

**Low Income Water Use Efficiency Assistance Program
High Efficiency Clothes Washer Direct Install**

Water, Energy, and GHG Savings

Step 1: Enter the baseline (pre-project) volume of water associated with the project.

For this project, the baseline is assumed to be the pre-project volume of water that is not conserved. The pre-project volume of water associated with the project is 6.3 MG/year. This is the volume of water that can be saved by installing high efficiency clothes washers (HECWs), low-flow showerheads, and aerators, and is calculated as follows:

- HECW clothes washer water savings: Assumes HECWs save 9,000 gallons per washer per year. The 500 washers to be replaced are assumed to use 4.5 million gallons of water per year.
- Showerheads: Assumes non-low flow shower heads use 2,900 gallons per showerhead per year. The 500 shower heads to be replaced are assumed to use 1.45 million gallons of water per year.
- Faucets without aerators: Assumes faucets without aerators use 700 gallons per faucet per year. The 500 faucets that will have aerators installed are assumed to use 0.35 million gallons per year.

Appendix 2-2 provides support for these volumes of saved water.

Step 2: Enter the volume of water that will be delivered after the project is implemented.

After the project is implemented, the water savings described in Step 1 will be realized. Therefore, the Step 2 volume is assumed to be 0 MG.

Step 3: Enter the volume of hot water saved from the project's electric water heating system (the summation of step 3 and step 4 must not exceed annual volume of water savings). If not applicable, enter "0".

The requirements of this rebate program include a water heater energy source provided by Southern California Gas Company which is a natural gas provider. Therefore, the volume of hot water provided by the project's electric water heating system is "0".

Step 4: Enter the volume of hot water saved from the project's natural gas water heating system (the summation of step 3 and step 4 must not exceed annual volume of water savings). If not applicable, enter "0".

According to Energy.gov (see Appendix 2-2, Tips: Water Heating, <http://energy.gov/energysaver/articles/tips-water-heating>), faucets and clothes washers use the following volumes of hot water:

**Low Income Water Use Efficiency Assistance Program
High Efficiency Clothes Washer Direct Install**

Water, Energy, and GHG Savings

- Clothes washers: 25 gallons per use
- Shower: 10 gallons per use
- Kitchen and bathroom faucets: 2 gallons per minute

It is assumed that these volumes of hot water are from non-efficient faucets and clothes washers. Non-efficient faucets, showerheads and clothes washers are assumed to use the following **total volume** of water per use:

- Clothes washers: Up to 45 gallons per use (Home Water Works, Clothes Washer, <http://www.home-water-works.org/indoor-use/clothes-washer>)
- Shower: 17.2 gallons per use (Home Water Works, Shower, <http://www.home-water-works.org/indoor-use/showers>)
- Kitchen and bathroom faucets: 2-4 gallons per minute. Assuming 3 gallons per minute for the purposes of this application. (USGS, Water Questions & Answers, <http://water.usgs.gov/edu/qa-home-percapita.html>)

Given this information, hot water makes up the following percentage use per device:

- Clothes washers: 56%
- Shower: 58%
- Kitchen and bathroom faucets: 67%

When these percentages are applied to the water savings discussed under Step 1, the volume of hot water saved per device is:

- Clothes washers: 2.52 million gallons of water per year
- Shower: 0.84 million gallons of water per year
- Kitchen and bathroom faucets: 0.23 million gallons of water per year

Based on these assumptions, 3.59 million gallons of hot water are saved from natural gas water heating systems through this project.

See Appendix 2-2 for screenshots of the above cited web pages.

Step 5: Enter the useful life in years for the project.

The useful life of the project is 13.4 years. This is based on a supply benefit weighted average of each fixture to be installed, and uses the following assumptions and formula:

- HECW useful life is 14 years, 5.6 MG/yr water savings
- Low-flow showerhead useful life is 5 years, 1.0 MG/yr water savings

**Low Income Water Use Efficiency Assistance Program
High Efficiency Clothes Washer Direct Install**

Water, Energy, and GHG Savings

- Aerator useful life is 2 years, 0.3 MG/yr water savings

(See EMWD Board letter dated February 22, 2012 provided in Appendix 2-2).

$[(\text{HECW useful life} \times \text{HECW annual benefit}) + (\text{Showerhead useful life} \times \text{showerhead annual benefit}) + (\text{Aerator useful life} \times \text{aerator annual benefit})] / \text{Total annual savings}$

$[(14 \text{ yrs} \times 5.6 \text{ MG/yr}) + (5 \times 1.0 \text{ MG/yr}) + (2 \times 0.3 \text{ MG/yr})] / 6.9 \text{ MG/yr} = \mathbf{13.4 \text{ yrs}}$

Step 6: Enter the percentage of water that is imported.

EMWD receives imported water, local potable water, local desalinated groundwater, and recycled water. As shown in Table 2-1, EMWD’s imported water supply consists of treated and untreated water for Metropolitan Water District of Southern California (MWD) and accounts for approximately **61%** of EMWD’s total water supply over the past 5 years.

Table 2-1 Water Supply (AFY) 2007-2011

Type	2009	2010	2011	2012	2013	Average Percent
Imported	84,200	75,000	72,510	53,467	52,013	47%
Imported – Locally Treated	17,000	16,600	17,023	20,274	29,618	14%
Groundwater	18,100	15,800	17,464	15,489	18,823	12%
Desalination	4,800	5,800	5,706	5,666	5,003	4%
Recycled Water	32,441	28,246	31,029	36,763	34,533	23%
Total	156,541	141,446	143,732	131,659	139,990	100%

Step 7: Enter the Energy Intensity (EI) of the System associated with the project's water savings.

According to Table 2-3 of EMWD’s Energy Management Plan, 2014 (see Appendix 2-2), the following system energy demands apply to the Project:

Table 2-2 EMWD Water System Electricity Usage

Water Category	Flow (MG)	Electricity Usage (kWh/year)
Water	30,279	36,553,280
Raw Water	n/a	1,990,000

Low Income Water Use Efficiency Assistance Program High Efficiency Clothes Washer Direct Install

Water, Energy, and GHG Savings

Wastewater	n/a	45,694,000
Total System Energy Usage	n/a	84,237,280
Total Water Flow	30,279	
Total Energy Use/flow	2,782 kWh/MG	

- **Water:** The “Water” category includes the facilities that treat and convey potable water to the EMWD service area. This is water treated by EMWD for potable use and purchased potable water. This category includes such facilities as wells, water treatment plants, and brine disposal.
- **Raw Water:** The “Raw Water” category includes facilities that import raw, untreated water to EMWD water treatment facilities and to groundwater wells for recharge. This energy demand originates from EMWD’s raw water booster pumping plants. The energy to pump this water back out of the aquifer is included in the “Water” category.
- **Wastewater:** The “Wastewater” category includes facilities that convey and treat wastewater in the EMWD service area. This category includes regional water reclamation facilities, sewage lift stations, and booster pump plants.

Because the Project only involves the potable water distribution system, EMWD’s recycled water system energy requirements and flow are not included in the EI calculation of the system associated with the Project. For a more detailed breakdown of the energy demands of each category, see the attached table from EMWD’s 2014 Energy Management Plan.

To calculate the energy intensity of the system, the energy demands of the water, raw water and wastewater were combined and divided by the total flow. To avoid double counting any water volume, the total flow only includes the “Water” flow, not the “Wastewater” flow. The energy per unit of water associated with the Project is therefore:

$$\text{Energy of the (Water + Raw Water + Wastewater)/Total Flow}$$

$$(84,237,280 \text{ kWh per year}) / (30,279 \text{ MG per year}) = \mathbf{2,782 \text{ kWh/MG}}$$

This EI is applied to the project benefit area, but is the EI for EMWD’s entire system.

