

Water and Natural Resources Department Public Recreation Management

Planning Committee November 10, 2015





- Discuss Mokelumne and East Bay Recreation Programs
- Review Results vs. Key Performance Indicators
- Discuss Major Activities and Initiatives in 2014/15
- Preview plans for 2015/16



- Four developed Recreation Areas plus over 35 miles of trail
- · Over 500,000 visitors in a typical year
- Implementing recommendations from Mokelumne Watershed Recreation Management Plan (2010)
- KPIs established for cost recovery, safety and visitor satisfaction

Mokelumne Recreation Financial KPIs



| Recreation Management Area | FY11 Actual | FY12 Actual | FY13 Actual | FY14 Actual | FY15 Actual |
|----------------------------------|----------------|----------------|----------------|----------------|----------------|
| And % Cost Recovery Target | | | | | |
| Pardee Recreation:40% | 33% | 26% | 41% | 40% | 45% |
| Camanche Northshore:45% | 46% | 64% | 66% | 66% | 67% |
| Camanche Southshore:45% | 34% | 58% | 64% | 64% | 63% |
| CHHP: 100% | 76% | 100% | 96% | 93% | 87% |

Mokelumne Recreation Public Safety



| RMP Goal | 2010 Result | 2011 Result | 2012 Result | 2013 Result | 2014 Result |
|------------------------------|---|--|---|---|---|
| Boating Safety <.01% | .013% 4 Accidents 30,918 Vessels | .014% 4 Accidents 29,612 Vessels | .015% 4 Accidents 27,267 Vessels | .019% 5 Accidents 26,713 Vessels | .005% 1 Accident 20,461 Vessels |
| Visitor Incidents <.2% | .13% 717 Incidents 542,761 Visitors | .10 % 528 Incidents 538,472 Visitors | .07% 363 Incidents 488,063 Visitors | .12% 634 Incidents 523,121 Visitors | .06% 294 Incidents 487,361 Visitors |

Mokelumne Recreation Customer Surveys



- Visitor surveys include request for feedback on Courtesy, Cleanliness, Value, Safety and Security
- Target rating is minimum 80% "Good" or "Excellent"
- · 2012 results: 89%
- · 2013 results: 93%
- 2014 results: 93%

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Mokelumne Recreation Projects and Initiatives





- Managing drought impacts to recreation in 2014/15
 - Major push to achieve water conservation goals
 - Volunteer Program evolution timed well for Butte Fire support

Mokelumne Recreation Projects and Initiatives (cont.)







- Camanche Northshore marina nearing completion
- Pardee RV renovation underway
- Extension of Camanche Hills Hunting Preserve concession contract planned for 2016

 RFP for Pardee Recreation concession planned for 2016 East Bay Watershed Recreation



- Two developed recreation areas and over 80 miles of trails
- About 1.1 million visitors in a typical year.
- Venue for 3 collegiate crew rowing teams and host of 4 amateur rowing events drawing over 3,000 spectators
- KPIs established for cost recovery, safety and visitor satisfaction

East Bay Recreation Financial KPIs



| Recreation Management Area | FY 2013 Actual | FY 2014 Actual | FY 2015 Actual |
|--|-------------------|-------------------|-------------------|
| % Cost Recovery Target | | | |
| Lafayette Recreation Management Area: 65% | 78% | 84% | 82% |
| San Pablo Recreation Management Area: 40% | *N/A | 54% | 50% |

*Final data not available at this time

East Bay Recreation Public Safety



CY 2014

| <u>KPI</u> | <u>Goal</u> | <u>Results CY</u> 2012 | <u>Results CY</u> 2013 | <u>Results CY</u> <u>2014</u> |
|--------------------------------------|-------------|-------------------------------|-------------------------------|----------------------------------|
| Visitor Incidents | | | | |
| (number of documented | .2% | .02% | .02% | .02% |
| visitor incidents per visitor day | | 268 Incidents 1,116,031 | 278 Incidents 1,090,101 | 281 Incidents 1,220,794 |
| | | visitors | visitors | visitors |
| | | | | |

East Bay Recreation Customer Surveys



- Visitor surveys initiated for the East Bay in 2012
- 2013 results: 89% of responses "Good" or "Excellent".
- 2014 results: 94% of responses "Good" or "Excellent".



East Bay Watershed Recreation Visitation



| Location | CY 2012 | CY 2013 | CY 2014 |
|---------------------------|-----------|-----------|-----------|
| Lafayette Recreation Area | 940,960 | 907,000 | 1,020,616 |
| San Pablo Recreation Area | 127,351 | 130,941 | 143,045 |
| Trail Use Permits Issued | 47,720 | 52,160 | 57,133 |
| Total | 1,116,031 | 1,090,101 | 1,220,794 |

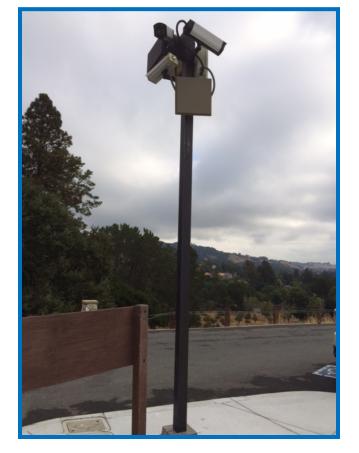
East Bay Watershed Recreation Revenue



| Location | CY 2012 | CY 2013 | CY 2014 |
|---------------------------------|-------------|-------------|-------------|
| Lafayette Recreation Area | \$1,035,257 | \$1,202,516 | \$1,252,962 |
| San Pablo Recreation Area | \$678,387 | \$771,041 | \$833,857 |
| Watershed Trails | \$44,030 | \$49,070 | \$53,880 |
| Total | \$1,757,674 | \$2,022,627 | \$2,140,699 |

