

**State of California  
The California Natural Resources Agency  
DEPARTMENT OF WATER RESOURCES**



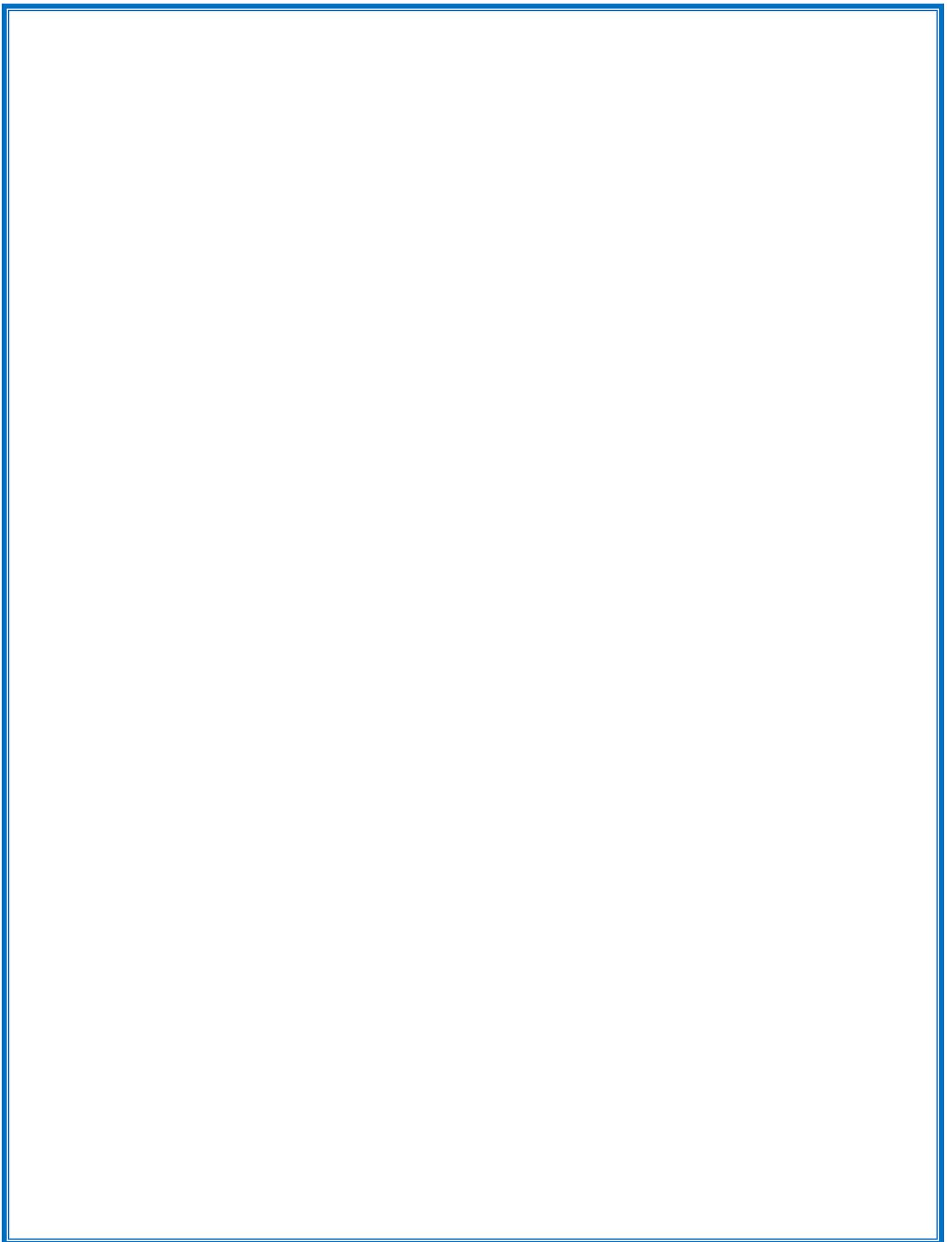
# **2011 Annual Sustainability Report**

**August 2012**

**Edmund G. Brown Jr.**  
Governor  
State of California

**John Laird**  
Secretary for Natural Resources  
Natural Resources Agency

**Mark W. Cowin**  
Director  
Department of Water Resources



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## Foreword

The Department of Water Resources (DWR) is pleased to present its second annual Sustainability Report. This second report continues DWR's reporting begun in 2011, and adds new sections as DWR continues to expand its Sustainability efforts. DWR's Sustainability effort recognizes the importance of sustainability concepts in its own daily operations and in fulfilling its mission to the people of the state of California. In recognition of the importance of sustainability, the Director issued the department's first sustainability policy on April 22, 2010, in conjunction with DWR's recognition of Earth Day. The two-page policy memo (Appendix A) declared DWR's resolve to become a sustainability leader, stating that *"sustainability must be integrated into every aspect of DWR's work."* In response to this directive, DWR has begun instituting a series of key steps to implement sustainable practices and will continue to contribute to a more sustainable future for California. DWR invites all employees to become engaged in learning about sustainability concepts and how to apply these concepts in the workplace and in daily life. This report is part of the on-going effort of helping DWR employees and the public understand sustainability and helps document the sustainability efforts at DWR.

The following goals are being integrated and coordinated as part of the current sustainability efforts for DWR:

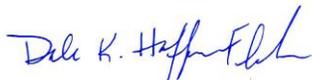
1. Climate protection practices,
2. Ecosystem stewardship,
3. Sustainable business operations,
  - a. Greening facilities,
  - b. Greening fleets,
  - c. Recycling and waste management and
  - d. Environmentally preferable procurement.

Additionally, six specific objectives have been established:

1. Reduce water use by 20% by 2020.
2. Reduce grid based retail energy demand by 20% by 2015.
3. Reduce carbon by 50% of 1990 levels by 2020 and 80% of 1990 levels by 2050.
4. Achieve waste diversion of 50% by 2020.
5. Reuse waste water wherever feasible.
6. Achieve renewable energy of 360 GWh by 2020.

These goals and objectives are helping guide DWR efforts toward sustainability. The goals and objectives will continue to change and grow over time as DWR continually refines its operations and recognizes new opportunities to promote sustainable activities.

This report captures both the statutory and policy aspects of DWR sustainability activities as well as DWR's other significant efforts toward sustainability in 2011.



Dale K. Hoffman-Floerke

Deputy Director



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## Executive Summary

In 2011, the Department of Water Resources (DWR) began a series of efforts designed to further sustainability principles. Using the initial goals and objectives targeted for sustainability efforts, DWR made continued progress in all of the focus areas as shown in the table below.

### Sustainability Goals

#### Sustainable Business Practices

- Greening facilities
  - LEED Standards
  
- Energy Efficiency
  
- Greening Fleets

### Sustainability Objectives

#### Greening facilities

- Pursue LEED Silver Certification as a minimum requirement. Pursue higher LEED Standards when feasible.
  
- Reduce grid based retail energy demand 20 percent by 2015.
  
- Ensure Energy Star purchasing.

#### To be Determined in Future Policies

### 2011 Sustainability Achievements

Pearblossom Facility- LEED Gold includes a 30 kW solar system to power the facility. Construction is underway and the project is expected to complete by August 2012.

Development of Energy Efficiency Unit to collect data, determine energy efficiency projects.

All electrical purchases for 2011 met Energy Star requirements.

Initial Data gathering and Benchmarking Efforts

Vehicle Pool Program

Fuel Management and Integration into SAP database

Alternative transportation Modes and Options

Fleet Reduction

Travel Reduction

#### Environmentally Preferable Purchasing

- Environmentally Preferable Purchasing
- Purchase products that are part of DGS's Environmentally Preferred Purchasing program whenever feasible.

New DGS enhancements to the EPP contracts have made it easier to purchase EPP items.

**Sustainability Goals**

**Sustainability Objectives**

**2011 Sustainability Achievements**

- **Recycling and Waste Reduction**

- **Recycling and Waste Reduction**
- Each employee engages in recycling and waste reduction practices in performing their duties and responsibilities

Recycling and Waste Reduction are on-going activities which culminate in the Waste Diversion statistics.

- **Waste Diversion**

- **Waste Diversion**
- Achieve 50% waste diversion by 2020.

2010 Waste Reduction 76%, with nearly 6000 tons less waste produced from previous year.

- **Water Efficiency**

**Water Efficiency**  
Achieve 20% reduction by 2020

Ongoing efforts to capture water use data for all DWR facilities continued in 2011.

- **Waste Water Reuse**

**Waste Water Reuse**  
Reuse recycled waste water wherever feasible.

Waste water reuse efforts were not a focus in 2011.

- **Climate Protection**

**Reduce Greenhouse gas emissions**

- 
- **Reduce Greenhouse gas emissions**

- 50% below 1990 levels by 2020
- 80% below 1990 levels by 2050

On-going. Current estimates show that DWR will meet its 2020 objective by 2013.

- **Procure renewable energy**

**Procure renewable energy**

- Purchase 360 Gw of Renewable Energy by 2020

Ongoing. Current efforts will allow DWR to meet its objective in 2020.

**Environmental Stewardship**

**Environmental Stewardship**

- To include environmental benefits as an objective and outcome in the planning and development of operations or projects.
- To build in environmental benefits at a meaningful scale that can address sustainability from economic, social and environmental perspectives

Final draft of Water Resources Engineering Memorandum 58B detailing how Environmental Stewardship will be implemented into all DWR projects was completed. Final approval anticipated in early 2012.

DWR has also begun other sustainability efforts which, although not identified in the initial targets, complement and enhance current efforts. These areas are described below.

#### **Other 2011 Sustainability Accomplishments**

##### **Sustainable Community Development and Outreach**

DWR's on-going grant programs provide millions of dollars to local communities to help them become more sustainable. Some DWR programs that directly promote sustainability include the Integrated Regional Water Management (IRWM) Program and DWR's Local Groundwater Assistance Program.

##### **Intra-Agency Sustainability Coordination Efforts**

1. Developed intra agency Collaboration Portal for Sustainability.
2. Formed External Group of Agency Sustainability Coordinators.
3. Participating in a State agencies 'recycling group of more than 50 California State agencies that offers suggestions on environmental issues, develops recycling workshops for employees, and raises awareness of waste and recycling issues.
4. Assisting in the development of Sustainability Indicators for the California Water Plan.
5. Reviewed and commented on the Delta Economic Sustainability Plan.

##### **Inter-Agency Sustainability Coordination Efforts**

###### **Coordination of DWR's Sustainability Efforts**

1. Added key Sustainability criteria to DWR Grant approval process
2. Reviewed various Department Documents for inclusion of Sustainability principles

###### **Formation of New Committees**

1. Established Bike Committee to advance commuter biking at DWR.
2. Established Life Cycle Assessment Committee.

###### **Sustainability Education and Awareness Efforts**

1. Developed a Sustainability Awareness Campaign.
2. Established Earth Day Activities.
3. Created a Sustainability Section in DWR's new Climate Change Class 201.
4. Developed article on sustainable transportation- DWR People News.

##### **Additional Energy Efficiency Efforts**

1. Development of new unit personnel job descriptions and duty statements to help DWR achieve Energy Efficiency directives.

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2. Ongoing benchmarking of current energy use through the identification and location of all DWR retail energy sources and meters.
3. Energy efficiency efforts by DWR's Department of Technology Services (DTS) have resulted in significant energy savings as well as achieving associated business process improvements.

### **Foundation Policy Development**

- Continued development of Sustainable Business Services Policy.

### **Paper Reduction Project**

Launched in 2010, Documentum is an enterprise system for managing all record types including video, podcast, images and other digital records as well as traditional media storage such as paper and microfilm. Full implementation of Documentum will result in reduced paper usage and paper record storage. Implementation efforts are on-going.

### **Pilot Projects**

1. Completion of tire pressure monitoring report and recommendations.
2. Continued development of the payroll deduction for transit passes.
3. Continued collection of information on water use by DWR employees.

### **Reporting Sustainability Efforts**

DWR produced its initial Annual Report in 2011, which covered the initial efforts to develop sustainability goals and activities.

*"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*

Our Common Future  
The Brundtland Commission report  
United Nations conference, 1983

## 2011 Annual Sustainability Report

Following are the Department of Water Resources (DWR) sustainability activities during 2011. This report transmits both the statutory and policy aspects of DWR's activities as well as DWR's significant efforts toward sustainability. The report begins with an overview of activities that have statutory and policy requirements and closes with DWR's pilot projects and outreach efforts.

### Goal – Sustainable Business Practices

#### Greening Facilities

##### **LEED Standards - Green Building Initiative (Executive Order S-20-04)**

DWR has responded to the initiative through its benchmarking efforts, new construction practices, and energy conservation projects. DWR has worked with the Department of General Services to benchmark facilities in the Energy Star Data Base utilized by the State of California for collecting energy use for State buildings as outlined in Executive Order S-20-04 and further defined in the Green Building Action Plan. DWR's newest building was designed and is presently under construction to exceed the minimum State Standard for Leadership in Energy and Environmental Design (LEED).

##### *Pearblossom Operations and Maintenance Center, Southern Field Division*

DWR is currently designing its first LEED-NC (Leadership in Energy and Environmental Design- New Construction) project at the Pearblossom Operations and Maintenance Center, Southern Field Division. DWR is pursuing a LEED-NC Gold Level Certification for this new administrative office building. In order to achieve LEED certification, the Operations and Maintenance Center will be built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, improved indoor environmental quality, stewardship of resources, and sensitivity to impacts.