Step 8: Enter the total output emission rate specific to the power supplier or use the default value of 0.278 kg CO₂e/kWh.

The default value of **0.278 kg CO₂e/kWh** is used as the total power supplier output emission rate. A more specific value could not be identified at this time.

Low Income Water Use Efficiency Assistance Program High Efficiency Clothes Washer Direct Install

Water, Energy, and GHG Savings

Step 9: Enter EI associated with the Supply and Conveyance segment of the imported water or enter “0” if imported water is not applicable.

Of EMWD’s imported water supplies, approximately 80% is from the SWP and 20% from the CRA (based on EMWD’s 2010 UWMP). EMWD receives water from the SWP from the Pearblossom Pumping Plant at 13,606 kWh/MG and from the CRA at 6,066 kWh/MG. The total EI associated with the supply and conveyance of the imported water is therefore 13,606 kWh/MG x 80% + 6,066 kWh/MG x 20% = **12,098 kWh/MG**

Step 10: Enter any additional annual energy savings from energy efficiency and renewable energy (EE/RE), etc.

Installation of HECWs in place of standard clothes washing machines is expected to result in energy savings as HECWs are more energy efficient than standard clothes washing machines. It is estimated that HECWs use approximately 270 kWh per year according to the Energy Star website (<http://www.energystar.gov/products/certified-products/detail/clothes-washers>). A review of eight models of standard, non-energy star washing machines finds that on average, standard washers use approximately 476 kWh/yr (see table below). Therefore, installation of one HECW will result in energy efficiency savings of 206 kWh/yr, or 103,000 kWh/yr for 500 HECWs.

Standard Clothes Washing Machine Model	Estimated Energy Usage
Kenmore 3.4 cu. ft. Top-Load Washing Machine	470
Kenmore 3.6 cu. ft. Top-Load Washer w/ Clean Washer Cycle	488
Maytag 3.6 cu. ft. Centennial® Top-Load Washer w/ Handwash Cycle	488
GE 3.9 cu. ft. Top Load Washer	492
GE 3.7 cu. ft. Top Load Washer	477
Maytag 3.6 cu. ft. Centennial® Top-Load Washer w/ Bulky/Sheets Cycle	488
Hotpoint 3.5 cu. ft. Top Load Washer	434
Average kWh/yr	476

Source: www.sears.com, December 9, 2014

**Low Income Water Use Efficiency Assistance
Program**

**Water and Energy Savings
and GHG Calculations**

Appendix 2-2
**Supporting Documentation for the High Efficiency Clothes Washer Direct
Install Project**

- **Board of Directors**
Water Planning, Quality and Resources Committee

November 9, 2004 Board Meeting

9-10

Subject

Approve increases to Metropolitan's existing High Efficiency Clothes Washer incentive and \$750,000 additional funding to sustain the program through the remainder of fiscal year 2004/05

Description

Staff proposes an increase to Metropolitan's current High Efficiency Clothes Washer (HECW) incentive of \$35 to \$60 per unit to encourage residential retrofits with models that save more water. Additional matching funds up to \$25 per unit are also proposed to sustain increased retrofit activity previously achieved using grant funds. Offering those higher incentives would incur an estimated \$750,000 above budget during the remainder of the fiscal year. Maintaining momentum, HECW retrofits will help Metropolitan meet its 2025 goal for regional water conservation.

New base incentive rate

Metropolitan's HECW incentive of \$35 per unit is based on board policy of \$154 per acre-foot of water saved and clothes washer unit savings of 5,250 gallons per year. The incentive is provided for washers with a Water Factor (WF) of 8.5, which represents the amount of water needed to clean a standard load of laundry. Washers with lower WFs save more water. Presently, there are more efficient models on the market, saving up to 70 percent more.

Staff recommends increasing Metropolitan's current incentive to \$60 per unit. This incentive rate is within the policy of providing \$154 per acre-foot of water saved and would not exceed half the cost of the device. The increased incentive reflects water savings for washers that meet or exceed a new WF benchmark of 6 or lower to save an average of 9,000 gallons per year. Metropolitan would immediately provide the \$60 incentive for all HECWs installed and, as a transition, wait until June 2005 to allow time for member agencies to establish the new WF of 6.0 in their marketing materials.

Sustaining a high level of retrofits

In February 2004, Metropolitan executed a \$2.5-million grant contract with the Department of Water Resources to provide funding for the HECW program under Proposition 13. Thus far, the response has been overwhelming, far exceeding staff expectations with retrofit activity increasing from an average of 2,800 units per month to 4,300 units per month between May and August. Staff estimates that current grant funds will likely be exhausted between November and June 2005, depending on each member agency's individual rebate activity levels.

To sustain momentum and success of customer response and retrofits under the Proposition 13 grant program, staff recommends providing an additional incentive of \$25 per unit, contingent on member agency matching funds. This commitment would begin as soon as each member agency's program allocation runs out and extend through December 2006. Member agencies that provide matching funds would receive up to \$85 per unit from Metropolitan. To receive the maximum amount, member agencies must provide customers at least \$100 per unit in incentives and may document to Metropolitan marketing costs of up to \$10 per unit as part of its matching funds.

A group of member agencies have requested that Metropolitan continue funding the program at the existing grant-level of \$110 per unit without requiring any matching funds from them. This alternative would result in a

departure from the existing board policy of providing \$154 per acre-foot of water saved and instead cost \$282 per acre-foot.

Budget Impacts

An increase in Metropolitan's incentive rate and matching funds would increase expenditures to \$750,000 beyond budget through the end of this fiscal year. Beginning next fiscal year and through December 2006, an estimated \$975,000 would need to be included in future years' budgets.

Metropolitan funding at \$110 per unit would result in an increased expenditure to \$1.1 million beyond budget through the end of this fiscal year. Beginning next fiscal year and through December 2006, an estimated \$1.9 million would need to be included in future years' budgets.

Future Grant Funding

In consultation with the member agencies, Metropolitan is exploring additional opportunities for grant funding beyond the conclusion of the current Proposition 13 program. The next opportunity is Proposition 50. If awarded, grant funding could be available in late 2005. Staff would cease or reduce the matching \$25 per unit incentive when grant funding is received.

Policy

By Minute Item 43397, dated Feb. 9, 1999, the Board authorized the General Manager to enter into agreements to provide \$35 per water efficient clothes washers.

By Minute Item 45534, dated Oct. 14, 2003, the Board adopted Resolution 8874 for \$2.5 million in Proposition 13 funds for the HECW program, and approved extending the expenditure of bridge funding (\$110/unit) until Proposition 13 funds become available or through June 2004, whichever comes first.

California Environmental Quality Act (CEQA)

CEQA determination for Options #1 and #2:

The proposed action is not defined as a project under CEQA because it involves continuing administrative activities (Section 15378(b)(2) of the State CEQA Guidelines). In addition, the proposed action is not subject to CEQA because it involves other government fiscal activities, which do not involve any commitment to any specific project, which may result in a potentially significant physical impact on the environment (Section 15378(b)(4) of the State CEQA Guidelines).

The CEQA determination is: Determine that the proposed action is not subject to the provisions of CEQA pursuant to Sections 15378(b)(2) and 15378(b)(4) of the State CEQA Guidelines.

