



**PUBLIC, LEGISLATIVE AFFAIRS, AND WATER RESOURCES
COMMITTEE MEETING
OF THE BOARD OF DIRECTORS
INLAND EMPIRE UTILITIES AGENCY*
AGENCY HEADQUARTERS, CHINO, CALIFORNIA**

**WEDNESDAY, APRIL 13, 2016
9:00 A.M.**

CALL TO ORDER

PUBLIC COMMENT

Members of the public may address the Board on any item that is within the jurisdiction of the Board; however, no action may be taken on any item not appearing on the agenda unless the action is otherwise authorized by Subdivision (b) of Section 54954.2 of the Government Code. Those persons wishing to address the Board on any matter, whether or not it appears on the agenda, are requested to complete and submit to the Board Secretary a "Request to Speak" form, which are available on the table in the Board Room. Comments will be limited to five minutes per speaker. Thank you.

ADDITIONS TO THE AGENDA

In accordance with Section 54954.2 of the Government Code (Brown Act), additions to the agenda require two-thirds vote of the legislative body, or, if less than two-thirds of the members are present, a unanimous vote of those members present, that there is a need to take immediate action and that the need for action came to the attention of the local agency subsequent to the agenda being posted.

1. ACTION ITEMS

A. MINUTES

The Committee will be asked to approve the Public, Legislative Affairs, and Water Resources Committee meeting minutes of March 9, 2016.

**B. PRADO BASIN HABITAT SUSTAINABILITY PROGRAM
REIMBURSEMENT AGREEMENT AMENDMENT**

It is recommended that the Committee/Board:

1. Amend the reimbursement agreement with the Chino Basin Watermaster for the Prado Basin Habitat Sustainability Program to increase the total program cost from \$600,000 to \$934,500; and
2. Authorize the General Manager to execute the reimbursement agreement amendment.

C. PROFESSIONAL SERVICES CONTRACT AWARD FOR SEPTIC USER FEASIBILITY STUDY

It is recommended that the Committee/Board:

1. Approve the professional services contract award for the Feasibility Study for Sewer Service Septic Users in the IEUA service area, Project No. PL16015 to RMC Water and Environment for the not-to-exceed amount of \$286,813; and
2. Authorize the General Manager to execute the contract.

D. EAST DECLEZ PROPERTY ACQUISITION

It is recommended that the Committee/Board:

1. Authorize the General Manager to purchase the East Declez property for the sum of \$3.0 million on behalf of Chino Basin Watermaster (Watermaster); contingent upon the approval by the Watermaster Board of Directors;
2. Authorize the General Manager to spend up to \$100,000 on behalf of Watermaster for necessary fees related to the purchase of the property; and
3. Approve a \$3.1 million budget amendment for Project No. EN18007 in FY 2015/16 through an inter-fund loan from the Regional Wastewater Capital Improvement (RC) fund to the Recharge Water (RW) fund.

E. ADOPTION OF RESOLUTIONS FOR THE USBR WATERSMART

It is recommended that the Committee/Board:

1. Adopt Resolution Nos. 2016-4-1, 2016-4-2, and 2016-4-3, authorizing the Agency to enter into financial assistance agreements with the U.S. Department of Interior – Bureau of Reclamation (USBR) for three grant applications submitted in April 2016: 1) Drought Contingency Planning Grant; 2) Drought Resiliency Implementation Grant; and 3) Agricultural Water Conservation Grant; and
2. Authorize the General Manager to execute the financial assistance agreement, any amendments, and any grant related documents thereto.

2. INFORMATION ITEMS

A. PUBLIC OUTREACH AND COMMUNICATION (WRITTEN)

B. LEGISLATIVE REPORTS (WRITTEN)

1. West Coast Advisors
 2. Innovative Federal Strategies
 3. Agricultural Resources
- C. **CALIFORNIA STRATEGIES MONTHLY REPORT (WRITTEN)**
 - D. **FEDERAL LEGISLATION MATRIX (WRITTEN)**
 - E. **STATE LEGISLATION MATRIX (WRITTEN)**
 - F. **2015 INTEGRATED WATER RESOURCES PLAN (WRITTEN/POWERPOINT)**
 - G. **REGIONAL WATER USE EFFICIENCY BUSINESS PLAN (2015-2020) (WRITTEN/POWERPOINT)**
 - H. **QUARTERLY PLANNING AND ENVIRONMENTAL COMPLIANCE UPDATE (POWERPOINT)**
 - I. **PLANNING AND ENVIRONMENTAL RESOURCES UPDATE (ORAL)**
3. **GENERAL MANAGER'S COMMENTS**
 4. **COMMITTEE MEMBER COMMENTS**
 5. **COMMITTEE MEMBER REQUESTED FUTURE AGENDA ITEMS**
 6. **ADJOURN**

*A Municipal Water District

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Board Secretary (909-993-1736), 48 hours prior to the scheduled meeting so that the Agency can make reasonable arrangements.

