WATER STEWARDSHIP PLAN
SAN DIEGO INTERNATIONAL AIRPORT
Protecting Our Water Resources
May 2016
The Water Stewardship Plan is provided as a summary of current efforts by and future goals of the San Diego County Regional Airport Authority. The information provided in the Water Stewardship Plan has been obtained from sources believed to be reliable but it is not a guarantee as to accuracy or completeness. It is provided for reference only and does not purport to include every item that may be relevant, nor does it purport to present full and fair disclosure with respect to any financial reports, transactions, bonds, notes and other obligations related to the San Diego County Regional Airport Authority or San Diego International Airport within the meaning of applicable securities laws and regulations. Nothing in the Water Stewardship Plan may be construed to imply that specific projects, means or methods have been approved, funded or committed to by the San Diego County Regional Airport Authority or require it to take any specific action in the future.
Executive Summary

Introduction

As issues of water scarcity and sea level rise escalate around the globe, the San Diego region is positioned not only to directly experience the impacts of these challenges, but also to play a leadership role in crafting a meaningful response. The San Diego County Regional Airport Authority (Authority) is widely recognized as a leader in sustainability, both regionally and across the airport industry. As operators of San Diego International Airport (Airport), we recognize the inextricable link between water resources and our viability as an airport enterprise, and are keenly aware that this interdependence warrants a bold vision and strategy to ensure our sustainability into the future.

The Water Stewardship Plan establishes our vision to be a leading, world-class steward of water resources and to operate in harmony with the natural water cycle of the San Diego Bay region.

A Cross-Cutting Strategy

The aim of the Water Stewardship Plan is to provide a framework for rethinking how we manage our water resources while we prepare to accommodate passenger growth, new airport developments, and a changing climate. Specifically, the plan addresses issues of water conservation, water quality, and flood risk considerations through an integrated approach that will enable us to grow airport operations while protecting our region’s limited resources. It describes key long term goals and supporting strategies across these dimensions of water stewardship, while leveraging crucial opportunities presented by our Airport Development Plan (ADP) and Capital Improvement Program (CIP). The Water Stewardship Plan is an element of our overarching Sustainability Management Program, which directly implements our Sustainability and Water Conservation Policies and is aligned with the Authority’s five Organizational Strategies.

<table>
<thead>
<tr>
<th>Key Issues</th>
<th>2035 Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WATER CONSERVATION</strong></td>
<td>• Only 17% of San Diego’s current water supply comes from local sources, and our entire supply is threatened by drought • 80% of water used at the Airport is used for non-potable purposes</td>
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<tr>
<td>Aim to eliminate potable water use for non-potable processes</td>
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<tr>
<td><strong>WATER QUALITY</strong></td>
<td>• Our 15 stormwater outfalls pose a regulatory risk and have been the source of compliance and litigation challenges</td>
</tr>
<tr>
<td>Strive to achieve zero stormwater discharge</td>
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<tr>
<td><strong>FLOOD RESILIENCE</strong></td>
<td>• Climate change increases our exposure to 100-year storms by 3 times • By the year 2050, Airport flood impacts are expected to be significantly exacerbated by sea level rise and storm surge</td>
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<tr>
<td>Strive to make all critical facilities resilient in a 100-year storm event</td>
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Six Actions to Promote Water Stewardship

The Water Stewardship Plan is intended to guide us in reducing these risks while proactively moving us toward greater independence from imported water supplies. The Water Stewardship Plan is a “living” document that will be reviewed and/or updated on an annual basis and will require ongoing engagement with both internal and external stakeholders. We have identified six primary actions that are intended to comprehensively address our risks and opportunities relative to water conservation, water quality and flood resilience:

1. **Promote A Culture Of Water Stewardship**
   A. Integrate Water Stewardship into the Capital Improvement & Airport Development Planning Process
   B. Establish a Total Cost of Ownership Approach to Drive Investment in Water Stewardship
   C. Maximize the Flexibility of Regulatory Processes to Promote Water Stewardship
   D. Make Water Stewardship Performance Measures Visible

2. **Develop A Water Reuse Infrastructure Plan**
   A. Tap New Sources of Water
   B. Develop a Closed-Loop Water System
   C. Refine the Airport Hydraulic Model
   D. Integrate Water Stewardship into the CIP & ADP
   E. Leverage Energy Management Opportunities that Promote Water Conservation

3. **Integrate Water Stewardship In Operations & Maintenance**
   A. Pursue Facility & Fixture Retrofits
   B. Install Water Efficient & Resilient Landscaping & Irrigation
   C. Ensure Climate Risks Are Addressed in the Airport Emergency Plan
   D. Protect Airport Access & Evacuation Routes

4. **Integrate Water Stewardship In Design Guidelines & Standards**
   A. Require New Developments to Integrate Water Efficient & Reuse Technology
   B. Ensure New Developments Protect Water Quality
   C. Require New Developments to Integrate Flood Resilient Design
   D. Update Landscaping & Irrigation Design Guidelines to Require Water Efficiency & Resilience

5. **Leverage Technology To Improve Data Analytics**
   A. Install Smart Meters & Real-Time Data Monitoring Technology
   B. Enhance Water Quality Sampling & Studies
   C. Leverage Advanced Sea Level Rise Modeling Resources to Support Resilience Planning

6. **Engage Tenants In Water Stewardship**
   A. Provide Incentives to Promote Water Stewardship
   C. Engage Business Partners in Developing An Airport Climate Resilience Plan
INTRODUCTION
Our Water Stewardship Imperative

The San Diego County Regional Airport Authority (Authority) is widely recognized as a leader in sustainability, both regionally and across the airport industry. As operators of San Diego International Airport (Airport), we embrace our role as stewards of the environment, and are proud of our many accomplishments in integrating sustainability across all that we do. We have already tackled much of the “low hanging fruit” for water conservation through water efficient fixtures and other retrofits. Nonetheless, we recognize the inextricable link between water resources and our viability as an airport enterprise, and are keenly aware that this interdependence warrants a bold vision and strategy to ensure our sustainability into the future. Our Water Stewardship Plan sets forth this vision and strategy.

The Authority has a range of enabling policies, principles, and programmatic initiatives that set the context for, and support the realization of, our water stewardship vision. The Water Stewardship Plan is an element of our overarching Sustainability Management Program, which directly implements our Sustainability and Water Conservation Policies and is aligned with the Authority’s five Organizational Strategies. Our Capital Improvement Program and Airport Development Plan, as well as robust body of knowledge related to Airport water management directly support the development and implementation of the Water Stewardship Plan.

A Supportive Management Framework for Water Stewardship

The Water Stewardship Plan was crafted by the many Authority departments that directly influence how we manage our water resources. Led by the Environmental Affairs Department, the Plan will be executed by a core group of internal stakeholders in consultation with our broad range of business partners. The Environmental Affairs Department will work to identify funding sources to support the implementation of the Plan, including grant and incentive funding from public and private sources. They will also coordinate opportunities to test the innovative water stewardship concepts discussed in this Plan through pilot programs and demonstration projects.
The Global Crises of Water Scarcity and Sea Level Rise

Climate change-induced sea level rise presents significant and unprecedented concerns across the globe. In just over a century—from 1880 to 2000—the planet’s average sea level rose approximately 8 inches. This trend is projected to continue at an increasing rate. According to the 2014 US National Climate Assessment, by 2100 we are likely to see an additional one to four feet, or up to 6 times the historical rise in even less time. This not only puts our coastal areas at risk of erosion and flooding, but can also cause saltwater intrusion to our surface water bodies and groundwater, sacrificing quality.

Water resources face additional risk from more intense storm events, which result in runoff that transports sediment and other pollutants, further impacting water quality. In addition, more frequent and intense heat waves across the globe are expediting the rate of evaporation while increasing the demand for water. It is clear that we can expect global competition over the supply for water in coming years.

California’s Water Woes

In California, we face major challenges caused by the interrelationships among a number of climate-related factors. Since much of California relies on water from the snowpacks of the Sierra Nevada in Northern California and the Rocky Mountains that feed the Colorado River, the decrease in precipitation, lower snow accumulations, and earlier thaws are having major effects on water supply, particularly in the south. In 2015, we saw an unprecedented snowpack in the Sierras that amounted to just 6% of normal.