Board Options/Fiscal Impacts

Option #1

Adopt the CEQA determination and

- a. Approve increase to Metropolitan's HECW incentive to \$60 per unit for units with a Water Factor of 6.0 or less;
- b. Approve additional incentive of up to \$25 per unit contingent on member agency matching funds; and
- c. Approve additional expenditure of \$750,000 of unbudgeted funds through June 2005 to sustain the program.

Fiscal Impact: Up to \$1.72 million through December 2006

Option #2

Adopt the CEQA determination and

- a. Approve increase to Metropolitan's HECW incentive to \$60 per unit for units with a Water Factor of 6.0 or less;
- b. Approve additional expenditure of \$50 per unit through December 2006 for a total incentive of \$110 per unit; and

- c. Approve additional expenditure of \$1.1 million of unbudgeted funds through June 2005 to sustain the program.

Fiscal Impact: Up to \$3 million through December 2006

Staff Recommendation

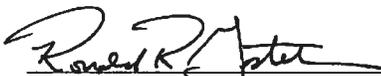
Option #1



B. Anatole Falagan
for Stephen N. Arakawa
Manager, Water Resource Management

10/28/2004

Date



Ronald R. Gastelum
Chief Executive Officer

10/28/2004

Date

BLA #3062

look for



WaterSense® Labeled

Bathroom Sink Faucets & Accessories

Most of us know we can save water if we turn off the tap while brushing our teeth (as much as 3,000 gallons per year!), but did you know that there are products that will help save water when you turn on the tap too? WaterSense labeled faucets and faucet accessories (e.g., aerators) are high-performing, water-efficient fixtures that will help you reduce water use in your home and save money on water bills.

FAUCET FLOWS

WaterSense labeled bathroom sink faucets and accessories that use a maximum of 1.5 gallons per minute can reduce a sink's water flow by 30 percent or more from the standard flow of 2.2 gallons per minute without sacrificing performance. We could save billions of gallons nationwide each year by retrofitting bathroom sink faucets with WaterSense labeled models.

All products bearing the WaterSense label complete a third-party certification process to ensure they meet U.S. Environmental Protection Agency (EPA) criteria. Faucets and faucet accessories—products that can be attached easily to existing faucets to save water—that obtain the WaterSense label have demonstrated both water efficiency and the ability to provide ample flow.

WATERSENSE SAVINGS

Replacing old, inefficient faucets and aerators with WaterSense labeled models can save the average family 700 gallons of water per year, equal to the amount of water needed to take 40 showers. Since these water savings reduce demands on water heaters, households will also save enough energy to run a hairdryer 10 minutes a day for a year. Achieving these savings can be as easy as twisting on a WaterSense labeled aerator, which can cost as little as a few dollars. If every home in the United States replaced existing faucets and aerators with WaterSense labeled models, we could save nearly \$1.2 billion in water and



WaterSense labeled bathroom faucets and aerators can save the average family 700 gallons of water per year.

energy costs and 64 billion gallons of water across the country annually—equivalent to the annual household water needs of more than 680,000 American homes.

LOOK FOR THE WATERSENSE LABEL!

Whether replacing an older, inefficient faucet, or looking to reduce water in your bathroom, choose a WaterSense labeled sink faucet or faucet accessory. WaterSense labeled models are available at a wide variety of price points and styles. In many areas, utilities offer rebates and vouchers that can lower the price further.

For more information or a list of WaterSense labeled products, visit www.epa.gov/watersense.



look for



WaterSense® Labeled

Showerheads

Showering is one of the leading ways we use water in the home, accounting for nearly 17 percent of residential indoor water use. For the average family, that adds up to nearly 40 gallons per day. That's nearly 1.2 trillion gallons of water used in the United States annually just for showering, or enough to supply the water needs of New York and New Jersey for a year! By retrofitting your showerheads with WaterSense labeled models, you can save a considerable amount of this water.

SHOWER WITH POWER

Did you know that standard showerheads use 2.5 gallons of water per minute (gpm)? Showerheads that earn the WaterSense label must demonstrate that they use no more than 2.0 gpm. The WaterSense label also ensures that these products provide a satisfactory shower that is equal to or better than conventional showerheads on the market. The U.S. Environmental Protection Agency (EPA) worked with a variety of stakeholders—including consumers who tested various showerheads—to develop criteria for water coverage and spray intensity. All products bearing the WaterSense label must be third-party certified to ensure they meet EPA water efficiency and performance criteria.

WATERSENSE SAVINGS

The average family could save 2,900 gallons of water per year by installing WaterSense labeled showerheads. Since these water savings will reduce demands on water heaters, they will also save energy. The average family could save more than 370 kilowatt hours of electricity annually, or the amount it takes to power a house for 13 days. On a national scale, if every home in the United States installed WaterSense labeled showerheads, we could save more than \$2.2 billion in water utility bills and more than 260 billion gallons of water annually. In addition, we could avoid about \$2.6 billion in energy costs for heating water.



WaterSense labeled showerheads could save the average family 2,900 gallons of water per year.

LOOK FOR THE WATERSENSE LABEL!

Whether you are replacing a showerhead or simply looking for ways to reduce water use and utility bills in your home, look for the WaterSense label when purchasing showerheads to help you identify models that save water and perform well.



In many areas, utilities offer rebates and vouchers that can lower the price of a WaterSense labeled showerhead. For more information or a list of WaterSense labeled products, visit www.epa.gov/watersense.



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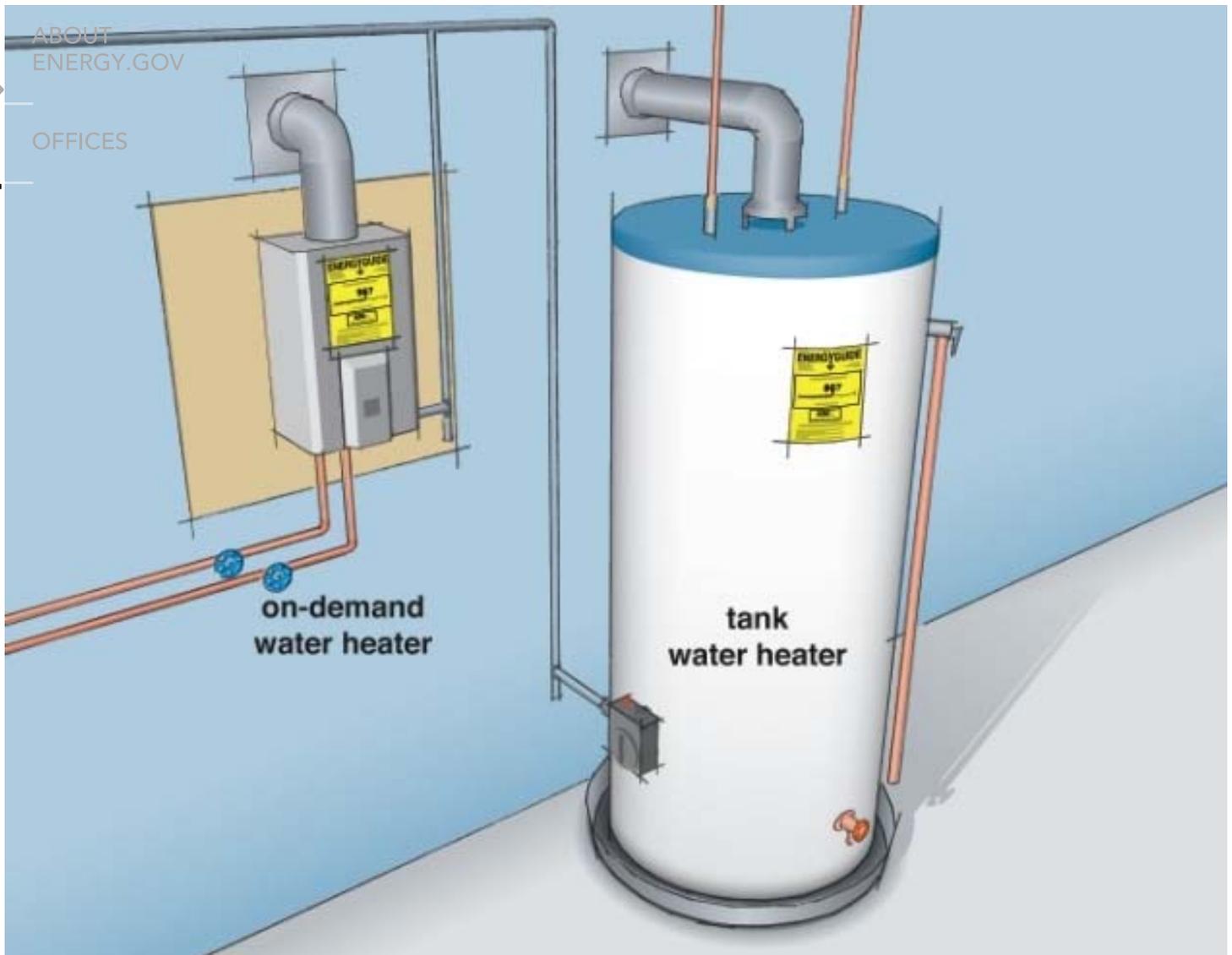
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Keep your energy bills out of hot water. Insulate your water heater to save energy and money, or choose an on-demand hot water heater to save even more.