Proofed by: JK

DECLARATION OF POSTING

I, April Woodruff, Board Secretary of the Inland Empire Utilities Agency, A Municipal Water District, hereby certify that a copy of this agenda has been posted by 5:30 p.m. in the foyer at the Agency's main office, 6075 Kimball Avenue, Building A, Chino on Thursday, April 7, 2016.

for Stephanie Riley
April Woodruff

**ACTION
ITEM
1A**



MINUTES

**PUBLIC, LEGISLATIVE AFFAIRS, AND WATER RESOURCES
COMMITTEE MEETING
INLAND EMPIRE UTILITIES AGENCY*
AGENCY HEADQUARTERS, CHINO, CA**

**WEDNESDAY, MARCH 9, 2016
9:00 A.M.**

COMMITTEE MEMBERS PRESENT

Steven J. Elie, Chair
Michael Camacho

STAFF PRESENT

P. Joseph Grindstaff, General Manager
Andy Campbell, Deputy Manager of Planning and Environmental Resources
Andrea Carruthers, Senior External Affairs Specialist
Jason Gu, Grants Officer
Sylvie Lee, Manager of Planning and Environmental Resources
Jeff Noelte, Manager of Technical Services
Lisa Morgan-Perales, Senior Water Resources Analyst
Craig Proctor, Pretreatment and Source Control Supervisor
April Woodruff, Board Secretary/Office Manager

OTHERS PRESENT

Don Holder – Conserv, Inc.

The meeting was called to order at 9:07 a.m. There were no public comments received or additions to the agenda.

ACTION ITEMS

The Committee:

- ◆ Approved the Public, Legislative Affairs, and Water Resources Committee meeting minutes of February 10, 2016.
- ◆ Recommended that the Board:
 1. Award a 15-month contact to ConServ Construction, Inc., or a not-to-exceed amount of \$300,000 to implement the Program; and
 2. Authorize the General Manager to execute the contract;as a Consent Calendar Item on the March 16, 2016, Board meeting agenda.
- ◆ Recommended that the Board that the Board adopt Resolution No. 2016-3-3, for the Agency to initiate a SGMA boundary change request to the California Department of Water Resources recommending that the Bulletin 118 Basin Boundary of the Chino Basin be conformed to the adjudicated Chino Basin boundary throughout the majority of the Chino Basin;

as a Consent Calendar Item on the March 16, 2016, Board meeting agenda.

◆ Recommended that the Board:

1. Adopt the Recycled Water Policy Principles; and
2. Initiate development of a Regional contract amendment based on the Recycled Water Policy Principles.

as an Action Item on the March 16, 2016, Board meeting agenda.

◆ Recommended that the Board:

1. Adopt Resolution No. 2016-3-1, authorizing the General Manager to sign a Financial Assistance Agreement with the State Water Resources Control Board for a Planning Grant application through the Small Community Wastewater Grant Program; and
2. Adopt Resolution No. 2016-3-2, dedicating certain revenues in connection with the Small Community Wastewater Grant Program and associated State Revolving Fund (SRF) loan financing;

as a Consent Calendar Item on the March 16, 2016, Board meeting agenda.

INFORMATION ITEMS

The following information items were presented or received and filed by the Committee:

- ◆ Public Outreach and Communication Report
- ◆ Legislative Reports
- ◆ California Strategies, LLC Activity Report
- ◆ Federal Legislation Matrix
- ◆ State Legislative Matrix
- ◆ Recycled Water Semi-Annual Update
- ◆ Planning and Environmental Resources Update

GENERAL MANAGER'S COMMENTS

General Manager Joseph Grindstaff had no comments.

COMMITTEE MEMBER COMMENTS

Director Elie reported that while he was in Sacramento to attend the Water Agencies of the Inland Empire Legislative Reception, he met with Senator Leyva the principal author of Senate Bill 970. He stated that in the next couple of weeks, there will be a lot of work to submit amendments to fit what needs to be done, before the April 6 committee hearing. Director Elie noted that he will be attending to testify on behalf of the Agency. He stated that we need to determine where the member agencies and cities stand on SB 970. Director Elie also stated that we need to think about the end use, i.e. turning food waste away from the landfills. He stated that part of what they want to do is solve the short-term air pollutant concerns, and not use all the gas for powering our own facilities. One suggestion is CNG of some kind, still adding a process to clean the gas for transportation. Director Elie stated that there needs to be a partnership component with the private industry that is taking the food waste right now. He stated that we should take advantage of "low-hanging fruit" that could be a pilot project, using our existing resources and sites. He closed his comments by recognizing Executive Manager of Policy Development/AGM Martha Davis as a "shining star", for her efforts in obtaining meetings with individuals that would otherwise not happen, if not for her personal and professional relationships with those individuals.