The proposed facility is a joint use facility for DWR between the Division of Operations and Maintenance (O&M), and the Division of Engineering (DOE). The objective is to design and construct a building that will address the shortage of available space for O&M's Southern Field Division staff and provide a more centralized and permanent location for DOE's Lancaster Project Headquarter (LPH) staff. Space will also be included in the building for staff participating in the FERC relicensing effort.

The building will accommodate approximately 30 staff from Southern Field Division, 10 staff that will participate in the FERC relicensing, and 15 staff from DOE's LPH: a total of 55 persons. Part of the building design and construction will include site facilities and improvements, including parking,

landscaping, and new or upgraded utilities for power, telecommunications, water, septic, and uninterrupted emergency power supply systems. Features included in the design to meet the planned LEED Gold certification include a ground source heat pump system for heating and cooling, photovoltaic panels, and mechanical wastewater system that will allow wastewater to be recycled and used for landscape irrigation. In addition, many recycled products have been included in the design along with waste reduction measures during and after construction.

## **Greening Fleets-Transportation**

This category could be placed either under Sustainable Business Practices or under Climate Protection as greening fleets falls into both areas. More effective fleet management is both a good business practice and a climate protection strategy. Due to the multi faceted aspect of transportation at DWR, this report treats it as a Sustainable Business Practice, but recognizes the implications for both of these Sustainability goals.

### **DWR's Fleet**

To perform its mission, DWR requires an array of mobile equipment, heavy machinery, trucks, trailers, fleet vehicles, and other wheeled vehicles. DWR's fleet averages approximately 899 vehicles such as light trucks, vans, and SUVs; as well as 240 pieces of heavy machinery such as backhoes, crawlers, and dozers. Of the 899 light duty vehicles, almost 89 percent are pickups and vans. These vehicles are the workhorse of DWR's fleet, transporting both people and equipment to the far reaches of the state to maintain the complex number of canals, levees, dams, flood control structures, and irrigation structures that supports California's water delivery systems. In addition, DWR personnel reconstruct wetlands, restore wildlife habitat, perform ongoing assessment of California's water supply infrastructure, perform compliance monitoring and conduct original field research to support DWR's mission. In support of this ongoing effort, DWR personnel travel approximately 13 million miles per year, consuming approximately 1.6 million gallons of gasoline, diesel, and bio-fuels.

### **Fuel Management Replacement Project**

The purpose of the Fuel Management Replacement Project (FRMP) is to replace the current fuel management system to provide better management of the Department's fuel inventory. When fully installed in 2012, the system will allow for the use of non-proprietary commercial grade hardware with pay-point functions (using the Voyager card), which will provide site administrators with access to system functionality from a personal computer. The system integrates the fuel management system with DWR's main data management system, SAP, with the following critical SAP administrative modules;

Materials Management (MM), Financial, and Plant Maintenance (PM). This project also integrates DWR’s Voyager credit card information into SAP. This information is used to identify fuel dispensed at Department fuel sites as well as fuel amounts and types that are purchased at commercial sites. Additionally, automated odometer readers at Department vehicle sites will provide correct and timely information on vehicle usage for maintenance and reporting requirements.

Although initially proposed as a fuel management system, the information from FRMP will be critical in helping DWR to meet its GHG emission reduction goals. FRMP allows for the tracking of fuel types and fuel blends which vary between fuel brands and allow a more accurate calculation of travel related GHGs.

**2011 Alternative Fuel Use/ Electric Vehicles**

Alternative fuels are an important way to reduce the use of fossil fuels and the corresponding GHGs. Some alternative fuels include compressed natural gas (CNG) oxygenated fuels such as ethanol and biofuels.

CNG vehicles may be either dedicated natural gas vehicles that are designed to run on natural gas only, or they may have a dual-fuel or bi-fuel system that can also run on gasoline or diesel. Dual-fuel vehicles allow users to take advantage of the wide-spread availability of gasoline or diesel but use a cleaner, more economical alternative when natural gas is available. Since natural gas is stored in high-pressure fuel tanks, dual-fuel vehicles require two separate fueling systems. DWR has 9 vehicles that are dedicated CNG fuel and 43 vehicles that are dual fuel. However, due to the difficulty of finding appropriate fueling stations, the CNG alternative is not used very frequently by DWR employees.

Flexible fuel vehicles (FFVs) are designed to run on gasoline or a blend of up to 85% ethanol (E85). Except for a few engine and fuel system modifications, they are identical to gasoline-only models. However, since ethanol contains less energy per volume than gasoline, FFVs typically get about 25-30% fewer miles per gallon when fueled with E85. FFVs comprise nearly 31% of DWR’s fleet with 276 vehicles being capable of utilizing E85 fuel.

According to the US Department of Energy, California has 1140 alternative fuel stations. Table 1 shows the number of alternative fuel stations by type.

Table 1. Alternative Fuel Stations in California and the Sacramento Area

Alternative Fuel	State-wide	Sacramento Area
Bio Diesel	30	2

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<b>CNG</b>	135	1
<b>E85</b>	49	8
<b>Electric</b>	682	31
<b>Hydrogen</b>	5	0
<b>Liquid Natural Gas (LNG)</b>	15	0
<b>Liquefied Petroleum Gas (LPG) or Propane</b>	224	7

Despite what appears to be a large number of alternative fuel stations state-wide, the distribution of these stations is centered around four main population centers; San Francisco, Sacramento, Los Angeles and San Diego. Most of the alternative fuel stations follow either the US 101 coastal highway or US 99, with only 3 alternative fuel stations located on Interstate 5 between Los Angeles and Sacramento. Unfortunately, the concentration of alternative fuel stations around a few population centers makes it difficult for DWR employees to effectively utilize alternative fuels. This difficulty is reflected in the following table of alternative fuel use. The amount of alternative fuel used by DWR is minimal and all of it is purchased in the Sacramento area.

Table 2. DWR Alternative Fuel Use

<b>Alternative Fuel Used</b>	<b>Amount statewide</b>	<b>Sacramento Area</b>
<b>CNG</b>	912 Gallons	912 Gallons
<b>All Others</b>	0	0

Historically, DWR had nine electric vehicles. However, when the leases on the vehicles expired, the vehicles reverted to the dealerships. Since that time, DWR has not had any electric passenger vehicles.

**2011 Travel Reduction, Executive Order B-06-11 (4-26-2011)**

On April 26, 2011, Governor Brown issued an Executive Order reducing state employee travel. The order prohibited all discretionary travel. Further, all in-state non-discretionary travel had to be approved by Agency Secretaries or Department Directors who did not report to an Agency Secretary. All out-of-state travel also had to be approved by the Governor’s Office. The travel restrictions did not apply to functions that were mission critical such as enforcement responsibilities, auditing, revenue collection, a function required by statute, contract or executive directive or job-required training necessary to maintain licensure or similar standards required for holding a position.

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Overall, despite the travel reduction order, DWR employees, using state vehicles, traveled approximately 1% more in 2011 than in 2012. DWR's travel miles have shown a steady increase since 2008 as additional mandates continue to flow from the legislature. Two major pieces of legislation that have dramatically impacted DWR's field work are the flood legislation passed in 2008, and the Bay Delta legislation passed in the special legislative session of 2009.

Table 4 shows DWR on the job travel mileage from 2008-2011. The table shows fleet gasoline mileage, (that mileage traveled with state owned vehicles); reimbursed mileage,(miles traveled by DWR employees in their personal vehicles) and diesel fuel mileage,( miles traveled in heavy duty, state owned vehicles). All three categories show a steady increase from 2008.

**Table 3. 2008-2011 DWR Work Miles Traveled - All Categories**

<b>Year</b>	<b>2008 Work Miles Traveled</b>	<b>2009 Work Miles Traveled</b>	<b>2010 Work Miles Traveled</b>	<b>2011 Work Miles Traveled</b>
<b>Total Passenger Miles State Vehicles</b>	8,152,207	9,233,445	10,533,166	11,073,040
<b>Total Reimbursed Passenger Miles, Personal Vehicles</b>	688,422	731,975	723,805	802,737
<b>Total DWR Diesel Engine Miles</b>	528,247	781,919	843,528	1,044,657
<b>Total for all categories:</b>	9,368,876	10,747,339	12,100,499	12,920,434

### **2011 Fleet Reduction**

On January 28, 2011, Executive Order B2-11 required all state agencies to inventory their mobile equipment and eliminate underutilized vehicles or conduct an analysis to determine the purpose of, the necessity for, and the cost-effectiveness of, the vehicles and equipment in their fleet. The purpose of the analysis was to develop a plan to relinquish non-essential and cost-inefficient vehicles and equipment. The plan was to be approved by the Director of the Department of General Services and the Department of Finance and the vehicles and equipment were to be relinquished within 120 days of plan approval. Vehicles and equipment were to be relinquished by selling them in a manner to maximize returns or by transferring them to other departments where there is a demonstrated need. Additionally the Department of Finance was to evaluate the total savings achieved and adjust departmental budgets to reflect those savings as appropriate.

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State agencies and departments were also prohibited from purchasing any vehicles for non-emergency use except when:

- The agency or department has fully relinquished its vehicles and equipment pursuant to its analysis and
- The plan is approved by Department of General Services;
- The purchase is necessary to protect the health and safety or security of the public;
- The purchase is necessary to provide critical services and functions; or
- The purchase will result in significant cost savings.

DWR submitted its reduction plan to the Department of General Services and the plan review is ongoing. The final plan is anticipated to be approved early in 2012.

### Other Sustainable Transportation Efforts

#### Sacramento Area Vehicle Pool

In 2010, DWR began a vehicle pool of 9 state vehicles. These vehicles were assigned to three Sacramento locations, the Joint Operations Command Center (JOC), DWR's West Sacramento location and DWR headquarters. The intent of the vehicle pool is to more effectively utilize state vehicles for travel between these three locations instead of using rental cars or taxis. Employees are able to reserve the vehicles electronically via their calendar, which simplifies the reservation process. In June 2011, the program was highlighted by a Department wide memo, explaining the reservation process and vehicle availability. In 2011, DWR employees logged nearly 58,000 miles through the vehicle pool.

Table 4. Sacramento Vehicle Pool Miles Traveled

Sacramento Location	Vehicle Pool Miles Traveled
JOC	7814
West Sacramento	18333
Headquarters	31714

Figure 1. 2011 Vehicle Pool Miles Traveled

## Vehicle Pool Miles Traveled



### **Bike Committee**

Bicycling is a valid alternative transportation that increases employee health, reduces greenhouse gases, reduces air pollution and reduces the need for employee parking. In recognition of these benefits, DWR encourages commuter cycling. Further, DWR has an active commuter bicycling community, with a majority of the commuter cyclists being located in the Sacramento area. This means that there is a high usage of biking facilities at DWR. Although DWR initially had 30 bike lockers at headquarters, there was a strong demand for more lockers. In 2011, DWR added an additional 50 lockers to meet the need for more storage space. The new lockers ensured that everyone who wanted a locker had access to one.

Based on the presence of an active cycling community and the need for biking facilities to keep pace with the usage, a bike committee comprised of interested DWR employees was formed in the fall of 2011. The committee met several times and began tackling issues related to assignment and use of bike lockers as well as beginning to determine DWR's policy needs to encourage and improve commuter biking. The bike committee will continue its efforts in 2012.

### **Energy Efficiency**

#### **Energy Efficient State Property Revolving Fund**

DWR is taking the lead with several other State departments on energy conservation projects funded through American Recovery and Reinvestment Act (ARRA). The Energy Efficient State Property Revolving Fund (Loan Fund) is administered by the Department of General Services, and ARRA funds received by the Energy Commission were deposited into the Loan Fund. Once the initial loans are paid back, the funds are available for further loans in the future.

The initial ARRA program looked at State facilities that were candidates for utilizing these funds to implement energy conservation projects to reduce energy use. Three DWR visitor facilities and the

Sacramento Maintenance Yard and Bryte Laboratory facilities are being upgraded, with the main improvements being applied to areas of lighting, heating and air conditioning, as well as water conservation. The initial loan of approximately \$900,000 is being paid back over a period of ten years through the energy savings from the projects.

### **Information Technology Consolidation Effort**

In 2011, DWR, in conjunction with the Natural Resources Agency, completely revised its data centers by consolidating 20 individual data centers/computer rooms to a single centralized Data Center. Utilizing the identical space as the previous data center, DWR drastically reduced its number of servers, replaced aging hardware and software, and significantly improved the data center energy and cooling elements. The new environment is 90 percent virtualized, and server racks have been reduced from 70 to just four. Because of the use of virtualization, DWR was able to reduce its physical server count while increasing the overall server computing capacity. The redesign has resulted in a 50 percent reduction in cooling requirements and 40 percent reduction in power-consumption. Overall, energy efficiency has increased nearly 30 percent. Additionally, with fewer machines, maintenance and support costs are lower. DWR completed the entire redesign and implementation in just 13 months. Avoided maintenance costs are estimated to be approximately 2.2 million dollars a year. (Intel, 2011)

### **Energy and Water Efficiency Special Unit Proposal**

With its Sustainability Policy, DWR has committed to reduce its retail water and power usage and GHG emissions. Further, both state law and Executive Orders add additional reduction requirements for both water and energy. For example, Executive Order S-20-04 requires that California state agencies reduce its retail energy usage by 20% by 2015. Senate Bill SB X7-7 requires that water suppliers reduce retail water usage by 10% by 2015, and by 20% by 2020.