Water heating is the second largest energy expense in your home. It typically accounts for about 18% of your utility bill after heating and cooling.

There are four ways to **cut your water heating bills**: use less hot water, turn down the thermostat on your water heater, insulate your water heater, or buy a new, more efficient model.

WATER HEATING TIPS

- Install aerating, low-flow faucets and showerheads.
- Repair leaky faucets promptly; a leaky faucet wastes gallons of water in a short period of time.
- Set the thermostat on your water heater to 120°F to get comfortable hot water for most uses.
- Insulate your electric hot-water storage tank but be careful not to cover the thermostat. Follow the manufacturer's recommendations.
- Insulate your natural gas or oil hot-water storage tank but be careful not to cover the water heater's top, bottom, thermostat, or burner compartment. Follow the manufacturer's recommendations; when in doubt, get professional help.
- Insulate the first 6 feet of the hot and cold water pipes connected to the water heater.
- If you are in the market for a new dishwasher or clothes washer, consider buying an efficient, water-saving ENERGY STAR® model to reduce hot water use. See the **Appliances** section for more information.
- Install heat traps on the hot and cold pipes at the water heater to prevent heat loss. Most new water heaters have built-in heat traps.
- Drain a quart of water from your water tank every 3 months to remove sediment that impedes heat transfer and lowers the efficiency of your heater. Follow the manufacturer's directions.

Although most water heaters last 10-15 years, it's best to start shopping now for a new one if yours is more than 7 years old. Doing some research before your heater fails will enable you to select one that most appropriately meets your needs.

LONG-TERM SAVINGS TIPS

- Buy a new energy-efficient water heater. While it may cost more initially than a standard water heater, the energy savings will continue during the lifetime of the appliance. Look for the ENERGY STAR® and EnergyGuide labels. You can find the ENERGY STAR label on efficient water heaters in the following categories: high efficiency gas non-condensing, gas condensing, electric heat pump, gas tankless, and solar.
- Consider natural gas on-demand or tankless water heaters, which heat water directly without using a storage tank. Researchers have found energy savings can be up to 30% compared with a standard natural gas storage tank water heater.
- Consider installing a drain-water waste heat recovery system. Drain-water, or greywater, heat recovery systems capture the energy from waste hot water -- such as showers and dishwashers -- to preheat cold water entering the water heater or going to other water fixtures. Energy savings vary depending on individual household usage.
- Heat pump water heaters can be very cost effective in some areas. Heat pump water heaters can cut water heating costs by an average of 50% over standard electric water heaters. If your water heater is located in your basement, it will also provide dehumidification in the summer months. However, this technology can pose some installation challenges, so you should consult with an installer before you purchase one.

AVERAGE HOT WATER USAGE

Faucets and appliances can use a lot of hot water, which costs you money. Look for ways to heat your water more efficiently and use less.

Activity	Gallons per Use
Clothes washer	25
Shower	10
Automatic dishwasher	6
Kitchen faucet flow	2 per minute
Bathroom faucet flow	2 per minute
Total daily average	64

SOLAR WATER HEATERS

If you heat water with electricity, have high electric rates, and have an unshaded, south-facing location (such as a roof) on your property, consider installing a solar water heater. The solar units are environmentally friendly and you can have them installed on your roof to blend with the architecture of your house.

Solar water heating systems are also good for the environment. Solar water heaters avoid the greenhouse gas emissions associated with electricity production. When shopping for a solar water heater, look for the **ENERGY STAR** label and for systems certified by the Solar Rating and Certification Corporation or the Florida Solar Energy Center.

LONG-TERM SAVINGS TIP

Visit the [Database of State Incentives for Renewables & Efficiency](#) website to see if you qualify for tax credits or rebates for buying a solar water heater.

LEARN MORE

- [Selecting a New Water Heater](#)
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Crisp, Clean Clothes Without the Waste

Washing laundry is a significant use of water in the average home; accounting for 15% to 40% of the overall water consumption inside the typical household of four persons. The average American family washes almost 400 loads of laundry each year.

Water Factor

Because washers come in various sizes and capacity, the water efficiency of clothes washers is rated using the term "Water Factor" to accurately compare water use. Water Factor (WF) is measured by the quantity of water (gallons) used to wash each cubic foot of laundry.

Older Washers

An old school washer will use approximately 40 to 45 gallons (151.4 L to 170.3 L) of water per load and have a water factor of 10 or higher. A family of four using a standard clothes washer will generate more than 300 loads per year, consuming 12,000 gallons (45.4 m³) of water annually.

High Efficiency Washers

New, High-Efficiency Washers (HEW) (front loading or top loading machines are available) can use 14 to 25 gallons (53 L to 94.6 L) of water per load and will have a water factor of 8 or less. Replacing an old and inefficient clothes washer can reduce this water use by more than 6,000 gallons per year (22.7 m³), save energy, clean the clothes better, and reduce fabric wear.

Clothes Washer Water Saving Tips

1. Run full loads only, even if the washer has an adjustable load setting. A full load is the most efficient way to wash clothes.
2. Replace the old inefficient clothes washer with a new high-efficiency model to save water and energy.



More Information About Clothes Washers

Standard Washers

The standard top loading clothes washer, using a vertical-axis drum, has changed little from General Electric's design in 1947. The vertical axis design requires enough water in the drum to suspend the fabric in the soapy water while the agitator churns the clothes to help remove dirt and stains. The large amount of water required to suspend the fabric in the tub limits the ability for this type of washer to efficiently use water. Historically, vertical axis washers consumed 45 gallons per load (170 L), though newer models of the past few years have reduced this to less than 40 gallons per load (151.4 L). Even the best designs manufactured today require more than 9 gallons (34.1 L) of water per cubic foot of capacity (28.31 L).

