



**BOARD OF DIRECTORS
EAST BAY MUNICIPAL UTILITY DISTRICT**

375 – 11th Street, Oakland, CA 94607

Office of the Secretary: (510) 287-0440

AGENDA

**Planning Committee
Tuesday, January 12, 2016
9:15 a.m.
Training Resource Center**

(Committee Members: Directors McIntosh {Chair}, Linney and Young)

ROLL CALL:

PUBLIC COMMENT: The Board of Directors is limited by State law to providing a brief response, asking questions for clarification, or referring a matter to staff when responding to items that are not listed on the agenda.

DETERMINATION AND DISCUSSION:

1. Use of Technology in Operations and Maintenance (Wallis)
2. Multi-family Residential Submetering Pilot Study Update (Hong)
3. Food Waste Program Update (Horenstein)

ADJOURNMENT:

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EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: January 7, 2016

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager *ARC*

FROM: Michael J. Wallis, Director of Operations and Maintenance *MJW*

SUBJECT: Use of Technology in Operations and Maintenance

INTRODUCTION

The effective use of technology helps the District with the operation and maintenance of its infrastructure, improves efficiency, and reduces community impacts. The District continues to investigate and adopt new technologies to address challenges including aging infrastructure, knowledge retention, efficient operations, and water quality. This memo provides a summary of the District's use and adoption of technology. These items will be discussed at the January 12, 2016 Planning Committee meeting.

SUMMARY

Technology is more than just desktop computers and software. The types of technology used by the District include mobile devices, field analyzers and instrumentation, and leak detectors. The effective use of technology helps the District reinvest wisely in its vast infrastructure by improving efficiency in every part of an asset's life cycle (from planning through operations and maintenance) and by reducing community impacts through better coordination and planning of work. The District has tested and deployed technologies to improve the efficiency and effectiveness of field staff, better manage the infrastructure, leverage data collected from existing information systems, and improve water quality management.

DISCUSSION

The District's technology investments are often motivated by the obsolescence of existing technology, regulatory changes, or operational requirements. Technology is used to improve efficiencies, reduce costs, and improve communications with customers. The effective use of technology is also important in attracting the best and brightest of today's workforce. The new workforce expects 21st century solutions to address today's challenges. However, utilities face both internal and external challenges to technology innovation.

Like most public utilities, the District's main focus is on public health and welfare and its stewardship of the environment. Consequently, utilities tend not to be early adopters of technology until the technology is proven safe and reliable. Technology investments require careful planning, testing, training, and execution. Pilot tests are often conducted to test the

feasibility, value, and applicability of a technology, and the design of the pilot test is critical to the evaluation and requires careful site and user selection. When researching technologies, it can be challenging to sort out the hype from the reality. Moreover, many technology companies serve a broad market and often do not understand the water business. To address these challenges, the District looks for partners who bring solutions that solve multiple problems, understand the integration costs, and have a viable business plan to be partners with us for the long-term.

The District has deployed many new technologies to improve efficiency and address the challenges facing the District. Some of these new technologies include:

- Pipeline Infrastructure: The District is piloting and evaluating new design and construction technologies for the Pipeline Rebuild initiative including alternative pipeline renewal technologies such as cured-in-place pipe to renew asbestos cement pipe, pipe bursting for cast iron pipe, and horizontal directional drilling for installing non-metallic pipe like high-density polyethylene and polyvinyl chloride. The District is also piloting a new type of ductile iron pipe (Kubota pipe) which offers greater earthquake resistance. The first pilot project was installed in Kensington in October 2015.
- Mobile Computing: Over 400 tablet computers and smartphones have been deployed to field staff. These devices give staff access to information such as maps, work orders, drawings, and manuals, improve communication between staff and customers and save time by allowing tasks to be conducted in the field instead of the office. The use of mobile computing will expand as technology improves and will continue to improve the effectiveness and efficiency of field staff.
- Leak Detection
 - *Acoustic Loggers*: The District uses over 1,000 acoustic leak detection loggers to identify leaks before they surface. In FY15, approximately 630 miles of pipe were surveyed and 348 leaks were found. In FY16, testing began on new acoustic loggers that can be accessed remotely, reducing the travel time needed to download data from the loggers.
 - *Non-metallic Pipe Leak Detectors*: Testing began in December 2015 on leak detection devices that may improve the ability to find leaks on non-metallic pipes. This project is scheduled to be completed by April 2016.
 - *Satellite Leak Detection*: Piloting began in March 2015 on leak detection software that uses satellite data to find leaks. This project is scheduled to be completed by April 2016.
 - *District Metered Areas (DMA)*: Testing will begin in early 2016 on hardware and software to help the District better understand real and apparent water losses in two test areas in Kensington and Blackhawk.
- Leveraging Data: The District collects a tremendous amount of data from the systems used to operate the water system. Data from these systems, along with hydraulic models of the distribution system are used to optimize operations and minimize energy costs.

