Sustainability Roadmap: Water Efficiency and Conservation

Progress Report and Plan for Meeting
the Governor's Sustainability Goals
for California State Agencies

Health and Human Services Agency
Edmund G. Brown Jr., Governor

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Department of Rehabilitation

Sustainability Road Map: Water Efficiency and Conservation

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Acronyms

BMP	Best Management Practices
CALGREEN	California Green Building Code (Title 24, Part 11)
DGS	Department of General Services
EO	Executive Order
DWR	Department of Water Resources
ESPM	Energy Star Portfolio Manager
GHGe	Greenhouse Gas Emissions
GSP	Groundwater Sustainability Plan
LCM	The Landscape Coefficient
LEED	Leadership in Energy and Environmental Design
MM	Management Memo
MAWA	Maximum Applied Water Allowance
MWELO	Model Water Efficient Landscape Ordinance
SAM	State Administrative Manual
SGA	Sustainable Groundwater Agency
SGMA	Sustainable Groundwater Management Act
WMC	Water Management Coordinator
WUCOLS	Water Use Classifications of Landscape Species

Glossary

Backflow - is the undesirable reversal of the flow of water or mixtures of water and other undesirable substances from any source (such as used water, industrial fluids, gasses, or any substance other than the intended potable water) into the distribution pipes of the potable water system.

Back flow prevention device – a device that prevents contaminants from entering the potable water system in the event of back pressure or back siphonage.

Blowdown - is the periodic or continuous removal of water from a boiler to remove accumulated dissolved solids and/or sludge. Proper control of blowdown is critical to boiler operation. Insufficient blowdown may lead to deposits or carryover. Excessive blowdown wastes water, energy, and chemicals.

Compost – Compost is the product resulting from the controlled biological decomposition of organic material from a feedstock into a stable, humus-like product that has many environmental benefits. Composting is a natural process that is managed to optimize the conditions for decomposing microbes to thrive. This generally involves providing air and moisture, and achieving sufficient temperatures to ensure weed seeds, invasive pests, and pathogens are destroyed. A wide range of material (feedstock) may be composted, such as yard trimmings, wood chips, vegetable scraps, paper products, manures and biosolids. Compost may be applied to the top of the soil or incorporated into the soil (tilling).

Critical overdraft - a condition in which significantly more water has been taken out of a groundwater basin than has been put in, either by natural recharge or by recharging basins. Critical overdraft leads to various undesirable conditions such as ground subsidence and saltwater intrusion.

Ecosystem services - are the direct and indirect contributions of ecosystems to human well-being. They support directly or indirectly our survival and quality of life. Ecosystem services can be categorized in four main types:

- Provisioning services are the products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources and medicines.

- Regulating services are the benefits obtained from the regulation of ecosystem processes such as climate regulation, natural hazard regulation, water purification and waste management, pollination or pest control.

- Habitat services provide living places for all species and maintain the viability of gene-pools.

- Cultural services include non-material benefits such as spiritual enrichment, intellectual development, recreation and aesthetic values.

Grasscycling -refers to an aerobic (requires air) method of handling grass clippings by leaving them on the lawn when mowing. Because grass consists largely of water (80% or more), contains little lignin and has high nitrogen content, grass clippings easily break down during an aerobic process. Grasscycling returns the decomposed clippings to the soil within one to two weeks acting primarily as a fertilizer supplement and, to a much smaller degree, mulch. Grasscycling can provide 15 to 20% or more of a lawn's yearly nitrogen requirements

Hydrozone – is a portion of a landscaped area having plants with similar water needs that are served by one irrigation valve or set of valves with the same schedule.

Landscape Coefficient Method (LCM) describes a method of estimating irrigation needs of landscape plantings in California. It is intended as a guide for landscape professionals.

Landscape water budget - is the calculated irrigation requirement of a landscape based on landscape area, local climate factors, specific plant requirements and the irrigation system performance.

Model Water Efficient Landscape Ordinance (MWELO) - The Water Conservation in Landscaping Act was signed into law on September 29, 1990. The premise was that landscape design, installation, and maintenance can and should be water efficient. Some of the provisions specified in the statute included plant selection and groupings of plants based on water needs and climatic, geological or topographical conditions, efficient irrigation systems, practices that foster long term water conservation and routine repair and maintenance of irrigation systems. DWR adopted the Model Ordinance in June of 1992. One element of the Model Ordinance was a landscape water budget. In the water budget approach, a Maximum Applied Water Allowance (MAWA) was established based on the landscape area and the climate where the landscape is located. The latest update to MWELO was in 2015. MWELO applies to all state agencies' landscaping.