High-Efficiency Washers

High-efficiency front or top loading washers facilitate greater efficiency because they use less water and energy. These high-tech machines are proven to be more effective in cleaning the clothes with less water, and is gentler on the fabric when compared to old-school vertical axis washers. Additional benefits of lower water use are: a) less laundry detergent is required; and, b) less water needs to be heated resulting in energy conservation. Most high-efficiency washers use only 15 to 30 gallons (56.8 to 113.6 L) of water to wash the same amount of clothes as older washers (29 to 45 gallons per load (109.7 to 170 L). The most efficient washers use less than 5 gallons (18.9 L) per cubic foot of capacity.

Water Efficiency of Washers

The smaller the water factor rating, the more water efficient the clothes washer. A typical residential clothes washer has a capacity of approximately 3 cubic foot, though sizes range from 1.7 cubic feet (48.13 L) to more



than 4.2 cubic feet (118.9 L) for the extra large capacity machines. The Water Factor provides a means to directly compare water efficiency of different sized machines.

Efficiency Example

Washer A uses 32 gallons of water per load (wash and rinse cycles) with a 4 cubic foot capacity of laundry; thus, has a Water Factor rating of 8 ($32 \div 4 = 8$).



Washer B uses 30 gallons of water (wash and rinse cycles) with a 2.5 cubic foot capacity; thus, has a Water Factor rating of 12 ($30 \div 2.5 = 12$).

Washer A uses water more efficiently (WF=8) than Washer B (WF=12). While Washer A uses slightly more water per load, it can clean 40% more clothes per load.

Looking for a New Water Efficient Washer?

When buying a new machine, finding the Water Factor rating of a clothes washer is not always easy. Though manufacturers measure Water Factors for each model of washer, manufacturers are not required to display the rating on the machine. Fortunately, the Energy Star Program reports [Water Factors and energy use for nearly every HEW in the market](#).

Listing of High Efficiency Clothes Washers

Are you in the market for a new clothes washer? The most recent listings of high-efficiency clothes washers are provided here:

- CEE Clothes Washer Qualifying Product List ([PDF](#) or [Excel](#))
- [CEE Specifications for Residential Clothes Washers](#)



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Showers

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Showering to Savings

In an average home, showers are typically the third largest water use after toilets and clothes washers. The average American shower uses 17.2 gallons (65.1 liters) and lasts for 8.2 minutes at average flow rate of 2.1 gallons per minute (gpm) (7.9 lpm).

Shower Water Saving Tips

1. Pay attention to the length of time spent in the shower. Try taking a shorter shower of around 5 minutes.
2. If you shower is equipped with an on-off switch use it while you are soaping and shampooing.
3. If you have to wait a period of time for the hot water to reach the shower, try collecting the normally discarded cold water in a bucket for watering plants.

An additional method to reduce water use in showers is to turn off the water while lathering and shampooing, often called a "navy shower". The method requires three steps: 1) turn on water to rinse body and hair; 2) turn off water while shampooing hair and washing body with soap and washcloth; 3) resume water flow and rinse off all shampoo and soap. Using this technique, the total duration of water flow can easily be reduced to 5 minutes or less.



Other Shower Information

Shower Heads

Replacing your current showerhead with a new model that uses 2.5 gpm (9.5 lpm) may or may not save water in your home. Many people already have a 2.5 gpm (9.5 lpm) showerhead installed.

Showerheads are inexpensive (starting at less than \$5) and can be a good way to save water in your home. Reducing hot water use saves energy because your hot water heater has less work to do.

Duration

The **duration** of the shower has a direct effect on water usage. A 20-minute shower will use twice as much water as a 10-minute shower taken at the same flow rate. Many have hypothesized reducing flow rates of showerheads might cause users to take much longer showers. Scientific studies that monitored thousands of homes across the nation have proven the flow rates have little influence on the duration of the shower. A shower timer might be a helpful tool in reducing the length of your showers - see [Shower Timer Introduction](#).



Flow Rate

Current national energy policy act (EPAct) standards mandate that all showerheads manufactured in the U.S. have a maximum flow rate of 2.5 gpm (9.5 lpm). Showerheads are also available at flow rates of 0.75 gpm (2.8 lpm), 1 gpm (3.8 lpm), 1.5 gpm (5.7 lpm), 1.75 gpm (6.6 lpm), and 2 gpm (7.6 lpm), although they may be harder to find at flow rates below 2.5 gpm (9.5 lpm). Before 1980, many showerheads exceeded 5 gpm (18.9 lpm).

man in shower



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The USGS Water Science School

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Water Questions & Answers

How much water does the average person use at home per day?



Estimates vary, but each person uses about 80-100 gallons of water per day. Are you surprised that the largest use of household water is to flush the toilet, and after that, to take showers and baths? That is why, in these days of water conservation, we are starting to see toilets and showers that use less water than before.

Many local governments now have laws that specify that water faucets, toilets, and showers only allow a certain amount of water flow per minute. Water agencies in some areas, such as here in Atlanta, Georgia, offer rebates if you install a water-efficient toilet. In fact, I just put in two new toilets and received a rebate of \$100 for each. Yes, they really do use a lot less water. For your kitchen and bathroom faucets, if you look real close at the head of a faucet, you might see something like "1.0 gpm", which means that the faucet head will allow water to flow at a maximum of 1.0 gallons per minute.



NOTE: Our data here is very general in nature...just to give you a quick idea of your water use. There are some other Web sites that will give you a much more detailed and accurate estimate of your per-capita water use:

- [WECalc](#)
- [CSGNetwork](#)
- [Southwest Florida Water Management District](#)

Typical water use at home

Bath	A full tub is about 36 gallons.
Shower	2-2.5 gallons per minute. Old shower heads use as much as 4 gallons per minute.
Teeth brushing	<1 gallon, especially if water is turned off while brushing. Newer bath faucets use about 1 gallon per minute, whereas older models use over 2 gallons.
Hands/face washing	1 gallon
Face/leg shaving	1 gallon
Dishwasher	20 gallons/load, depending of efficiency of dishwasher

Dishwashing by hand:	4 gallons/minute for old faucets.. Newer kitchen faucets use about 1-2 gallons per minutes.
Clothes washer	25 gallons/load for newer washers. Older models use about 40 gallons per load.
Toilet flush	3 gallons for older models. Most all new toilets use 1.2-1.6 gallons per flush.
Glasses of water drunk	8 oz. per glass
Outdoor watering	2 gallons per minute

[U.S. Department of the Interior](#) | [U.S. Geological Survey](#)

URL: <http://water.usgs.gov/edu/qa-home-percapita.html>

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V.I.
M-43/12

Board of Directors

February 22, 2012

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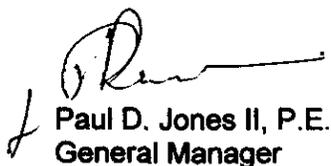
TO: Board of Directors
FROM: General Manager
SUBJECT: Approve and Authorize Appropriation of \$195,000 for Rebates to Customers in the Residential and Commercial Sector

RECOMMENDATION

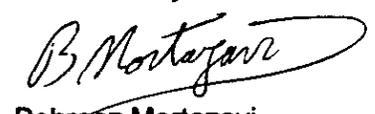
The following proposal was presented to the Board Planning Committee on February 21, 2012, and received its full concurrence. It is recommended that the Board, by Minute Order, approve and authorize the following:

1. Appropriation of funds from the Special Projects Budget in the amount of \$125,000 to be used for residential rebates on water saving devices, including high-efficiency clothes washers, high-efficiency nozzles and smart irrigation controllers; and
2. Appropriation of funds from the Special Projects Budget in the amount of \$70,000 to be used for rebates towards the Turf Replacement Rebate Program.