COMMITTEE MEMBER REQUESTED FUTURE AGENDA ITEMS

There were no Committee member requested future agenda item.

With no further business, Director Elie adjourned the meeting at 10:03 a.m.

Respectfully submitted,

April Woodruff
Board Secretary/Office Manager

*A Municipal Water District


APPROVED: APRIL 13, 2016


**ACTION
ITEM
1B**


Date: April 20, 2016

To: The Honorable Board of Directors

Through: Public, Legislative Affairs, and Water Resources Committee (04/13/16)
Finance, Legal & Administration Committee (04/13/16)

From:  Joseph Grindstaff
General Manager

Submitted by: Chris Berch 
Executive Manager of Engineering/Assistant General Manager

Sylvie Lee 
Manager of Planning and Environmental Resources

Subject: Prado Basin Habitat Sustainability Program Reimbursement Agreement
Amendment

RECOMMENDATION

It is recommended that the Board of Directors:

1. Amend the reimbursement agreement with the Chino Basin Watermaster for the Prado Basin Habitat Sustainability Program to increase the total program cost from \$600,000 to \$934,500; and
2. Authorize the General Manager to execute the reimbursement agreement amendment.

BACKGROUND

In December 2010, the Inland Empire Utilities Agency (IEUA) approved the Peace II Subsequent Environmental Impact Report (SEIR). The Peace II SEIR was collaboratively completed by IEUA and Chino Basin Watermaster (CBWM) and laid the foundation for the implementation of hydraulic control, reoperation of the Chino Basin and continued use of recycled water.

The SEIR, requires IEUA, CBWM, Orange County Water District (OCWD) and individual stakeholders, to convene a Committee to develop and implement the Prado Basin Habitat Sustainability Program (Program). Under this Program, IEUA and CBWM are committed to performing the following Tasks:

1. Develop an Adaptive Management Plan (AMP)

Prado Basin Habitat Sustainability Program Reimbursement Agreement Amendment

April 20, 2016

Page 2 of 3

2. Construct groundwater monitoring wells; and
3. Perform vegetation surveys

The AMP and monitoring wells needed to be complete prior to the operation of the Chino Desalter expansion (part of the Peace II agreement), which was scheduled for December 2015. Through the completion of these tasks, the project experienced unforeseen impacts which resulted in changes to the costs currently approved. Impacts included time delays due to land acquisitions, environmental permitting and monitoring and increased scope for the AMP. To allow the project to complete in time, IEUA and CBWM agreed to track changes as they occur and reconcile after the completion of the tasks. This allowed both tasks to be completed in time.

Under the Program, IEUA and CBWM have entered into a reimbursement agreement for a total Program cost of \$600,000 (cost-shared 50/50 by both agencies) through fiscal year 2022/23. Due to the time and scope impacts identified above, the Program is expected to incur an additional \$334,500 in costs through fiscal year 2025/26. This will require an amendment to the current reimbursement agreement, increasing the total Program cost from \$600,000 to \$934,500. To date, \$795,387 has been spent under this Program.

During the reconciliation process, tasks associated with photo monitoring and vegetation surveys were included as part of the AMP, as these are considered part of the monitoring program. According to the 2008 Bright Line approach agreement, costs associated to the monitoring requirements of the AMP will be the responsibility of the CBWM in full. This resulted in changes to each agencies costs-sharing allocation as presented in Table 2.

Table 1: Program cost summary since inception, including all amendments

Task	Initial Cost	2013 Amendment	Proposed 2016 Amendment
AMP Report	\$25,000	\$97,780	\$179,400
Monitoring Wells	\$390,000	\$377,220	\$625,100
Vegetation Surveys	\$20,000	\$80,000	\$100,000
Photo Monitoring	\$0	\$15,000	\$0
Annual Permit Fees	\$0	\$0	\$30,000
Contingency	\$5,000	\$30,000	\$0
Total Program Cost	\$440,000	\$600,000	\$934,500

Table 2: Proposed Cost-Share Allocation to each Agency

Task	Lead Agency	% Cost Share IEUA	% Cost Share Watermaster
AMP Report	IEUA	50	50
Monitoring Wells	IEUA	50	50
Vegetation Surveys	IEUA	0	100
Photo Monitoring	CBWM	0	100
Annual Permit Fees	IEUA	50	50
Total Program Costs by Agency		\$417,250	\$517,250

The item will be presented to CBWM Board in May 2016.

The PBHS Program is consistent with the *Agency's Business Goal of Water Reliability* by maximizing the beneficial reuse of recycled water and sources of groundwater within the Chino Basin.

PRIOR BOARD ACTION

On August 21, 2013, the IEUA Board of Directors awarded the contract for installation of the groundwater monitoring wells and approved an amendment to IEUA/CBWM reimbursement agreement in the amount of not-to-exceed \$600,000.

On October 17, 2012, the IEUA Board of Directors approved an MOU with the United States Bureau of Reclamation and the CBWM for the Prado Basin Habitat Sustainability Program to perform the vegetation surveys.