East Bay Recreation Projects and Initiatives





2015 Security Camera Upgrade

2015 Trails Resurfacing



East Bay Recreation Projects and Initiatives







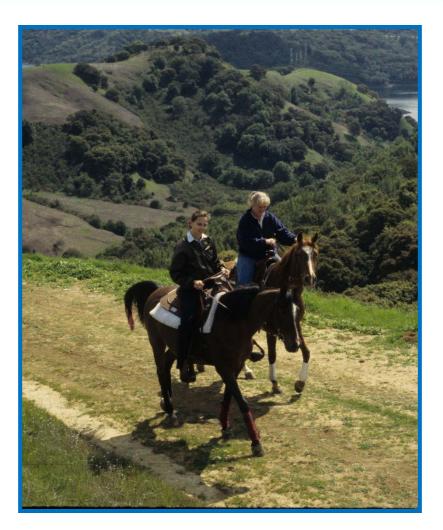


- San Pablo Recreation Area: Replacement of pumps and upgrades to the electrical systems at the Sewage Lift Station.
- Installation of two
 CXT prefabricated
 concrete restrooms at
 group picnic sites.
- In progress: Upgrade to the rental boat dock in FY16.

Next Steps



- Focus on successful completion of 2015/16 initiatives
- Review KPIs after 2015 season and recommend changes if warranted
- Update BOD Planning Committee in September 2016



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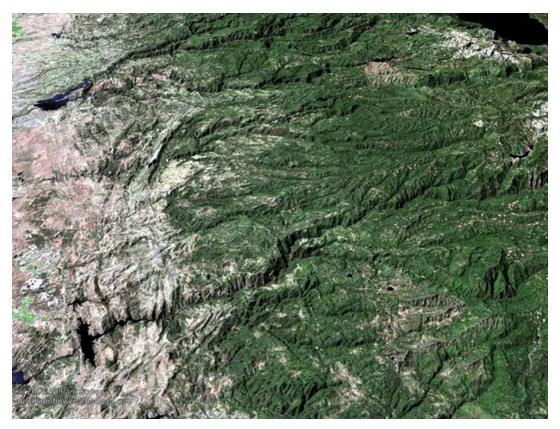


Planning Committee November 10, 2015





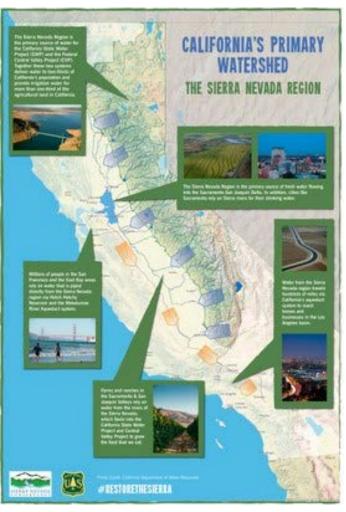
- Background
- Mokelumne Avoided
 Cost Analysis
- Finances
- \cdot Research
- Collaborative groups
- Next Steps



(Used with permission Dr. W. Bowen)

\cdot California source waters

- > 60% forested watersheds (SNC)







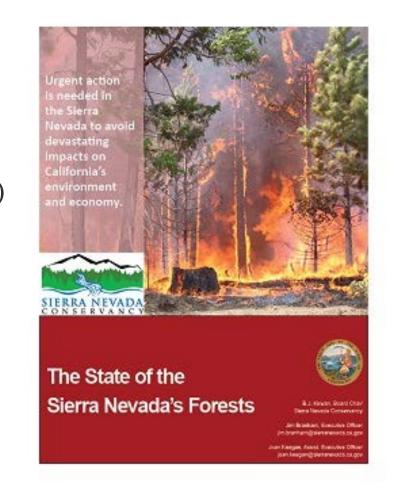


California source waters

 > 60% forested watersheds (SNC)

 Decline in forest health

 Fire suppression priorities
 Forest management conflicts





California source waters

 > 60% forested watersheds

 Decline in forest health

 Fire suppression priorities
 Forest management conflicts

- \cdot Accelerating decline
 - -Climate change
 - -Drought
 - -Insects/disease

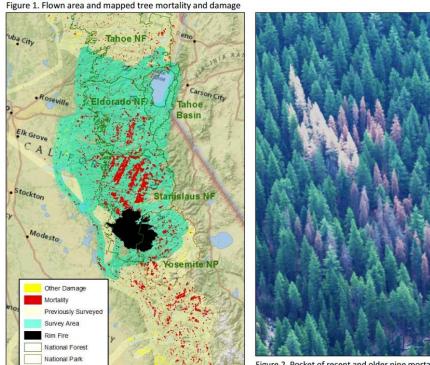


Figure 2. Pocket of recent and older pine mortality on the Stanislaus National Forest.