Concur:


Paul D. Jones II, P.E.
General Manager

Submitted by:


Behrooz Mortazavi
Assistant General Manager
Resources Development

Directors: All
Divisions: All

BACKGROUND

Eastern Municipal Water District (EMWD) has a history of successful rebate programs. Funding for rebates by EMWD is supplemented by The Metropolitan Water District of Southern California (MWD) conservation credits program. Currently, there are three rebate programs available to EMWD customers:

1. A Residential Rebate Program (RRP) administered by MWD through a region-wide program vendor. In 2011, 3,097 devices were retrofitted through the rebate program for a lifetime water savings of 849 acre-feet (AF) at a cost of \$239,506 to EMWD and \$151,981 to MWD;
2. A Commercial Rebate Program (CRP) administered by MWD through a region-wide program vendor. In 2011, 12,874 devices were retrofitted through the rebate program for a lifetime water savings of 646 AF at a cost of \$2,451 to EMWD and \$96,140 to MWD; and
3. A Turf Replacement Rebate Program (TRRP) administered by EMWD; currently funded by MWD with secured grants through the United States Bureau of Reclamation and the Department of Water and Power. Since December 2011, 100,000 square-feet (SF) of turf are scheduled for conversion to water efficient landscape, for a lifetime water savings of 135 AF at a cost of \$0.0 to EMWD and \$100,000 to MWD.

Staff is requesting that funding be added to the RRP and the TRRP. Current rebate amounts are listed in Table 1. The majority of the funding will be used to encourage the purchase of a high efficiency clothes washer in order to meet the requirements of the Best Management Practice No. 3 (BMP 3) and the SBx7 (20x2020 - 20 percent conservation by 2020). The estimated water savings by the RRP with \$125,000 of funding is 500 acre-feet over the lifetime of the devices. The cost per AF of water saved is approximately \$250.

Table 1 - Summary of Water Use Efficiency Rebates

	Program	EMWD Rebate	MWD Rebate	Annual Savings (AFY)	Lifetime Acre Savings (AF)	EMWD Cost per AF Saved
High Efficiency Clothes Washer	Residential	\$140	\$85.00	0.03450	0.48300	\$289.86
Smart Controller	Residential	\$65.00	\$80.00	0.04140	0.41400	\$157.00
High Efficiency Nozzles	Residential/Commercial	\$2.00	\$3.00	0.00400	0.02000	\$100.00
Smart Controller	Commercial	\$8/station	\$25/station	0.0129	0.129	\$62.02
Turf Replacement (current)	Turf	\$0.00/SF	\$1.00/SF	0.00014	.0014	\$257 Average
Turf Replacement (proposed)	Turf	\$0.70/SF	\$0.30/SF	0.00014	.0014	

Funding for the TRRP will allow the current program to continue and will convert an additional 100,000 SF of turf to water efficient landscaping by providing \$1 per SF rebate to the customers. MWD will provide 30 cents per SF for a total of \$30,000 and EMWD will pay 70 cents per SF for a total of \$70,000. The proposed TRRP will provide an additional 135 AF of lifetime water savings. The average cost of the current and proposed TRRP for EMWD is \$257 per AF of water saved.

Funding water-use efficient rebate programs supports the Strategic Plan Objective III (Conservation), Tactic III.C., to "Promote efficient use of water through appropriate rebate programs for replacing excessive water consuming appliances and fixtures."

Finance



Purchasing/Contracts



Author: SR:EL

SR:EL

Rebates Brd Ltr_022212

August 2014

Energy Management Plan



Prepared by

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Eastern Municipal Water District FINAL Energy Management Master Plan

August 2014



Prepared for

Eastern Municipal Water District
2270 Trumble Road
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K/J Project No. 1244111*00

Table of Contents

List of Tables.....	viii
List of Figures.....	xi
List of Appendices.....	xiv

Section 1: Process Description 1-1

Section 2: Energy & GHG Profiles and Forecasts 2-1

2.1	Purpose.....	2-1
2.2	Summary Energy Use and Cost.....	2-1
2.3	Methodology.....	2-5
2.3.1	Water.....	2-5
2.3.2	Recycled Water.....	2-5
2.3.3	Wastewater.....	2-6
2.3.4	Raw Water.....	2-6
2.3.5	Administration.....	2-6
2.3.6	Fuel.....	2-6
2.3.7	Future Projects.....	2-6
2.4	Existing Flowrates.....	2-11
2.5	Baseline Energy Use and GHG Emissions.....	2-11
2.5.1	Electricity Use.....	2-11
2.5.2	Electricity Cost.....	2-13
2.5.3	Baseline Unit Electricity Use.....	2-13
2.5.4	Natural Gas Use.....	2-14
2.5.5	Natural Gas Cost.....	2-17
2.5.6	Digester Gas Use.....	2-17
2.5.7	Fuel Use.....	2-17
2.5.8	GHG Emissions.....	2-19
2.6	Flowrate Projections.....	2-20
2.6.1	General Projections.....	2-20
2.6.2	Water Treatment Facility Projections.....	2-21
2.6.3	RWRF Projections.....	2-21
2.7	Electricity Forecast.....	2-22
2.8	Natural Gas Forecast.....	2-24
2.9	Fuel Use Forecast.....	2-25
2.10	Greenhouse Gas Emissions Forecast.....	2-26

Section 3A: Derceto System Audit 3A-1

3A.1	Purpose and Methodology of the Operational Audit.....	3A-1
3A.2	Summary Conclusions.....	3A-1
3A.3	Audit Review Documents.....	3A-2
3A.3.1	Email Exchange Between Khos Ghaderi and Ravi Ravishanker (12/5/06).....	3A-3

Table of Contents (cont'd)

3A.3.2 EMWD Derceto Audit Report Stage 1 (1/26/07) and
EMWD Stages 2 & 3 - Derceto Aquadapt Software
Performance Audit (7/1/08) 3A-3

3A.3.3 Performance Audits for Moreno Valley (8/17/09) 3A-5

3A.3.4 Wellness Audit (7/16/12) 3A-6

3A.4 Existing Operational Issues 3A-7

3A.4.1 “Derceto non-solve” 3A-7

3A.4.2 Manual Overrides 3A-8

3A.4.3 Integration with SCADA 3A-9

3A.4.4 Data Gaps 3A-9

3A.5 Additional Benefit - Support for Electric Utility Real Time Pricing .. 3A-10

3A.6 Potential Test Protocols 3A-12

3A.6.1 The 2006 kWh/mg Protocol Used by Ghaderi and
Ravishanker 3A-12

3A.6.2 \$/mg Protocol 3A-12

3A.6.3 Test Protocols using “Data Mining” of the Derceto and/or
SCADA Databases 3A-12