In order to meet both its own goals and the above mandates, DWR must take several steps from preparing baseline documentation, determining energy and water efficiency opportunities and priorities, implementing efficiency measures, and ultimately, maintaining ongoing compliance. This means that DWR must collect data before, during, and after it makes efficiency gains to demonstrate increased efficiencies as well as compliance. DWR must plan and successfully execute projects to improve retail water and power efficiency throughout all leased and DWR owned buildings. DWR's commitment to sustainability and environmental leadership as a leading steward of retail water and power resources, and by inference, bulk water and power resources, requires an ongoing effort. After examining several options, DWR proposed forming a new Retail Water and Power Efficiency unit to carry

out the duties necessary to achieve DWR’s goals and to assure compliance with state law and Executive Orders. The current proposal has been forwarded for final approval. If approved, the new unit is anticipated to become operational in the summer of 2012.

**State Water Project Energy Efficiencies**

The Edmonston Pumping Plant and Edward Hyatt Power Plant are two State Water Project-owned hydroelectric facilities where major energy efficiency projects have been undertaken. These projects have resulted in a reduction of GHG emissions by 48,000 metric tons of CO2 annually. DWR is evaluating the feasibility of additional energy efficiency upgrades at Edmonston, which would start in 2013 and extend through 2020.

Table 4 illustrates the cumulative energy savings and fossil fuel emissions equivalents associated with the energy efficiency improvements from 2003 through 2020. This table reflects the weighted average of the emissions rates from the SWP’s energy portfolio from 2007 through 2011.

**Table 5. State Water Project Energy Efficiency and Emissions Reductions 2003- 2020**

<b>Energy Efficiency Program</b>	<b>Cumulative Energy Savings (MWH)</b>	<b>Emissions Reductions (Metric Tons CO2)</b>	<b>Emissions Avoided</b>		<b>Equivalents</b>
<b>Years</b>	Hyatt Generation	Edmonston Pumping	Hyatt Generation	Edmonston Pumping	Automobile Equivalents
<b>2003-2007</b>	306,949	5,951	84,108	1,631	15,703
<b>2008-2020</b>	1,721,443	773,202	471,698	211,867	125,195
<b>Total (2003-2020)</b>	2,028,392	779,153	555,806	213,498	140,898
<b>CUMULATIVE TOTAL</b>	2,807Gigawatt Hours	0.77 Million Metric Tons			140,898 Automobiles

## Environmentally Preferred Procurement (EPP)

DWR's efforts in waste reduction and recycling begin with its purchasing policy. DWR is also subject to the Environmentally Preferred Purchasing statutes (Appendix C). By buying environmentally friendly items that also contain post-consumer recycled content, DWR helps reduce waste and encourages recycling throughout its business processes.

The Department of General Services (DGS) is the California lead agency for EPP. In 2011, DGS introduced a new web section on EPP which simplifies the product selection process. Previously, a buyer had to search the terms of a purchasing contract to know if the contract included EPP. Even when a buyer found an EPP contract, it was possible to order non EPP items by mistake. The new section now directs the buyer to EPP products immediately. The picture below shows the ease of the improved buyer screen.

Figure 2. Improved DGS Website for EPP



By immediately directing the buyer to the *Buy Green Now* option, it is easier for the buyer to simply click a button and know that they are complying with EPP requirements.

## Recycling and Waste Reduction

### Statutory and DWR Policy Requirement Activities

DWR's waste and recycling efforts are the result of both DWR's own recycling policy and the State of California's statutes (Appendix B). California requires the diversion of solid waste from landfills and mandates the recycling of certain materials. DWR is subject to Public Resources Code sections 42920–42982, which require that State agencies comply with a 50 percent diversion rate from landfills by 2004 and submit an annual report. The first report was due September 1, 2010, with an annual report due on or before September 1 each year thereafter. Currently DWR's objective of 50% diversion of waste is concurrent with State law.

## DWR's Waste Reduction and Recycling Efforts

In 2008, the Per Capita Disposal Measurement System Act (SB 1016, Wiggins, and Public Resources Code Section 42920–42927, 2008) was passed. This changed the way State agencies and local governments measure their progress toward meeting the statutory waste diversion mandates. Under this Act, State agencies are still required to maintain the 50 percent waste diversion requirement as mandated by California's Integrated Waste Management Act of 1989. However, with the passage of the Per Capita Disposal Measurement System Act, State agencies and large State facilities also must use per capita disposal as an indicator of their progress toward meeting the mandate.

## Waste Diversion and Recycling Coordinators

DWR has a waste diversion and recycling coordinator who collects waste disposal and recycling information from 33 offices/facilities around the state. This information is then compiled into the Waste Management Annual Report.

## 2010 Waste Diversion and Recycling Report

Table 5 compares DWR's 2009 and 2010 waste reduction in reportable categories. (Actual waste reports lag by one year, with the 2010 Sustainability Reports reporting 2009 and 2011 reporting 2010.)

Table 6. Waste Reduction Amounts by Diversion Programs & Activities

Category	Amount Reported (in tons) 2009	Amount Reported (in tons) 2010
Total Business Source Reduction	10.60	16.51
Material Exchange	6.30	7.1
Salvage Yards	0.00	0
Recycling Activities		
Batteries Reclaimed	1.70	0
Beverage containers	192.10	11.05
Cardboard	81.00	178.77
Construction and Demolition	57.40	97.06
Glass	0.10	5.49
Mixed office paper	1,443.50	1408.24
Newspaper	1.20	1.03
Other Materials	2,035.20	n/a
Other Plastic	0.60	3.42
Phone Books	0.29	.5
Plastic Pallets	2.29	2.00
Sandblast Media recycled	2,061.20	0.0
Scrap Metal	291.70	170.42
Special Collection Events	51.00	10.0

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Category	Amount Reported (in tons) 2009	Amount Reported (in tons) 2010
Textiles, Rags	0.00	.6
White office paper	34.50	76.12
Composting		
On-site composting	128.00	24
Commercial Pickup of Compostables	0.00	193.41
Self-Haul Green-waste	0.00	22.94
Xeriscaping, grass cycling	1.70	8806
Special Waste		
Concrete/Asphalt/Rubber	876.20	781
Rendering	12,255.30	202
Scrap Metal	98.20	11.74
Sludge	16.20	0
Tire Recycling	19.80	28.55
Wood Waste Recycling	0.00	188.06
Hazardous Waste		
Batteries	5.10	25
Electronic Waste (Computers, TVs, Cell Phones, etc.)	41.10	2.64
Other (Stripping Products, Oil Filters, Paint Thinner, etc.)	11.70	16.30
Paint	0.30	2.09
Universal Waste	3.80	12.94
Used Oil/Antifreeze	165.51	192.02
<b>Total Tons of Waste Diverted</b>	<b>19,666.60</b>	<b>12246.08</b>
<b>Total Tonnage of Waste Landfilled</b>	<b>2367.82</b>	<b>3955.83</b>
<b>Total Tonnage of All Waste Produced</b>	<b>22,034.42</b>	<b>16201.91</b>

The following table shows the actual diversion rates for 2009 and 2010. Note that although the 2010 numbers for Landfilled waste is higher than in 2009, the total amount of waste produced is nearly 6000 tons less than 2009. When looking at waste reduction, recycling and buying of recycled products statistics, it is important to focus on the overall goal. In this case, not producing waste in the first place is far more important than waste diversion.

Table 7. 2009 -2010 Per Capita Disposal Rates and Waste Diversion Percentage

Waste Diversion	2009	2010
<b>Total Tonnage Actual Disposed in Landfill</b>	<b>2,842.0</b>	<b>3,175.0</b>
<b>Total Number Employees</b>	<b>2912</b>	<b>2899</b>
<b>Per Capita Disposal (lbs/emp/day)</b>	<b>5.3</b>	<b>6.0</b>
<b>Diversion Rate</b>	<b>89%</b>	<b>76%</b>

### State Agency Buy Recycled Campaign

DWR is part of the State Agency Buy Recycled Campaign (SABRC). This campaign focuses on buying products that contain some percentage of previously used material or, as it is called, post-consumer content. The SABRC campaign requires all State agencies to follow the Public Contracts Code, which mandates that all agencies purchase recycled materials, sets the amount of the post-consumer content recycle percentage in these materials, and mandates the percentage of purchasing dollars spent on each category (Appendix D). Further, each State agency is required to report its progress annually in meeting recycled-content product purchasing requirements (Public Contracts Code section 12211(a)) to the California Department of Resources Recycling and Recovery (CalRecycle). The following section discusses DWR’s latest information on SABRC from 2010 with a detailed explanation of DWR’s efforts.

### 2010 State Agency Buy Recycled Campaign (SABRC) Report

DWR follows State requirements and its own environmentally preferred purchasing policy. Table 2 details DWR’s purchasing percentages in all 11 categories for years 2009 and 2010.

Table 8. 2009-2010 SABRC Statistics

Required Category	% of SABRC Dollars Required	DWR 2009 % SABRC Dollars Spent	DWR 2010 % SABRC Dollars Spent
<b>Paper Products:</b>	At least 50 %	54.00%	64.34%
<b>Printing and Writing Paper</b>	At least 50 %	56.30%	56.65%
<b>Mulch, Compost and Co-Compost</b>	At least 50 %	N/A	N/A
<b>Glass Products</b>	At least 50 %	14.90%	23.12%
<b>Lubricating Oil Products</b>	At least 50 %	17.90%	23.84%
<b>Metal Products</b>	At least 50 %	37.40%	53.83%
<b>Plastic Products</b>	At least 50 %	14.30%	20.63%
<b>Paint</b>	At least 50 %	13.70%	16.25%
<b>Antifreeze</b>	At least 50 %	10.00%	25.89%
<b>Tires</b>	At least 50 %	14.10%	18.24%
<b>Tire-derived Products</b>	At least 50 %	0%	5.21%

In 2010, DWR increased its percentage of SABRC compliance in all categories; most notable in metal products, antifreeze and lubricating oils. However, only three categories exceeded the mandated purchasing percentages shown in Table 2: paper products and printing, metals and writing materials. DWR spends no purchasing dollars on mulch, compost, and co-compost. However, in the remaining eight categories DWR falls short of its goals by 27 to 45 percent.

***Glass Products.*** DWR improved its glass product purchases over 2009, but still falls short of its goal by nearly 27 percent. However, DWR's glass purchasing consists mainly of windshields and windshield glass is not made from recycled products. It may be useful to place windshields in a subcategory of glass. This would better clarify DWR's actual SABRC purchasing in all other glass categories.

***Lubricating Oil Products, Antifreeze, and Tires.*** DWR increased its used oil products almost 7% over 2009. However, DWR is having difficulty meeting the mandate to use 50 percent recycled products in these three categories. Despite the fact that the Department of General Services (DGS) contract for lubricating oil stipulates that all re-refined lubricating oil be at least 70 percent recycled oil, and that SABRC requires that least 50 percent of oil-purchasing dollars must be used to buy recycled oil, barriers to compliance with these mandates exist. Currently, most of DWR's oil servicing is now outsourced, and tracking the type of oil used is difficult. Further, most vendors that provide oil changing services are reluctant to suggest re-refined oil to the customer in order to avoid the appearance of "steering the customer" to a specific brand (Foundation, 2005).

A similar situation exists for recycled antifreeze, where the actual servicing is done by third-party vendors. Although recycling the antifreeze that is drained from its vehicles, DWR finds it difficult to track whether vendors are putting re-refined antifreeze into the vehicle. Even with these difficulties, DWR increased its use of recycled antifreeze to over 25%, an increase of nearly 15%.

Currently, DWR recycles all of its used tires. However, DWR is required to spend at least 50 percent of its tire-purchasing dollars on SABRC retreaded tires. No retreaded tires were purchased in 2009 or 2010. (Reasons for this are explained in the 2010 Annual Sustainability Report)

***Tire-derived Products.*** This area has a minimal increase over 2009. One barrier to achieving this goal is difficulty in obtaining information on products that contain tire-derived products. This is an area of needed improvement for DWR.

***Metal Products.*** Metal products increased nearly 16% over 2009. Much of DWR's purchasing is of items for which new metal is seldom used (such as paper clips, staples, scissors, shelving, file cabinets, etc.) and for which used metal certification is nearly impossible to obtain. Under these circumstances, the increase of 16% is a significant improvement.

***Plastic Products.*** Plastic products showed a slight improvement over 2009 by an increase of 6%. However, DWR has little information on the recycled content of its plastic products. Most plastic products lack sufficient documentation to determine their post consumer content.

***Recycled Paint Products.*** The use of recycled paint inched up slightly by 3%. DWR staff is reluctant to use recycled paint due to concerns that the paint might peel sooner, might not cover as well, might not spread easily or that the paint may not be available in the correct color.

## **Water Use Efficiency**

The Director's Sustainability Policy has targeted water use at DWR to be reduced by 20 percent per employee by 2020. Key to fulfilling that directive is to determine what the current water use at DWR is per employee. DWR has 67 facilities throughout the state, ranging in size from approximately 1,200 employees at its main office to facilities that have only 1 to 5 employees. Some facilities are used only for emergencies. To accurately determine water use per employee, all facilities must report their water use, which means gathering all of the utility water meters' readings for the year. Due to the nature of some of the facilities, frequently these readings are combined with electricity meter readings and lumped under one billing code as utility expenses. These readings must be separated prior to determining water usage. DWR has begun the necessary work to begin to determine its current water use. (See DWR Pilot Projects Section of this report for further information.)

## **Waste Water Reuse**

Although not a target in the original 2009 Sustainability Policy, waste water reuse is a logical fit with the Sustainability Policy, the LEED building standards and DWR's mission. Waste water reuse will also help DWR meet its commitment to increasing its water use efficiency. Currently, no data is available on the amount and types of DWR's waste water. Waste water will be a focus in future data gathering efforts.