As we face warmer temperatures, the demand for water will continue to rise and is further exacerbated by a growing population. The sea level rose 7” in California since 1900 and will continue to rise at an increasing rate (2014 US National Climate Assessment). At the same time, California is experiencing never-before-seen sea level rise. This “coastal creep,” as well as more intense storm events, will degrade our surface and groundwater quality, further stressing our supply.

A Regional Response

As California experiences warmer temperatures, increasing evaporation, and decreased snowpack in the northern part of the state and Rocky Mountains, the San Diego region is particularly vulnerable to severe water shortages. According to San Diego, 2050 is Calling. How Will We Answer, only 17% of San Diego’s current water supply comes from local sources, which are facing risks of reduced quality due to runoff and salt water intrusion attributed to sea level rise. The remaining water is reliant on melting snowpack that, due to higher temperatures and reduced precipitation during the winter months, is decreasing each year. Coupled with population growth, these factors are expected to result in a 46% increase in water demand by 2035 with a price increase of up to 400%. Meanwhile, we can expect 16% fewer rainstorms, while the largest rainstorms may produce 8% more rainfall—potentially stressing our stormwater infrastructure even further. According to Climate Central’s Surging Seas, climate change increases our exposure to 100-year storms by 3 times.

Fortunately, our region boasts a rich history of environmental protection, and our collective response to the threats of climate change and water scarcity has been robust. With broad recognition of the risks posed by sea level rise, a collaboration of multidisciplinary stakeholders, led by the Authority, released the Sea Level Rise Adaptation Strategy for San Diego Bay in February 2012. One of the nation’s first regional approaches to sea level rise adaptation, this project was instrumental in establishing the San Diego Region Climate Collaborative to advance comprehensive solutions to facilitate climate change planning. The Authority is also a member of the Steering Committee for the Climate Collaborative and engages closely with our peers in the region on these and other environmental issues.

“The reliable supply and cost of water are likely to be the most critical resource challenges that the San Diego region will face during the next two decades as it strives to achieve sustainable growth.”

–Equinox Center and Fermanian Business & Economic Institute

A THEMED REGION ANTICIPATES

• Global Sea Level Rise

1880 1940 2000 2060

Global Sea Level Rise

Projected to rise 1 to 4 feet more by 2100

8” since 1880

16% fewer rainstorms

3x the chance of a 100-year storm

THE SAN DIEGO REGION ANTICIPATES
Setting the Stage for Water Stewardship at San Diego International Airport

During an average year, approximately 180 million gallons of rain falls on the San Diego International Airport property. After accounting for losses due to evapotranspiration and infiltration (up to 45%), approximately 100 million gallons of rainfall requires management. At an annual estimated cost of $2.6 million, we currently convey most of this runoff to the San Diego Bay. In the meantime, we purchase nearly 80 million gallons of potable water each year, most of which we use for non-potable uses and discharge to the sewer after consumption.

This conventional approach is an effective solution when the primary goal is to minimize rainfall impacts on Airport operations. When other externalities, such as water scarcity, impacts to local habitat, operational water demand, regulatory liability, and public perception are added as considerations, a whole-systems approach to stormwater management can lead to an array of benefits to our internal and external stakeholders.

The aim of our Water Stewardship Plan is to provide a framework for rethinking how we manage our water resources while we prepare to accommodate passenger growth, new airport developments, and a changing climate. Specifically, the plan addresses issues of water conservation, water quality, and flood risk considerations through an integrated approach that will enable us to grow airport operations while protecting our region’s limited resources.

TOWARD A WHOLE SYSTEMS VIEW OF OUR RELATIONSHIP WITH WATER

Water Conservation: Airport Water Use By the Numbers

Water conservation has been embedded in our culture for many years, and we have pursued numerous initiatives to improve our water efficiency across the Airport. Since 2008, we have decreased our water use by 13%. Even so, the price we paid for water increased by 16%, consistent with the overall trend in the cost of water throughout the region.

As we plan to serve more and more passengers into the future, we are also preparing for more frequent climatic extremes like those we have felt in the past few years. From 2012-2014, an increase in passenger volumes and facility square footage, coupled with reduced rainfall and higher temperatures, increased our demand for water. If we continue on this path, our water use could increase by 64% by 2030. However, our recent experience has shown that a business-as-usual approach to water management will not be sustainable as these trends continue.

Below is a snapshot of our water use by facility type in 2014. We will use this as a baseline for evaluating our progress toward our water conservation goals.

2014 WATER USE

- Terminal 1: 29%
- Terminal 2: 22%
- Landscaping: 25%
- Central Utility Plant: 17%
- Other: 1%
- Administrative Building: 4%
- Washing Activities: 2%
- 20% potable water needs
- 80% processes not requiring potable water (washing, toilet flushing, cooling towers, irrigation)
Setting the Stage for Water Stewardship at San Diego International Airport (continued)

Flood Risk: Preparing for Sea Level Rise & Storm Surge

Our Airport-wide hydrologic model for 5- and 10-year storm events illustrates future Airport-wide flood conditions in accordance with the FAA’s design requirements for runway and apron flood avoidance. The model also accounts for future storm surge and sea level rise, which are expected to exacerbate existing flood conditions. The model indicates:

- By the year 2050, Airport flood impacts are expected to be significantly exacerbated by sea level rise and storm surge.
- Some of our most critical infrastructure, including Runway 9-27, most taxiways, and the Air Traffic Control Tower, are not at risk of flooding, but many other Airport facilities are believed to be moderately or highly vulnerable.

In November 2015, sea levels in San Diego Bay reached an all-time high. The elevations were higher than the “King Tides” predicted by the National Oceanic and Atmosphere Administration and street flooding was observed several miles inland (California Ocean Protection Council, 2015).

Water Quality: Protecting Our Resource

Our stormwater conveyance system is vulnerable to both flooding and pollutant discharges. Each of our 15 stormwater outfalls poses a regulatory risk and has been the source of compliance issues. As regulatory enforcement for stormwater and sediment discharges becomes more and more stringent, we have come to see these outfalls as a liability, and are seeking alternate means by which to manage our stormwater and streamline the mounting complexities of our current system.
Setting the Stage for Water Stewardship at San Diego International Airport (continued)

Engaging Our Stakeholders

Inherent to our approach in developing this Plan was the guiding principal that the people closest to the work must be involved actively in the development of the strategy and actions. Over a dozen Authority staff from Planning, Facilities Management, Facilities Development, Design & Construction, Environmental Affairs, Airport Operations, Ground Transportation, and Business & Financial Management worked side by side in series of facilitated workshops and site visits to:

• Establish a vision and goals
• Understand the current cultural, operational, and physical constraints that impact the Airport’s current performance
• Identify the strengths and systems already in place at the Airport
• Co-develop solutions and implementation plans

By engaging the entire system at the Airport in this process, we have created a Plan which is both visionary and actionable because it was shaped directly by Authority staff. Together, we were able to see the broad construct of challenges and opportunities facing the Airport relative to water conservation, flood resilience, and water quality through the lens of the people who keep the Airport running every day. We developed a collective vision for what is possible into solutions that are implementable and flexible to adapt to changing conditions.

Plan Implementation

The Water Stewardship Plan will require ongoing engagement with a wide array of internal and external stakeholders. To support our overarching goals and long-term vision for water stewardship, our team has crafted a series of actions that strive to identify clear steps toward implementation, assign responsibility, and define timeframes for completion. The implementation plans will ensure that the Water Stewardship Plan continues to evolve as a living document, reflecting our progress and emerging opportunities as we advance toward our vision.

Our Vision For Water Stewardship

Through our stakeholder engagement process, we have crafted a long-term vision for water stewardship at the Airport. The Water Stewardship Plan will serve as our blueprint for working towards this vision, along with overarching goals and strategies that support it. The Water Stewardship Plan was developed to support this vision, with a set of actions that our teams will aspire to undertake in coming years.
Actions
To realize our vision, Authority staff identified the highest impact opportunities that will influence our business practices to promote water stewardship. The Plan is comprised of six primary actions that will allow us to integrate water conservation, water quality, and resilience to flooding in our planning, design, construction, operations and maintenance activities over the next twenty years.