Mulch – Mulch is a layer of material applied on top of soil. Examples of material that can be used as mulch include wood chips, grass clippings, leaves, straw, cardboard, newspaper, rocks, and even shredded tires. Benefits of applying mulch include reducing erosion and weeds and increasing water retention and soil vitality. Whenever possible, look for mulch that has been through a sanitization process to kill weed seeds and pests.

Trickle flow – A device that allows users to reduce flow to a trickle while using soap and shampoo. When the device is switched off, the flow is reinstated with the temperature and pressure resumes to previous settings.

Sprinkler system backflow prevention devices – are devices to prevent contaminants from entering water supplies. These devices connect to the sprinkler system and are an important safety feature. They are required by the California Plumbing Code.

Submeter- a metering device installed to measure water use in a specific area or for a specific purpose. Also known as dedicated meters, landscape submeters are effective for separating landscape water use from interior water use, evaluating the landscape water budget and for leak detection within the irrigation system.

Water Budget - A landscape water budget is the calculated irrigation requirement of a landscape based on landscape area, local climate factors, specific plant requirements and the irrigation system performance.

Water-energy nexus - Water and energy are often managed separately despite the important links between the two. 12 percent of California's energy use is related to water use with nearly 10 percent being used at the end water use. Water is used in the production of nearly every major energy source. Likewise, energy is used in multiple ways and at multiple steps in water delivery and treatment systems as well as wastewater collection and treatment.

Water Shortage Contingency Plans - each urban water purveyor serving more than 3,000 connections or 3,000 acre-feet of water annually must have an Urban Water Shortage Contingency Plan (Water Shortage Plan) which details how a community would react to a reduction in water supply of up to 50% for droughts lasting up to three years.

EXECUTIVE SUMMARY

The Governor's Office requested that departments owning or managing buildings prepare a Roadmap to Achieving Executive Orders B-18-12 and B-16-12 by December 16, 2013. Additional direction and guidance regarding meeting the state's sustainability goals has been provided through Executive Order B-30-15 and other policy documents. In response, the Department of Rehabilitation (DOR) has prepared this roadmap document to describe the status and steps to achieving the objectives, targets and requirements related to water efficiency and conservation.

The mission of the DOR is to work in partnership with consumers and other stakeholders to provide services and advocacy resulting in employment, independent living and equality for individuals with disabilities in California. Since it was established in 1963, the DOR has reported to the Health and Human Services Agency, with functions and responsibilities contained in Section 19000-19856 of the California Welfare and Institutions Code. The DOR is the designated state administrative unit responsible for the State's vocational rehabilitation program authorized by Federal Title IV of the Workforce Innovation and Opportunity Act (WIOA), which incorporates the Federal Rehabilitation Act of 1973, as amended.

The aforementioned laws were enacted to ensure all Americans have the opportunity to learn and develop skills, engage in productive work, make choices about their daily lives, and participate fully in community life. The DOR provides vocational counseling, guidance, and services to individuals with disabilities to prepare for, obtain and maintain employment, and to live independently in their communities.

The DOR provides vocational rehabilitation and independent living services to over 130,000 consumers annually through 84 field offices statewide. The DOR has over 1,800 employees with approximately 1,300 employees in the field providing direct services to individuals with disabilities.

The majority of DOR office locations are within 74 private leased office spaces and 9 DGS managed buildings. However, the DOR owns and manages the Orientation Center for the Blind (OCB), a three-building campus located in Albany, California. The OCB fosters independent living for the blind or visually impaired adults through an immersion program in a residential environment. This live-in, dorm style community operates 24 hours a day, 7 days a week.

Of the DOR office locations, currently the OCB is the sole reporting source for water usage for the Department. From a 2010 baseline, the OCB has reduced water usage by 34.24%, meeting the reduction goals for both 2015 and 2020 as identified in Executive Order B-18-12. These goals were achieved through several measures, including cleaning and maintenance of all three boilers, termination of landscape watering, replacement of less efficient porcelain bathroom fixtures and communication/education of staff and stakeholders regarding conservative water usage practices.

However, there is still much which can be achieved to further reduce water usage in this facility and increase the data obtainable for all DOR facilities. Some measures taken and others in

progress include a water audit of OCB conducted by the East Bay Municipal Utility District in 2015, installation of water submeters to better regulate usage between the multiple buildings on the OCB campus, and seek leased facilities with separate water meters to better identify total department water usage. Through these actions and others, the DOR continues to strive to meet and exceed the sustainability goals set forth by the Governor's Executive Orders and other mandates.