Health Detection Survey 2014 (USFS)



- · California source waters
 - > 60% forested watersheds
- Decline in forest health
 -Fire suppression priorities
 -Forest management conflicts
- Accelerating decline
 - -Climate change
 - -Drought
 - -Insects/disease
- · High intensity wildfire

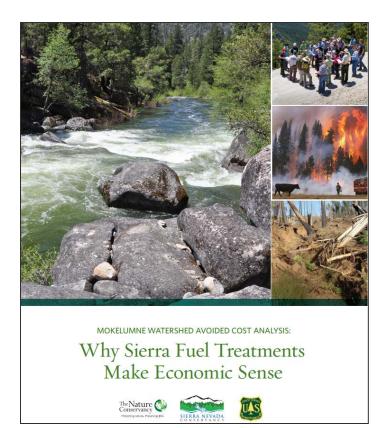


Butte Fire 2015 (Photo: C. Swann)

Mokelumne Avoided Cost Analysis



- · Sierra Nevada Conservancy
- Many stakeholders
- · Completed April 2014
- Case for investment into forested watersheds



Financing



· Mokelumne Fund

- National Forest Foundation
- · Blue Forest Conservation
 - -For-profit
- Public Capital For Public Good

-Non-profit



Who We Are > Regional Offices > California Program > Mokelumne Watershed Restoration Fund

PROJECTS -

BLOG CONTEST

BIG TUJUNGA CANYON RESTORATION ON THE ANGELES NATIONAL FOREST

CALIFORNIA ASSESSMENT OF WOOD BUSINESS INNOVATION OPPORTUNITIES AND MARKETS MOKELUMNE WATERSHED RESTORATION FUND

SAN GABRIEL MOUNTAINS COMMUNITY

SAN GABRIEL MOUNTAINS NATIONAL MONUMENT

TRUCKEE RIVER RESTORATION ON THE TAHOE NATIONAL FOREST SAN GABRIEL MOUNTAINS NATIONAL MONUMEN

Mokelumne Watershed Restoration Fund

Providing a major portion of the East San Francisco Bay's water, the Mokelumne River is a major Northern California watershed originating in the Sierra Nevada, draining in the Sacramentor-San Joaquin Delta and providing 90% of San Francisco: Statt Bay with its drinking water.

Read about a recent avoided cost study about the Mokelumne

The NFF is working with the Forest Service. Amador Calaveras Consensus Group. The Nature Conservancy. Sustainable Conservation. Sierra Nevada Conservancy and Environmental Defense to create public-private sector based founding for restoration. particularly in the upper watershed where ecological restoration may be critical for the future of the East Bay's water supply.

- Prezi: Moke Fund for Indivduals
 PDF: Moke Fund for Indivduals
- Prezi: Moke Fund for Businesses
- PDF: Moke Fund for Businesses
- Prezi: Moke Fund Restoration Examples
- PDF: Moke Fund Restoration Examples

Research



Forest restoration – water yield

- Sierra Nevada Research Institute (U.C. Merced)
- -Center for Forestry (U.C. Berkeley)
- Research needs
 - Water quality and economic benefits of forested watershed protection
 - ·U.S. Endowment for Forests and Communities
 - \cdot Water Research Foundation





Amador-Calaveras Consensus Group

ЕВМИД

Community-based

- Fire-safe communities
- Healthy forests and watersheds
- Sustainable local economies
- Grant projects
 - Cornerstone Project (USFS)
 - Capacity building (USFS/NFF)



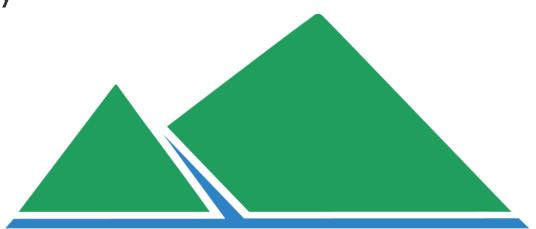
(Photo: USFS)

Upper Mokelumne River Watershed Authority



· Joint powers authority

- 3 counties
- 6 water agencies
- Sustainable local economies
- \cdot Regional
 - Regional Partnership Committee
 - MAC Plan (IRWMP)
 - MokeWISE (DWR)



Upper Mokelumne River Watershed Authority

Next Steps



Collaborations

- Forest health and restoration initiatives
 - ·E.g. USFS video project
- Research in forest health and watershed protection
- Directly and through the UMRWA
- Mokelumne Fund (NFF)
 - Website and bill insert



(Photo: SNC)



Use of Technology in Operations and Maintenance

Planning Committee November 10, 2015







- · Why adopt new technologies
- Internal and external challenges
- District use of technology
- · Lessons learned
- Next steps



· Obsolescence



- · Obsolescence
- Workforce expectations













- Obsolescence
- Workforce expectations
- · Regulatory

.







- · Obsolescence
- Workforce expectations
- · Regulatory
- · Operations



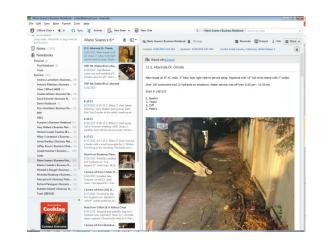


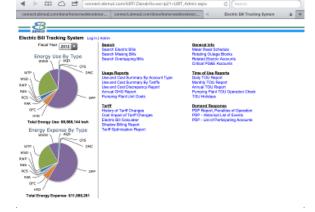


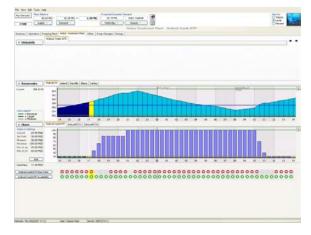


Why Adopt New Technology

- · Obsolescence
- Workforce expectations
- · Regulatory
- · Operations
- Efficiency, cost savings communication











- Internal challenges
- External challenges





Internal Challenges



- Risk
- Resources
- \cdot Complacency
- Resistance to change
- Purchasing rules

External Challenges



- Technology not ready (hype vs reality)
- · Salespeople vs technical staff
- Underestimating integration effort
- Actual cost includes our time
- Don't understand water business
- Viability of business