1. Promote A Culture Of Water Stewardship
2. Develop A Water Reuse Infrastructure Plan
3. Integrate Water Stewardship In Operations & Maintenance
4. Integrate Water Stewardship In Design Guidelines & Standards
5. Leverage Technology To Improve Data Analytics
6. Engage Tenants In Water Stewardship

Key Focus Areas
For each of these actions, we have established a series of focus areas that describe the specific activities that will allow us to effectively achieve the actions. Focus areas may tie back to the three overarching dimensions of our vision, and will be denoted with these symbols:

- WATER CONSERVATION
- WATER QUALITY
- FLOOD RESILIENCE

Linkages
We have also identified key linkages between plan activities, as well as opportunities to pursue Capital Improvement Program funding to support these activities.

Implementation Plans
Finally, each action is further defined with a set of clear implementation steps that we will strive to take to address the focus areas and overall action. These steps are assigned to the departments responsible for implementing them, and the timeframe in which we expect they will be implemented.
PROMOTE A CULTURE OF WATER STEWARDSHIP
ACTION 1
PROMOTE A CULTURE OF WATER STEWARDSHIP

To advance our goal of becoming a world-class steward of water resources, the Authority is facing much more than just a technical challenge. Unlike technical challenges which are well understood and have been solved before, comprehensive water stewardship is an “adaptive challenge,” and has the added complexity of requiring Authority leadership, staff, stakeholders and partners to change our understanding, attitudes, or habits in order to truly understand the problems and innovate to develop solutions. While focusing on the behaviors of the users of our facilities is important, it is also critical that we adapt our business management processes, planning processes, operation and maintenance practices and even our rewards systems to achieve truly transformative change. Aiming to achieve the aggressive goals established in this Water Stewardship Plan will require the Authority to continue to adapt and change many aspects of life at the Airport. To do this, departments and teams across the Airport must embrace interdependent thinking, collaborative planning, and measurable implementation.

In addition, successful implementation of the Water Stewardship Plan will require creative approaches to funding the multiple actions that comprise it. In addition to pursuing funding from emerging grant opportunities and government sources, such as Proposition 1 (“Water Bond”) funding, we will strive to incorporate water stewardship in our every-day decisions as well as our long-term planning processes in order to minimize the investment required to support this Plan.

Critical Areas of Focus to Drive Change

A. Integrate Water Stewardship into the Capital Improvement & Airport Development Planning Process
B. Establish a Total Cost of Ownership Approach to Drive Investment in Water Stewardship
C. Maximize the Flexibility of Regulatory Processes to Promote Water Stewardship
D. Make Water Stewardship Performance Measures Visible

A. Integrate Water Stewardship into the Capital Improvement and Airport Development Planning Process

Many of the goals of the Water Stewardship Plan will be achieved through the integration of water stewardship measures into the development of new buildings and infrastructure and capital renewal projects. Accordingly, it is envisioned that the goals and actions of this program will be embedded into the phased implementation of the Airport Development Plan (ADP) and the Airport’s 5-year and 20-year Capital Improvement Planning (CIP) process. This systematic integration of water considerations into our Planning, Development, and Capital Budgeting and Renewal processes will take many forms, including adaptation of design standards, modification of CIP evaluation and approval criteria to explicitly consider water stewardship, integration of water performance indicators into product and vendor selection, and inclusion of total cost of ownership in decision making. We will continue to use the Water Balance Method (wherein water use is equal to water captured) as we have in the past to assess water demand and potential alternative water uses.

Conversely, we will leverage the Water Stewardship as central to our strategy in gaining community and regulatory support for the various components of the ADP. As development review processes become increasingly focused on issues of water quality, coastal impacts, and other water stewardship considerations, it will be crucial for us to demonstrate our ability to manage the impacts of new development through many of the actions identified here.

B. Establish a Total Cost of Ownership Approach to Drive Investment in Water Stewardship

Taking a whole systems view of water management involves policies and decision-making practices which consider the whole life cycle of a building or asset. Life cycle costs (often referred to as “total cost of ownership” or TCO) take into account capital, operations, maintenance, and in some cases, replacement costs over the life of a product, building, or facility. Our Sustainability Policy requires an analysis of the life cycle operating costs and impacts of facilities, operations, and services, using a TCO approach to determine project feasibility and economic sustainability. However, actions are still needed to systematically integrate TCO throughout the decision-making process for planning, budgeting, building, operating, and maintaining facilities through asset management.

There are many models readily available, which provide a framework for calculating capital and long-term maintenance costs of individual assets, infrastructure, and best management practices. These models are flexible and can easily be adapted by Airport finance and operations staff, and/or design firms to ensure decisions are made on a project level and during our budgeting processes, which take into account TCO as it relates to water and energy, and which are aligned with specific financial and operating criteria currently in place at the Airport.
ACTION 1 (continued)

**PROMOTE A CULTURE OF WATER STEWARDSHIP**

### C. Maximize the Flexibility of Regulatory Processes to Promote Water Stewardship

The Airport’s operations and stormwater discharges are currently regulated by three overlapping permit regimes – the Municipal, Industrial and Construction General Permits. We recognize that the ultimate solution to protecting the Bay would be to achieve zero discharge of stormwater off-site, and have crafted our vision around this solution. While this is a long-term aspiration, there are measures the Authority can take to further minimize discharges, especially from the most potential impactful aspects of our operations. Short-term and interim stormwater pollution control strategies and activities are outlined in our Storm Water Management Plan and our portion of the San Diego Bay Watershed Management Area Water Quality Improvement Plan. We intend to engage with the Regional Water Quality Control Board (RWQCB), our stormwater regulator, to work on ways to maximize the use of the flexibilities of the regulatory process to reach our common goals of:

1. Minimizing pollutant discharges off-site;
2. Minimizing the regulatory burden for compliance; and
3. Finding acceptable ways to do this that have co-benefits such as stormwater capture and reuse.

### D. Make Water Stewardship Performance Measures Visible

Beyond tracking expenditures and cost savings, performance indicators can be powerful means to motivate and engage people and create connection to a strategy. To do this, the Authority will need to make its water performance visible through clear, simple, and visible metrics which become a part of daily life at the Airport for our leadership team, our maintenance staff, our vendors, and the traveling public.

We report our social, economic, and environmental sustainability performance through the Global Reporting Initiative (GRI). GRI establishes a standard framework through which to evaluate performance across multiple aspects of sustainability, including water resources. Specifically, GRI promotes reporting in the areas of water conservation, stormwater quality, and water reuse, each of which is a component of our Water Stewardship Plan. By utilizing GRI as our framework for evaluating these water stewardship metrics, our performance in water stewardship will be visible to our stakeholders much in the way that we report financial performance as well as progress in a range of environmental and social responsibility areas.

### Implementation Plan

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Critical Activities</th>
<th>Responsible</th>
<th>Time Horizon</th>
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<tbody>
<tr>
<td>A. Integrate Water Stewardship into the Capital Improvement and Airport Development Planning Process</td>
<td>Work with Capital Improvement Committee to Adapt CIP Project Documentation / Approval Process to integrate TCO and train Asset Owners and Asset Managers on use.</td>
<td>BFM</td>
<td>S</td>
</tr>
<tr>
<td>A. Integrate Water Stewardship into the Capital Improvement and Airport Development Planning Process</td>
<td>Work with Capital Improvement Committee to establish a process to review all 5-year CIP projects on a rolling basis to assess water demand and potential alternative water uses using Water Balance Method.</td>
<td>PD</td>
<td>S</td>
</tr>
<tr>
<td>A. Maximize the Flexibility of Regulatory Processes to Promote Water Stewardship</td>
<td>Define and incorporate major mechanism(s) for integrating evaluation of water demand / opportunity analysis into ADP Phasing (RFPs, Performance Based Design Standards, Contracts, Specs) and create implementation plan to build Water Stewardship into processes.</td>
<td>PD</td>
<td>S</td>
</tr>
<tr>
<td>A. Review existing CIP and ADP Projects not yet underway for potential to pilot new criteria and practices (A1-A3) immediately.</td>
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<td>PO</td>
<td>ADC</td>
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<tr>
<td>B. Establish a Total Cost of Ownership Approach to Drive Investment in Water Stewardship</td>
<td>Research best available TCO models for calculating capital and long-term maintenance costs of individual assets, infrastructure, and best management practices. Consider using the Utility Working Group as a team to vet, review, and establish the best methodology for the Authority to calculate TCO.</td>
<td>EAD/FDD Utility Working Group</td>
<td>S</td>
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<tr>
<td>C. Maximize the Flexibility of Regulatory Processes to Promote Water Stewardship</td>
<td>Engage with the RWQCB on the Airport’s long-term strategy for stormwater management and monitoring as outlined in this plan. As part of this, explore opportunities to streamline the regulatory process, e.g., disconnect from the MS4.</td>
<td>EAD</td>
<td>S</td>
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<tr>
<td>D. Make Water Stewardship Performance Measures Visible</td>
<td>Deploy a process for regular (bi-annual) check and adjust of Water Stewardship Plan with all appropriate stakeholders in conjunction with the GRI reporting process.</td>
<td>EAD</td>
<td>S</td>
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**Acronyms**