Joe Xavier
Director

SUSTAINABILITY GOALS

The Governor has directed California State Agencies to demonstrate sustainable operations and to lead the way by implementing sustainability policies set by the state. Sustainability includes the following general initiatives:

- Greenhouse Gas Emissions Reductions
- Building Energy Efficiency and Conservation
- Indoor Environmental Quality (IEQ)
- Water Efficiency and Conservation
- Monitoring Based Building Commissioning (MBCx)
- Environmentally Preferable Purchasing (EPP)
- Financing for Sustainability
- Zero Emission Vehicle (ZEV) Fleet Purchases
- Electric Vehicle Charging Infrastructure
- Monitoring and Executive Oversight

The Governor has issued numerous executive orders directing sustainable state operations. The orders relevant to water are:

Executive Order B-18-12

EO B-18-12 and the companion *Green Building Action Plan* require state agencies to reduce the environmental impacts of state operations by reducing greenhouse gas emissions, managing energy and water use, improving indoor air quality, generating onsite renewable energy when feasible, implementing environmentally preferable purchasing, and developing the infrastructure for electric vehicle charging stations at state facilities. The Green Building Action Plan also established two oversight groups; the staffs level Sustainability Working Group and the executive level Sustainability Task Force, to ensure these measures are met.

Executive Order B-18-12 requires State agencies to reduce agency-wide water use 10% by 2015 and 20% by 2020 as measured against a 2010 baseline. The 2015 and 2020 targets reinforce the SB X7-7 requirement that State agencies reduce water use at facilities they operate to support local water suppliers in meeting their targets.

On February 28, 2013, the California Department of Water Resources issued its Water Use Reduction Guidelines and Criteria, pursuant to Executive Order B-18-12. Each applicable agency was required to take actions to reduce water use in facilities and landscapes that are operated by the state, including facilities owned, funded or leased. State operated facilities are defined as facilities where the agency has direct control of the buildings' function, maintenance and repair. For leased facilities, the Green Building Action Plan directed at that time that new and renegotiated leases include provisions for water conservation, reporting water use and installation of sub-meters to the extent possible and economically feasible.

All the following sections in this water plan and the accompanying worksheet only repeat the initial criteria and guidelines issued at that time. Only the MWELO requirements have been updated since that time. Additionally, other Executive Orders have followed, strengthening and elaborating on the issues contained in EO B-18-12.

EO B-18-12 requires that beginning January 2013, agencies shall regularly report current water use into the water tracking database. Since January 2014, annual water use reports have documented progress towards the 2015 and 2020 targets using the ESPM http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager_benchmarking to track energy and water use and to submit annual reports to DGS. (Sustainability Manager, Department of General Services, 707 Third Street, 8th Floor, West Sacramento, CA 95798-9052). Additionally, for facilities with landscape areas over 20,000 sq. ft. the landscape water use must be tracked with a water budget program.

Executive Order B-29-15

EO B-29-15 directs state agencies to take actions in response to the ongoing drought and to the State of Emergency due to severe drought conditions proclaimed on January 17, 2014. The Governor directed numerous state agencies to develop new programs and regulations to mitigate the effects of the drought, and required increased enforcement of water waste state wide. Agencies were instructed to reduce potable urban water use by 25% between 2013 and February 28, 2016.

Executive Order B-30-15

EO B-30-15 declared climate change to be a threat to the well-being, public health, natural resources, economy, and environment of California. It established a new interim statewide greenhouse gas emission reduction target of 40 percent below 1990 levels by 2030, and reaffirms California's intent to reduce greenhouse gas emissions by 80 percent below 1990 levels by 2050. To support these goals, this order requires numerous state agencies to develop plans and programs to reduce emissions.

Other Relevant Executive Orders…

Executive Order B-37-16

EO B37-16 builds on what were formerly temporary statewide emergency water restrictions in order to establish longer-term water conservation measures, including permanent monthly water use reporting, new permanent water use standards in California communities and bans on clearly wasteful practices such as hosing off sidewalks, driveways and other hardscapes. The EO focuses on using water more wisely, and eliminating water waste by taking actions to minimize water system leaks. DWR estimates that leaks in water district distribution systems siphon away more than 700,000 acre-feet of water a year in California - enough to supply 1.4 million homes for a year.

The EO further strengthens local drought resilience and looks to improve agricultural water use efficiency and drought planning. State agencies are to cooperate with urban water management plans which include plans for droughts lasting for at least five years by assuring that the water efficiency and conservation plan has drought contingency actions.

State Administrative Manual & Management Memos

The following sections of the State Administrative Manual (SAM), and associated Management Memos (MM), currently impose sustainability requirements for water on the department under the Governor's executive authority:

SAM Sections

- Landscaping practices 1821.5
- Drought moratorium 1821.4

Relevant Management Memos

- MM 15-06 State Buildings And Grounds Maintenance And Operation
- MM 15-04: Energy Use Reduction for New, Existing, and Leased Buildings
- MM 14-02 Water Efficiency and Conservation
- MM 14-07: Standard Operating Procedures For Energy Management In State Buildings
- MM 14-09: Energy Efficiency in Data Centers and Server Rooms

Relevant Legislation

Sustainable Groundwater Management Act of 2014 - The Sustainable Groundwater Management Act (SGMA) directs the Department of Water Resources (DWR) to identify groundwater basins and sub-basins in conditions of critical overdraft. Conditions of critical overdraft result from undesirable impacts, which can include seawater intrusion, land subsidence, groundwater depletion, and/or chronic lowering of groundwater levels. As defined in the SGMA, "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts."