## **Goal - Climate Protection**

### **Reduce Greenhouse Gases**

Greenhouse gases from the burning of fossil fuels are driving climate change that is already affecting California's water resources. Assembly Bill AB32 requires California to reduce its greenhouse gas emissions to 1990 levels by 2020. Warmer temperatures, different patterns of precipitation and runoff, and rising sea levels will increasingly affect DWR's ability to manage water supplies and other natural resources. Adapting California's water management systems in response to climate change is one of DWR's most significant challenges. California has begun to respond to this challenge through executive orders and significant legislation to reduce greenhouse gas (GHG) emissions. For a list of State laws and executive orders, see Appendix E. For further information on DWR's climate change efforts, go to the Web site <http://www.water.ca.gov/climatechange>.

### **Climate Action Plan**

During 2011, the CEQA Climate Change Committee began developing a programmatic approach—in the form of a Climate Action Plan and GHG Emissions Reduction Plan—to address climate change across all DWR programs and projects to comply with the new CEQA Guideline Amendments recently adopted by the California Natural Resources Agency. The Climate Action Plan will also help document DWR's compliance with AB32; set GHG reduction targets and reduction strategies; streamline environmental review; and demonstrate DWR's commitment to environmental stewardship, sustainability, and climate change mitigation and adaptation.

### **Procure Renewable Energy**

DWR is charged with management of the State Water Project, the largest state-built, multi-purpose water project in the country. The State Water Project was designed and built to deliver water, control floods, generate power, provide recreational opportunities, and enhance habitats for fish and wildlife. DWR has contracts with 29 local water agencies for delivery of up to 4.2 million acre-feet of water per year. Water deliveries serve 24 million people and provide irrigation for 750,000 acres of farmland. The State Water Project is the third largest generator of hydropower in California producing over 1,900 MW and accounting for 2 percent of California's total generating capacity. Hydropower is classified as renewable energy under California law.

Although DWR produces 1,900 MW of renewable hydropower annually as a result of the moving of water, it is not enough to offset the amount of energy needed. DWR needs to purchase additional

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power. As a result, DWR is both a consumer and producer of electricity. Currently, the majority of energy purchased by DWR is produced by the use of fossil fuel (See table 3). In 2011, the SWP consumed 8.5 million MWh to deliver 3.6 million acre-feet of water, representing 3 percent of total electricity usage in California. This energy was derived from SWP and off-Aqueduct hydrogeneration resources (63 percent), purchases from CAISO market (27 percent), and from DWR's contract to receive electricity from the Reid Gardner coal-fueled power plant in Nevada (10 percent). Table 9 shows the emissions from 2007 to 2011.

**Table 9. 2007-2011 State Water Project CO2 Emissions**

State Water Project CO2 Emissions (Million Metric Tonnes Carbon Dioxide)					
Source	2007	2008	2009	2010	2011
Reid Gardner Unit 4	1.4	1.0	1.0	0.8	0.9
Purchases (Unspecified Energy)	1.7	1.4	1	1.1	1
<b>Gross Emissions</b>	<b>3.1</b>	<b>2.4</b>	<b>2.0</b>	<b>1.9</b>	<b>1.9</b>
Surplus Sales	0.7	0.8	0.4	0.4	0
<b>Net Emissions</b>	<b>2.3</b>	<b>1.6</b>	<b>1.6</b>	<b>1.5</b>	<b>1.9</b>

DWR's greenhouse gases reduction plan includes discontinuing the purchase of electricity from the Reid Gardner Unit 4 in 2013 when the current contract expires. Discontinuing the Reid Gardner contract will allow DWR to meet its 2020 goal of 50% reduction in GHG emissions. However, DWR will continue to reduce its GHG emissions ahead of schedule. Part of the continuing reduction will occur in the procuring of renewable energy for State Water Project operations.

Table 10 below shows DWR's plan for reducing GHG emissions by increasing the annual amount of renewable energy that it will purchase in future years. In each year, additional renewable energy is purchased, adding to the previous year's total, i.e., Year 1 = 36 GWh, Year 2 = 36 GWh + 36 GWh from year 1, Year 3 = 36 GWh + 72 GWh from prior years. The Renewable Energy Procurement Plan is based on achievement of DWR's Long-Term Goal and used a long-term average of emissions over a 20-year period since 1990 and forecasted power requirements to develop the schedule of renewable resource procurements. The Renewable Energy Procurement Plan is designed to incrementally reduce GHG emissions from operation of the SWP so that total operational emissions fall to 80% below 1990 levels by 2050. DWR structured the Renewable Energy Procurement Plan to be more than adequate to meet its Near-Term Goal for 2020. The reason for this approach is that it will enable DWR to initiate

renewable procurement in the short-term and expand that procurement as the renewable energy market matures. This approach will also provide the smoothest ramp up of renewable power procurement as a base to build on in order to meet its projected Long-Term Goal for 2050. DWR will monitor emissions trends and modify the schedule for procurement of renewable energy, as necessary, to meet its Near Term and Long-Term Goals.

It should be noted that the renewable energy purchased through the Renewable Energy Procurement Plan will, for the most part, offset energy that is currently purchased from unspecified sources or other sources of power that have disproportionally high rates of emissions per MWh of energy supplied.

**Table 10. Renewable Energy Procurement Plan**

<b>OP-3 Renewable Energy Procurement Plan</b>	<b>Annual Increase in Renewable Energy Procurement Rate</b>	<b>End of Period Portfolio Target</b>	<b>Annual Emissions Reduction at End of Period</b>
<b>2010-2020</b>	36 GWh/yr	360 GWh	157,320 mtCO <sub>2</sub> e/yr
<b>2021-2030</b>	72 GWh/yr	1,080 GWh	471,960 mtCO <sub>2</sub> e/yr
<b>2031-2040</b>	108 GWh/yr	2,160 GWh	943,920 mtCO <sub>2</sub> e/yr
<b>2041-2050</b>	144 GWh/yr	3,600 GWh	1,573,200 mtCO <sub>2</sub> e/yr

## **Additional Climate Protection Practices**

DWR has begun a series of efforts that both adapt to climate change as well as mitigate certain climate changing activities. Following are the key steps that form DWR’s climate protection practices.

***Regional Climate Planning and Management.*** California lies within multiple climate zones, and each region of the state will experience climate change differently. Some climate impacts will be unique to a region as will be the economic and environmental effects. This means that adaptation strategies must also be regionally appropriate. Here is where IRWM provides a critical framework for actions to address the uncertainties presented by climate change, as well as other risks to California’s water future. Further, for every IRWM plan, water use efficiency must be a foundational action and a key part of every water agency’s portfolio. In many instances, water conservation achieves not only water demand reduction but energy demand reduction as well. By reducing energy demand, reductions in GHG emissions are achieved as well.

***Flood Protection.*** DWR is preparing a Central Valley Flood Protection Plan (CVFPP) that will explicitly consider climate change impacts to flood management, due by 2012. Even at an early stage of developing the CVFPP, DWR has already convened a special workgroup composed of some of the top climate scientists and planners in the country, to provide input about the scope of climate change considerations to be addressed in the CVFPP. The charge of the workgroup was to (1) identify key aspects of climate change that may affect flood management, (2) ascertain existing problems and expected future challenges related to climate change, (3) develop a checklist of climate change considerations, (4) inventory related climate change projects and programs, and (5) compile a list of climate change references. The above mentioned draft report *State Plan of Flood Control Descriptive Document* (Jan 2011) is available on DWR website at:

[http://www.water.ca.gov/cvfmp/docs/DRAFT\\_SPFC\\_Descriptive\\_Doc\\_20110115.pdf](http://www.water.ca.gov/cvfmp/docs/DRAFT_SPFC_Descriptive_Doc_20110115.pdf)

***Improve Management and Decision-Making Capacity.*** Determining the impacts of climate change on the varying regions of the state requires that data about our environment be collected and analyzed in a consistent and comprehensive way. Improved data collection and a robust monitoring network will help identify trends, provide for better real-time system management, and evaluate and, if necessary, correct adaptation strategies. In addition, sea level rise presents a particular dilemma for water planners because of the great uncertainty around ice sheet dynamics, as well as the potentially large impacts. Developing more focused research on sea level rise and other topics can help narrow the range of uncertainty in climate changes.

***Climate Change Analyses.*** All climate change analyses in DWR environmental documents are now reviewed by DWR's CEQA Climate Change Committee, which was formalized in June 2010. Through these reviews the committee has developed environmental analysis methodologies and reference materials for use by DWR staff and consultants. These guidance documents provide a consistent approach to conducting project-specific environmental analyses for CEQA compliance documents, biological assessments, permit applications, and other environmental needs. Because of the evolutionary nature of climate change analysis, these documents will be updated periodically to include the most current legal rulings and state-of-the-science on the subject.

***Greenhouse Gas Offsets.*** On Earth Day in 2010, DWR and Sacramento Municipal Utility District (SMUD) jointly announced a new partnership in which SMUD would provide 33 percent renewable energy and 33 percent carbon offsets for DWR's retail electrical and natural gas use, respectively, based on its 2008 retail consumption data. DWR now participates in SMUD's Commercial "Greenergy" Program

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whereby SMUD matches 33 percent of DWR's estimated retail electricity needs with Greenergy purchases from renewable resources such as landfill gas, wind, solar, and small hydroelectric plants. In addition, SMUD matches an additional 40 percent to the amount DWR pays under the agreement to build new, cleaner energy resources, reducing the need to build future polluting power plants. Through SMUD's Carbon Offset program, DWR reduces the effects of its GHG emissions related to its natural gas use.

## Goal - Environmental Stewardship

DWR has been engaged in developing and adopting environmental stewardship as a business strategy since 2006/2007, including the establishment of the new FloodSAFE Environmental Stewardship and Statewide Resources Office; identifying environmental stewardship as a foundational action in the California Water Plan; and as an objective and outcome of the Central Valley Flood Protection Plan development. DWR has made Environmental Stewardship an integral part of its daily work as the following quote from DWR's Environmental Stewardship Policy, makes clear:

*DWR managers will embrace environmental stewardship as part of their responsibilities. As managers develop and deliver reliable water supplies and provide for flood protection for the State's residents, they can incorporate environmental stewardship in several ways:*

- *Integrate ecosystem protection and restoration into water storage and conveyance and flood control/management planning*
- *Include environmental stewardship and ecosystem protection and restoration as a criteria in project funding decisions for all DWR programs*
- *Plan for conservation, restoration and maintenance of the biological diversity and natural physical processes of aquatic and related terrestrial ecosystems*

Continuing the integration of Environmental Stewardship into DWR's mission, DWR staff has begun updating its Water Resources Engineering Memorandum (WREM) 58A. This WREM is intended to provide guidance and direction to Department of Water Resources (DWR) staff and management in implementing DWR's Environmental Stewardship Policy ([DAM 2140](#)), as well as meeting DWR's continuing obligation to comply with all environmental laws and other regulatory requirements. When completed and approved, WREM 58b will help assure that Environmental Stewardship practices become embedded in all future DWR programs and projects.

## **DWR Green Priorities Pilot Projects**

As previously discussed, the sustainability workgroup proposed an implementation plan to the DWR Governance Board on April 19, 2011. Part of that plan included three pilot projects for sustainability. These pilot projects are detailed below.

### **Tire Pressure Monitoring Program**

The Tire Pressure Monitoring Program took place over a six-month period in 2011, with the purpose of performing a self-assessment of the routine tire pressure found in DWR's fleet.

### **Final Results from DWR Tire Pressure Monitoring Pilot Program**

*January 2011 to June 2011*

#### **Objective: Greenhouse Gases (GHGs) Reduction**

##### **Introduction**

DWR's fleet averages approximately 899 vehicles such as light trucks, vans, and SUVs; and 240 pieces of heavy machinery such as backhoes, crawlers, and dozers. Of the 899 light duty vehicles, almost 89 percent are pickups and vans. DWR personnel travel between 18-23.5 million miles per year, consuming approximately 1.1 million gallons of gasoline, diesel, and bio-fuels. One gallon of gasoline consumed produces ~19.4 PSI of CO<sub>2</sub>.

After the amount of electrical power used to store, control, and transport water throughout the state, DWR's transportation needs account for the second largest amount of GHGs produced by DWR operations. This means that fuel reduction is an important focus for DWR's initiative to reduce GHGs in its daily operations. On average, tires lose one psi per month and fuel efficiency is reduced one percent for every three psi of under-inflation on average of all four tires (California Environmental Protection Agency Air Resources Board). Various studies show that correcting tire pressure to the vehicle manufacturer's recommended pressure improves fuel economy from 1 to 3 percent. Therefore, correcting tire pressure is one of the quickest, most cost-effective ways to obtain better fuel efficiency.

The Tire Pressure Monitoring Program was a six-month pilot project begun in January and ending in July of 2011. The program performed a self-assessment of the tire pressure found in DWR's fleet. An assortment of 59 vehicles ranging from sedans to pickups were selected from various locations around the state, and tested once a month for a period of 6 months. (See Attachment A for study methodology.)

**Significant findings:**

1. 23.6% of DWR's fleet vehicle tires are severely underinflated by 6 PSI or more.
2. When tire pressure requirements increased past 35 PSI, the number of tires severely underinflated jumped from a minimum of 50% severely underinflated at 50 PSI to 97% severely underinflated at 80 PSI.
3. Tire pressure requirements on large pickups and heavy trucks and other heavy mobile equipment are at higher PSIs than sedans and light pickups. These tire pressures range from 50-80psi or higher.
4. DWR fleet's fuel efficiency could be increased by at least 2.6% or more with a tire pressure monitoring program.
5. Employee safety would be increased with a tire pressure monitoring program.