Staff implemented an energy management system that saves several hundred thousand dollars each year in energy costs; staff is currently reevaluating this system. In addition, software has been developed that uses operations and PG&E data to verify the accuracy of electric bills and select the electric tariff that minimizes energy costs.

- Water Quality Monitoring: Increasingly stringent water quality regulations have pushed staff to think beyond traditional tools to address water quality issues.
 - *Trihalomethane (THM) Analyzer*: THM analyzers are being used that can provide results in 30 minutes, allowing staff to adjust operations to minimize THM formation.
 - *Field Analyses*: Typical microbial analyses take a day to process. A portable analyzer is being used that detects microbes by testing for the presence of adenosine triphosphate (ATP). The device provides results in minutes and is used for reservoir and pipeline monitoring.
 - *Chloramine Boosting*: To manage the chloramine residual in the distribution reservoirs, a chloramine boosting station was installed at Tice Reservoir. The unit has been effective at maintaining the chloramine residual and several more installations are being planned.
 - *Ice Pigging*: Conventional pigging involves flushing water at high volumes to clean the pipe. Ice pigging, which uses ice with a slush-like consistency, has been successfully used at two locations. The two pilot tests demonstrated that ice pigging can be used in limited applications at the District.

Testing and deploying technology requires extensive resources, coordination, and integration with existing systems. Consequently, the number of technologies that can be tested is limited. In 2013, the District joined the Isle Utility's Technology Advisory Group (TAG). The Isle TAG is a technology and innovation consultant whose mission is to accelerate the market uptake of technologies. There are over 80 TAG members worldwide (15 in the United States) including American Water, Contra Costa Water District, Las Vegas Valley Water District, Los Angeles Department of Water and Power, Metropolitan Water District, San Francisco Public Utilities Commission, San Jose Water, Santa Clara Valley Water District, and Zone 7 Water Agency. In addition, in 2015, a Technology Committee was established to identify and vet new technologies and includes staff from across the Operations and Maintenance department to ensure technologies meet the broader needs of the department.

NEXT STEPS

In FY16, the District will continue to evaluate and test new technologies that focus on improving the infrastructure, improving water quality and minimizing water loss, and will leverage the capabilities and expand the use of mobile computing in the field. In addition, the District will continue its participation in the Isle TAG to learn about emerging technologies in the water industry.

ARC:MJW:ss

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: January 7, 2016

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager *ARC*

FROM: Sherri A. Hong, Manager of Customer and Community Services *S. Hong*

SUBJECT: Multi-family Residential Submetering Pilot Study Update

BACKGROUND

The District's Strategic plan initiatives include leveraging technology to improve operational efficiencies, enhance customer service, and achieve conservation goals to support long term water supply management. For over a decade, the District has investigated the merits of using submeters within the multi-family residential (MFR) and commercial sectors. MFR complexes are generally outfitted with a single master meter to serve the entire complex. The installation of submeters allow for each unit's use to be monitored and measured and provides tenants with valuable water consumption information to encourage conservation.

As a result of the District's submetering research and demonstrated water savings, the Board adopted a new regulation to Section 2 – Applying for Service, effective January 1, 2009, requiring all new water service requests to install individual metering for multi-family and multi-occupancy (e.g., commercial) structures three stories or less. Also in 2009, the District launched a MFR Submeter Retrofit Pilot Incentive Program to provide conservation rebates for existing customer-installed submeters at eligible sites. In December 2010 and September 2012 under Board Resolutions 33794-10 and 33896-12, the Board authorized a variance to the individual metering regulation allowing applicants to install submeters in lieu of individual meters where the installation of individual meters were deemed infeasible by the District. An update on the submetering pilot studies for customer retrofits and new service applicants will be discussed at the Planning Committee meeting on January 12, 2016.