As required in the SGMA, basins designated as high or medium priority *and* critically overdrafted shall be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2020. All other high and medium priority basins shall be managed under a groundwater sustainability plan by January 31, 2022.

WATER EFFICIENCY AND CONSERVATION REPORT

This Water Efficiency and Conservation Report demonstrates to the Governor and the public the progress the Department has made toward meeting the Governor's goals. This report identifies successful accomplishments, ongoing efforts, and outstanding challenges.

Introduction

California experiences the most extreme variability in yearly precipitation in the nation. In 2015, California had a record low statewide mountain snowpack of only 5 percent of average while 2012-14 were the 4 driest consecutive years of statewide precipitation in the historical record. Now, the 2017 water year (October 1, 2016-September 30, 2017) is surpassing the wettest year of record (1982-83) in the Sacramento River and San Joaquin River watersheds and close to becoming the wettest year in the Tulare Basin (set in 1968-69). These potential wide swings in precipitation from one year to the next show why California must be prepared for either flood or drought in any year.

Therefore, using water wisely is critical. The E.O.s and SAM sections listed in the previous section help demonstrate the connection between water and energy use, (the water-energy nexus), water and climate change, and water and landscaping. Further, the impact of water uses by state agencies goes beyond the scope of these E.O.s and SAM sections and DGS management memos as these documents do not address such related issues as water runoff from landscaping and various work processes and the potential for water pollution or the benefits of water infiltration, soil health and nutrient recycling. However, by using holistic water planning, a well-crafted water plan can not only meet all state requirements but add considerable value and benefits to the organization and surrounding communities.

Department Mission and Built Infrastructure

The mission of the DOR is to work in partnership with consumers and other stakeholders to provide services and advocacy resulting in employment, independent living and equality for individuals with disabilities in California. The DOR provides vocational counseling, guidance, and services to individuals with disabilities to prepare for, obtain and maintain employment, and to live independently in their communities.

The DOR's field offices are located in 74 private leased office spaces, which generally comprise a portion of a larger office building. Additionally, the DOR occupies 9 DGS managed buildings. Water usage in these locations is included in the lease costs for each location and is not separately metered for the individual office spaces used.

The DOR also owns and manages the Orientation Center for the Blind (OCB), a three-building campus encompassing 42,152 sq. ft. and located in Albany, California. The OCB fosters independent living for the blind or visually impaired adults through an immersion program in a

residential environment. This live-in, dorm style community operates 24 hours a day, 7 days a week. Of the DOR office locations, currently the OCB is the sole reporting source for water usage for the Department.

The campus is divided into three buildings, an Administration building, a 35 student dormitory and a cafeteria/gym building.

Currently, the three buildings are not separately metered by sub-water meters, so usage between the three cannot be specified at this time. However, the DOR plans to install sub-meters to better identify usage and conservation opportunities.

Table 1: Total Purchased Water

Purchased Water	Quantity	Cost ($/yr)
Potable	1,238,500	$ 11,884
Recycled Water		
	1,238,500 Gallons	$ 11,884

Table 2: Properties with Largest Water Use Per Capita

Building Name	Area (ft^2)	Total Gallons	Total Irrigation in Gallons (if known)	Gallons per Capita
Orientation Center for the Blind	42,152	1,238,500	0	57
Total for Buildings in This Table	42,152 ft^2			---
Total for All Department Buildings	42152 ft^2			---
% of Totals	100 %	100 %		---

Table 2a: Properties with Largest Landscape Area

Building Name	Area (ft^2)
Orientation Center for the Blind	16,777
Total for Buildings in This Table	16,777 ft^2
Total for All Department Buildings	16,777 ft^2
% of Totals	100 %

The OCB has experienced several challenges in meeting the Governor's water efficiency and conservation goals. Most notably was a pervasive underground water leak, and because of the time and difficulty involved in locating and repairing the leak, water usage in 2015 rose from 1.22 thousand gallons to 3.95 thousand gallons. Upon repair, the reduction in water usage fell dramatically to 1.24 thousand gallons in 2016.

One component which would have made locating the leak easier and will also assist with identifying water usage and savings opportunities between the three OCB campus buildings is water sub-meters. Although a grant application to utilize Water Conservation Grant funds was completed in 2015 to request funding for the installation of water sub-meters in 2015, the project was not approved. However, installation of water sub-meters is still a prerogative for

the OCB's water conservation efforts, and products and funding options are being explored for 2018.