Technology Strategy



- Do the right things to address our business needs
- Communicate with staff
- Make the right investments
- Plan for the future
- Ensure what technology is secure and solution is cost effective
- Ensure long-term support

Technology at the District



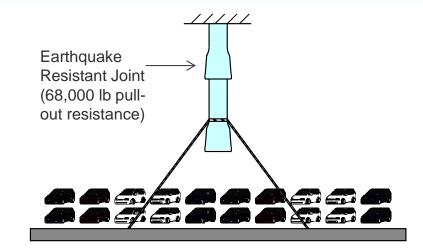
- Technology can improve efficiency and effectiveness
- Examples
 - Pipeline infrastructure
 - Mobile computing
 - Leak detection
 - Leveraging data
 - Water quality

Pipeline Infrastructure Kubota Pipe



<u>Earthquake resistant</u> <u>pipes</u>

- · Ductile iron pipe
- Multiple trials in the United States







Pipeline Infrastructure Kubota Pipe



- Pilot in Kensington completed October 2015
- 1800 feet on Edwin and Kerr Drive





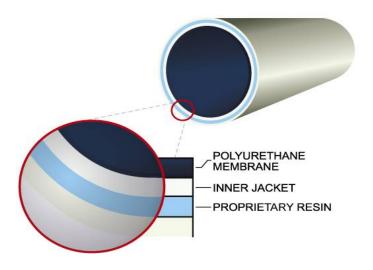


Pipeline Infrastructure Aquapipe



Alternative to open trench pipeline replacement

- Less impact to communities
- Structural liner from 6- to 24-inches
- Bonds to host pipe
- Pilot in early 2016 in Lafayette, Walnut Creek, Richmond





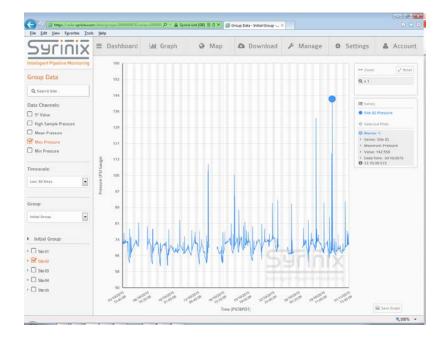
Pipeline Infrastructure Syrinix



Real-time monitoring of pressure transients

- Battery-powered
- 100+ readings per second
- Automatic notifications

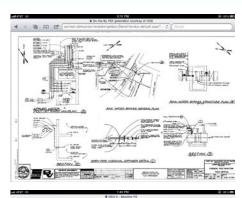


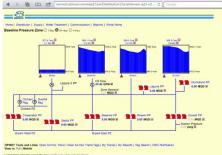


Mobile Computing

Information access for field staff

- Initial pilot in 2011
- Over 400 tablet computers and smartphones deployed
- Access to
 - Email
 - Drawings
 - Operational data
 - Field inspections





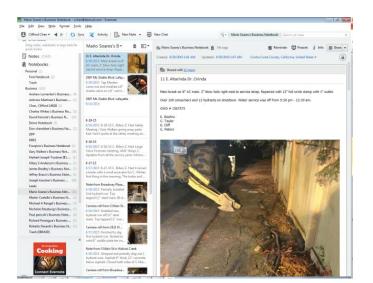




Mobile Computing



- Access to
 - Work orders
 - Journals
 - Customer inquiries



| | General Work Order System |
|---|--|
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| <u>GIS)</u> | Entered By: CSAYAD Entered On: 10/10/2011 Service No: assistant Construction status: |
| | Bldg Fract Street Apt City Cross Street |
| Create GWO Create Multiple General Work Orders | (60) SPOKANE () AVE () ALE (61) SNGHTON |
| Receive and Schedule New Service Orders | 211 ft (S of BRIGHTON ANE) on (E stde of SPOKANE AVE |
| Re-issue, Cancel or Print Schedules | Nap 1482 512 Tap # 034671 Thomas Bros: Page: 609 Grid: E5 From Org: 722 |
| (Query GWD:) | CS Flag: No GWO FENA Code: Service Improvement Nu: |
| | Water Discharge? Yes Est Flow Rate GPM 100 Discharge to storm drain? Yes FMP Used? Yes |
| (Query Scite) | Cause COMPLECTIVE MAINTERNANCE Priority S 7 Pipe Ext Backbone/Critical |
| Query GWOs | Problem STREET LEAK / USA. EXP. 11.02/11, C8 11/03/11 |
| Query All Work Orders | Damage Rpt? No 💽 Shut Down? No 💽 USAN 240172 USA Notif. Due Date/Time 1010207 🔤 07.92 |
| ColdFusion Reports | Permit # OT Code # of Surveys Issued |
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| Admin: | Issue Date: 1010301 - Comp Date: 1010001 - Prog/Proj: 5729 Est Hrst 0.6 Act Hrst 1 |
| Admin: Edit Default Program/Project Codes Edit Estimated Hours | |
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| | | | CTS: C | luery Inspections (cchar | •] | | | | |
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| ۵ 🔸 ک | connect.ebmud.com/cgi-bin/cts/,DanaInfo=database-info+cts_mai C Google | | | | | | | | |
| Home | Create an | Inspection | Query Inspections | Мар | Reports | Admin | Help | | |