The pilot studies provided valuable experience and understanding of the benefits and challenges of submetering. Staff has conveyed these findings to help shape recommendations and proposed state submetering regulation and/or legislation.

DISCUSSION

Submetering Pilot Study Incentive Program for Multi-Family Properties

The Submetering Pilot Study Incentive Program was designed to study point-of-use submeter technology and offer technical and financial assistance to MFR buildings and/or mobile home

properties within the EBMUD service area. This grant study assessed water savings, costs, community interest, and administrative issues associated with submetering.

All participants were required to install submeters tested and approved by the County Weights and Measures office and agreed to provide tenants consumption information and/or bills based on their water use. Eligible apartment owners were also required to install water efficient fixtures to achieve additional conservation savings prior to participating in the program. Mobile home parks and condos where the property manager did not own the interior of the buildings were only required to install the meters. Apartment owners were provided a \$250 rebate per dwelling unit and mobile homes and condos a rebate of \$150 per dwelling unit.

The goals of the submeter pilot study were to:

- Encourage the installation of individual water meters in apartment complexes to increase water savings.
- Develop a new water conservation measure that could lead to significant savings.
- Monitor the water use and savings from the installation of submeters as compared to master metering.
- Evaluate administrative and technical issues, program barriers and cost-effectiveness.
- Report on these submetering projects and provide conclusions and recommendations.

Submeter Incentive Program Findings

Staff solicited participants representing multi-family properties, mobile home parks, and homeowner associations through a number of outreach efforts. As summarized in Table 1 in Attachment A, to date, 650 submeter rebates across eleven properties have been approved.

The pilot study identified a number of water conservation, operational and customer service benefits in the following areas:

- Identification of leaks and excessive use in tenant units.
- Reduction of monthly fees for property owners by removing cost of water service.
- Tenant access to and understanding of their individual water use.
- Greater property management identification of water losses/leaks.
- Direct EBMUD relationship with sub-metered customers to promote and communicate District initiatives including conservation goals during the drought.
- Enhanced property management access to better property water use data.

Water Savings from Retrofits

The limited number of participants and the ongoing drought has introduced some challenges in determining the estimated water savings attributed to submetering. Most participants indicated that they believe submeters facilitate conservation and tenant support of submeters. Water

savings from the pilot study analysis indicated a 15 percent savings which is comparable to national studies expected savings. Participants in the submeter retrofit pilot were also introduced to clotheswasher and toilet upgrade rebates which enhanced water savings.

Mobile Home Park (MHP) Case Studies

The two largest submetering retrofit projects in the study were mobile home parks (MHPs) interested in the individual billing of residents for water service. The District worked with the MHP tenants on water audits of their mobile homes and provided free conservation devices. Each MHP demonstrated measurable water savings in comparison to use prior to the submeter installations with savings ranging from 11 to 35 percent over the study period. While much of the decrease in 2014-15 usage can be attributed to the drought outreach and watering restrictions, a significant portion may also be a result of customer response to submetering which is consistent with prior District and national submetering research findings of 15 percent savings.

New Water Service Submeter Pilot Study

During the implementation of the District's 2009 new individual metering regulation for multi-tenant residential and commercial properties of three stories or less, the District chose not to allow submetering because there was little to no regulatory oversight governing third-party billing practices, meter testing and accuracy, and concerns about consumer protection for property owners, residents, and utilities existed. However, the submeter pilot study has provided an opportunity for the District to gain additional knowledge of best management practices, installation costs, improved maintenance controls and administrative issues related to submetering. Information gained through extending the pilot study has proved helpful with respect to new construction to determine future submetering options to the individual metering requirement.

New Water Service Submeter Eligibility Criteria

As summarized in Table 2 in Attachment A, to date, 456 new water service accounts across fifteen properties have and/or will be participating in the submetering pilot study. All new water service applicants that volunteered for the pilot completed a District application and met all eligibility criteria as established by the District, including the following: 1) the applicant's project site was within the jurisdiction of the District; 2) all occupant dwelling units on the property were individually submetered; 3) all submeters were compliant with the Uniform Plumbing Code and certified for use by the California Department of Weights & Measures; 4) the applicant agreed to operate and maintain all submeters in perpetuity and to place this as a condition in the buyer's contract if the property is sold; and 5) the property owner was responsible to ensure that customer billing based on the submeters meets all applicable laws and regulations. The District had the final determination as to the feasibility of individually metering or submetering each unit. In addition, the District did not reimburse costs for installing submeters

in new construction, meter or submeter certification and registration, permits, maintenance or replacement of submeters, and software or costs associated with the billing system.