The DOR was successful in obtaining $70,000 for Water Conservation Grant funding for replacement of porcelain bathroom fixtures in 2015. The project included replacement of 2 urinals and 20 toilets, many of which were original to the 1964 construction of the campus. Additionally there was addition/replacement of 30 aerators, including replacement of several faucet fixtures to accommodate aerators. Finally 14 handheld shower heads with ADA compliant shower slide bars were replaced in the student dormitories.

Another 2015 Water Conservation Grant application, which was not approved, was replacement of 16,777 sq. ft. of irrigated lawns and plants with decomposed granite or other drought tolerant substrate and vegetation. However, in response to the 2015 drought, the OCB shut off all landscape watering to the facility. The irrigation equipment remains shut down to date, with only minor hand watering accomplished when most needed. Fortunately, due to the climate in Albany, California, and the transition by OCB staff to sustainable local vegetation, watering occurs very infrequently. The DOR still plans to transition the turf areas to more sustainable landscaping, but as watering is minimal, this is not a current priority project.

In 2016 the OCB conducted thorough maintenance and cleaning of its three boilers to ensure efficient operation. Effort included cleaning of the burner to mounting plate gasket, cleaning of the grafoil burner flange to heat exchanger head gasket, cleaning of the heat inspector replacement of the igniter and cable. In addition, the following parts were replaced in one or more of the three boilers, as needed: inverter, temperature sensor, flame scanner, variable frequency drive, UV scanner, burner element, loop pump.

Finally, the OCB has always been proactive in their communication to staff, students and other stakeholders regarding their responsibilities at OCB and at home for sustainable practices, including water conservation. This transfer of knowledge, especially to the changing student population at this facility, promotes conservation efforts both within the campus and beyond.

Table 3: Department Wide Water Use Trends

Year	Total Occupancy /year	Total Amount Used (Gallons/year)	Per capita Gallons per person per day
Baseline Year 2010	60	2,078,300	95
Baseline Year 2013	60	2,041,292	93
2016	60	1,238,500	57
2020 Goal	60	1,000,000	46

Table 4: Total Water Reductions Achieved

Total Water Use Compared to Baseline	Total Amount Used (gallons per year)	Annual Gallons Per capita
20% Reduction Achieved	1,238,500	57
Less than 20% Reduction		
25% Reduction Achieved		
Less than 25% Reduction Achieved		
Totals	1,238,500	57
Department-Wide Reduction	-839,800	-36%

Table 5: Summary of Boilers and Cooling Systems Projects Completed or In Progress

Year Funded	Water Saved (Gallons/yr)	Number of Systems with Water Efficiency Projects	Percent of Department Heating and Cooling systems
2012			
2013			
2014			
2015			
2016	To be determined	3	100%

Although a base line usage of the restroom fixtures was not discernible from other water usage, it was estimated based on internet data obtained that up to 200,000 gallons per year was potential water savings from the interior Water Conservation Grant project which was approved. However, due to the water leak which occurred in 2015, the success of the water savings as a result of the above efforts has not yet been determined. Likewise, it was difficult to obtain an estimate of water savings from the maintenance of the three boilers, termination of the landscape watering, conservation communications to staff and stakeholders and other actions due to the water leak and the absence of water sub-meters between the separate OCB campus buildings. However, with the repair of the water leak and sub-water meter installation planned for 2018, the DOR intends to track future water savings efforts to assess project successes and report reductions on upcoming Sustainability Roadmaps.

Water Shortage Contingency Plans and Critical Groundwater Basins

Urban water suppliers are required to maintain Water Shortage Contingency Plans that are customized to local conditions. These plans include a staged response to water shortages and droughts lasting up to three years. When implementing the stages of the Water Shortage Contingency Plan, the water supplier will require increasingly stringent reductions in water use.

State agencies are to be aware of their water suppliers' Water Shortage Contingency Plan and the potential impact each stage may have on their water use. State agencies are to have their own contingency plans in place for their building and landscaping water use in order to respond to any stage implemented by the water supplier.

The Sustainable Groundwater Management Act (SGMA) established a new structure for managing California's groundwater resources at a local level by local agencies. SGMA requires, by June 30, 2017, the formation of locally-controlled groundwater sustainability agencies (GSAs) in the State's high- and medium-priority groundwater basins and subbasins (basins). A GSA is responsible for developing and implementing a groundwater sustainability plan (GSP) to meet the sustainability goal of the basin to ensure that it is operated within its sustainable yield, without causing undesirable results. For those facilities located in critical groundwater basins, state agencies are are to work with the local GSA plan.