On October 3, 2012, the IEUA Board of Directors approved the reimbursement agreement in the amount of \$440,000 with CBWM for the Prado Basin Habitat Sustainability Program.

On July 18, 2012, the IEUA Board of Directors approved the application for a \$250,000 DWR grant.

On October 6, 2010, the IEUA Board of Directors approved the Peace II SEIR.

IMPACT ON BUDGET

If approved, the total project cost will be amended from \$600,000 to \$934,500. CBWM cost share will increase from \$300,000 to \$517,250 and the corresponding Agency's cost share will increase from \$300,000 to \$417,250. The budget of Project No. WR13022 under the Recharge Water (RW) fund will be amended to reflect the new program cost.

Attachments: Amended Reimbursement Agreement (4600001511-002).

Sale of One Brine Line Capacity Unit to Eastside Water Treatment Plant
April 20, 2016
Page 2 of 2

The Agency has available capacity units in the Brine Line to provide to EWTP. The Agency has received the signed EWTP capacity right agreement for the capacity unit consistent with the Board adopted ordinance.

The sale of one capacity unit to EWTP is consistent with the Agency's business goal of *Environmental Stewardship* by meeting federal, state and local pretreatment regulations within the Agency's service area, helping ensure protection of the water recycling plants, and safeguarding public health and the environment.

PRIOR BOARD ACTION

None.

IMPACT ON BUDGET

If approved, the Agency's Non-Reclaimable Wastewater (NC) Fund will be increased by \$215,000 from the sale of one capacity unit in FY 2015/16.

Attachments: 1. Capacity Right Agreement
2. EWTP County Parcel Description



AMENDMENT NUMBER: 4600001511-002

AGREEMENT BETWEEN CHINO BASIN WATERMASTER AND INLAND EMPIRE UTILITIES AGENCY REGARDING REIMBURSEMENT OF THE PEACE II SUBSEQUENT ENVIRONMENTAL IMPACT REPORT MITIGATION MEASURE 4.4.3 (PRADO BASIN HABITAT SUSTAINABILITY PROGRAM)

THIS AMENDMENT NUMBER 2, to Contract Number 4600001511, between the Chino Basin Watermaster and the Inland Empire Utilities Agency shall revise the Agreement as follows:

REVISE SECTION 3, TO READ AS FOLLOWS:

Project costs related to the Program will be cost shared between the Watermaster and IEUA as indicated below and included in Attachments A and B. Watermaster and IEUA will contribute up to a total project cost amount of a **not-to-exceed \$934,500** through the end of FY 2029/30. Refer to Attachment A for additional details on project cost. Total contributions by Watermaster will be \$517,250 and IEUA will be \$417,250 as indicated in Attachment B. Program cost includes, but is not limited to the following tasks as required by the Peace II Subsequent EIR mitigation measure 4.4-3.

- a) IEUA shall retain a qualified consultant to develop the Prado Basin Habitat Sustainability Adaptive Management Plan (ID 1-A). This activity shall be cost shared 50/50 between Watermaster and IEUA.
- b) Watermaster shall retain Wildermuth Environmental, Inc. (WEI) to complete and finalize the Prado Habitat Sustainability Adaptive Management Plan (ID 1-B). This activity shall be cost shared 50/50 between Watermaster and IEUA.
- c) Watermaster shall retain WEI to perform project management and construction tasks related to the monitoring well installations under this program (ID 2). This activity shall be cost shared 50/50 between Watermaster and IEUA.
- d) IEUA shall retain a qualified contractor to construct and install monitoring wells (ID 3). This activity shall be cost shared 50/50 between Watermaster and IEUA.
- e) IEUA shall retain the United States Bureau of Reclamation (USBR) to perform four separate vegetative monitoring trip reports by 2025 (ID 4). This activity and corresponding materials will be made part of the Prado Basin Habitat Sustainability Adaptive Management Plan. This activity will be administered by IEUA and all task related costs will be the responsibility of the Watermaster.
- f) Watermaster shall retain a qualified contractor to perform monthly or quarterly photo monitoring (ID 5). This activity and corresponding materials will be made part of the Prado Basin Habitat Sustainability Adaptive Management Plan. All task related costs will be the responsibility of the Watermaster. Estimated scope of work and budget will be determined after completion of the Prado Basin Habitat Sustainability Adaptive Management Plan. Budget related to this task will not be included or part of this agreement.