- Responsible: BFM = Business & Financial Management Department; EAD = Environmental Affairs Department; EPPS = Emergency Preparedness & Public Safety; FDD = Facilities Development Department; FMD = Facilities Management Department; PD = Planning Department; PSBD = Procurement & Small Business Development

**Timeframe:** S = Short-term (2017-2020); M = Medium-term (2020-2025); L = Long-term (2025-2035)
DEVELOP A WATER REUSE INFRASTRUCTURE PLAN
**ACTION 2
DEVELOP A WATER REUSE INFRASTRUCTURE PLAN**

Developing a sophisticated water infrastructure system that achieves multiple goals related to water conservation, stormwater quality, and flood resilience will require a highly coordinated approach that maps out the individual components of such systems as well as how they all interrelate, particularly with respect to the ADP. The ADP outlines our strategy for accommodating future passenger growth within the constraints of our existing footprint over the next 20 years, and will define a phasing concept that will allow us to realize the ADP within our financial means.

It will be essential to our water stewardship vision to closely connect our future water infrastructure needs to the ADP, so as to ensure that we take full advantage of opportunities to integrate water reuse infrastructure in new development projects when planning begins. A Water Reuse Infrastructure Plan will allow us to align the elements of our future water infrastructure with the development projects identified in the ADP. The incremental cost of integrating water stewardship considerations at the outset of our larger capital projects will be far less than pursuing them separately – or worse, correcting them later.

**Critical Areas of Focus to Drive Change**

A. Tap New Sources of Water
B. Develop a Closed-Loop Water System
C. Refine the Airport Hydraulic Model
D. Integrate Water Stewardship in the Capital Improvement Program & Airport Development Plan
E. Leverage Energy Management Opportunities that Promote Water Conservation

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**A. Tap New Sources of Water**

The City of San Diego imports 83% of its potable water from the California State Water Project and the Colorado River, and potable water supplied by the City of San Diego is the only source of water used at the Airport. There is inherent risk in relying on one water source and conversely, great benefit to achieving water independence and redundancy in our water systems. We are exploring a range of potential new sources of water to reduce our dependence on distant and insecure supplies.

We are already capturing and reusing condensate water generated from pre-conditioned air units (PCAs) at 10 jet bridges, and are currently evaluating the potential for capture and reuse of condensate from 41 other PCAs and over 100 air handling units located on terminal building roofs. There is currently an ongoing GIP project to refurbish and/or replace 35 jet bridges and infrastructure for collecting condensate at these PCAs could be incorporated into this project.

Rooftop rainwater capture is another source. Current rooftop area is approximately 1.69 M square feet with a potential annual rainwater capture of 8.5 million gallons with an additional 4.5 M gallons of capture potential following completion of the ADP. In addition, we are currently evaluating a stormwater capture and reuse system beneath Terminal 2 Parking Plaza. This system could potentially store up to 1.5M gallons of water that would be used at the Central Utility Plant (CUP) which is located adjacent to the facility. The CUP is estimated to use 35,000 to 55,000 gallons per day, and would provide a constant use for this stored water.

The City of San Diego is moving forward with the Pure Water program to install a water purification facility that will purify recycled water for drinking and ultimately provide 83 MG of water per day (one third of San Diego’s water supply needs) by 2035. We will coordinate with the City to understand the water quality requirements for the program and determine if there are opportunities for us to coordinate water sources as part of this program given that the Airport is located adjacent to the potential location of this facility. We will also track any planned installation of piping for reclaimed water near the Airport (currently, none is planned/anticipated).

**B. Develop a Closed-Loop Water System**

Our ultimate goal of water independence demands that we rethink our infrastructure systems and move toward an off-the-grid approach to managing our water. Our vision for water independent infrastructure includes a closed-loop system that enables water capture, treatment, storage, and conveyance to Airport facilities for non-potable water uses. Ultimately, the system would allow for the continuous reuse of water by eliminating our need to discharge waste and stormwater for treatment by external facilities. See schematic of closed-loop system on page 11.

We are exploring the potential for a ring main or closed-loop system that encircles the Airport property for water conveyance, much in the way that electricity is supplied to our facilities via the 12 kV line (microgrid). The ring main would serve every phase in the water cycle, from capture to reuse; it would also enable storage of large quantities of water in the conveyance system itself, eliminating the need for vast underground storage facilities.

We have developed design considerations for this closed-loop system which include:

- **Scalability**: The system should allow for incremental development in accordance with funding availability, ADP phasing, construction schedules, and water demand based on passenger volumes, facility needs and so on.
- **Flexibility**: The system should accommodate a variety of water inputs, including rainwater, greywater, condensate, and potable blackwater.
- **Water security**: The system should be designed to ensure reliable water supply even in times of drought.
- **Water quality**: Real-time flow monitoring should be integrated into the system to ensure water quality requirements are met in accordance with planned end uses. Also, pending end water uses, appropriate water treatment options should be explored and evaluated.
- **Energy efficiency and production**: Ensure that system energy requirements do not outweigh water savings, and consider multi-benefit opportunities such as tidal energy production and anaerobic digestion for organic waste and wastewater.
**ACTION 2 (continued)**

**DEVELOP A WATER REUSE INFRASTRUCTURE PLAN**

**C. Refine the Airport Hydraulic Model**

Phase I of our Strategic Master Drainage Plan (SMDP) included the development of a hydrologic and hydraulic base model of runoff and discharges from Airport watersheds for both existing (baseline) and future conditions in multiple storm scenarios. Future conditions incorporated sea level rise as projected by the California Coastal Commission of one foot by 2030 and two feet by 2050. Future conditions also incorporated storm surge of over two feet based on historical storm events. Based on inundation maps and modeling runs, the SMDP stated that many sections of the existing drainage system are undersized, contributing to localized ponding. The system shows ponding at a 5-year event and it becomes increasingly pronounced with larger events. Although ponding begins at the 5-year storm, Airport operations would likely not be substantially impacted because ponding does not encroach onto the runway. While our existing storm drain system meets the 5-year and 10-year storm event FAA requirement, the predicted sea level rise and storm surge will negatively impact the existing conveyance system capacity at the Airport. The reduced capacity will also increase potential ponding and overland flow throughout the system. Runoff from one basin can be conveyed to another system by overland flow. This base model shows present capacity issues.

Phase I of the SMDP recommended that we build upon the Stormwater Management Model (SWMM) by preparing a three-dimensional surface inclusive of all the current projects in construction and adjust all rim elevations in the SWMM model, obtain an up-to-date topographic conditions, conduct additional field surveys to refine storm drain invert elevations, add two-dimensional surface modeling to more accurately define overland flow, and revise future conditions with revised rainfall intensities (related to climate change) as future guidance becomes available. This task is currently being conducted under an existing CIP project.

**D. Integrate Water Stewardship into the Capital Improvement Program & Airport Development Plan**

All of the Airport’s development activities are guided by our Airport Development Plan (ADP) and our 5-year and 20-year CIP processes. As such, it is crucial that our efforts to advance a closed-loop water infrastructure system, as well as our continued development of the Airport hydraulic model (Actions 2B and 2C), inform both the ADP and CIP. In particular, we envision that the closed-loop system will be phased in incrementally, as development projects allow. It is therefore necessary that we check and adjust opportunities to include water conservation, capture and reuse early in project planning and budgeting process, to ensure these considerations are integrated in design, construction and budget decisions. Similarly, it is critical that these discussions benefit from the most up-to-date knowledge about Airport drainage and flood predictions using the Airport Hydraulic Model.