3A.7 Conclusions and Recommendations 3A-14

Section 3B1: PVRWRF Equipment Audit 3B1-1

3B1.1 Executive Summary 3B1-1

3B1.2 Process Overview 3B1-3

3B1.3 Energy Efficiency Measures Analyzed 3B1-4

3B1.4 Detailed Descriptions of Recommended EEMs 3B1-8

3B1.5 Detailed Description of EEMs Not Recommended 3B1-18

Section 3B2: PVRWRF Process Audit 3B2-1

3B2.1 Executive Summary 3B2-1

3B2.2 Process Overview 3B2-2

3B2.3 Plant Background Information 3B2-2

3B2.4 Energy Efficiency Measures Analyzed 3B2-6

3B2.5 Detailed Description of Recommended EEMs 3B2-10

3B2.6 Other Findings to Consider and Investigate Further 3B2-18

Section 3B4: RWRWRF Surplus Capacity Strategy 3B4-1

3B4.1 Purpose 3B4-1

3B4.2 Background 3B4-1

3B4.3 Used and Surplus Treatment Capacities 3B4-1

3B4.4 Existing Flow Equalization Capacities 3B4-2

3B4.5 Inter-basin Transfer Capabilities 3B4-2

3B4.6 Treatment Energy Use and Costs 3B4-3

3B4.7 Lift Station Energy Use and Cost 3B4-4

3B4.8 Total Cost Differential 3B4-4

3B4.9 Recommendations 3B4-5

Table of Contents (cont'd)

Section 3C: Perris WFR Energy Audit	3C-1
3C.1 Executive Summary	3C-1
3C.2 Process Overview	3C-2
3C.3 Energy Efficiency Measures Analyzed	3C-3
3C.4 Detailed Descriptions of Recommended EEMs	3C-8
3C.5 Detailed Description of EEMs Not Recommended.....	3C-14
3C.6 Detailed Description of WEMs.....	3C-21
Section 3D: IC Engine Audit	3D-1
3D.1 Purpose and Background.....	3D-1
3D.2 Summary of IC Engine Data.....	3D-2
3D.2.1 Baseline IC Engine Operational Data	3D-2
3D.2.2 Baseline IC Engine Cost Data.....	3D-11
3D.2.3 Baseline IC Engine Greenhouse Gas Emissions.....	3D-12
3D.3 Air Quality Regulatory Constraints and Opportunities.....	3D-12
3D.3.1 Regulatory Background.....	3D-12
3D.3.2 Regulatory Discussion and Analysis	3D-15
3D.3.3 Regulatory Constraints Summary and Recommendations .	3D-18
3D.4 Fuel Source Vulnerability and Reliability Analysis.....	3D-19
3D.4.1 Fuel Providers	3D-19
3D.4.2 Vulnerability and Reliability during Natural Disasters.....	3D-19
3D.4.3 Vulnerability and Reliability During Manmade Disasters.....	3D-20
Sabotage 20	
Shortages/Blackouts.....	3D-21
3D.4.4 Analysis Summary	3D-22
3D.5 IC Engine and Electric Motor Modeling	3D-23
3D.6 Prioritization of IC Engines Conversion to Electric Motors	3D-31
3D.6.1 EMWD Ranking Based on Prioritization Matrix (Plan A).....	3D-32
3D.6.2 Operating Cost Ranking (Plan B)	3D-33
3D.6.3 Comparing Plan A and Plan B	3D-33
3D.6.4 Melded Ranking (Plan C)	3D-37
3D.7 Plan Comparison.....	3D-42
3D.8 Conclusion	3D-45
Section 4A: Microturbines.....	4A-1
4A.1 Purpose and Background.....	4A-1
4A.2 Summary of Baseline Microturbines Data	4A-2
4A.2.1 Baseline Administrative Facility Microturbines Data	4A-3
4A.2.2 Baseline SCAQMD Microturbines Data	4A-6
4A.3 Forecasted Operating Costs	4A-9
4A.3.1 Forecasted Administrative Facility Microturbines	
Operating Costs.....	4A-9
4A.3.2 Forecasted SCAQMD Microturbines Operating Costs.....	4A-11
4A.4 Fuel Source Vulnerability and Reliability	4A-12

Table of Contents (cont'd)

4A.5	Recommendations	4A-12
Section 4B:	Fuel Cells	4B-1
4B.1	Purpose and Background.....	4B-1
4B.2	Baseline Fuel Cell Operational Data	4B-2
4B.3	Baseline Fuel Cell Cost Data	4B-6
4B.4	Forecasted MVRWRF Fuel Cell Operating Costs	4B-9
4B.5	Forecasted PVRWRF Fuel Cell Operating Costs.....	4B-10
4B.6	Air Quality Considerations.....	4B-11
4B.7	Fuel Source Vulnerability and Reliability	4B-11
4B.8	Recommendation	4B-11
Section 4C:	Solar Facilities.....	4C-1
4C.1	Description	4C-1
4C.2	History and Technical Maturity	4C-2
4C.3	Vendors	4C-3
4C.4	Energy Production, Energy Savings and GHG Reductions	4C-4
4C.5	Site Evaluation	4C-5
4C.5.1	Potential Sites	4C-5
4C.5.2	Siting Criteria and Constraints	4C-8
4C.5.3	Resource.....	4C-9
4C.5.4	Size, Location and Land Use	4C-9
4C.5.5	Interconnection to Transmission Line	4C-9
4C.5.6	Sensitive Neighbors	4C-9
4C.5.7	Sensitive Environment	4C-9
4C.5.8	Other	4C-10
4C.5.9	Scoring Metrics	4C-10
4C.5.10	Siting Evaluation	4C-10
4C.6	Weighting	4C-12
4C.6.1	Site Recommendations	4C-13
4C.7	Purchase Structures and Roles.....	4C-13
4C.8	Rebates and Incentives.....	4C-18
4C.9	Cost.....	4C-21
4C.10	Environmental Impacts.....	4C-23
4C.11	Operational Impacts	4C-23
4C.12	Summary of Advantages and Disadvantages	4C-24
4C.13	Recommendations	4C-24
4C.14	References.....	4C-26

Table of Contents (cont'd)

Section 4D: Food Waste To Energy.....	4D-1
4D.1 Purpose and Background.....	4D-1
4D.1.1 History of FWTE.....	4D-1
4D.1.2 Summary of Data Received	4D-2
4D.2 Digester Capacity Analysis.....	4D-3
4D.2.1 Digester Capacity Criteria	4D-3
4D.2.1.1 Volatile Solids Loading	4D-4
4D.2.1.2 Detention Time	4D-4
4D.2.2 Food Waste Digestion Capacity.....	4D-5
4D.2.3 Digester Mixing Capabilities.....	4D-6
4D.3 Food Waste Expectations	4D-7
4D.3.1 Waste Quality.....	4D-7
4D.3.2 Waste Quality.....	4D-9
4D.3.3 PVRWRF Food Waste Processing Requirements	4D-10
4D.4 Treatment and Resulting Digester Gas Production.....	4D-12
4D.4.1 Gas Utilization Options - Cogeneration.....	4D-12
4D.4.2 Gas Utilization Options - CNG	4D-13
4D.5 Program Costs	4D-14
4D.5.1 Food Waste to Energy	4D-14
4D.5.2 Compressed Natural Gas.....	4D-14
4D.6 Comparison of Alternatives	4D-15
4D.7 Recommendations	4D-15
Section 4E: Biodiesel	4E-1
4E.1 Purpose and Background.....	4E-1
4E.2 Grease Production and Recovery Estimates	4E-1
4E.3 Alternatives Evaluation.....	4E-2
4E.4 Biofuel Feedstock Production Facility Alternative	4E-2
4E.5 Digester Gas Production Alternative	4E-5
4E.6 Cost Comparison of Alternatives.....	4E-6
4E.7 Funding Opportunities.....	4E-8
4E.8 Regulatory Compliance.....	4E-8
4E.9 Recommendation	4E-8
Section 4F: Biosolids Dryer	4F-1
4F.1 Purpose and Background.....	4F-1
4F.2. Current and Future Solids Production	4F-1
4F.3 Summary of Federal, State, and Local Biosolids Regulations	4F-2
4F.4 Biosolids Treatment Technologies and Evaluation Criteria.....	4F-2
4F.5 Drying Technologies.....	4F-3
4F.5.1 Fenton Dryer (Indirect Drying).....	4F-3
4F.5.2 Therma-Flite Dryer (Indirect Drying)	4F-6
4F.5.3 Haarslev Industries (Belt Dryer)	4F-9
4F.5.4 Andritz Dryer (Direct Drying)	4F-12