- g) IEUA shall retain qualified contractors to perform environmental and regulatory permitting tasks related to the construction of the monitoring wells under this program (IDs6 and 7). This activity shall be cost shared between the Watermaster and IEUA.
- h) Contract Labor retained by either Watermaster or IEUA to perform project management and administration shall be cost shared 50/50 between Watermaster and IEUA (ID 8).
- i) IEUA shall obtain the required easements and licenses related to the construction and long-term monitoring activities of the monitoring wells under this Program (ID 9). This activity shall be cost shared between Watermaster and IEUA.
- j) Watermaster shall retain a qualified consultant and/or contractor to prepare reports required by the Prado Basin Habitat Sustainability Adaptive Management Plan (ID 10). Costs related to this activity are unknown at this time. All task related costs will be the responsibility of the Watermaster. Estimated scope of work and budget will be determined after completion of the Prado Basin Habitat Sustainability Adaptive Management Plan. Budget related to this task is not included or part of this agreement.

ALL OTHER PROVISIONS OF THIS CONTRACT REMAIN UNCHANGED.

The parties hereto have mutually covenanted and agreed as per the above amendment item(s), and in doing so have caused this document to become incorporated into the Contract documents.

INLAND EMPIRE UTILITIES AGENCY:
*(*A MUNICIPAL WATER DISTRICT)*

CHINO BASIN WATERMASTER:

 P. Joseph Grindstaff
 General Manager

 (Date)

 Peter Kavounas
 General Manager

 (Date)

Project Cost Summary
 WR13022 - Prado Basin Habitat Sustainability Program
 Contract 4600001511 (Effective May 1, 2012)
 Contract 4600001511-001 (Effective August 22, 2013)
 Contract 4600001511-002 (Proposed Budget for April 2016 Board Adoption)

ATTACHMENT B - COST SHARE SUMMARY

Prado Basin Cost Share Agreement									
ID	Description	Lead Agency	Cost to Date (01/25/16)	Total ID Cost	% Expended	% Cost Share IEUA	% Cost Share CBWM	IEUA Commitment	CBWM Commitment
1-A	Adaptive Management Plan (AMP) - RBF	IEUA	\$ 123,030	\$ 123,100	100%	50%	50%	\$ 61,550	\$ 61,550
1-B	Adaptive Management Plan (AMP) - WEI	CBWM	\$ 26,286	\$ 56,300	47%	50%	50%	\$ 28,150	\$ 28,150
2	Monitoring Wells - WEI CM Services	CBWM	\$ 325,664	\$ 325,700	100%	50%	50%	\$ 162,850	\$ 162,850
3	Monitor Wells - Construction	IEUA	\$ 168,235	\$ 168,300	100%	50%	50%	\$ 84,150	\$ 84,150
4	USBR Vegetation Survey	IEUA	\$ 20,000	\$ 100,000	20%	0%	100%	\$ -	\$ 100,000
5	Photo Monitoring	CBWM	\$ -	TBD	0%	0%	100%	\$ -	\$ -
6	Monitor Wells-Environmental/Monitoring	IEUA	\$ 51,594	\$ 51,600	100%	50%	50%	\$ 25,800	\$ 25,800
7	Monitor Wells - Permits and Easements	IEUA	\$ 67,935	\$ 68,000	100%	50%	50%	\$ 34,000	\$ 34,000
8	Monitor Wells - IEUA contract labor for CM	IEUA	\$ 11,409	\$ 11,500	99%	50%	50%	\$ 5,750	\$ 5,750
9	Annual Permit Fees	IEUA	\$ 1,235	\$ 30,000	4%	50%	50%	\$ 15,000	\$ 15,000
10	AMP Monitoring and Reporting	CBWM	\$ -	TBD	0%	0%	100%	\$ -	\$ -
Total			\$ 795,387	\$ 934,500				\$ 417,250	\$ 517,250

Project Cost Summary
 WR13022 - Prado Basin Habitat Sustainability Program
 Contract 4600001511 (Effective May 1, 2012)
 Contract 4600001511-001 (Effective August 22, 2013)
 Contract 4600001511-002 (Proposed Budget for April 2016 Board Adoption)