**E. Leverage Energy Management Opportunities that Promote Water Conservation**

The interdependence of energy and water use, referred to as the energy-water nexus, is widely recognized. Treatment and conveyance of water require vast amounts of energy, while production of energy requires substantial inputs of water. This interconnection is evident at the Airport, and our use of water and energy impacts one another. For instance, our Central Utility Plant (CUP), which supplies chilled water and space heating hot water to our terminals, utilized 39% more water in 2014 than in 2012. While part of this change is due to an increase in terminal square footage, our overall cooling demand increased as a result of a rise in annual average temperature by three degrees.

Concurrent with the Water Stewardship Plan, we are also pursuing an Energy Master Plan to guide us toward energy independence, enhanced operational resiliency, and carbon neutrality in a manner that is fiscally responsible and aligned with the overall capital plan. Key to the plan is determining the future of the CUP as we implement the ADP. The location and capacity of the existing CUP may meet the needs of our future terminal developments. If not, this presents an opportunity to design a high efficiency plant and potentially rethink how we supply heat and chilled water to our facilities. In particular, we will explore options to integrate water reuse technologies in our future CUP infrastructure in alignment with the ADP. This will require a clear understanding of capture, storage and conveyance technologies and siting options, as well as a phasing plan to ensure the timing of infrastructure investments are aligned.
### ACTION 2 (continued)
#### DEVELOP A WATER REUSE INFRASTRUCTURE PLAN

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<thead>
<tr>
<th>Focus Area</th>
<th>Critical Activities</th>
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<th>Time Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Tap New Sources of Water</strong></td>
<td>Coordinate with the design team for the Jet Bridge Rehab Project so that infrastructure can be installed to collect, store and reuse condensate from 35 jet bridge PCAs.</td>
<td>EAD, FDD</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Conduct a feasibility study to identify infrastructure components to collect, store, and reuse condensate from over 100 AHUs.</td>
<td>EAD, FDD</td>
<td>S</td>
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<tr>
<td></td>
<td>Work with the Terminal 2 Parking Plaza design-build team to evaluate the cost and feasibility of installing up to 1.5M gallons of water storage and treatment to reuse captured water as makeup water in the Central Utility Plant.</td>
<td>EAD, ADC, FDD, FMD</td>
<td>S (ongoing)</td>
</tr>
<tr>
<td></td>
<td>Engage City of San Diego regarding Pure Water Program to understand the timing; coordinate with City staff to identify water quality needs and future opportunities to use treated water onsite (discuss as part of quarterly meetings with City); and meet with the RWQCB 401 group.</td>
<td>FDD, EAD</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Engage with San Diego County Water Authority regarding their Pay for Performance opportunities.</td>
<td>EAD</td>
<td>S</td>
</tr>
<tr>
<td><strong>B. Develop a Closed-Loop Water System</strong></td>
<td>Use existing CIP funds (CIP 104133) to conduct a feasibility analysis to identify, evaluate and select an alternative for closed-loop system.</td>
<td>FDD, EAD</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Refine forecast of potential water demand by use type based on future passenger volumes and facility square footage</td>
<td>EAD</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Identify project phasing and coordinate with ADP and CIP.</td>
<td>FDD</td>
<td>S</td>
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<tr>
<td></td>
<td>Prepare design plans and finalize cost estimates which include Total Cost of Ownership analysis.</td>
<td>FDD</td>
<td>S</td>
</tr>
<tr>
<td><strong>C. Refine the Airport Hydraulic Model</strong></td>
<td>Use existing CIP funds to prepare a 3-D baseline model (CIP 104133).</td>
<td>FDD, EAD</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Use existing CIP funds to obtain x, y, z coordinates for all stormdrain inlets (CIP 104133).</td>
<td>FDD, EAD</td>
<td>S</td>
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</tbody>
</table>

#### Implementation Plan

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<tr>
<td>D. Integrate Water Stewardship in the Capital Improvement Program &amp; Airport Development Plan</td>
<td>As potential projects are identified in A and C, develop a list of time-phased CIP projects needed to support infrastructure plan for regular integration into the 5-year and 20-year CIP process.</td>
<td>FDD</td>
<td>S</td>
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<tr>
<td></td>
<td>Coordinate Energy Master Plan and Water Stewardship Plan and determine best sequencing of various Water Infrastructure and Energy Infrastructure projects, as appropriate with ADP phasing.</td>
<td>PO</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Other activities TBD upon further advancement of Focus Area B.</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>E. Leverage Energy Management Opportunities that Promote Water Conservation</td>
<td>Coordinate next steps to identify alternatives for future CUP replacement.</td>
<td>EAD</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Refine forecast of potential CUP water demand by use type based on future passenger volumes and facility square footage.</td>
<td>EAD</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Develop water-related externalities total cost of ownership analysis for future Airport energy supply.</td>
<td>FDD</td>
<td>S</td>
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<tr>
<td></td>
<td>Identify water sources, potential treatment needs, and infrastructure routing required to support future Airport energy generation facilities.</td>
<td>FDD, EAD</td>
<td>S</td>
</tr>
</tbody>
</table>

**Acronyms**
- BFM = Business & Financial Management Department
- EAD = Environmental Affairs Department
- EPPS = Emergency Preparedness & Public Safety
- FDD = Facilities Development Department
- FMD = Facilities Management Department
- PD = Planning Department
- PSBD = Procurement & Small Business Development

**Timeframe:**
- S = Short-term (2017-2020)
- M = Medium-term (2020-2025)
- L = Long-term (2025-2035)
INTEGRATE WATER STEWARDSHIP IN OPERATIONS & MAINTENANCE
A. Pursue Facility & Fixture Retrofits

As we plan for investments in new water infrastructure, we will continue to retrofit our existing buildings and building systems to maximize water efficiency. It is estimated that approximately 70% of indoor building and terminal water is used in our restrooms, and we have already made substantial headway in retrofitting these with water efficient fixtures.

Given our immediate proximity to San Diego Bay, we are also exploring the use of salt water from the Bay to flush toilets. We have investigated the feasibility of this concept with guidance from Sea World, who has successfully retrofitted its facilities to use water from the Bay, and it appears to provide a simple, cost-effective solution to significantly reduce our potable water use.

As we work to implement Action 2A to collect additional condensate from jet bridge PCAs and AHUs, we will need to evaluate additional infrastructure and equipment requirements to enable water reuse.

Finally, while some of our operation and maintenance activities that impact water consumption can be automated through building management systems (see Action 5A), our personnel will also need to adjust existing operations and maintenance manuals, schedules and activities accordingly.

B. Install Water Efficient & Resilient Landscaping & Irrigation

Landscaping is the link between the built and natural environments. Airport landscaping along Harbor Drive is the first visual impression for visitors to the Airport, and it functions as a sustaining aesthetic feature of the bay community. Although there is minimal landscaping at the Airport, it contributes to the overall customer experience. In support of our vision to operate in harmony with the natural water cycle of the region, we have established a goal to embrace water-saving landscape design and irrigation.

In 2014, our irrigation activities required nearly 13,000,000 gallons of water, representing 17% of total onsite use at a cost of more than $80,000. In our arid climate, landscaping choices can have a significant impact on water use; turf uses up to 70% more water than native vegetation. By transitioning to xeriscape, we can significantly reduce the need for irrigation. For the landscape installations that still require watering, local and state regulations support the use of non-potable water sources (e.g. greywater, rainwater, stormwater, reclaimed water, and condensate water) for irrigation purposes.

Recent improvement projects completed by the Authority have implemented new drought-tolerant xeriscape/landscape throughout the majority of the Authority’s property. The three branches of the Terminal Access Roads that enter from Harbor Drive are generally the only remaining portions of the property that feature water-intensive grass and shrubbery. Our proposed landscape replacement project could replace the landscaping along Harbor Drive at these three locations with the drought-tolerant xeriscape featured throughout the majority of the Authority’s property.