**Recommendations:**

1. DWR should institute a department wide tire pressure monitoring program.
2. Priority should be given to vehicles with a recommended tire pressure of 50 PSI or higher.
3. Correct tire pressure reading must be made part of DWR employee training for employees who drive vehicles with recommended tire pressures of 50 PSI or higher.
4. Service agreements on vehicles with recommended tires pressure of 35 PSI or less must include maintaining proper tire pressure when vehicle is serviced.
5. Tire pressure readings should be tracked along with vehicle mileage.
6. Tire pressure gauges and pumps should be included in standard equipment on vehicles with recommended tire pressures of 50 PSI or higher.

*(See all findings in Appendix F1, Tables 1 -4 attached)*

**Discussion**

Other than the total of severely underinflated tires, one of the most significant findings in the above data is the jump in both number and degree of underinflated tires at increasing tire pressure

requirements. Higher tire pressure requirements generally are found on heavy equipment such as dump trucks and larger pickups such as the Ford F-250's, Dodge Ram 2500s and Chevy 2500's. The potential for tire failures and resulting accidents and employee injury due to vehicle size and weight are greater than in sedans and smaller pickups.

Overall, only 36.8% of all front tires are within the recommended range while 40% of all rear tires are within the recommended range. When overinflation is added to the total of incorrect pressures, the percentage of correct tire pressure is even lower.

### **Fuel Efficiency**

Fuel efficiency is reduced 1% for every 3 psi of under-inflation meaning that tires underinflated by 6 psi have fuel efficiency reduced by 2% and tires underinflated by 9 psi have fuel efficiency reduced by 3%. The California Air Resources Board (CARB) considers tires underinflated by 6 psi or more to be severely underinflated. If the numbers in Table 1 are considered to be representative of DWR's fleet, then over 26% of the tires in the fleet are severely underinflated.

### **Potential Fuel Savings**

Potential fuel savings are calculated by the following equation:

**Fuel Savings Equation=  $FGC - FGC / (1 + IFE)$**  where FGC = Forecasted Gasoline Consumption (California Air Resources Board, 2007), "1" = represents current fuel efficiency, and IFE = Increase in Fuel Efficiency w/proper inflation (expressed as a decimal).

#### **26% of DWR' fleet tires are severely under-inflated by an average of 7.7 PSI**

$$7.7PSI \div 3\%/PSI = 2.6 \rightarrow (IFE = 2.6\%)$$

*DWR's fleet fuel efficiency could be increased by at least 2.6% with a proper tire pressure program insuring accurate tire pressure for severely underinflated tires.*

#### **18.9 % of DWR' fleet tires are moderately under-inflated by an average of 3.5 PSI**

*DWR's fleet fuel efficiency could be increased by at least 1.3% with a proper tire pressure program insuring accurate tire pressure for moderately underinflated tires.*

### **Maintenance Savings**

An additional savings can be realized from a tire pressure monitoring program in reduced tire wear and replacement costs. Improper tire pressure can cause both increased and uneven wear on a tire, as well as increased stress on sidewall strength, all of which increase the probability of tire failure. Increased tire wear and stress when coupled with road hazards and debris greatly increase the risk of tire failure. Proper tire maintenance will reduce tire replacement costs.

### **Employee Safety**

Although increased fuel efficiency was the initial catalyst for this pilot program, the most important reason for implementing a department wide tire pressure monitoring program is increased employee safety. Several transportation studies bear this out. Both the Virginia Legislature and the Arizona Department of Transportation performed studies in 1999 on tire failure and concluded, "For all types of tires, under-inflation and damage due to roadway hazards and debris were the most common causes of tire failure." (Transportation, 1999, p. 1) In a third report, The University of Michigan Transportation Research Institute performed a study that was designed to determine if there were tires that were more blowout resistant than other tires for commercial highway vehicles. That study ended in 2000, and reached the conclusion that "Maintenance issues (e.g., under-inflation, overloading, tire mismatching, excessive wear, inadequate inspections, and associated matters leading to increased heat and tire operating temperatures) are the major causes of tire blowout." (Bareket, 2000, p. 40)

DWR employees' daily work routinely takes them into situations where road hazards such as potholes and road debris are common occurrences. This combination of poor tire pressure maintenance and occupational hazards presents a potential risk to DWR employees as well as increasing maintenance costs.

Overall, proper tire pressure helps reduce all of the following potential driving hazards, which in turn promote employee safety:

- Reduces skidding
- Improves vehicle handling
- Allows for shorter stopping distances
- Reduces flat tires and blowouts

### **Liability and Financial Savings**

DWR also derives reduced liability and additional financial benefits. A proper tire pressure and maintenance program helps reduce the number of accidents that would result from improperly inflated tires. Because proper tire pressure reduces wear on tires, tires last longer so maintenance costs for tire replacement are reduced. Finally, proper tire pressure helps increase fuel efficiency, thus reducing GHG emissions.

### **California Law on Tire Pressure Maintenance**

In recognition of the benefits of proper tire pressure for GHG emissions, California law now requires that tire pressure be checked on private vehicles whenever the vehicle is routinely maintained (Attachment B).

### **Water Use at DWR Pilot Project**

The Director's Sustainability Policy targeted water use at DWR to be reduced by 20 percent per employee by 2020. Key to fulfilling that directive is to determine what the current water use at DWR is per employee. DWR has 67 facilities throughout the state, ranging in size from approximately 1,200 employees at its main office to facilities that have only 1 to 5 employees. Some facilities are used only for emergencies. To accurately determine water use per employee, all facilities must report their water use, which means gathering all of the utility water meters' readings for the year. Due to the nature of some of the facilities, frequently these readings are combined with electricity meter readings and lumped under one billing code as utility expenses. These readings must be separated prior to determining water usage.

The current inability to break out the necessary information led to the creation of a pilot project that would track and isolate this critical information. Staff began working with the purchasing and billing departments to determine water providers throughout DWR's 33 field offices and 34 related facilities. Because of the large amount of data that need to be reviewed, staff has not yet been able to determine the number of water meters, the number of providers, and the total amount of water used.

### **Payroll Deduction—Monthly Transit Pass Pilot Program**

State employees may participate in a program aimed at reducing the number of single occupant vehicles on urban freeways at peak commute hours. As an incentive, the program provides a 75 percent reduction up to \$65 toward the cost of monthly transit passes and tickets. Currently, the pass must be purchased from an outside vendor or at the counter in the main lobby of the Resources Building on

## 2011 Annual Sustainability Report

certain days of the month. Recognizing the opportunity to potentially to increase public transit ridership through a payroll deduction plan for transit passes, a pilot project was initiated to determine how this could be achieved.

Currently, the mass transit reduction pass program has approximately from 250 to 500 employees a month who buy passes. At an estimated commute of 20 miles per employee per day, total employee travel is potentially reduced from 1.25 million to 2.50 million miles per year with a commensurate reduction in GHG emissions and air pollution. By easing purchase of the transit pass, it is anticipated that ridership will increase and a corresponding reduction in GHG and air pollution will result.

The current projected date for payroll deduction implementation is March of 2012.

## Other Sustainability Efforts

### Paper Reduction Efforts - Documentum Project

Paper management and the vital information it represents, is a critical task for DWR. In 2008, in meeting its 5 year inventory requirement to the Department of General Services (DGS), DWR reported a total of 33,743 cubic feet of files. The cubic footage included:

- 4,804 file cabinets and desk drawers of paper.
- 402,014 boxes of paper files (both office storage and offsite long-term storage).
- 32 boxes of microfiche.
- 156 boxes of microfilm.

Additionally, the inventory included a total of 199 terabytes of unstructured electronic files. That storage included:

- 18 terabytes of electronic files on DWR servers.
- 1 terabyte of files on compact discs.
- 180 terabytes of files on desktop personal computers which includes 7,971 Word, Excel & PowerPoint Documents

What these numbers do not reveal are the various types of vital information contained in these records. Examples include: DWR's various licenses, including federal licenses to operate hydropower plants; various permits necessary to carry out DWR's mission; legal records including critical court decisions, administrative records of decision and memorandums of understanding with other governmental agencies; historical information on myriad water resources, such as watershed information and data, rainfall records, and evapotranspiration records. Additional information that must be maintained includes project documentation and blueprints of the numerous State Water Project facilities throughout the state, records of environmental restoration efforts and endangered species information and protection efforts. The above enumeration is just a sample of the vast quantity of vital information and public records maintained by DWR.

The sheer quantity of this information does not reduce easily; it can only be stored differently. That storage, regardless of format, comes at a cost. Although digital storage has many advantages, it still has its own storage requirements that involve significant amounts of time, effort, expertise and equipment. Additionally, all archival, current and future paper information still needs to be translated to the new medium and the information must be able to be retrieved. With the amount of information being generated by new DWR projects and programs each year, as well as the need to translate over 50 years of information into a new medium, the task of paper reduction takes on a daunting perspective.

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DWR originally thought to take an incremental approach in its effort to design, develop, and implement Documentum. The implementation focused on two (2) business areas: the Imaging and Records Management Unit (IRMU) (an organization within the Division of Management Services) and the Division of Engineering (DOE), with an "Enterprise" foundation to be established for the future. However, the ever increasing amount of electronic information being generated over the last 2 years forced DWR to consider implementing Documentum Department wide. Work on the Enterprise side was slowed and the focus of the effort shifted from the Enterprise side of Documentum to what is known as the "Organizational" side. Electronic space, known as "cabinets", was set up department wide and the Organizational side of Documentum was opened for the storage of the daily work from all DWR employees. This had the benefit of slowing the production of paper records while forcing the individual personal computer electronic files generated by the daily work process into centrally located electronic files that may be accessed by all DWR employees. This effort has been paying off, with DWR employees becoming accustomed to the new electronic storage system while gaining experience with using DWR's electronic information retrieval systems.

However, that does not mean that DWR has yet made the transition to all digital storage. It is anticipated that paper reduction efforts at all levels will continue years into the future, while historical records are converted into digital media and existing and new forms of digital media being brought into order through new library methods and library science. The next 5 year record inventory is due in 2013. The results of that inventory will help determine the next Documentum implementation steps.

### **Life Cycle Analysis Committee**

Life cycle analysis is a tool that reviews all of the manufacturing steps involved in making a product or service. Its purpose is to determine between comparably priced goods, whether or not one product or service is more environmentally friendly than the other. Computer based lifecycle analysis tools vary in scope and price. DWR has established a small committee to explore the usefulness of life cycle analysis for purchasing needed goods and services. The committee will study various computer tools and apply life cycle analysis principles to commonly purchased products to see if DWR could make better overall sustainable choices. The committee is reviewing a select sampling of DWR purchases and will make a determination of what products to study early in 2012.

### **Sustainability Indicators California Water Plan**

The *California Water Plan* provides a collaborative planning framework for elected officials, agencies, tribes, water and resource managers, businesses, academia, stakeholders, and the public to develop findings and recommendations and make informed decisions for California's water future. The

plan, updated every five years, presents the status and trends of California's water-dependent natural resources; water supplies; and agricultural, urban, and environmental water demands for a range of plausible future scenarios. The **California Water Plan** also evaluates different combinations of regional and statewide resource management strategies to reduce water demand, increase water supply, reduce flood risk, improve water quality, and enhance environmental and resource stewardship. The evaluations and assessments performed for the plan help identify effective actions and policies for meeting California's resource management objectives in the near term and for several decades to come.

The California Water Sustainability Indicator Framework is a part of the **California Water Plan Update 2013**. As currently envisioned, the Framework is composed of a cycle of process steps that build upon each other. The cycle begins with defining what is meant by sustainability and other terms and completes one cycle by informing policy and decision-making. The process is intended to be part of a cycle of adaptive learning and action. The indicators and the process of developing, analyzing, and interpreting them are not intended to stand alone, so links are described with regional planning, ecosystem services, and the idea of a water footprint.

The Framework is currently in development until the Water Plan Update 2013 is finalized. Until then, it will undergo periodic review by the Water Plan Sustainability Indicators Workgroup with interagency participation, the Public and Tribal Advisory Committees, and other bodies and individuals.

## **Sustainability Education and Awareness Efforts**

### **Sustainability Collaboration Portal**

The Sustainability Collaboration Portal is a web based tool that serves a variety of functions. More flexible than a web site, it allows interactive learning through the sharing of documents, the ability to have online discussions as well as being able to develop “wikis” on various Sustainability topics. The portal’s functions include the ability to calendar events, host other Web linked resources and handle e-mail servers, host forums, etc. Further, the Sustainability portal has the ability to contain multiple groups and organizations by maintaining a viewer privacy protocol. Dedicated passwords determine the content that a particular viewer may see. This feature allows numerous topics to be hosted on the portal as needed but keeping the content relevant to the respective viewers.

Currently, DWR is engaged in several activities designed to connect with other California state agencies in sustainability efforts. The collaboration portal serves as an important connection for sharing

information, ideas and links with one another. The flexibility of this Web-based tool allows significant savings of travel time and facilitates communication between agencies.

### **Sustainability Awareness Campaign**

DWR is a large agency with numerous field offices throughout the state. For sustainability efforts to be effective, awareness as well as education of sustainability principles and practices is important. In 2011, an awareness and education campaign was developed on various aspects of sustainability as it relates to DWR and DWR employees. The program consists of seven videos and corresponding messages to help DWR employees understand how sustainability relates to their daily work. Filming and presenting of the videos and development of educational materials is anticipated to be completed in 2012.