As the DOR has 83 field offices throughout California, there are numerous locations that may be subject to drought impacts. The water usage at DOR field offices is low as would be expected in a standard office setting, e.g. break room and restroom usage. In the event of a drought, the DOR field offices would follow guidelines for water usage as provided by the local municipal utility district's water shortage contingency plans. The DOR is also in the process of updating the DOR Central Office Building and Operations Plan and developing Field Office and OCB Building Operations Plans to include conservative resource operation guidelines and response to resource shortages, including water and energy shortages. Additionally, the DOR is in the process of identifying available water shortage contingency plans and regions with critical groundwater basins for each field office. A template is also being created so each of these offices can utilize their regional contingency plans to develop additional or office specific measures to meet continued office function needs for long durations where available water may be very limited.

The DOR's OCB resides in the East Bay Municipal Utility District (EBMUD), which possesses a 2015 Urban Water Management Plan for addressing drought conditions in this region. In 2018 the DOR will be working with local OCB leadership to develop a water shortage contingency plan for staff and students, based on the EBMUD's 2015 plan. This plan will differ from the plans for other DOR field offices as it must account for a facility which is operational 24/7 and in addition to providing vocation services, also provides meals and lodging for up to 30 OCB students.

Currently the only DOR office where water usage is metered and measured is the OCB, thus total amount of water used by buildings is not identified in the chart below. As existing or new DOR offices can employ separate water meters specific to DOR suites/offices, this information will be added to the chart below.

Table 6: Number of Buildings with Urban Water Shortage Contingency Plans and in Critical Groundwater Basins

Number of Buildings with urban water shortage contingency plans.	Number of buildings in critical groundwater basins	Total Amount of water used by buildings in critical groundwater basins (Gallons)
5+ (To be determined)	4	Water usage not currently measured

Building Inventories Summary

As discussed, the DOR primarily resides in leased office space and DGS managed buildings. In these locations there is limited options for employing water efficiency measures related to the building inventory as the inventory is the property of other parties; however the DOR is amending the DOR Facility Design Package to include water efficient faucets/aerators in new field office construction.

In 2015 at the OCB, the DOR replaced 2 urinals and 20 toilets, many of which were original to the 1964 construction of the campus. Additionally there was addition/replacement of 30 aerators, including replacement of several faucet fixtures to accommodate aerators. Finally 14 handheld shower heads with ADA compliant shower slide bars were replaced in the student dormitories. This $70,000 project was funded from a State Water Conservation Grant and addressed all toilet, urinal, faucet and shower replacement needs at the OCB. Currently the OCB utilizes water efficient clothes washers at the campus. Additionally, all garbage disposals employed at the OCB were replaced in the last few years and utilize water conservatively when in use.

Table 7: Summary of Building Inventory Needs

Number of toilets to be replaced with 1.25 gallon per flush	Number of urinals to be replaced	Number of faucet aerators to be replaced	Number of showerheads to be replaced @ 2.0 gpm and trickle flow control	Number of clothes washers to be replaced with Energy Star washers	Number of garbage disposals to be replaced.	Number of pre-rinse valves to be purchased and replaced
0	0	0	0	0	0	0

Heating and Cooling Systems Inventories Summary

The DOR is in the process of assessing the inventory and assessing the efficiency and replacement need of the OCB campus heating and cooling systems. Once this information is obtained, including water usage in this equipment, that information will be added to the Water Roadmap. However, in 2016 the OCB conducted thorough maintenance and cleaning of its three boilers to ensure efficient operation. Effort included cleaning of the burner to mounting plate gasket, cleaning of the grafoil burner flange to heat exchanger head gasket, cleaning of the heat inspector replacement of the igniter and cable. In addition, the following parts were replaced in one or more of the three boilers, as needed: inverter, temperature sensor, flame scanner, variable frequency drive, UV scanner, burner element, loop pump.

Irrigation Hardware Inventories Summary

Landscaping typically uses 50 percent or more of an agency's total water use. While landscaping serves critical functions, the accompanying irrigation hardware, if not properly installed and maintained, can contribute to water waste. By reviewing and inventorying all irrigation hardware, it is possible to achieve significant water savings.

The DOR's OCB campus is the department's only facility with landscape or an irrigation system. The OCB campus has a total of 16,777 sq. ft. of lawns and plants with decomposed granite or other drought tolerant substrate and vegetation. In 2015, in response to the Governor's declaration of drought, the OCB shut off all landscape watering to the facility. The irrigation equipment remains shut down to date, with only minor hand watering accomplished when most needed. Prior to the 2015 shutdown, the OCB irrigation system was identified as in need of replacement, due to inconsistent watering and broken components. However, with irrigation discontinued since 2015, the mild climate in Albany, California and that the campus is bordered by the fertile Cerrito Creek, inventory and replacement of the campus irrigation system has not been a priority. This is still a component of the campus' function which the DOR intends to address, but it will remain a low priority as long as the need for watering is still very minimal.