The same “plant-and-stone palette” used in the Green Build, Rental Car Center, Terminal Link Road, and elsewhere will be used in the landscape replacement project to provide a unified look across the Airport. The project will conserve water by reducing irrigation needs, and opportunities to retain stormwater runoff onsite in cobblestone swale and channels will improve the quality of stormwater discharged offsite.
ACTION 3 (continued)

INTEGRATE WATER STEWARDSHIP IN OPERATIONS & MAINTENANCE

C. Ensure Climate Risks Are Addressed in the Airport Emergency Plan

Our Airport Emergency Plan includes an Emergency Plan that provides general guidance to the Airport Authority in assisting the airlines to ensure passenger needs are rapidly identified and addressed during schedule delays. The plan addresses the manner of emergency considerations, from coordination with airlines and concessionaires to ensure passenger safety and comfort are addressed both on and off aircraft, to communication with the Transportation Security Administration regarding staffing of checkpoints for higher passenger volumes. While the plan does not contain unique procedures for different types of emergencies, we will ensure that future updates account for the expected increase in flood and climate risks.

We anticipate that most flood events with the potential to impact Airport operations will be relatively short in duration, and that long periods of runway and access roadway closure will be extremely rare. However, our Emergency Plan needs to reflect the potential for more frequent flooding in a manner that minimizes risks and inconvenience for the traveling public. In particular, we recognize the need for enhanced planning and coordination with our business partners, including airlines, the Federal Aviation Administration, ground transportation and hotel operators, and others to ensure that our response to flooding and other severe weather is seamless.

D. Protect Airport Access & Evacuation Routes

As a key asset in the regional, state, and national transportation systems, protecting access to the Airport is essential. Further, the Airport has the potential to help protect the broader region during storm events by supporting evacuations by air, filling in transportation gaps when other infrastructure such as highways is jeopardized, and convening regional organizations and transportation agencies to develop a cohesive approach for planning for and responding to other disruptive events.

In order to protect access and evacuation routes in the face of increasingly intense storm events and flooding, we will update our Traffic Control Plan for staff to reach their place of work during disruptive events. To complement our plan, we will use the employee notification system to reach staff during disruptive events to guide them on the most current access and evacuation information. We will leverage social media, intercom systems, and coordinate communication with local media to provide information to the traveling public about weather disruptions.

Given our reliance on the City of San Diego and other neighboring jurisdictions to provide access and evacuation infrastructure, we will explore the potential for convening a task force or other coordination working group comprised of local jurisdictions and partnering agencies to develop a cohesive strategy for preparing for and responding to severe storm events and floods. This will include identification of shared infrastructure that is most at risk during severe storms, and a plan for mitigating these risks.

Implementation Plan

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<tbody>
<tr>
<td>A. Pursue Facility &amp; Fixture Retrofits</td>
<td>Identify possible saltwater intake locations, and understand water quality and permit requirements.</td>
<td>FDD</td>
<td>S</td>
</tr>
<tr>
<td>1</td>
<td>Design and install withdrawal, treatment, and plumbing infrastructure for saltwater toilet flushing through ADP.</td>
<td>FDD</td>
<td>M</td>
</tr>
<tr>
<td>2</td>
<td>Update O&amp;M program (including schedules and activities) for all retrofitted systems and provide training for O&amp;M staff.</td>
<td>FMD</td>
<td>S</td>
</tr>
<tr>
<td>3</td>
<td>Continue preventative maintenance programs to ensure that water leaks, automatic shutoff sensors, and other equipment failures are corrected quickly.</td>
<td>FMD</td>
<td>S</td>
</tr>
<tr>
<td>B. Install Water Efficient &amp; Resilient Landscaping &amp; Irrigation</td>
<td>Request CIP funds to convert water intensive landscaping located at three branches of the Terminal Access Roads that enter from Harbor Drive to drought-tolerant xeriscape consistent with &quot;plant-and-stone palette.&quot;</td>
<td>FDD</td>
<td>S</td>
</tr>
<tr>
<td>1</td>
<td>Evaluate the evapotranspiration factor for irrigation system.</td>
<td>FDD</td>
<td>S</td>
</tr>
<tr>
<td>B</td>
<td>Ensure the approved Emergency Plan is informed by the most up to date climate science and flood risk data, and incorporates coordination efforts with local agencies and Airport business partners.</td>
<td>EAD</td>
<td>S</td>
</tr>
<tr>
<td>C</td>
<td>Update the Traffic Control Plan and employee notification system to provide Airport access and evacuation information during disruptive weather events.</td>
<td>EPPS</td>
<td>M</td>
</tr>
<tr>
<td>1</td>
<td>Convene a task force of local jurisdictions and partnering agencies to develop a cohesive strategy for preparing for and responding to severe storm events and floods, including infrastructure improvements.</td>
<td>EAD</td>
<td>S</td>
</tr>
</tbody>
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Acronyms

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Timeframe: S = Short-term (2017-2020); M = Medium-term (2020-2025); L = Long-term (2025-2035)
INTEGRATE WATER STEWARDSHIP IN DESIGN GUIDELINES & STANDARDS
ACTION 4
INTEGRATE WATER STEWARDSHIP IN DESIGN GUIDELINES & STANDARDS

The paradox of our future climate conditions requires us to prepare for increased water scarcity while at the same time enhancing our ability to cope with more severe storm events, sea level rise, and flooding. As we develop new Airport facilities to accommodate higher passenger volumes in the future, we must consider the impact that water scarcity and severe weather will have on our daily operations.

The Authority upholds a range of design guidelines, standards, and other requirements that help us maintain consistency in our development projects. Just as local building codes must be updated regularly to reflect new knowledge about fire protection, energy consumption, and other considerations, our design guidance and specifications must evolve with the times to account for new water realities. These guidelines and standards ensure that we do not discover missed opportunities after development occurs – when it is far too late to integrate water stewardship in a cost-effective manner.

Critical Areas of Focus to Drive Change

A. Require New Developments to Integrate Water Efficient & Reuse Technology
B. Ensure New Developments Protect Water Quality
C. Require New Developments to Integrate Flood Resilient Design
D. Update Landscaping & Irrigation Design Guidelines to Require Water Efficiency & Resilience

A. Require New Developments to Integrate Water Efficient & Reuse Technology

Approximately 180 million gallons of rainwater falls on our property every year. However, the entire 77 million gallons of potable water used at the Airport in 2014 was potable water provided by the City of San Diego. The incorporation of LEED standards into facility/terminal design has helped to reduce total onsite water use by 13% (as compared to 2008), even though the number of passengers has increased by 3.5% over that period. While we have updated almost all water fixtures in existing buildings to be efficient, our commitment to conserving water must continue as we build new facilities. The US Green Building Council estimates that investing in efficient solutions and plumbing for alternate water use results is less than a 1% impact to the total cost budget and with an estimated 6% year-over-year increase in the price of potable water makes the payback period attractive.

In addition to integrating water efficient fixtures, we also need to consider using alternate sources of water so that by 2020, ADP projects not only evaluate and integrate water efficiency, but also aspire to commit to 100% of activities not requiring potable water meet their water demand by using alternate water sources. For instance, the substantial amount of groundwater that we pump for dewatering purposes may be suitable for non-potable processes such as dust control at some locations at the Airport. While in the past, our ability to reuse water was limited by a variety of regulatory constraints, California now promotes water reuse through the recently adopted Rainwater Capture Act of 2012, Sustainable Groundwater Act, and 20x2020 Water Conservation Plan, as well as an updated California Plumbing Code that includes non-potable water reuse and rainwater catchment systems. To date, the City of San Diego has not provided specific guidance to non-residential entities around water reuse but they frequently develop new sustainability plans (including its Climate Action Plan) which may impact new building standards.

We will incorporate all available guidance, such as those cited above, along with industry best practices, into our design guidelines and standards to ensure that we have the proper references to design facilities to accept alternate water sources and achieve maximum water efficiency.

B. Ensure New Developments Protect Water Quality

As regulatory conditions evolve, we are increasingly subject to permit requirements and restrictions governing our management of stormwater. In addition, water quality permits continue to evolve and have become increasingly complex and prescriptive. Low impact development (LID) is an approach to water quality management that can be applied at development or redevelopment projects that employs site design principles works and natural hydrologic processes manage stormwater as close to its source as possible. These principles include minimizing interconnected impervious surfaces and preserving or constructing landscape features that treat stormwater using more natural processes or that capture and reuse stormwater. Some examples include permeable pavements, bioretention facilities, and stormwater cisterns. The MS4 permit adopted in 2013 included requirements to use LID controls to accomplish multiple objectives. Specifically, this permit includes the following provision:

“Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e., intercept, store, infiltrate, evaporate, and evaporate/surface) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume).”