While interest in the submeter program from a retrofit standpoint has not been as popular as expected, there has been some interest from developers of new multi-family properties to participate in the submetering study as an alternative to individually metering. These applicants for new service contend that submetering can be a less costly alternative to individual metering, especially for small projects that involve significant rehabilitation.

New Water Service Submeter Pilot Study Findings

Submetering can be a powerful and equitable conservation tool to provide end users with valuable consumption data to manage their own water use. The District conducted post inspection audits of all the participants in the pilot new construction program and found mixed results with regards to compliance with EBMUD submetering requirements, such as failing to report the submetered consumption data to the District as required. Some of the properties were resold or under new property management and new owners were unaware of the submeters and requirements to read them and share data with the District. Others were aware of the requirements but had not yet initiated reading the meters. These operational issues are important components required of the participants as well as the District to confirm accurate water use, billing information, identify leaks, evaluate water savings and measure tenant satisfaction.

The findings have helped to identify a need for additional education, outreach and streamlined reporting templates and mechanisms for newly master metered and submetered water service accounts to comply with District regulations to minimize oversight and administrative costs. Staff will be developing additional information and templates for the water service application packet and will post samples and fillable PDF forms on the website for ongoing reporting and tracking of the approved submetered accounts. Additionally, this issue also supports the initial challenges identified by the District where submetering best practices could benefit from adoption of statewide standards through submetering legislation.

NEXT STEPS

The District's submetering pilot program, although successful in the evaluation of the technology and customer acceptance, posed some challenges for submetering within new developments. Staff is recommending the following changes to the program going forward.

Custom Submeter Retrofit Incentive Program

Customer and water savings benefits from the submeter retrofit pilot program warrant continuing some form of conservation incentive, however, because of the uniqueness of each installation, coupled with low participation rates; it is recommended that the program be incorporated into the District's custom conservation rebate program. Beginning February 1, 2016, the District will

continue to offer rebates for submetering retrofits via its customized residential and commercial programs.

New Water Service Account Submetering Criteria

Submetering provides a viable option to individual metering on a case-by-case basis, as solely determined by the District, for new multi-tenant water services where it is infeasible to install individual meters. Going forward, the District will document submetering standards and detailed installation requirements, including the possible use of automated meter reading in compliance with existing regulations, and provide additional information and templates for new water service applications. This will help streamline the application review process and improve the data sharing and reporting requirements where submetering is requested and authorized by the District to help enforce water service regulations.

ARC:SAH:rwh:dlb

Attachment

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ATTACHMENT A

Table 1. Multi-Family Submeter Retrofit Incentive Participants

Customer Type	City	# of meters
Duplex	Oakland	2
Mobile Home	San Leandro	366
Fourplex	Oakland	4
Mobile Home	Castro Valley	87
Duplex	Oakland	2
Fourplex	Berkeley	4
Apartment	Berkeley	9
Condo	Alameda	42
Condo	Oakland	41
Townhouse	San Leandro	3
Townhouse	Castro Valley	14
Mobile Home	Castro Valley	56
Apartment	Oakland	18
Duplex	Oakland	2
	Total	650

Table 2. New Water Service Account Submeter Pilot Study Participants

Customer Type	City	# of meters	Status
Live/Work	Richmond	25	Completed
Medical Offices	Castro Valley	6	Completed
Assisted living	Alameda	19	Completed
Assisted living	Emeryville	6	Completed
Commercial	Oakland	50	In design
Commercial	Alameda	38	In construction
Commercial	Berkeley	6	Completed
Assisted living	San Lorenzo	85	In planning
Assisted living	Oakland	18	Completed
Assisted living	Walnut Creek	48	Completed
Assisted living	Lafayette	85	Project on hold
Mixed use	Lafayette	4	Project on hold
Residential/Commercial	Lafayette	66	In design
Live Work	San Ramon	pending	On hold
Low income	Alameda	pending	In design
	Total	456	