Table of Contents (cont'd)

4F.6	Evaluation Criteria Summary.....	4F-14
4F.7	Recommendation	4F-15
Section 4G:	Small Hydro	4G-1
4G.1	Description of Small Hydro.....	4G-1
4G.2	History	4G-2
4G.3	Vendors	4G-3
4G.4	Technical Maturity	4G-3
4G.5	Energy Production, Energy Savings and GHG Reductions	4G-4
4G.6	Environmental Impacts.....	4G-7
4G.7	Operational Impacts	4G-8
4G.8	Rebates and Incentives.....	4G-8
4G.9	Cost.....	4G-8
Section 4H:	Other Technology Summary.....	4H-1
4H.1	Purpose	4H-1
4H.2	RWRF and WFP Energy Audits	4H-1
4H.3	Irrigation Controls Program Analysis.....	4H-2
4H.4	Fleet Fuel Efficiency and Reductions	4H-2
4H.5	Renewable Purchases and RECs	4H-4
4H.6	Thermal Generation (Organic Rankine Cycle)	4H-5
Section 5:	Grants & Funding Opportunity	5-1
5.1	Purpose and Background.....	5-1
5.2	Types of Funding and Incentives	5-1
5.3	Explanation of the Funding and Incentive Database.....	5-2
5.4	Grant and Funding Opportunities	5-3
Section 6:	Evaluation Criteria, Scoring and Ranking.....	6-1
6.1	Evaluation Criteria and Weighting Workshop.....	6-1
6.2	Project Evaluation Criteria.....	6-1
6.3	Project Evaluation Criteria Weighting	6-2
6.4	Scoring Approach.....	6-2
6.5	Detailed Evaluation Criteria Descriptions	6-3
6.6	Project Scoring and Ranking.....	6-8
6.7	Short-List of Preferred Projects	6-9
Section 7:	Action Plan	7-1
7.1	Project List	7-1
7.1.1	Project Descriptions	7-2
7.1.1.1	Project #2: PVRWRF Equipment Audit.....	7-2
7.1.1.2	Project #3: PVRWRF Process Audit	7-2
7.1.1.3	Project #4: WRF Surplus Capacity	7-2

Table of Contents (cont'd)

	7.1.1.4	Project #5: Perris WFP Energy Audit.....	7-2
	7.1.1.5	Projects #6 and #7: ICE - Plan C Melded Ranking and Plan D - Optimized Ranking	7-2
	7.1.1.6	Projects #8, #9, and #10: Microturbines— Install 17, Install 15, or Install 5 on Digester Gas	7-3
	7.1.1.7	Projects #11, #12, and #13: Perris Valley and Moreno Valley Fuel Cells	7-3
	7.1.1.8	Projects #14 and #15: Solar PV: Own & Operate and PPA.....	7-3
	7.1.1.9	Projects #16, #17, #18, and #19: FWTE.....	7-3
	7.1.1.10	Projects #20 and #21: Biodiesel—Fuel Production and Microturbines	7-3
	7.1.1.11	Projects #22, #23, #24, and #25: Biosolids.....	7-4
	7.1.1.12	Projects #26 through #31: Small Hydro	7-4
	7.1.2	Project Data	7-4
7.2		Portfolio Analysis.....	7-6
	7.2.1	Portfolio 7 is the Recommended Preferred Portfolio.....	7-12
7.3		Scenario Analysis.....	7-19
	7.3.1	Examples of Potential Future Scenarios Discussed	7-19
	7.3.2	Scenario Analysis on the Preferred Portfolio	7-20
	7.3.2.1	GHG Regulation & Price	7-20
	7.3.2.2	Electricity Prices Scenario	7-21
	7.3.2.3	Natural Gas Prices Scenario.....	7-22
	7.3.2.4	Bond Rate Scenario.....	7-23
	7.3.2.5	Discount Rate Scenario	7-24
7.4		Action Plan	7-25
	7.4.1	Implementation Plan	7-27
7.5		Suggested Additional Tasks.....	7-29
	7.5.1	Energy Equipment and Process Audits of the Moreno Valley, Temecula Valley and San Jacinto Valley RWRFs and the Hemet WFP Plant.....	7-29
	7.5.2	Energy Equipment Audit	7-29
	7.5.3	Energy Process Audit.....	7-29
	7.5.4	Energy Equipment Audit of Admin Building	7-30
	7.5.5	Fleet Fuel Efficiency and Reduction Analysis	7-30
	7.5.6	Solar Procurement	7-31
	7.5.7	Microturbine design and Implementation	7-31
	7.5.8	Irrigation Controls Program Analysis.....	7-31

Table 2-3: Existing EMWD Facilities Included in the Baseline Forecast

#	Category	Flow (AFY)	Facility Name	Nat Gas. Source	Baseline			
					Electricity Use (kWh/year)	Natural Gas Use – SCG (Therms/year)	Natural Gas Use – Shell (Therms/year)	GHG (MT/year)
1	Water	92,930	Booster Pumping Plants	SCG/Shell	12,700,000	1,090,000	475,000	9,600
2			Storage	--	105,000	--	--	30
3			Wells -- Potable	SCG	9,310,000	141,000	--	3,500
4			Wells -- Brackish	--	4,130,000	--	--	1,200
5			WTP (including Desalters)	SCG	9,840,000	10,300	--	2,900
6			Brine Disposal	--	449,780	--	--	130
7			Water Miscellaneous	--	18,500	--	--	5
8	Recycled Water	48,870	Booster Pumping Plants	SCG	10,900,000	243,000	--	4,500
9			Storage	--	260	--	--	0.1
10			Energy Dissipaters	--	33,400	--	--	10
11			Recycled Water - Miscellaneous	--	1,770	--	--	1
12	Wastewater	53,600	Regional Water Reclamation Facilities	SCG/Shell	39,600,000	2,280,000	1,970,000	23,900
13			Sewage Lift Stations	SCG	5,280,000	34,600	--	1,700
14			Wastewater – Miscellaneous	--	814,000	--	--	230
15	Raw Water		Booster Pumping Plants		1,990,000	--	--	520
16			Storage		--	--	--	0
17			Wells		--	--	--	0
18	Admin	--	HQ	SCG/Shell	6,930,000	450,000	321,000	4,500
19			Customer Service Call Center	SCG	194,000	280	--	60
20			Admin -- Miscellaneous	SCG	--	710	--	4
				Gallons/yr	Diesel	Gasoline	Propane	
21	Fuel	--	--	--	74,300	227,000	670	2,800

⁽¹⁾ Natural gas is purchased both from SCG and Shell, but natural gas volume used is recorded through SCG's meter. The natural gas use shown on this table reflects the usage as provided on SCG invoices.