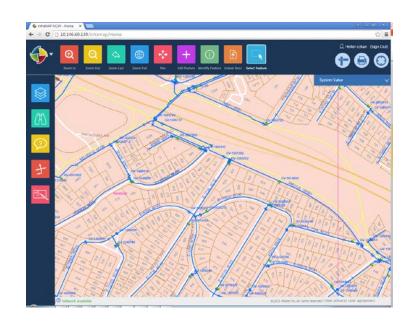
| Rear Respsi Front Respsi Message: Mr sz there is black particles in the water since last month ecp Request: C-Sediment - Particles; Cause: B-Consumer Comment | Customer: Phones: | JOHNATHAN CHIN 510 238-3684 (primary:C | | 03:15:33 Area: | S - SOUTH | (#167250) | 4844 Dunkirk Ave |
|--|----------------------|---|---------------------------|-----------------------|-----------|-----------|------------------|
| Medier No. 20775324 Size 56 Top 255444 Medier Loc. 1554/WOOTTER Zone B4 Account 4055/578-4 Pipe Size 6 Year 1956 Material: Association Cruiter (a) Lining: Coating: Static | Fax: | | E-mail: | | | | |
| Miller Loc. 185W COTTER Zone B4B Account 4051576-4 Pipe Size 6 Year 1966 Material: Assests concerver (µ). Lining: Coating: Static | Map: | 1530 B 460 | Old Thomas: 16 A 7 | New Thomas: | 671 E4 | | |
| Pipe Size: 6 Year: 1966 Material: Addicators Countyr (µ) Lining: Coating: Static psi Front Del gorn Rear Del gorn Massage: Mr sz thero is black particles in the water since last month exp; psi Front Res psi Request: C-Sediment - Particles; CMA Dispatch # 192717 Cause: B-Consumer Comment Action: E-Customer Advised Comment | | | Size 58 | Tap 256444 | | | |
| Static psi Front Del gom Rear Res psi Rew Del gom Front Res gsi opm Message: Mr sz there is black particles in the water since last month cop Request: C-Sediment - Particles; CMA Dispatch # 192717 Gause: B-Consumer Comment Comment Comment Action: E-Customer Advised Comment No refum call 2/28/11 | | | | | 51576-4 | | |
| Rear Respsi Front Respsi Mr sz there is black particles in the water since last month exp Request: CS-Sediment - Particles; Cause: B-Consumer Comment Action: E-Customer Advised Comment | Pipe Size: | 6 Year: 1956 Material: ASBESTO | S CEMENT (A) Lining: | Coating: | | | |
| Rear Res psi Front Res psi Message: Mr sz there is black particles in the water since last month cop Request: C-Sediment - Particles; CM Dispatch # 192/17 Gause: B-Consumer Comment Comment Comment Action: E-Customer Advised Comment No refum call 2/28/11 | | | | | | | |
| Message: Mr sz there is black particles in the water since last month ocp Request: C-Sediment - Particles; CMA Dispatch # 192/17 Cause: B-Consumer Comment Action: E-Oustomer Advised Comment | Static | psi | | | | | |
| Request C-Sediment - Particles; CMA Dispatch # 192/17 Cause: B-Consumer Comment Action: E-Customer Advised Comment No return call 2/28/11 | | | Rear Res p | si Front Res | psi | | |
| Gauss: B-Consumer Comment Action: E-Oustomer Advised Comment No return call 2/28/11 | Message: | Mr sz there is black particles in | the water since last mont | th.ecp | | | |
| Action: E-Customer Advised Comment No return call 2/28/11 | Request: | C-Sediment - Particles; | CMA Dispa | tch # 192717 | | | |
| | Cause: | B-Consumer | Comment | | | | |
| (J. Lyons) | Action: | E-Customer Advised | Comment | No return call 2/28/1 | 1 | | |
| | | (J. Lyons) | | | | | |
| | | (J. Lyons) | | | | | |
| | | | | | | | |
| | | | | | | | |

Mobile Computing



<u>Access to distribution</u> <u>system maps</u>

- Support maintenance
- Valve testing
- Shutdown planning and tracking



Leak Detection



Find non-surfacing leaks and quantify water loss

- · Acoustic Loggers
- Non-Metallic Pipe
 - Pilot starting December 2015
 - Complete April 2016
- Satellite Leak Detection
 - Pilot started March 2015
 - Complete April 2016
- District Metered Areas
 - Pilot starting early 2016

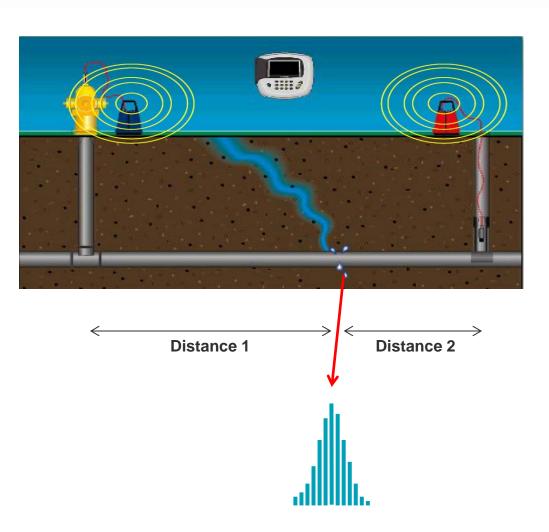




Leak Detection Acoustic Loggers









Leak Detection Acoustic Loggers



- Find non-surfacing leaks
- Goal to survey 300 miles each year

| Year | Miles Surveyed | Leaks Repaired |
|------|-------------------|-------------------|
| FY11 | 355 | 118 |
| FY12 | 315 | 128 |
| FY13 | 535 | 143 |
| FY14 | 227 | 183 |
| FY15 | 629 | 348 |