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: January 7, 2015

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager *ARC*

FROM: Bennett K. Horenstein, Director of Wastewater *BK*

SUBJECT: Food Waste Program Update

SUMMARY

The District continues to develop long-term partnerships to expand digestion of food waste for renewable energy production at the Main Wastewater Treatment Plant (MWWTP). Staff is expecting deliveries in January of urban organics from San Francisco under the contract with Recology approved in October 2015. In addition, staff is nearing completion of contract negotiations with Harvest Power of Tulare, LLC (Harvest Power) to design, build, and operate the preprocessing facilities required to accept City of Oakland material delivered via the District's contract with Waste Management of Alameda County (WMAC), as well as digested food waste dewatering and compressed natural gas facilities. Staff is also working with the City of Oakland to align the timelines of the Harvest Power project with the City's expectations. Staff continues to pursue other sources of food waste for the facility - including with the City of Berkeley. Staff will provide an update on food waste program activities to the Planning Committee on January 12, 2016.

DISCUSSION

Recology

On October 13, 2015, the Board approved a contract with Recology to deliver urban organics derived from mixed solid waste in San Francisco. The waste is to be preprocessed by Recology in San Francisco to extract an organic paste that will be delivered to the District for digestion and energy generation. Recology is currently installing its preprocessing equipment in San Francisco and expects to begin delivering loads in late January 2016. Deliveries will take place on a pilot basis over a six month period as Recology and the District gather information about the quality and energy value of the waste. At the end of the pilot phase, staff will bring a contract amendment to the Board for consideration which will include long-term quantity commitments and tip fees.

Harvest Power

The District continues to work with Harvest Power to develop a contract for design, construction, and operation of food waste preprocessing, dewatering, and compressed natural gas (CNG) facilities at the MWWTP. District and Harvest Power staff have agreed on a Term Sheet that outlines the key risk and financial terms to be documented in the contract. Key terms include:

- District to provide the majority of capital funding and own all buildings and equipment, with HP providing a \$4.8M CEC grant
- District to receive a prioritized annual “Capital Recovery Payment” prior to distribution of net revenues
- After costs and fees are paid, net revenue to be split: 85% to District, 15% to HP. After full District capital has been recovered (estimated Year 9), revenue split shifts: 77.5% to District, 22.5% to HP
- Initial Contract Term is 10 years
 - District has discretion to extend in two 5-year increments
 - Automatic 5-year extensions if project is financially successful

The Net Present Value of the project for EBMUD is estimated to be \$23 million. District and Harvest Power staff are working on the approach to operation of the facilities.

Contract drafting is underway, and staff expects to bring the contract to the Board for consideration on January 26, 2016. To meet the aggressive schedule required to accept City of Oakland material, Harvest Power is continuing engineering and permitting work under a preliminary engineering design services agreement authorized by the Board in July 2015 and amended in November 2015.

City of Oakland

Given delays associated with the City’s contract award to WMAC and subsequent delays in approval of the District’s contract with WMAC, the Harvest Power facilities required to process Oakland food waste will not be ready by the July 1, 2016 milestone included in the WMAC contract, even with the preliminary design services Harvest Power is completing in advance of the full project contract. Per the process outlined in the WMAC contract, the District submitted a Remedial Plan to City staff requesting an extension to an outside date of December 31, 2017 for the District’s readiness to accept Oakland material. District staff is continuing discussions with WMAC and City staff regarding this request.

City of Berkeley

District staff is in discussions with the City of Berkeley regarding dedication of Berkeley’s commercial organics to the District’s food waste facility, once constructed. District and Berkeley

staff are meeting to share alignment between the District's and City's climate change and waste diversion goals and to ensure that anaerobic digestion of Berkeley's food waste at the MWWTP is considered in any future organics processing contract.

MWWTP Site and Utility Improvements for Food Waste Program

The District needs to complete design and construction of process piping and utility connections at the MWWTP to support implementation of the Harvest Power food waste processing and Recology urban organics initiatives. Staff is currently designing the majority of the required improvements; however, specialized engineering design services are required for design of a new digester gas management system and integration of the new CNG facility for the Harvest Power project, as well as expansion of the existing digester gas conditioning system to reduce the potential for gas flaring and improve system reliability. The January 12, 2016 Board agenda includes a recommended contract with Brown and Caldwell (\$400,000) to perform this work. Staff expects to complete design of the required site and utility improvements in the next two months and to submit the construction contract for Board consideration by June 2016.

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