ATTACHMENT A - TOTAL PROJECT COST

Project Cost Summary Table											
ID	Description	Lead Agency	Est. % Complete	Initial Budget	2013		2016		Cost to Date (01/25/16)	Outstanding Cost	Total ID Cost
					Amended Budget	Amended Budget	Amended Budget	Amended Budget			
1-A	Adaptive Management Plan (AMP) - RBF	IEUA	100%	\$ 25,000	\$ 98,000	\$ 123,100	\$ 123,030	\$ -	\$ 123,100	\$ -	\$ 123,100
1-B	Adaptive Management Plan (AMP) - WEI	CBWM	50%	\$ -	\$ -	\$ 56,300	\$ 26,286	\$ 30,000	\$ 56,300	\$ 30,000	\$ 56,300
2	Monitoring Wells - WEI CM Services	CBWM	100%	\$ 170,000	\$ 215,000	\$ 325,700	\$ 325,664	\$ -	\$ 325,700	\$ -	\$ 325,700
3	Monitor Wells - Construction	IEUA	100%	\$ 210,000	\$ 162,000	\$ 168,300	\$ 168,235	\$ -	\$ 168,300	\$ -	\$ 168,300
4	USBR Vegetation Survey	IEUA	25%	\$ 20,000	\$ 80,000	\$ 100,000	\$ 20,000	\$ 80,000	\$ 100,000	\$ 80,000	\$ 100,000
5	Photo Monitoring	CBWM	0%	\$ -	\$ -	\$ -	\$ -	TBD	\$ -	TBD	TBD
6	Monitor Wells-Environmental/Monitoring	IEUA	100%	\$ 15,000	\$ 15,000	\$ 51,600	\$ 51,594	\$ -	\$ 51,600	\$ -	\$ 51,600
7	Monitor Wells - Permits and Easements	IEUA	100%	\$ -	\$ -	\$ 68,000	\$ 67,935	\$ -	\$ 68,000	\$ -	\$ 68,000
8	Monitor Wells - IEUA contract labor for CM	IEUA	100%	\$ -	\$ -	\$ 11,500	\$ 11,409	\$ -	\$ 11,500	\$ -	\$ 11,500
9	Annual Permit Fees	IEUA	5%	\$ -	\$ -	\$ 30,000	\$ 1,235	\$ 28,700	\$ 30,000	\$ 28,700	\$ 30,000
10	AMP Monitoring and Reporting	CBWM	0%	\$ -	\$ -	\$ -	\$ -	TBD	\$ -	TBD	TBD
	Contingency			\$ -	\$ 30,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Project Cost				\$ 440,000	\$ 600,000	\$ 934,500	\$ 795,387	\$ 138,700	\$ 934,500	\$ 138,700	\$ 934,500