This requirement needs to be considered early in the planning process for new development and redevelopment projects, as this may affect the site layout and design of the overall project. To some extent, this provision may be met through stormwater capture and reuse at the Airport and the possibility of implementing an Alternative Compliance Program.

The principles of LID focus on minimizing impervious surfaces and promoting infiltration and evaporation. LID control measures should be integrated within the footprint of the project as an integral part of the site design. As part of the BMP selection process, we also need to consider the long-term operation and maintenance costs to ensure proper operation and pollutant removal.
ACTION 4 (continued)
INTEGRATE WATER STEWARDSHIP IN DESIGN GUIDELINES & STANDARDS

C. Require New Developments to Integrate Flood Resilient Design

In order to safeguard future Airport developments from flooding, we will develop design guidance and establish a design review process that complement our existing sustainable design requirements such as Leadership in Energy & Environmental Design (LEED) and ENVISION certification. Our guidance may require designers to consider the following:

- Projected flood elevations at project location
- Alternative siting options to reduce flood risk
- Risk of flood occurrence in accordance with the life cycle of the project
- Identification and appropriate protection of critical facility infrastructure
- Benefits and costs of potential flood mitigation measures, particularly when compared to the long-term costs of not designing for flood resilience (including the cost of recovery from flooding)

D. Update Landscaping & Irrigation Design Guidelines to Require Water Efficiency & Resilience

In order to ensure that all future Airport developments integrate water efficient designs for our landscaped areas, we are creating an Airport-wide landscape palette. The palette will provide a uniform set of guidelines for planting and irrigating native vegetation that is well suited to our regional climate conditions. Native vegetation typically adapts better to changes in local climate, which means it can survive with limited or no irrigation beyond natural precipitation.

We will continue to pursue LEED and Low-Impact Development (LID) guidelines into standards that apply to any CIP/ADP projects to meet the following objectives:

1. To conserve water used for irrigation by replacing water-intensive grass and shrubbery with xeriscape
2. To complete the “campus” look and provide a uniform landscape palette for the Airport.
3. To retain stormwater runoff onsite and improve the quality of stormwater discharged offsite.
4. Using non-potable water sources for irrigation.

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<tr>
<td>A. Require New Developments to Integrate Water Efficient &amp; Reuse Technology</td>
<td>A 1 Update design guidelines &amp; standards to include alternate water/reuse guidance identified in the Rainwater Capture Act of 2012, California Plumbing Code, and forthcoming guidance documents.</td>
<td>FDD</td>
<td>S</td>
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<tr>
<td></td>
<td>A 2 Evaluate the feasibility of integrating water capture, storage, and reuse technologies/infrastructure as part of ADP environmental review process.</td>
<td>FDD</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>A 3 Quantify dewatering activities and determine feasibility of reuse for dust control and other appropriate uses.</td>
<td>EAD FDD</td>
<td>S</td>
</tr>
<tr>
<td>B. Ensure New Developments Protect Water Quality</td>
<td>B 1 Provide training so that Authority staff understands permit requirements and how to meet them.</td>
<td>EAD</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>B 2 Each project should evaluate water quality regulatory requirements and the design team should understand how LID site design, source control, and non-structural/structural BMPs function.</td>
<td>EAD FDD ADC</td>
<td>S</td>
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<tr>
<td></td>
<td>B 3 Include technical requirements for BMPs in the design plans and ensure there is training and a program in place to operate and maintain BMPs.</td>
<td>EAD FDD</td>
<td>S</td>
</tr>
<tr>
<td>C. Require New Developments to Integrate Flood Resilient Design</td>
<td>C 1 Identify the top five most likely design alternatives and cost estimates that might be used at SDIA to address flooding.</td>
<td>EAD</td>
<td>S</td>
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<td></td>
<td>C 2 Incorporate resilience design options into ADP environmental review process.</td>
<td>EAD PD</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>C 3 Update vulnerability assessment, identify resiliency projects and incorporate into CIP project cycle.</td>
<td>EAD FDD</td>
<td>S</td>
</tr>
<tr>
<td>D. Update Landscaping &amp; Irrigation Design Guidelines to Require Water Efficiency &amp; Resilience</td>
<td>D 1 Incorporate the Airport-wide landscape palette into the design guidelines.</td>
<td>FDD</td>
<td>S</td>
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ACTION 5

LEVERAGE TECHNOLOGY TO IMPROVE DATA ANALYTICS
ACTION 5
LEVERAGE TECHNOLOGY TO IMPROVE
DATA ANALYTICS

The major infrastructure of San Diego International Airport was constructed at a time when water conservation was not a primary consideration. As our collective awareness of the importance of water stewardship has elevated, technology has also advanced leaps and bounds since this time, and our ability to keep pace with technology is somewhat limited by the speed of our overall Airport modernization efforts.

We fully embrace the concept of smart buildings, and have begun phasing in a variety of building management systems that will continue to enhance our data analytics, building operations, and quickly respond to problems such as spikes in our energy loads, water leaks, and so forth. We believe these technology enhancements will greatly improve our ability to manage our resource use in a systematic and cost-effective manner.

Critical Areas of Focus to Drive Change

A. Install Smart Meters & Real-Time Data Monitoring Technology

B. Enhance Water Quality Sampling & Studies

C. Leverage Advanced Sea Level Rise Modeling Resources to Support Resilience Planning

A. Install Smart Meters & Real-Time Data Monitoring Technology

Our current approach to monitoring our water use involves manual management of data to create periodic audits at a high level. We are in the process of transitioning to a “smart metering” system that will provide automated water use data on a daily basis through a dashboard and other visualization technologies. This system will enable us to better manage our operations, identify emerging issues such as water leakage, and take actions to mitigate impacts. Better data will provide greater visibility into individual water users and water using processes, and will ultimately help us to identify and prioritize areas of opportunity for conservation.

Specifically, we are pursuing a potential public-private partnership to deploy a water sensor network across various water infrastructure in order to measure water use at a highly granular level and identify opportunities to reduce usage, eliminate leaks, potentially predict failure events, and identify water reuse and efficiency opportunities. Ultimately, this system may allow us to also tackle other challenging activities such as stormwater flow and sediment monitoring.

B. Enhance Water Quality Sampling & Studies

The Airport is located along San Diego Bay downstream of a much larger watershed that includes lands owned by the City of San Diego, Caltrans, and private commercial and industrial landowners. The existing 60-inch, 42-inch, and 84-inch storm drains (and their tributaries) capture runoff from these upstream areas, which co-mingles with runoff from the Airport prior to discharging into the San Diego Bay. Another portion of the stormwater conveyance system collects stormwater from the western portion of the Airport, co-mingled from upstream runoff discharging from the Naval Training Center that abuts the Airport property along the northwestern border. This runoff discharges into the Navy Boat Channel to the west. It would be useful to understand the contribution of constituents in runoff from upstream sources. Similar to understanding what is coming onto the Airport from upgradient sources, it would be helpful to understand actual loads at each of the outfalls. This information would help the Airport to establish, measure and track water quality performance and be considered in design guidelines for new projects.
**ACTION 5** (continued)

**LEVERAGE TECHNOLOGY TO IMPROVE DATA ANALYTICS**

### C. Leverage Advanced Sea Level Rise Modeling Resources To Support Resilience Planning

Significant advancements in sea level rise and climate change modeling are being made by government and institutional organizations that will continue to expand our knowledge about potential impacts to the Airport. To support our climate resilience efforts, we are exploring opportunities to collaborate with government and institutional partners in order to leverage the best available climate science and technology. Advanced flood modeling takes into account tides, currents, wind, storm surge, and topographic features to result in a more precise evaluation of sea level rise and flood impacts. These new models will allow us to continuously improve the Airport Hydraulic Model and enhance our ability to make informed decisions about future infrastructure investments.

For example, we are collaborating with the Scripps Institution of Oceanography to advance the development of a sophisticated hydrodynamic model for the San Diego Bay. The model will provide a comprehensive and more nuanced understanding of the potential reach and impact of sea level rise throughout the region. The US Geological Survey’s Coastal Storm Modeling System (CoSMoS) makes detailed predictions of storm-induced coastal flooding, erosion and cliff failures over large geographic scales. CoSMoS 3.0, focused on Southern California, is expected to be available in early 2016. We will closely track developments with CoSMoS 3.0 in order to leverage this resource when it is released. Our continued involvement in the Climate Collaborative allows us to stay informed about the latest advancements with this and other modeling efforts.