Leveraging Data Electric Bill Tracking



Leverage operational data

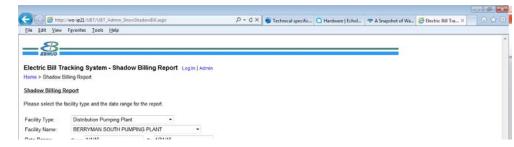
- · SCADA data
- Electric bill data
- · Hydraulic models



| Pref ENERGY STATEME | ENT Account No Statement Date Due Date | |
|---|--|---|
| | Due Date | . 11/09/2013 |
| Service For: | Your Account Summary | |
| EAST BAY MUNICIPAL UTILITY DISTRICT 1198 21ST ST | Amount Due on Previous Statement Payment(s) Received Since Last Statement | \$12,419.26 0.00 |
| OAKLAND, CA 94607 | Previous Unpaid Balance | \$12,419.26 |
| | Current Electric Charges | \$11,900.14 |
| Questions about your bill? | Total Amount Due by 11/09/2015 | \$24,319.40 |
| 24 hours, 7 days/wk 1-800-468-4743 Business Specialist available: Mon-Sat: 7am to 9pm www.pge.com/MyEnergy | | 024,010.40 |
| Local Office Address | | |
| 1919 WEBSTER ST OAKLAND, CA 94612 | | |
| | | |
| EV- | Electric Monthly Billing History | Daily Usage Comparison |
| 1 G | \$15000 \$11250 \$7500 | 1 Yeat Last Current Ago Period Period Isat 38 1909 39 |

Leveraging Data Electric Bill Tracking





Shadow Billing Report from 1/1/2015 to 1/31/2015

| · Lev | Service Name | Service ID | Calculated \$ | PG&E \$ | \$ Difference | % Difference | |
|-------|--------------------------|------------|---------------|--------------|---------------|--------------|---------|
| | BERRYS/DINGEE/SUMMITS PP | 2991337005 | \$104,067.22 | \$102,831.19 | \$1,236.03 | 1% | Details |

and I use uata

Electric Bill Tracking System - Tariff Optimization Report Log In | Admin

Home > Tariff Optimization Report

Tariff Optimization Report

- Shadow billing

Please select the facility type and the calendar year for the report.

Facility Type: Distribution Pumping Plant

Calendar Year: 2015 •

Tariff Comparison Report for accounts currently in E19 Tariff for Calendar Year 2015

| Service Name | Service ID | Current Tariff | Current Tariff \$ | | 20 \$ | A | 6\$ | 4 | \10 \$ | | A1 \$ | \$ D | ifference | % Difference |
|--------------------------|------------|-------------------|---|--------------|-------------------|---------------------|--------------|------------|------------|-------------|---------------|--------------|-----------|--------------|
| BAYFAIR PP PERALTA PP | 5897607611 | E19PX | \$71,910 | \$84 | 4,612 | \$60 |),379 | \$7 | 79,52 | 4 | \$70,415 | 5 - | \$11,531 | -16% |
| punneau | IVII | | EMMONS PP | 5897607044 | E19S | \$70,441 | \$70,411 | \$77,641 | \$95,758 | \$102,470 | -\$29 | 0% | 1 | |
| | | | HAWTHORNE PP | 5897607159 | E19SX | \$68,651 | \$74,812 | \$76,161 | \$83,981 | \$90,165 | \$0 | 0% | | |
| - | | | JOAQUIN MILER PP | 5897607889 | E19SX | \$44,118 | \$50,436 | \$43,811 | \$52.093 | \$52,367 | -\$307 | -1% | | |
| | | | MADRONE PP PALO SECO PP | 5897607912 | E19SX | \$46,755 | \$53,698 | \$43,639 | \$52,220 | \$52,635 | -\$3,116 | -7% | | |
| | | | MONTCLAIR PP | 5897607317 | E19SX | \$57,992 | \$63,730 | \$45,914 | \$61,988 | \$54,610 | -\$12,078 | -21% | | |
| | | | MOYERS PP ROAD 24 NO. 2 PP | 5897607884 | E19SX | \$59,019 | \$64,745 | \$39,665 | \$61,623 | \$48,325 | -\$19,354 | -33% | | |
| | | | PIEDMONT PP | 5897607553 | E19SX | \$90,601 | \$95,085 | \$70,963 | \$93,201 | \$79,560 | \$19,639 | -22% | | |
| | | | QUARRY PP | 5897607371 | E19SX | \$49,925 | \$55,908 | \$48,014 | \$58,326 | \$57,987 | -\$1,911 | -4% | | |
| | | | Total | | | | | | | | \$107,843 | | | |
| | | | | Tariff Compa | rison Report | for accounts | currently in | E20 Tariff | for Calend | lar Year 20 | 15 | | | |
| | | | Service Name | Service ID | Current Tariff | Current Tariff S | E19 \$ | A6 \$ | A10 \$ | A1 S | \$ Difference | % Difference | | |
| | | | BERRYMAN SOUTH PP DINGEE PP SUMMIT SOUTH PP | 2991337005 | E20P | \$468,350 | \$467,130 | \$590,324 | \$591,669 | \$693,947 | -\$1,220 | 0% | | |
| | | | CASTENADA PP | 6522588005 | E20P | \$375,660 | \$374,350 | \$391,160 | \$454,572 | \$476,849 | -\$1,310 | 0% | | |
| | | | SAN RAMON PP | 7522612022 | E20S | \$434,171 | \$445,801 | \$473,548 | \$538,836 | \$567,273 | | 0% | | |
| | | | Total | | | | | | | | -\$2,530 | | | |