Prado Basin Habitat Sustainability Program Reimbursement Agreement Amendment



Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

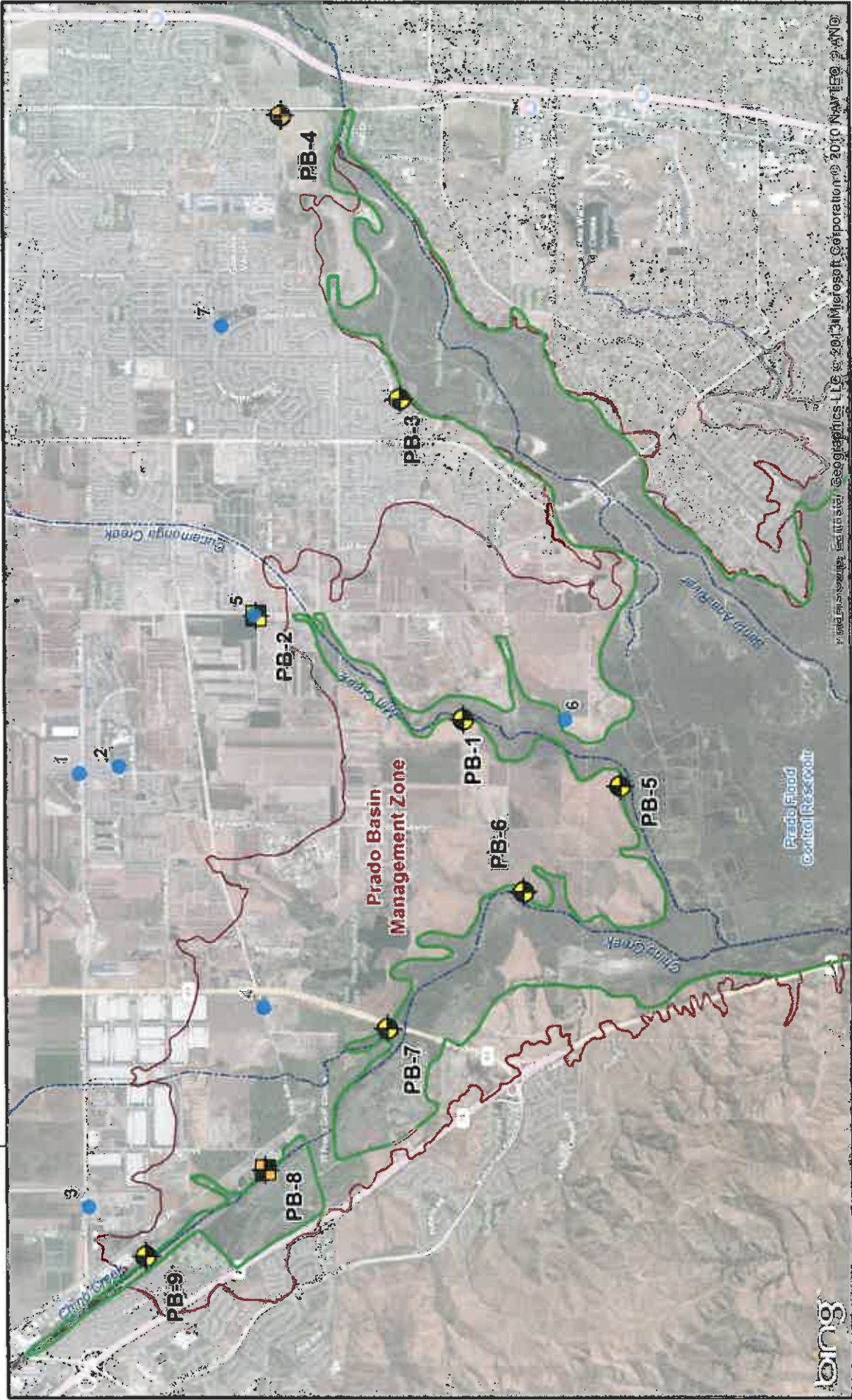
Jason Pivovarovff

IEUA Board of Directors Meeting
April 2016

Prado Basin Habitat Sustainability Program

- **CEQA Mitigation Measure for Peace II**
 - Develop an Adaptive Management Plan, including:
 - **Biological Monitoring:**
 - Riparian habitat quality and extent
 - Hydrological factors essential to the long-term ecological sustainability
 - Identify key indicators/stressors that would trigger change in water management
 - **Corrective Actions:**
 - Identification of water management options that would minimize impact
- **Integral Part of approving Hydraulic Control**

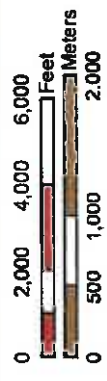
117°40'0"W



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Prepared by:
 Author: MAB
 Date: 4/1/2013
 Name: Fig_1_PB Well Locations
 WILDERMUTH
 ENVIRONMENTAL, INC.
 23602 Batcher Drive
 Lake Forest, CA 92650
 949.420.3030
 www.wildermuthenvironmental.com

- Main Features**
- Dual-Clustered Monitoring Well (Yellow = Habitat only, Orange = HCMP/Habitat)
 - Single Monitoring Well (Yellow = Habitat only, Orange = HCMP/Habitat)
 - Prado Basin Habitat Sustainability Program Study Area
 - HCMP Monitoring Well



PBHSP Monitoring Well Locations

Figure 1

Prado Basin Habitat Sustainability Agreement

- Oct 2012 Board approved initial reimbursement agreement between CBWM and IEUA
 - Current agreement in the amount of NTE \$600,000
 - All Program cost to be split 50/50
- Amendment required to increase Program cost, adjust cost-share allocation and extend term
 - To date, \$795,387 has been spent under this Program

Program Cost Summary

Task	Initial Agreement	2013 Amendment	2016 Amendment
AMP Report	\$25,000	\$97,780	\$179,400
Monitoring Wells	\$390,000	\$377,220	\$625,100
Vegetation Survey	\$20,000	\$80,000	\$100,000
Photo Monitoring	\$0	\$15,000	\$0
Annual Permit Fees	\$0	\$0	\$30,000
Contingency	\$5,000	\$30,000	\$0
Total Program Cost	\$440,000	\$600,000	\$934,500
IEUA Cost		\$417,250	
CBWM Cost		\$517,250	



Recommendation

Amend the reimbursement agreement with the Chino Basin Watermaster for the Prado Basin Habitat Sustainability Program to increase the total program cost from \$600,000 to \$934,500 and authorize the General Manager to execute the reimbursement agreement amendment.

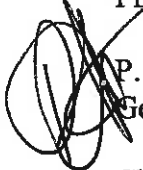
The PBHS Program is consistent with the **Agency's Business Goal of Water Reliability** by maximizing the beneficial reuse of recycled water and sources of groundwater within the Chino Basin.


**ACTION
ITEM
1C**


Date: April 20, 2016

To: The Honorable Board of Directors

Through: Public, Legislative Affairs, and Water Resources Committee (04/13/16)
Finance, Legal & Administration Committee (04/13/16)

From:  P. Joseph Grindstaff
General Manager

Submitted by: Chris Berch 
Executive Manager of Engineering/Assistant General Manager

Sylvie Lee 
Manager of Planning and Environmental Resources

Subject: Professional Services Contract Award for Septic User Feasibility Study

RECOMMENDATION

It is recommended that the Board of Directors:

1. Approve the professional services contract award for the Feasibility Study for Sewer Service to Septic Users in the IEUA Service Area, Project No. PL16015 to RMC Water and Environment for the not-to-exceed amount of \$286,813; and
2. Authorize the General Manger to execute the contract.

BACKGROUND

The groundwater resources for the Agency's service area represent a significant source of the region's drinking water supply. In 1989, the California Regional Water Quality Control Board (Regional Board) performed a review of the nitrate problem in the groundwater of the Santa Ana Region and the relationship to septic tanks. The review, which included specific areas of the Agency's service area, found that there was a link between the nitrate contamination in the groundwater and septic tanks installed in local high density developments.