### **Earth Day Activities**

Earth Day activities were a weeklong series of presentations on Sustainability as it relates to DWR. The presentations began on Monday, April 18, 2011 and continued throughout the week with presentations on each day having multiple presentations to allow DWR staff flexibility in attending. The first presentation was a brief overview of the diverse aspects of Sustainability at DWR, with a Question and Answer period. Other presentations followed through the week including a presentation on DWR's carbon offset agreement with the Sacramento Municipal Utility District (SMUD) by SMUD Personnel, and a third presentation on DWR's new Natural Gas Plant, featuring time-lapse video of the construction taking place in Lodi as DWR begins reducing its carbon footprint. A fourth presentation was on DWR's outreach efforts on water conservation for Long Beach aquarium. The water conservation message was unique in that it traced the history of water in California over geologic time and ended with why water conservation is important. The Earth Day presentation replicated the Aquarium's 50 foot display via a 25 foot banner hung in the eleventh floor hallway of the Resources Building in Sacramento. The final presentation detailed the energy efficiency efforts at DWR's Southern Field Division Office and the pursuit of Leadership in Energy and Environmental Design (LEED) gold certification.

### **Climate Change Class 201**

DWR began developing classes for employees on climate change. Climate Change 201 is a more advanced class and contains a section on Sustainability and how it is related to Climate Change efforts. The first Climate Change 201 class is being offered in January 2012.

### **DWR Grant Programs for Sustainability**

Following is a detailed summary of the various grant programs funded by DWR. The funding provided by DWR promotes more water conservation and water use efficiency programs and helps local and regional entities become more sustainable.

### **Local Groundwater Assistance Program**

The Local Groundwater Assistance Program supports agricultural and urban water use efficiency implementation projects or studies that carry out the goals of the California Bay Delta Program's Water Use Efficiency Program. This program provides grants of up to \$250,000 for groundwater data collection, modeling, monitoring, and management studies; monitoring programs and installation of equipment; basin management; development of information systems; and other groundwater related work.

### **Integrated Regional Water Management (IRWM) Program**

The IRWM Program is intended to promote and practice integrated regional water management to ensure sustainable water uses, reliable water supplies, better water quality, environmental stewardship, efficient urban development, protection of agriculture, and a strong economy.

### **Urban Streams Restoration Program (USRP)**

The USRP funds grants to local communities for projects to reduce flooding and erosion and associated property damages; restore, enhance, or protect the natural ecological values of streams; and promote community involvement, education, and stewardship.

### **Agricultural Water Conservation Program**

The Agricultural Water Conservation Program makes loans to local public agencies and incorporated mutual water companies to finance feasible, cost-effective agricultural water conservation projects or agricultural programs to improve water use efficiency. A total of \$28 million is available for the Agricultural Water Conservation Program with up to \$5 million for each project.

## **DWR Outreach Efforts for Sustainability**

DWR recognizes the value of sharing information and forming partnerships in developing and achieving sustainability throughout the department. These outreach efforts are discussed below.

### **Collaboration on Recycling and Environmentally Preferred Purchasing Programs**

Other activities include meeting with other California agencies regarding recycling and environmentally preferred purchasing via monthly meetings, participating in sustainability conferences

and workshops, and meeting with other outside agencies' sustainability coordinators to discuss implementation of sustainability activities.

### **Collaboration on Climate Change Efforts**

DWR has several efforts under way that reach out to local communities and nongovernmental organizations. One such effort is the "Climate Change Handbook for Regional Water Management," which will be available in the summer of 2011. Jointly developed by DWR, U.S. Environmental Protection Agency Region 9, U.S. Army Corps of Engineers, and Resources Legacy Fund, this handbook will provide a framework for integrating climate change analysis into regional water management planning. The handbook provides several case studies highlighting successful analyses performed by large and small water management agencies throughout the western United States.

#### *Presentations*

DWR staff made approximately 33 presentations on climate change, including several keynote addresses, including at interstate and international venues (a list is provided as Appendix G).

#### *Exhibits*

Staff continued to assist the Fossil Discovery Center of Madera County in developing an exhibit on climate change.

#### *Workgroup Participation*

Regional DWR staff participated in the following workgroups: the California Department of Fish and Game Stakeholder Workgroups; the Climate Action Team (CAT) Biodiversity Working Group; the CAT Climate Change, Land Use, and Infrastructure (CCLU-In) Working Group; Delta Conservancy; California Landscape Conservation Cooperative (CA-LCC); the Bay Area Ecosystem Climate Change Consortium; and the California Water-Energy Coalition (CalWEC), which was formed in 2011 by the Water Research Foundation to bring together water and electricity providers to share information and increase reliability of these resources.

#### *Committees*

Staff was also an active participant in the Communications Committee of CalWEC. As an Interim Steering Committee member of the CA-LCC, staff helped launch the CA-LCC in southern California in January and develop the CA-LCC charter. Staff will continue to represent DWR on the full Steering Committee of the CA-LCC, which convened for the first time in September and held an in-person meeting in December.

### **Collaboration on Water Conservation Programs**

DWR has an urban planning assistance program to assist urban water suppliers with preparing comprehensive plans, implementing water conservation programs, and understanding the requirements of the Water Conservation Act. DWR is also conducting workshops and has prepared a draft Urban Water Management Plans (UWMP) Guidebook to support water suppliers in UWMP preparation. The guidebook includes, for the first time, guidance on conducting a climate change vulnerability assessment for urban water providers.

Additionally, for the first time DWR is also developing a guidebook for agricultural water suppliers to assist them in preparing their Agricultural Water Management Plans.

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## Appendix A DWR's Sustainability Policy Memos

State of California

California Natural Resources Agency

### Memorandum

Date: April 22, 2009

To: All DWR Employees

From: Department of Water Resources

Subject: Sustainability Workgroup

As we celebrate Earth Day this year, the Department of Water Resources (DWR) must resolve to carry out its mission in a more sustainable manner, by minimizing its impact on the environment and reducing its greenhouse gas (GHG) emissions. DWR is already responding to the Governor's Climate Change Initiative (Executive Order S-03-05), Green Building Initiative (Executive Order S-20-04), the Global Warming Solutions Act (AB 32), and State Agency Recycling and Waste Diversion (AB 75) requirements by making changes to the Department's business operations and the State Water Project.

We must now build upon these existing efforts to become a sustainability leader within State government and the California water community. These changes will not only make us better stewards of the environment, but should also yield long-term cost savings to State taxpayers through reduced operations and maintenance costs, as well as provide healthier and more productive work environments for staff and visitors. Overall, sustainability must be integrated into every aspect of DWR's work.

DWR's goals and measures for ecosystem stewardship and sustainability will be achieved through implementation of DWR's new Sustainability Policy (attached). Implementation of the policy will explicitly consider technical feasibility and cost-effectiveness of changes, utilize environmental management systems, and focus on the following business areas:

- Climate Protection Practices;
- Ecosystem Stewardship;
- Sustainable Business Operations;
- Greening Facilities;
- Greening Fleet;
- Recycling and Waste Management; and
- Environmentally Preferable Procurement.

With this memo, I am creating a Sustainability Workgroup, under the leadership of John Engstrom and Dale Hoffman-Floerke, to collaboratively develop the guidelines for implementing the new Sustainability Policy, informed by industry best practices, by no later than April 2010. Please join me in supporting John and Dale in this exciting new effort, and promoting a more sustainable future for DWR.



Lester A. Snow  
Director

DWR 9045 (Rev. 1/09)

## 2011 Annual Sustainability Report

State of California

California Natural Resources Agency

### Memorandum

Date: SEP 20 2010

To: All DWR Employees

From: Department of Water Resources

Subject: Sustainability Targets

Over the past two years, the Department of Water Resources (DWR) has made notable progress in carrying out its mission in a more sustainable manner, by minimizing its impacts on the environment and reducing its greenhouse gas (GHG) emissions. DWR's goals and measures for ecosystem stewardship and sustainability will be achieved through implementation of DWR's Sustainability Policy signed in April, 2009.

As we build on this effort to be a sustainable leader within State government and the California water community, we must now establish clear and measurable targets to accomplish these goals. As part of that implementation, I am establishing the following initial sustainability targets for DWR, specifically for the environmental aspects of water, wastewater, energy, carbon, and waste:

- *Water* - 20 percent reduction in per employee water use by 2020;
- *Wastewater* - Incorporate recycled wastewater into facilities when technically feasible and cost-effective;
- *Energy* - Progressive acquisition of 360 GWh of renewable energy resources by 2020; reduce grid-based retail energy demand 20 percent by 2015; ensure Energy Star purchasing;
- *Carbon* - 50 percent reduction below 1990 levels by 2020; 80 percent reduction below 1990 levels by 2050; and
- *Waste* - 50 percent diversion from waste stream by 2020.

The Department's Sustainability Workgroup will work with individual DWR organizations to assist in meeting these targets. The Workgroup will also annually review these targets and issue a report card on our progress towards meeting these targets every April.



Mark W. Cowin  
Director

## Appendix B

### Statutory Requirements for Waste Reduction and Recycling

DWR is subject to Public Resources Code sections 42920–42982 requiring State agencies to comply with a 50 percent diversion rate from landfills by 2004 and the submission of an annual report. The first report was due September 1, 2010, with an annual report due on or before September 1 each year thereafter. The annual report to the board must, at a minimum, include all of the following:

1. Calculations of annual disposal reduction.
2. Information on the changes in waste generation or disposal due to increases or decreases in employees, economics, or other factors.
3. A summary of progress made in implementing the integrated waste management plan.
4. The extent to which the state agency intends to utilize programs or facilities established by the local agency for the handling, diversion, and disposal of solid waste. If the State agency does not intend to utilize those established programs or facilities, the State agency shall identify sufficient disposal capacity for solid waste that is not source reduced, recycled, or composted.
5. Other information relevant to compliance with Section 42921.

In 2008, the Per Capita Disposal Measurement System Act (SB 1016, Wiggins, Public Resources Code Section 42920–42927, 2008) was passed. This changed the way State agencies and local governments measure their progress toward meeting the statutory waste diversion mandates. Under this Act, State agencies are still required to maintain the 50 percent waste diversion requirement as mandated by California’s Integrated Waste Management Act of 1989. However, with the passage of the Per Capita Disposal Measurement System Act, State agencies and large State facilities use per capita disposal as an indicator of their progress toward meeting the mandate. As a result of this statutory change, DWR now calculates waste reduction both as a percentage of total waste generated and as a per capita total.

**DWR Waste Reduction and Recycling Policy.** In addition to the statutory requirements, DWR has its own policy on waste reduction and recycling. This policy requires employees to engage in waste

reduction as they carry out their daily duties. Although many of these efforts are not quantified, the daily efforts of DWR's employee are instrumental in reducing waste.

**Policy on Waste Reduction and Recycling (Rev. Apr 2011).** DWR is committed to good stewardship of the environment by managing and conserving California's resources through recycling and the reuse of materials to the extent possible. A key element of that stewardship is the reduction of the amount of solid waste going from our work locations into landfills.

In accordance with Public Resources Code Sections 42920–42928, to effectively implement DWR's Waste Reduction and Recycling program, employees will engage in waste reduction practices as they apply to their duties and responsibilities. Specifically, employees shall participate in recycling programs and be mindful of opportunities to reduce waste in their own job, office, Division, Region, or Field Division.

Recyclable materials include but are not limited to paper, glass, cardboard, plastic, used motor oil, ferrous metal, or aluminum, as well as wood or pallets. (SAM 1920, SAM 1960) DAM section 8005

**Waste Reduction and Recycling Coordinator Responsibilities (New Oct 2008).** DWR's Waste Reduction and Recycling Coordinator within the Division of Management Services' Departmental Services Office is responsible for coordinating the Waste Reduction Program and Recycling Program efforts department-wide. The coordinator collects DWR organization's waste diversion rates from Recycling Coordinators for inclusion in the annual Waste Reduction Report. DAM section 8005.11

**Recycling Coordinator (New Oct 2008, Rev. Apr 2011).** Recycling Coordinators shall be designated at each Division, Region, Office, and/or Field Division to assist in the development and implementation of the Waste Reduction and Recycling program. Recycling Coordinators are also responsible for tracking and reporting their organization's waste diversion rates to DWR's Waste Reduction and Recycling Coordinator. DAM section 8005.12

**Disposition of Recycle Materials (Current Dec 2011).** Any materials created, purchased, or obtained by DWR during the course of business operations is the property of the State. No person, other than the authorized recycling agent shall remove paper, glass, cardboard, plastic, used motor oil, ferrous metal, aluminum, or other recyclable materials which have been segregated from other waste materials and placed in a designated collection location for the purposes of collection and recycling.

## Appendix C

# Statutory Requirements for Environmentally Preferable Purchasing

**Environmentally Preferable Purchasing Law:** Public Contract Code sections 12400-12404 [AB 498 (Chan), Statutes of 2002, Chapter 575]

The EPP law, enacted in September 2002, directs the Department of General Services (DGS), in consultation with the California Environmental Protection Agency (Cal/EPA), members of the public, industry, and public health and environmental organizations, to provide State agencies with information and assistance regarding EPP including, but not limited to, the following:

- The promotion of EPP.
- The development and implementation of a strategy to increase EPP. This may include the development of statewide policies, guidelines, programs, and regulations.
- The coordination with other State and federal agencies, task forces, workgroups, regulatory efforts, research and data collection efforts, and other programs and services relating to EPP.
- The development and implementation, to the extent fiscally feasible, of training programs designed to instill the importance and value of EPP.
- The development, to the extent fiscally feasible, of an EPP best practices manual for state purchasing employees.