Large landscape water use

Large landscape water use often represents a significant percentage of a facility's water use and significant water savings can often be achieved through better irrigation scheduling or inexpensive improvements in irrigation hardware. As part of the Water Use Guidelines and Criteria, the water use for landscape areas over 20,000 sq. ft. shall be tracked through a water budget program.

The DOR does not have buildings with large landscape over 20,000 sq. ft.

BMPs

Building Best Management Practices (BMPs) are ongoing actions that establish and maintain building water use efficiency. State agencies are required by DGS Management Memo 14-02 to implement the building BMPs outlined below.

The DOR is in process of refining its BMPs for OCB, the only Department owned building. Several measures are already in place for care and maintenance of the campus, however new initiatives are being employed, as well as measures for tracking the water savings associated with the current and forthcoming conservation efforts.

Building Water Management BMPS

General Water Management

- The OCB currently does not have separate water meters to identify water usage between buildings or its irrigation system (currently not in use). The DOR intents to install water sub-meters at the OCB campus in 2018. Until such time, water usage is monitored through the Energy Star Portfolio, to identify usage changes, as was the case in identification of the water leak which occurred in 2015.

Leak Detection and Repair

- Monthly check of OCB campus toilets, urinals, faucets, showers, sinks, garbage disposals, kitchen equipment, boilers, HVAC and other water usage equipment is performed monthly. Leak repairs are addressed as a priority, with water source disabled until the leak can be resolved, whenever possible.

- Water efficient aerators, showerheads, toilets, urinals were installed in 2015 at the OCB with the Water Conservation Grant Project and meet the defined gpm guidelines applicable in 2015.

Kitchens

- Kitchen staff alerts the OCB Facility Manager whenever kitchen equipment is identified as in need of repair. Due to the needs of the campus to maintain kitchen services for students, repairs are addressed promptly.
- Dishwashers are run only when full to capacity.
- Water temperature and flow rates are not currently periodically checked, however this component is being added to OCB BMPs.
- The campus ice machine was identified as inefficient and production rate was not regulated. However in 2015 the ice machine was replaced with a more efficient machine which regulates production based on usage, so in the winter months, ice production decreases.
- In the OCB Kitchens, water is not used to melt ice, defrost food or to flow unnecessarily. Standing water is used to soak utensils in the main kitchen and as needed in the student kitchens.

Laundry Facilities

- Water level and temperature is set appropriately according to load type and run only when at maximum capacity

Building Heating and Cooling Systems BMPs

Directions for completing this section

As provided, in 2016 thorough maintenance was conducted where several components of the three boilers were replaced to obtain more efficient and effective operation. Since 2016, the OCB's three boilers are regularly inspected and maintained by onsite facility staff. Additionally, the OCB is investigating having the campus boilers inspected and maintained by a third party professional to ensure all efficiency and water/energy savings opportunities are employed and to measure and record water savings.

Landscaping Hardware Maintenance and Living Landscape BMPs

- As discussed, the OCB had discontinued watering through the irrigation system since the drought in 2015. Although the grounds are maintained, the need for hand watering is very infrequent, as the climate and moisture level in Albany, California benefit the local vegetation in and around campus. The OCB does intend to reevaluate the turf areas for replacement, as well as a more efficient and weather sensitive irrigation system, however this is not a priority for the facility as water usage is very low at this time. When landscape changes are employed, they will be thoroughly researched to employ conservative water practices and native plants for the climate zone.

