apparent losses are the nonphysical losses that occur when water is successfully delivered to the customer but is not measured or recorded accurately. Therefore, apparent losses are the sum of the unauthorized consumption, customer metering inaccuracies and system data handling errors.

Customer metering inaccuracies

Customer metering inaccuracies are inaccuracies in registering water consumption by a retail customer meter. AWWA software suggest a default percentage value of 1% to represent these losses.

Systematic data handling errors

Systematic data handling errors are errors caused by accounting omissions, errant computer programing, data gaps, and data entry; inaccurate estimates used for accounts that fail to produce a meter reading, and billing adjustments. AWWA software suggest a typical default percentage value of 0.25% to represent these losses.

Both customer metering inaccuracies and systematic data handling error are given a default percentage value. The City doesn't currently have a meter testing or replacement program. As meter age they typically under register or allow more water through the meter than what the meter reads. AWWA guidance suggests using 1% to estimate the amount if customer meter inaccuracies if the utility doesn't have substantial data from meter testing activities. AWWA suggest using a default error of 0.25% for systematic data handling errors if the utility doesn't have a detailed data or assessment of systematic data handling errors.

Non-revenue water is the water loss + unbilled metered + unbilled unmetered water. This is water which does not provide revenue to the utility.

Lastly various system data is compiled to determine the unavoidable annual real losses (UARL). UARL uses length of mains, number of service connections, average distance of customer laterals and average operating pressure. The UARL is a value representing the low limit of leakage that could be achieved if all of todays best technology could be successfully applied. This number is used to determine the Infrastructure leakage index (ILI). ILI is the ratio

of the Real Losses to the UARL. The ILI is a performance indicator for comparing the performance of utilities in operational management of real losses.

To understand the cost of water loss the annual operating budget, customer retail unit cost and variable production costs are accounted. Customer retail unit cost represents the charge that customers pay for water service. This amount is applied to apparent losses, since these losses represent water reaching customers but not fully paid for. Variable production cost is the cost to produce and supply the next unit of water e.g. \$/million gallons. The variable production costs are applied to real losses.

SYSTEM DATA			
Length of mains:	+ ? 9	77.0	miles
Number of active AND inactive service connections:	+ ? 5	5,502	
Service connection density:	? 71	71	conn./mile main
Are customer meters typically located at the curbside or property line?		Yes	(length of service line, <u>beyond</u> the property boundary, that is the responsibility of the utility)
Average length of customer service line:	+ ?		
Average length of customer service line has been set to zero and a data grading score of 10 has been applied			
Average operating pressure:	+ ? 1	65.0	psi
COST DATA			
Total annual cost of operating water system:	+ ? 10	\$5,469,556	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ? 9	\$15.31	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ? 5	\$2,169.69	\$/acre-ft <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

Data Validity

For every quantity entered in the white boxes a data validity score must be determined. The data validity score is determined by a grading scale to determine the accuracy of the number entered. The only “good” data validity score is whether the score accurately reflects the quality of data. In other words, a low data validity score is not in itself a bad thing. AWWA states it is better to have a lower score that accurately reflects the quality of the data than a higher score that is less accurate. That being said each utility should try to improve a trustworthy validity score to improve the accuracy of the amount entered.

WATER AUDIT DATA VALIDITY SCORE:	
*** YOUR SCORE IS: 60 out of 100 ***	
A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score	
PRIORITY AREAS FOR ATTENTION:	
Based on the information provided, audit accuracy can be improved by addressing the following components:	
1: Water imported	
2: Billed metered	
3: Customer metering inaccuracies	

The water audit data validity score is a composite score that reflects the quality of the data entered into the audit, determined by the City’s entered validity scores for individual fields. The score is a volumetrically-weighted average, in which a lower score reflects less confidence in the accuracy of the data. Morro Bay’s score is 60 out of 100.

Validation

The regulations require each utility to have their water loss audit validated by a Certified Water Loss Validator. To become a Certified Water Loss Validator individuals must complete a 2-day course and successfully pass an exam. The certified water loss auditor must not be the individual whom completed the audit. The City of Morro Bay reached out to the City of San Luis Obispo who provided a Certified Water Loss Validator to validate this water loss audit.

Morro Bay plans to have a staff member complete this course in the coming year so that the City can provide assistance to neighboring Cities with validating their audits.

The Validator is required to go over the entire water loss audit with the utility and determine if the validity scores entered are mutually agreed upon. This helps to make sure that all audits have an unbiased review and the validity scores are evaluated the same for all utilities across California. Also the validator makes sure all water is accounted for in the correct locations, and the audit is completed correctly.

DETAILED AUDIT FINDINGS

The AWWA water loss audit provides the City with more than a percent of water loss but also relates the amount of water lost to a financial cost and operational efficiency. Overall Morro Bay has a very low water loss percentage of 4.2%. The non-revenue water as a percent by cost of operating system is only at 3%. Typical water loss for water utilities range from 5-15%. The validity score for the audit is 60 out of 100. This validity score can be raised in the next year's audit if the individual validation scores on water imported, billed metered and customer metering inaccuracies are raised. The largest number in the weighted average is the water imported, in order for the City to achieve a higher score the water provided to the City would need to perform meter accuracy testing. Currently only meter calibration tests are performed.

The City is looking into how we can improve in these areas and if they are worth the cost benefit. Because Morro Bay does have a low percent water loss it might not make financial sense to spend a lot of resources on these aspects.