Water Quality Monitoring



Improve real time water quality monitoring

- Trihalomethane Analyzer
 - Purchased in 2014
 - Results in 30 minutes
- Luminultra
 - Purchased in 2014
 - Detect biological activity
 - Results in minutes





Water Quality Monitoring



Improve distribution system water quality

- Chloramine Boosting
 - Maintain chloramine residual in reservoirs
 - Installed 2014 at Tice Reservoir in Walnut Creek
- Ice Pigging
 - Clean distribution system pipes
 - Piloted in 2014 and 2015 at two sites



TANK Shark™



Utility Service

Groud



- Understand the purpose of the pilot
 - Test the technical feasibility of technology
 - Demonstrate feasibility with staff
- Carefully pick the pilot location and testers
- Think about scalability
- Include users in pilot design



- "What are you trying to solve?" Don't get caught up in the allure of new technology
- "Do I already have something that solves this problem?"
- "Is this going to create more problems?"
- "How much is this going to <u>really</u> cost?"

Isle Technology Advisory Group



- · Joined in 2013
- \cdot Technology and innovation consultant
- Partnership with Water Research Foundation
- · 80 members worldwide, 15 in the United States

| Technologies Presented | Technologies Piloted or Investigated | Technologies Used by District |
|---------------------------|--|-------------------------------------|
| 50 | 15 | 8 |

Maintenance Technology Committee



- Started in 2015
- Staff from divisions within OMD
- Identify and vet new technologies
- Four new technologies identified

Lessons Learned



- Identify technology champions
- · Plan big, start small
- Meet with the users
- Manage expectations
- Look for small wins
- Leverage existing technologies, tools and applications
- Be willing to make mistakes





- Evaluate and test new technologies
- Leverage and expand use of mobile computing
- Continue participation in Isle TAG





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Water Recycling Coordination with West County Wastewater District

Planning Committee November 10, 2015



Presentation Outline



- \cdot Background
- · Recycled Water Quality Issues
- Coordination Efforts with WCWD
- Next Steps

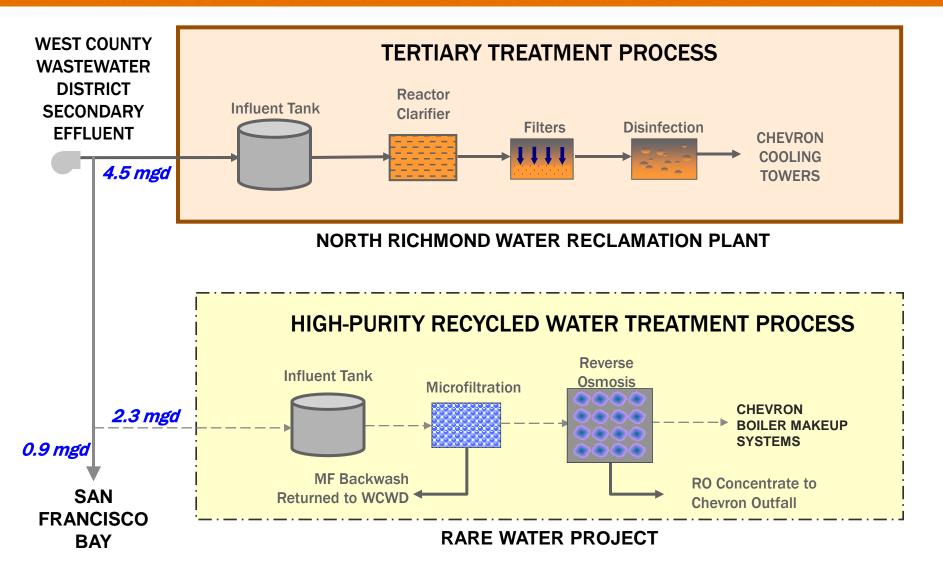
Water Recycling Facilities Serving Chevron Refinery





WCWD Supply to District Water Recycling Facilities

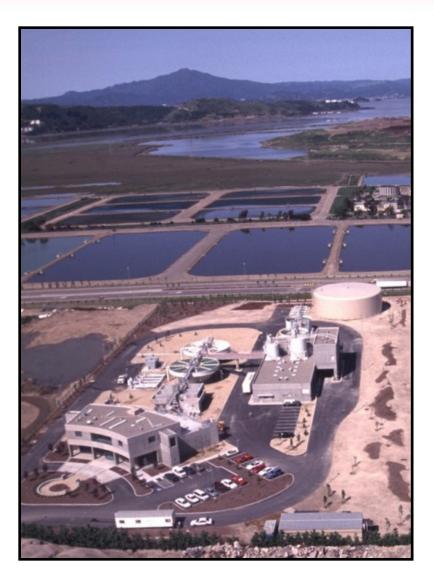




North Richmond Water Reclamation Plant



- Product water has been used in Chevron cooling towers since 1995
- Not designed to remove ammonia
- High ammonia and turbidity in WCWD source water