**Environmentally Preferred Purchasing Best Practices Manual.** Following Public Contract Code sections 12400–12404, a best practices manual has been developed as a template for state agencies to follow. The manual defines environmentally preferable products as “those products that have a lesser or reduced effect on human health and the environment when compared with other products that serve the same purpose.” The guiding principles are listed below. Not all questions are pertinent to each buyer, but the principles help guide and educate the buyer to become proficient in choosing more environmentally safe products.

**Guiding Principles.** Questions to ask before purchasing a product include:

- Is the product less hazardous?
- Is it reusable or more durable?
- Is it made from recycled materials? Do we really need to buy a virgin product when the recycled version is just as good?
- What happens to the product at the end of its life? Can it be recycled? Will the manufacturer take the product back? Will it need special disposal?
- Does it conserve energy or water?
- What is needed to properly maintain and/or operate this product?
- Have its environmental attributes been certified by a non-biased, widely accepted source?

The manual encompasses a large variety of issues from batteries and building supplies to medical equipment and vehicles. The manual describes issues associated with various supply categories, lists statutory requirements, and provides guidance on how to purchase environmentally preferred products.

**DWR'S Policy for Environmentally Preferred Purchasing.** DWR is committed to buying recycled-content products rather than non-recycled-content products, whenever price, quality, and availability are comparable. In addition, DWR's purchasing agents will consider other environmental factors such as manufacturing and production practices, maintenance, and end-of-life disposal methods during the purchasing process. The purchase of products that cannot be reused and/or recycled is discouraged.

DWR will also encourage contractors/subcontractors, service providers, building maintenance, and project partners, where appropriate and feasible, to use recycled content, recyclable or reusable products, and practice other waste reduction measures.

## Appendix D

### Statutory Requirements for the State Agency Buy Recycled Campaign

State agencies shall ensure each of the following to accomplish the mandate:

1. At least 50 percent of reportable purchases are recycled products (Public Contract Code section 12201(c)).
2. The requirements apply to all 11 reportable purchases for product categories. (Public Contract Code section 12209).
3. The reportable purchases shall meet each requirement and be applied to the total dollar amount of each specified product category. The purchase of a recycled product from one category may not be applied toward the requirements or the total dollar amount of any other category. (Public Contract Code section 12203(d)).

**Note:** Reused or refurbished products should be considered 100 percent recycled, and no minimum content is required.

**Table D-1. Reportable Product Categories, Descriptions, Minimum Content Requirement, and Percentage of Mandated Purchasing Dollars**

Required Category	Description	Minimum content requirement	% of Mandated Purchasing Dollars (SABRC)
Paper Products	Paper janitorial supplies, cartons, wrapping, packaging, file folders and hanging files, building insulation and panels, corrugated boxes, tissue, and toweling	30% postconsumer (PCC section 12209(a)).	At least 50% of the total dollars spent within this category must be used to procure product(s) meeting the 30% postconsumer requirement.
Printing and Writing Paper	Including, but not limited to, copy, xerographic watermark, cotton fiber, offset, forms, computer printout paper, white wove envelopes, manila envelopes, book paper, note pads, writing tablets, newsprint, and other uncoated writing papers, posters, index cards, calendars, brochures, reports, magazines, and publications	30% postconsumer (PCC section 12209(a)).	At least 50% of the total dollars spent within this category must be used to procure product(s) meeting the 30% postconsumer requirement.
<b>Mulch, Compost and Co-Compost</b>	Including soil amendments, erosion controls, soil toppings, ground covers, weed suppressants, and organic materials used for water conservation.	80% postconsumer (PCC section 12209(c)).	At least 50% of the total dollars spent within this category must be used to procure products(s) meeting the 80% postconsumer requirement.
Glass Products	Including, but not limited to, windows, test tubes, beakers, laboratory or hospital supplies, fiberglass (insulation), reflective beads, tiles, construction blocks, desktop accessories, flat glass sheets, loose-grain	10% postconsumer (PCC section 12209(d)).	At least 50% of the total dollars spent within this category must be used to procure products(s) meeting the 10% postconsumer requirement.

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	abrasives, deburring media, liquid filter media, and containers.		
Lubricating Oil Products	Including, but not limited to, any oil intended for use in a crankcase, transmission, engine, power steering, gearbox, differential chainsaw, transformer dielectric fluid, cutting, hydraulic, industrial, or automobile, bus, truck, vessel, plane, train, heavy equipment, or machinery powered by an internal combustion engine.	70% re-refined oil (PCC section 12209(e)).	At least 50% of the total dollars spent within this category must be used to procure products(s) meeting the 70% postconsumer requirement.
Plastic Products	Including, but not limited to, printer or duplication cartridges, diskette, carpet, office products, plastic lumber, buckets, waste baskets, containers, benches, tables, fencing, clothing, mats, packaging, signs, posts, binders, sheet, building products, garden hose, and trays.	10% postconsumer (PCC section 12209(f)).	At least 50% of the total dollars spent within this category must be used to procure products(s) meeting the 10% postconsumer requirement.
Paint	Including, but not limited to, water-based paint, graffiti abatement, interior and exterior, and maintenance.	50% postconsumer (PCC section 12209(g)).	At least 50% of the total dollars spent within this category must be used to procure products(s) meeting the 50% postconsumer requirement.
Antifreeze	Including recycled antifreeze, and antifreeze containing a bittering agent or made from polypropylene or other similar nontoxic substance.	70% postconsumer (PCC section 12209(h)).	At least 50% of the total dollars spent within this category must be used to procure products(s) meeting the 70% postconsumer requirement.
Tires	Including, but not limited to, truck and bus tires, and those used on fleet vehicles and passenger cars.	Retreaded tires must use an existing casing that has undergone an approved or accepted recapping or retreading process (PCC section 12209(i)).	At least 50% of the total dollars spent within this category must be used to procure tire(s) meeting the approved or accepted recapping or retreading process.
Tire-Derived Products	Including, but not limited to, flooring, mats, wheelchair ramps, playground cover, parking bumpers, bullet traps, hoses, bumpers, truck bed liners, pads, walkways, tree ties, road surfacing, wheel chocks, rollers, traffic control products, mud flaps, and posts.	50% recycled used tires (PCC section 12209(j)).	At least 50% of the total dollars spent within this category must be used to procure tire(s) meeting the 50% recycled used tires.
Metal Products	Including, but not limited to, staplers, paper clips, steel furniture, desks, pedestals, scissors, jacks, rebar, pipe, plumbing fixtures, chairs, ladders, file cabinets, shelving, containers, lockers, sheet metal, girders, building and construction products, bridges, braces, nails, and screws.	10% postconsumer (PCC section 12209(k)).	At least 50% of the total dollars spent within this category must be used to procure product(s) meeting the 10% postconsumer requirement.
<b>PCC = Public Contract Code</b>			

## Appendix E

### California Statutory Requirements on Climate Change

**Table E-3. Summary of State Laws and Executive Orders on Climate Change**

Legislation Name	Signed into Law/ Ordered	Description
<b>SB 1771</b>	September 2000	Establishes the California Climate Registry to develop protocols for voluntary accounting and tracking of GHG emissions.
<b>AB 1473</b>	July 2002	Directs ARB to establish fuel standards for noncommercial vehicles that would provide the maximum feasible reduction of GHGs.
<b>SB 1078, 107, EO S-14-08</b>	September 2002, September 2006, November 2008	Establishes renewable energy goals as a percentage of total energy supplied in the state.
<b>EO S-3-05, AB 32*</b>	June 2005, September 2006	Establishes statewide GHG reduction targets and biennial science assessment reporting on climate change impacts and adaptation and progress toward meeting GHG reduction goals.
<b>SB 1368</b>	September 2006	Establishes GHG emission performance standards for base load electrical power generation.
<b>EO S-1-07</b>	January 2007	Establishes of Low Carbon Fuel Standard.
<b>SB 97*</b>	August 2007	Directs OPR to develop guideline amendments for the analysis of climate change in CEQA documents.
<b>SB 375</b>	September 2008	Requires metropolitan planning organizations to include sustainable communities' strategies in their regional transportation plans.
<b>EO S-13-08*</b>	November 2008	Directs the Natural Resources Agency to work with the National Academy of Sciences to produce a California Sea Level Rise Assessment Report. And directs CAT to develop a California Climate Adaptation Strategy.
<b>GHG = greenhouse gas</b>		

## **Appendix F**

### **California Law on Tire Pressure Maintenance**

On September 1, 2011, the California Air Resources Board's (ARB's) Tire Pressure Regulation took effect. The purpose of this regulation is to reduce greenhouse gas emissions from vehicles operating with under inflated tires by inflating them to the recommended tire pressure rating. The regulation applies to vehicles with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. Automotive service providers must meet the regulation's following requirements:

- Check and inflate each vehicle's tires to the recommended tire pressure rating, with air or nitrogen, as appropriate, at the time of performing any automotive maintenance or repair service.
- Indicate on the vehicle service invoice that a tire inflation service was completed and the tire pressure measurements after the service were performed.
- Perform the tire pressure service using a tire pressure gauge with a total permissible error no greater than + two (2) pounds per square inch (psi).
- Have access to a tire inflation reference that is current within three years of publication.
- Keep a copy of the service invoice for a minimum of three years, and make the vehicle service invoice available to the ARB or its authorized representative upon request. (Tire Inflation Regulation, 2010)

## Appendix F1 Tire Pressure Readings from 6 Month Pilot Study

Table 11. 6 Month Pilot Project - Front Tire Pressure Readings

Recommended Tire Pressure (PSI)	Total Front Tire Readings	# Readings Within + or - 2 (PSI)		# Readings Above+ or - 2 (PSI)		# Readings Below+ or - 2 (PSI)		Lowest Pressure (PSI)	Highest Pressure (PSI)
		Actual #	%	Actual #	%	Actual #	%		
<b>30 PSI</b>	70	31	44.3 %	20	29%	19	27.1%	21.5 (-8.5)	35.5 (+4.5)
<b>32 PSI</b>	68	30	44.1 %	15	22%	23	33.8%	10 (-22)	39 (+7)
<b>33 PSI</b>	10	8	80%	1	10%	1	10%	27.5 (-5.5)	36.5 (+3.5)
<b>35 PSI</b>	162	79	48.8 %	14	9%	69	42.6%	25 (-10)	44 (+9)
<b>50 PSI</b>	48	7	14.6 %	12	25%	27	56.3%	32.5 (-18.5)	66 (+16)
<b>55 PSI</b>	48	20	41.7 %	21	44%	7	14.6%	33 (-22)	81.5 (+16.5)
<b>65 PSI</b>	20	0	0%	10	50%	10	50%	50 (-15)	82(+17)
<b>75 PSI</b>	42	1	2.4 %	0	0%	41	97.6%	52 (-23)	74 (-1)
<b>Total of All Front Tire Readings</b>	<b>468</b>	<b>176</b>	<b>37.6%</b>	<b>93</b>	<b>19.9%</b>	<b>197</b>	<b>42.1%</b>		

Table 12. 6 Month Pilot Project - Rear Tire Pressure Readings

Recommended Tire Pressure (PSI)	Total Rear Tire Readings	# Readings Within + or - 2 (PSI)		# Readings Above+ or - 2 (PSI)		# Readings Below+ or - 2 (PSI)		Lowest Pressure (PSI)	Highest Pressure (PSI)
		Actual #	%	Actual #	%	Actual #	%		
<b>30 PSI</b>	71	46	64.7%	9	12.6%	16	22.5%	16.5 (-13.5)	33.5 (+3.5)
<b>32 PSI</b>	68	37	54.4%	18	26.5%	13	19.1%	15 (-17.0)	39 (+7.0)
<b>33 PSI</b>	10	7	70%	1	10%	2	20%	26.5 (-6.5)	35 (+2.0)
<b>35 PSI</b>	162	82	50.6%	14	8.6%	66	40.7%	27 (-8.0)	55 (+20.0)
<b>60 PSI</b>	35	5	14.3%	6	17.1%	24	68.6%	33 (-27.0)	68 (+8.0)
<b>80 PSI</b>	122	14	11.5%	3	2.5%	105	86%	42 (-38.0)	84.5 (+4.5)
<b>Total of All Rear Tire Readings</b>	<b>468</b>	<b>191</b>	<b>40.8%</b>	<b>51</b>	<b>10.9%</b>	<b>226</b>	<b>48.3%</b>		

## Appendix F1 (Continued)

### Tire Pressure Readings from 6 Month Pilot Study

Table 13. 6 Month Pilot Project - Total of Severely Underinflated Tires

Recommended Tire Pressure (PSI)	Severely Underinflated > 6 PSI (Includes Both Front and Rear Tires)	Total Readings (Includes Both Front and Rear Tires)	Percentage of Total
30 PSI	13	141	9.2%
32 PSI	7	136	5.1%
33 PSI	2	20	10%
35 PSI	28	324	8.6%
50 PSI	22	48	45.8%
55 PSI	9	48	18.6%
60 PSI	24	35	68.6%
65 PSI	10	20	50%
75 PSI	40	42	95.2%
80 PSI	101	122	83.6%
<b>Totals</b>	<b>256</b>	<b>936</b>	<b>26.3%</b>

Table 14. 6 Month Pilot Project - Total of all Severely Underinflated Tires

Vehicle Type	Number	Model Year Range
Pickups	45	1998-2009
Sedans	10	1993-2008
Vans	3	1994-1999
SUVs	1	2000