#### Implementation Plan

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Critical Activities</th>
<th>Responsible</th>
<th>Time Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Install Smart Meters &amp; Real-time Data Monitoring Technology</td>
<td>A. Leverage public-private partnership and AIMMs to install water meters and collect real-time data.</td>
<td>EAD</td>
<td>S</td>
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<tr>
<td></td>
<td>B. Provide training to building engineers and other staff that are responsible for operating, maintaining, and utilizing output from smart metering systems.</td>
<td>FMD</td>
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<td></td>
<td>A. Link data management and analysis to the bi-annual Airport sustainability report (Global Reporting Initiative).</td>
<td>EAD</td>
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<tr>
<td>B. Enhance Water Quality Sampling &amp; Studies</td>
<td>B. Expand stormwater and dry weather sampling to quantify the concentrations of CODs entering the Airport’s upgradient stormwater conveyance system.</td>
<td>EAD</td>
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<td>B. Conduct a literature review of pollutant contributions from stormwater, sediment and atmospheric deposition sources.</td>
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<td></td>
<td>B. Conduct sampling to calculate the baseline loads at each of the 15 outfalls from the Airport into San Diego Bay.</td>
<td>EAD</td>
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<tr>
<td>C. Leverage Advanced Sea Level Rise Modeling Resources To Support Resilience Planning</td>
<td>B. Continue to explore potential grant funding and opportunities for collaboration with Scripps and other academic institutions to advance modeling and other regional climate science and planning tools.</td>
<td>EAD</td>
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<tr>
<td></td>
<td>C. Continue to track the development of CoSMoS 3.0 and integrate results in Airport Hydraulic Model.</td>
<td>EAD FDD</td>
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</tbody>
</table>

**Acronyms**

- BFM = Business & Financial Management Department
- EAD = Environmental Affairs Department
- EPPS = Emergency Preparedness & Public Safety
- FDD = Facilities Development Department
- FMD = Facilities Management Department
- PD = Planning Department
- PSBD = Procurement & Small Business Development

**Timeframe:**

- S = Short-term (2017-2020)
- M = Medium-term (2020-2025)
- L = Long-term (2025-2035)
ENGAGE TENANTS IN WATER STEWARDSHIP
ACTION 6
ENGAGE TENANTS IN WATER STEWARDSHIP

Our tenants play a major role in operating the Airport, from moving passengers and cargo, offering car rentals, feeding the traveling public, and providing ground transportation for visitors. The collective environmental footprint of our business partners is arguably greater than that of the Authority, and it is crucial that we engage them as we work to achieve our vision for water stewardship.

The scale and nature of our tenants’ operations vary greatly, ranging from small retail kiosks to aircraft maintenance facilities. Through our multiple engagement channels with our business partners, we will work together to identify the opportunities that have the greatest potential to impact our cumulative progress toward our water conservation, water quality, and resilience objectives. Through our tenant agreements, design requirements, and planning processes, we will strive to provide a consistent approach to fostering a water stewardship mindset throughout the Airport ecosystem.

### Critical Areas of Focus to Drive Change

|---------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|

**A. Provide Incentives to Promote Water Stewardship**

From food preparation to aircraft washing, our tenant’s activities are heavily reliant on water. Our current agreements with our tenants do not incent water conservation, although their consumption patterns in many cases directly affect the Airport’s overall water usage. As water scarcity becomes more prevalent and the cost of water continues to increase, it is critical that we work together to conserve.

As we renew existing lease agreements and enter new tenant relationships, we will work with the tenants to identify opportunities to promote water efficiency in accordance with their activities. We will promote sub-metering technology in new tenant build-outs to provide visibility into tenant water use and promote accountability for conservation. We will explore mechanisms to better connect tenant financial liabilities and incentives to actual usage, rather than rolling water costs into lease payments regardless of use, if feasible.

We are exploring the development of a green concessions program that rewards adoption of sustainability practices while engaging passengers in sustainable food choices. Water considerations would be central to such a program, and we will collaborate with our tenants to enhance awareness among employees about water use and motivate behavior change, and explore opportunities to recognize and reward tenants and their staff for their conservation efforts.


The best opportunity to advance water stewardship at the tenant level is during the design stage, before projects are constructed. Our tenant improvement guidelines are a central repository to address a range of design and operations considerations; we will use these guidelines as our mechanism to encourage water efficiency and flood resilience in tenant projects.

In order to ensure that our tenants adequately address these requirements, we will need to educate our design review team so that they understand our water stewardship objectives, and to equip them with the technical knowledge required to effectively review tenant submittals for water efficiency, reuse, and resilience elements.
ACTION 6 (continued)
ENGAGE TENANTS IN WATER STEWARDSHIP

C. Engage Business Partners in Developing An Airport Climate Resilience Plan

Just as we begin to prepare the Airport to withstand more severe weather, our tenants will face increased flood risk as a result of sea level rise, storm surge and heavier storms, and will also be impacted by continued water scarcity and other changes in our climate. It is imperative that we collaborate closely with our Airport business partners as we develop our climate resilience strategy to leverage their intimate knowledge of the strengths and vulnerabilities of their own infrastructure and assets, and to unify our response to climate threats.

We have developed a flood vulnerability assessment for Airport assets which points to the need for additional analysis of impacts on our tenants’ facilities. In particular, we must address potential risks to navigational, utility equipment and other infrastructure that is critical to Airport operations. Our hydraulic model also indicates a potential for future flood impacts to cargo, general aviation, and other facilities that warrants further discussion with their operators.

As we begin to craft our overarching climate resilience strategy, we can consider a range of best practices for flood mitigation that may include infrastructure hardening, green infrastructure solutions, and soft measures such as emergency procedures. Our business partners will play a central role in determining which measures are most appropriate to ensure public safety, continuity of Airport operations, and protection of Airport assets. Collaboration with our partners will also be necessary to ensure that we preserve passenger safety and comfort during extreme weather events, providing food, seamless communications, and other critical services.

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<tr>
<td>A. Provide Incentives to Promote Water Stewardship</td>
<td>Install smart meters to collect tenant water use data.</td>
<td>BM FMD</td>
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<td>Identify physical and contractual barriers to promote water stewardship in future tenant procurement processes and agreements.</td>
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<td>Evaluate the feasibility of transitioning new tenant agreements to connect tenant water use and financial responsibility.</td>
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<td>Develop a training and recognition program for tenant water stewardship achievements.</td>
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<td>Integrate water stewardship in tenant selection criteria as part of the procurement process.</td>
<td>PSBD EAD</td>
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<td>Update Airport Rules &amp; Regulations to incorporate water stewardship objectives.</td>
<td>Air Ops</td>
<td>M</td>
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<tr>
<td>B. Integrate Water Conservation &amp; Resilient Design in Tenant Improvement Guidelines &amp; Design Review Process</td>
<td>Update tenant improvement guidelines to include water metering, efficiency, and flood resilience standards, leveraging existing third-party resources such as LEED-EBOM where possible.</td>
<td>FDD Ten/Ter</td>
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<td>Ensure Water Stewardship Plan objectives are clearly addressed in tenant design review process by providing education to design review team and integrating water stewardship considerations in review checklists.</td>
<td>FDD EAD Ten/Ter</td>
<td>S</td>
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<tr>
<td>C. Engage Business Partners in Developing An Airport Climate Resilience Plan</td>
<td>Update the Airport-wide vulnerability assessment to account for tenant facility flood sensitivity and adaptive capacity.</td>
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<td>Engage Airport business partners in identifying necessary flood protection measures as part of an overarching Airport Climate Resilience Plan.</td>
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- S = Short-term (2017-2020)
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ACKNOWLEDGEMENTS

The following departments of the San Diego County Regional Airport Authority contributed to the development of the Water Stewardship Plan:

- Air Operations Department
- Airport Design & Construction
- Business & Financial Management Department
- Environmental Affairs Department
- Facilities Development Department
- Facilities Management Department
- Ground Transportation Department
- Planning Department

Photos courtesy San Diego County Regional Airport Authority
Prepared by Haley & Aldrich, Inc.