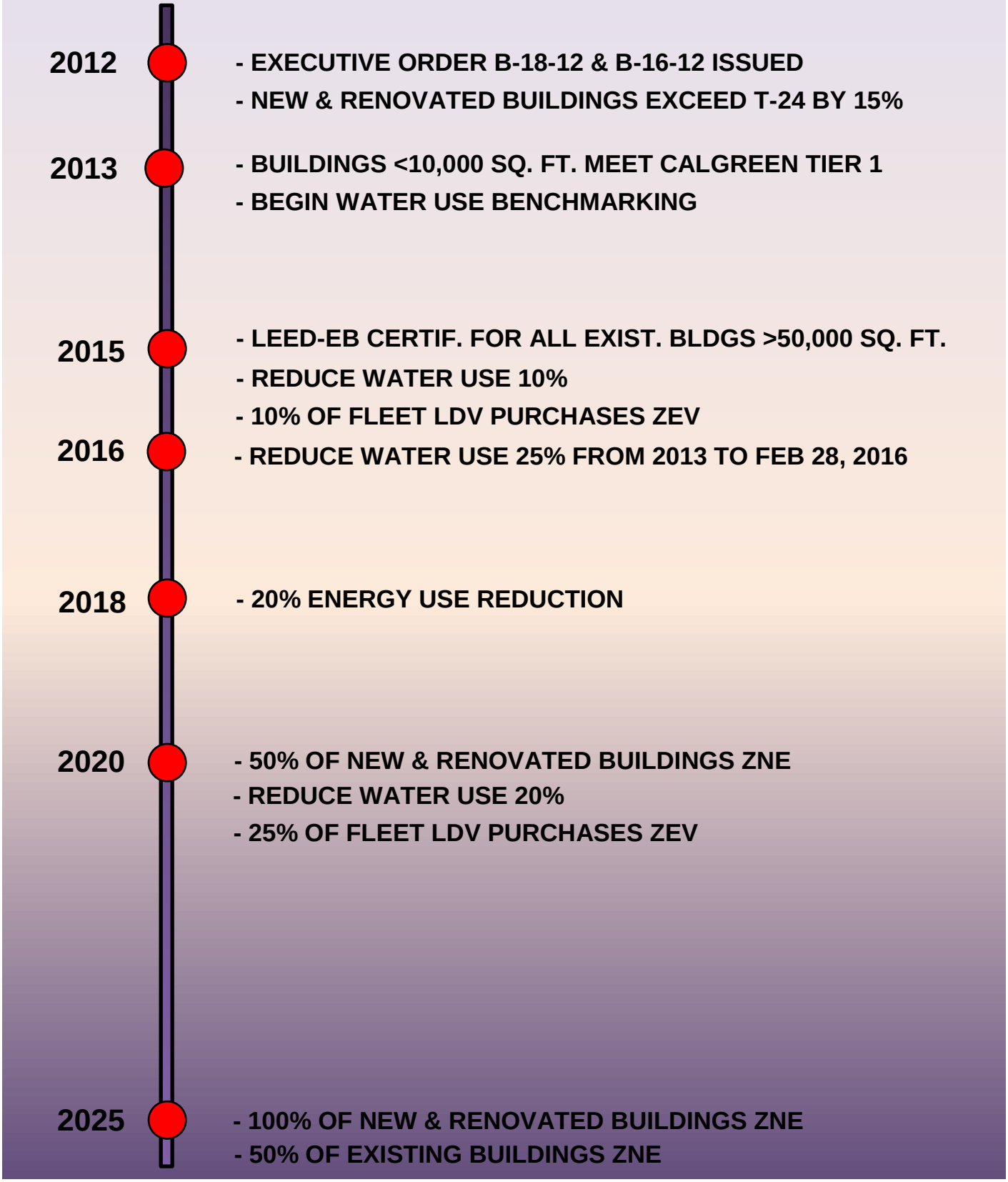
Monitoring, Reporting and Compliance

Each state agency is responsible for monitoring water use and reporting baseline and annual water use for compliance with the water use reduction targets. Water use shall be measured at facilities that have meters and submeters.

Water use must be estimated at state facilities that do not have water meters. All estimates and assumptions of water use should be well documented.

Where feasible, the DOR will employ separate water metering for privately leased facilities. Additionally, in 2018 the DOR will install water sub-meters at the OCB campus to better identify and regulate water usage and water savings opportunities at the facility.

SUSTAINABILITY MILESTONES & TIMELINE



RESPONSIBLE DEPARTMENT, PROGRAMS AND EMPLOYEES

The "**responsible party**" is the individual or entity that controls, manages, or directs the entity and the disposition of the entity's funds and assets

Indoor Water Efficiency Projects In Progress First initiative	
Business Services Section	Joseph Carmena III, Chief of Business Services Donald Kohaya, Assistant Chief of Business Services Identifying objectives and possible funding options
OCB	Jessica Grove, OCB Administrator Implementing changes at OCB campus.

Boilers and Cooling Systems Projects In Progress	
Business Services Section	Joseph Carmena III, Chief of Business Services Donald Kohaya, Assistant Chief of Business Services Identifying objectives and possible funding options
OCB	Jessica Grove, OCB Administrator Implementing changes at OCB campus.
Landscaping Hardware Water Efficiency Projects In Progress	
Business Services Section	Joseph Carmena III, Chief of Business Services Donald Kohaya, Assistant Chief of Business Services Identifying objectives and possible funding options
OCB	Jessica Grove, OCB Administrator Implementing changes at OCB campus.

Living Landscaping Water Efficiency Projects In Progress	
Business Services Section	Joseph Carmena III, Chief of Business Services Donald Kohaya, Assistant Chief of Business Services Identifying objectives and possible funding options
OCB	Jessica Grove, OCB Administrator Implementing changes at OCB campus.

Buildings with Urban Water Shortage Contingency Plans In Progress	
Business	Joseph Carmena III, Chief of Business Services

Services Section	Donald Kohaya, Assistant Chief of Business Services Identifying objectives and possible funding options
OCB VRED	Jessica Grove, OCB Administrator Susan Senior, Regional Manager Conan Petrie, Regional Manager Implementing changes at DOR Offices.