## Attachment 1. Green Priorities Pilot Project –Study Requirements & Methodology

Table 15. 6 Month Pilot Project - Study Methodology and Requirements

Project Description	<p>Tire Pressure Monitoring Program to perform a self assessment of DWR’s fleet. The assessment will perform Tire Pressure Analysis at the following locations:</p> <ol style="list-style-type: none"> <li>1. DWR Headquarters</li> <li>2. Northern Region Office</li> <li>3. North Central Region Office</li> <li>4. South Central Region Office</li> <li>5. Southern Region Office</li> </ol> <p>Identify Opportunities to:</p> <ol style="list-style-type: none"> <li>1. Increase Vehicle Safety</li> <li>2. Reduced Skidding</li> <li>3. Improved Handling</li> <li>4. Shorter Stopping Distances</li> <li>5. Fewer Flat Tires and Blowouts</li> <li>6. Increase Fuel Efficiency</li> <li>7. Reduce Green House Gas Emissions</li> <li>8. Decrease Maintenance Cost</li> </ol>
Goals	<ol style="list-style-type: none"> <li>1. To ensure increased employee safety,</li> <li>2. reduce department liability,</li> <li>3. less vehicle down time,</li> <li>4. more efficient fuel consumption,</li> <li>5. minimize carbon emissions, and</li> <li>6. reduce costs</li> </ol>
Who Implements?	Trained on-Site Staff
What metric will be used, and how will it be measured?	Tire Pressure data will be recorded for six months and entered into the tire pressure spreadsheet. At the end of the six month testing period, we will compile the data and present the results to the Sustainability Workgroup.
Duration	Six months
Plan	<p>Outline steps below and estimated times to complete activity.</p> <ol style="list-style-type: none"> <li>1. Activity</li> <li>2. <b>Provide procedures and instruction as required</b></li> <li>3. Monitor and record vehicles at pilot locations</li> <li>4. Provide procedures as required for cost analysis for plan</li> <li>5. Draft future recommendations with priorities and projected cost</li> <li>6. Finalize plan and send to management and SAG</li> </ol>

## Attachment 1. (continued) Green Priorities Pilot Project –Study Requirements & Methodology

### Methodology

1. Use your digital tire gauge to record your tire pressure.



2. Find the tire pressure level required for your car. This information is usually on a yellow sticker in the doorjamb on the driver side (and it is also contained in the owner's manual). It might call for different pressure levels for the back tires and the front tires.



3. Check the pressure when the tires are cold. Tires heat up as they drive. They take about a half hour to cool down. Or you can just check the tires first thing in the morning.
4. Unscrew the valve cap and set it to the side or in a pocket where you won't lose it. Press the tire gauge onto the valve stem. There might be a slight hiss as you press down on the valve stem and again as you release it. You only need to do this for a second or two, long enough to get an accurate reading.
5. Record the tire pressure data.
6. Compare the tire pressure readings with the specified amount called for by the manufacturer (on the doorjamb or in the manual). If the level of pressure is below the specified amount, have the vehicle serviced.
7. Tire Pressure data will be recorded for six months.

## **Attachment 2**

# **Regulation to Reduce Greenhouse Gas Emissions from Vehicles**

Operating with under inflated tires

### **Final Regulation Order**

Adopt new section 95550 in the new subarticle 8 of article 4, subchapter 10, chapter 1, division 3, title 17, California Code of Regulations, to read as follows: (Note: All of the text shown below is new language to be added to the California Code of Regulations.)

Subarticle 8. Regulation for Under Inflated Vehicle Tires § 95550.

Regulation for Under Inflated Vehicle Tires

(a) Purpose. The purpose of this regulation is to reduce greenhouse gas emissions from vehicles operating with under inflated tires by inflating them to the recommended tire pressure rating.

(b) Applicability.

(1) This regulation applies to all automotive service providers performing or offering to perform automotive maintenance or repair services in California.

(2) This regulation does not apply to:

- (A) Auto body and paint facilities;
- (B) Auto glass installers;
- (C) Auto parts distributors or retailers; or
- (D) Auto wreckers or dismantlers.

(c) Definitions.

(1) "ARB" means the California Air Resources Board.

(2) "Auto Body and Paint Facility" means a business that reconstructs, or paints motor vehicles and does not perform or offer to perform automotive maintenance or repair services.

(3) "Auto Glass Installer" is a business that repairs or replaces damaged automotive windshields and windows and does not perform or offer to perform automotive maintenance or repair services.

(4) "Auto Parts Distributer or Retailer" is a business that sells replacement parts or performance accessories for cars, trucks, vans and sport utility vehicles and does not perform or offer to perform automotive maintenance or repair services.

(5) "Auto Wrecker or Dismantler" means an automobile dismantler, as defined in section 220 of the Vehicle Code and does not perform or offer to perform automotive maintenance or repair services.

(6) "Automotive Maintenance or Repair Services" includes, but is not limited to, the performance of any automotive diagnostics of or repairs made to a motor vehicle.

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(7) "Automotive Service Provider (ASP)" is any business, or government or private vehicle fleet maintenance provider that performs or offers to perform automotive maintenance or repair services (including, but not limited to, automotive dealerships, maintenance or repair garages, government or publicly maintained or operated fleets, oil change facilities, tire centers, and smog check facilities).

(8) "Gross Vehicle Weight Rating (GVWR)" shall have the same meaning as defined in Vehicle Code Section 350.

(9) "Recommended Tire Pressure Rating" is the specification recommended by the vehicle manufacturer. The vehicle manufacturer's recommended tire pressure rating specifications can be found on the vehicle's door placard, glove box door, or owner's manual. If the vehicle manufacturer's recommended tire pressure rating is not available or the vehicle is equipped with a tire not meeting the vehicle manufacturer's tire specifications for that vehicle, then Recommended Tire Pressure Rating shall mean the Tire Inflation Reference.

(10) "Tire Inflation Reference" is any industry recognized resource, book or electronic, that contains tire pressure inflation specifications for original equipment tires and wheels and non-original equipment sized tires and wheels.

(11) "Tire Pressure Gauge" means a device that is capable of measuring the air pressure of passenger vehicle tires.

(12) "Total Permissible Error" means the allowable accuracy error indicated by the total difference in the true value and the indicated value during measurement.

(13) "Under Inflated Tire" means a tire that is one pound per square inch (psi) or more below the recommended tire pressure rating.

(14) "Unsafe Tire" means any tire considered unsafe in accordance with standard industry practices, due to tire tread wear, age, tread irregularity, or damage- Examples include any tire with exposed ply or cord, sidewall crack, bulge, knot, or ply separation.

(15) "Vehicle Fleet" is one or more vehicles that is owned, leased, or managed as a unit within or by a business or government agency.

(16) "Vehicle Service Invoice" is a document issued by the ASP to the customer in the normal course of business that identifies all service repairs performed by the ASP, as well as the associated costs, and is maintained by the ASP as provided in subsection (d).

(17) "Vehicle Tires" means the operating tires on the vehicle. (d) Requirements and Compliance Deadlines. Automotive service providers must meet the following requirements:

(1) By September 1, 2010, all automotive service providers are required to:

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(A) Check and inflate each vehicle's tires to the recommended tire pressure rating, with air or nitrogen, as appropriate, at the time of performing any automotive maintenance or repair service; and

(B) Indicate on the vehicle service invoice that a tire inflation service was completed and the tire pressure measurements after the services were performed; and

(C) Perform the tire pressure service using a tire pressure gauge with a total permissible error no greater than I two (2) pounds per square inch (psi); and

(D) Have access to a Tire Inflation Reference that is current within three years of publication; and

(E) Keep a copy of the vehicle service invoice for a minimum of three years, and make the vehicle service invoice available to ARB, or its authorized representative upon request.

(2) Notwithstanding subsection (d)(1), an automotive service provider need not meet the requirements set out therein if the automotive service provider is performing only a free check and inflate service at the customer's request.

(3) Notwithstanding subsection (d) (1)

(A), automotive service providers need not perform the check and inflate service if:

(A) The tires are on a vehicle with a GVWR over 10,000 lbs., or

(B) The tires are determined by the automotive service provider to be unsafe, as defined in subsection (c) (14); or

(C) The customer declines the "check and inflate" service pursuant to subsection (d) (5).

(4) Customers with vehicle tires inflated with nitrogen gas are subject to the requirements in subsection (d)(1)(A-E), but may refuse the inflation portion of the service if a nitrogen inflation system is not available at the time of the service.

(5) A customer may decline the check and inflate service if the customer affirms one of the following:

(A) He or she has performed (or had performed) a tire pressure check and inflate service within the last 30 days, or

(B) He or she will perform (or will have performed) a tire pressure check and inflate service within the next 7 days.

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(6) If a tire inflation service was not performed as provided in subsections (d)(3)-(5), the automotive service provider must indicate on the vehicle service invoice why the service was not completed.

(e) Penalties and Injunctions.

(1) Penalties. Penalties may be assessed for any violation of this article pursuant to Health and Safety Code section 38580. Each day during any portion of which a violation occurs is a separate offense.

(2) Injunctions. Any violation of this article may be enjoined pursuant to Health and Safety Code section 41513. (f) Relationship to Other Law.

Nothing in this section allows automotive service providers to operate in violation of other applicable laws, including but not limited to:

(1) California Vehicle Code.

(2) Health and Safety Code.

(3) Business and Professions Code.

(4) any other applicable law, ordinance, rule or requirement as stringent as, or more stringent than the requirements in section (d) of this regulation.

(g) Severability. If any subsection, paragraph, subparagraph, sentence, clause, phrase, or portion of this regulation is, for any reason, held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, such portion will be deemed as a separate, distinct, and independent provision, and such holding will not affect the validity of the remaining portions of the regulation. Note: Authority cited: Sections 38510, 38560, 39600, and 39601, Health and Safety Code. Reference: Sections 38510, 38560, 39600, Health and Safety Code. 5

## Appendix G

### Climate Change Outreach Efforts

#### **Presentations and Posters**

##### Jamie Anderson

Moderator, California Water and Environmental Modeling Forum Conference, March, Monterey

##### Michael Anderson

“Climate Change and Water Resources in California,” delegation from Macedonia, February, Sacramento

“Incorporating Climate Change into the Central Valley Flood Protection Plan,” Advances in Climate Change Assessment, California Water and Environmental Modeling Forum Conference, March, Monterey

“Planning for extreme events in a changing climate,” Western States Water Council, March, Washington, DC “Dealing with extremes in operational and planning environments,” ASCE Climate Change Symposium, May, Palm Springs

“Threshold Analysis Approach for Incorporating Climate Change into the CVFPP,” SAME, October, Sacramento

“General discussions with other western SCs and federal resource agency partners on climate change and observed data and the intersection for data services,” Western Extension Research Activity, WERA-102, November, Davis and Monterey

##### John Andrew

Sierra Institute, January, Chester

UC Berkeley Institute for International Studies, Berkeley

UC Berkeley Goldman School of Public Policy, Berkeley

Center for Safe Energy, June, Sacramento

Hydrovision, July, Sacramento

CLE CEQA Conference, August, San Francisco

UC Davis King School of Law, September, Davis

Sierra College Natural History Museum, October, Rocklin

##### Erin Chappell

“Climate Change Program at DWR”, delegation from Macedonia, February, Sacramento

“Climate Change Program at DWR”, delegation from Canada, February, Sacramento

“Climate Change Activities at DWR”, delegation from Japan, December, Sacramento

##### Pete Coombe

“California Climate, Extreme Events, and Climate Change Implications”, Sacramento River Conservation Area Forum, February, Willows

“Climate Variation, Storm Frequency, and Extreme Precipitation in California”, Book in Common, California State University Chico, November, Chico

“California Meteorology and Global Weather Patterns”, Sacramento River Conservation Area Forum, November, Willows

##### Messele Ejeta

“A New Insight towards Establishing a Baseline for Uncertainty Analysis in Projected Climate Change,” Advances in Climate Change Assessment, California Water and Environmental Modeling Forum Conference, March, Monterey

##### Lauma M. Jurkevics

Two presentations on “Climate Change at the DWR,” Thousand Oaks High School 2<sup>nd</sup> Annual Sustainability Summit, January, Thousand Oaks

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*Climate Change at the Department of Water Resources and Climate Change: Stressing Our Water Systems*, Fairfax High School Planeteers' Earth Day Event, April, Los Angeles

"Using the Climate Change Handbook for IRWM Planning," DWR IRWM Process Improvements Workshop, December, Chino

### Tariq Kadir

"Impact of Warming on Outflows from Selected Upper Watersheds in California," Advances in Climate Change Assessment, California Water and Environmental Modeling Forum Conference, March, Monterey

### Maury Roos

"Can we save the California Delta?" at International Committee on Irrigation and Drainage conference working group on Climate Change, October, Tehran, Iran

### Andrew Schwarz

Workgroup discussion and coordination. Sacramento Regional Air Quality Control Board and Army Corps of Engineers Coordination Group. March, Sacramento

"Climate Change handbook for IRWM", CA/NV chapter of AWWA Conference. March, Long Beach  
Poster presentation: "Climate Change Characterization and Analysis in California Water Planning Studies". World Environmental & Water Resources Congress. May, Palm Springs

"DWR Resources for Meeting the IRWM Climate Change Standard" IRWM Conference. May, Sacramento

"GHG analysis and cumulative impacts analysis for CEQA" USBR Biennial Environmental Compliance Conference May, Sacramento

### Michelle Selmon

"Climate Change, Water Resources, & Land Use Planning in California" - Seminar: *Water Planning for Commercial, Residential and Industrial Development: Creating a Defensible Water Supply*, October, Santa Monica

### Jianzhong (Jay) Wang

"Recent Developments and Comparisons of Statistical and Dynamical Downscaling Techniques," Advances in Climate Change Assessment, California Water and Environmental Modeling Forum Conference, March, Monterey