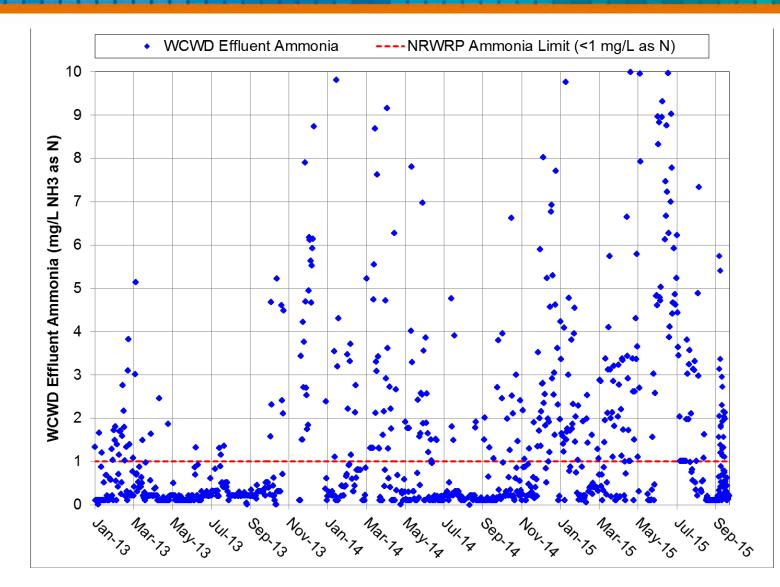
Recycled Water Quality Issues Key NRWRP Water Quality Requirements



- Ammonia <1.0 mg/L—District agreement with Chevron
- Effluent turbidity <2 NTU—RWQCB Order

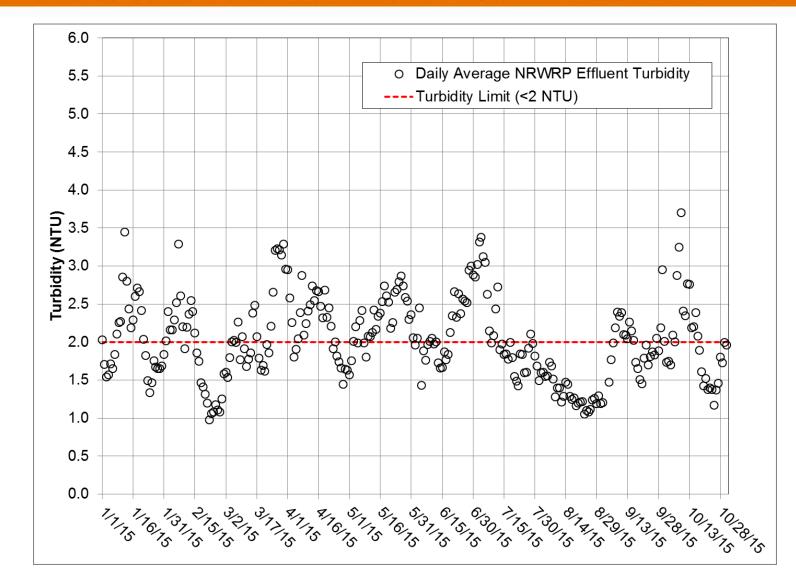
Recycled Water Quality Issues WCWD Effluent Ammonia





Recycled Water Quality Issues NRWRP Effluent Turbidity

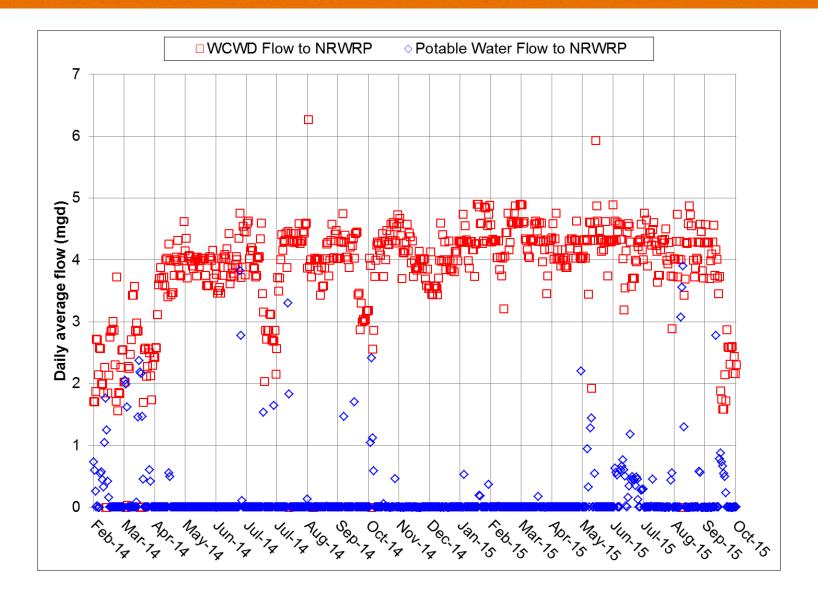




Recycled Water Quality Issues District Operational Response

- Blend NRWRP recycled water product with potable water to meet Chevron requirements (avoid plant shutdown)
- \cdot Use breakpoint chlorination
 - Oxidizes ammonia to a nitrogen gas
 - Limited effectiveness, unreliable, costly

Potable Water Blending at NRWRP





- In September 2015, senior management from both agencies met to develop a joint process to address water quality issues
 - Agreement to jointly develop operational and capital improvements with short- and long-term focus
- Staff is participating in regular technical meetings with WCWD staff to jointly develop short- and long-term improvement plans

- Identify and implement interim measures (pre-June 2017) to ensure reliable ammonia removal via the biological treatment process at WCWD
- Identify fair apportionment of costs between the two agencies

Joint Coordination Long-term Plan Development

- WCWD intends to have a new nitrogen removal process operational by June 2017
 - Work with WCWD to meet District recycled water quality requirements using new process
 - Identify fair apportionment of costs between the two agencies
- Coordinate development of the District's master planning activities for NRWRP and RARE with WCWD long-term planning efforts

Next Steps



- Continue joint development of long- and short-term improvement plans
- Request a meeting with Board representatives from both agencies where staff would jointly present the improvement plans