As a result of the review, the Regional Board adopted a Basin Plan amendment on October 13, 1989 to include minimum lot size requirements to limit the density of new septic tank installations in order to control the nitrate quality issues within the Santa Ana Region. Since then, the Regional Board has adopted an updated policy approved by the State Water Resources Control Board for the installation of new and replacement septic tank systems.

The Agency, with the assistance of the regional contracting agencies (RCA), performed an initial review of the service area septic parcels in June 2015. The review estimated approximately 3.0 to 6.0 million gallons per day is managed through use of septic tanks within the service area.

A request for proposal (RFP) was issued on January 7, 2016, seeking the professional services of a consultant to complete a feasibility study to evaluate providing sewer service to septic users in the IEUA service area. The feasibility study will define sewer service regions and prioritize the regions on a ranking methodology based on grant funding opportunities and other benefits to the service area such as groundwater quality, recycled water, and low impact development considerations. The assessment of the existing sewer system capacity for the RCAs and IEUA along with associated costs to convert the communities to sewer will also be addressed in the feasibility study.

On January 28, 2016, Staff presented the project as an informational item to the Technical Committee. On February 23, 2016, two responses to the RFP were received by the Agency from RMC Water & Environment (RMC) and TKE Engineering, Inc. (TKE). A selection panel consisting of representatives from the cities of Fontana, Montclair, Ontario, and IEUA reviewed the two proposals. Based on the proposals, RMC was selected based on their understanding of the scope of work, the project team qualifications, previous similar project experience, and their ability to meet the project schedule. The projected costs of the feasibility study is \$251,544 with two optional tasks of outreach and geotechnical condition evaluations for \$35,269. The feasibility study is scheduled to be completed by September 2016.

This feasibility study aligns with the Agency's business goal of *Water Reliability* by protecting groundwater quality and supporting new water supplies, the recycled water program, and the groundwater recharge program.

PRIOR BOARD ACTION

None.

IMPACT ON BUDGET

The award of the professional services contract for the Feasibility Study for Providing Sewer Service to Septic Users in the IEUA Service Area, for the not-to-exceed amount of \$286,813 is within the total project budget of Project No. PL16015 in the Regional Wastewater Capital Improvement (RC) Fund. The current total project budget for FY 2015/16 is \$50,000 with the remaining \$350,000 to be budgeted through the FY 2016/17 budget process. In February 2016, IEUA applied for a Small Community Wastewater Planning Grant seeking \$500,000 to support the feasibility study in areas that will qualify as small disadvantaged communities. Upon approval from the SWRCB, the project budget will be revised to align with the grant funding.

Attachments: Contract with RMC

Sewer Service to Septic Users Feasibility Study Award



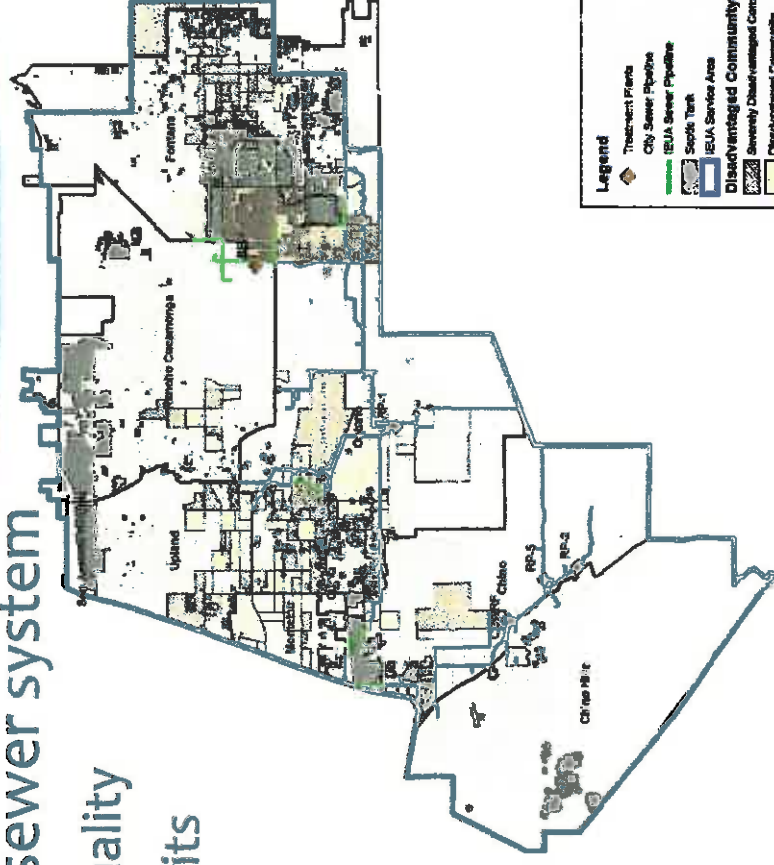
Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Ken Tam

IEUA Board of Directors Meeting
April 2016

Project Background

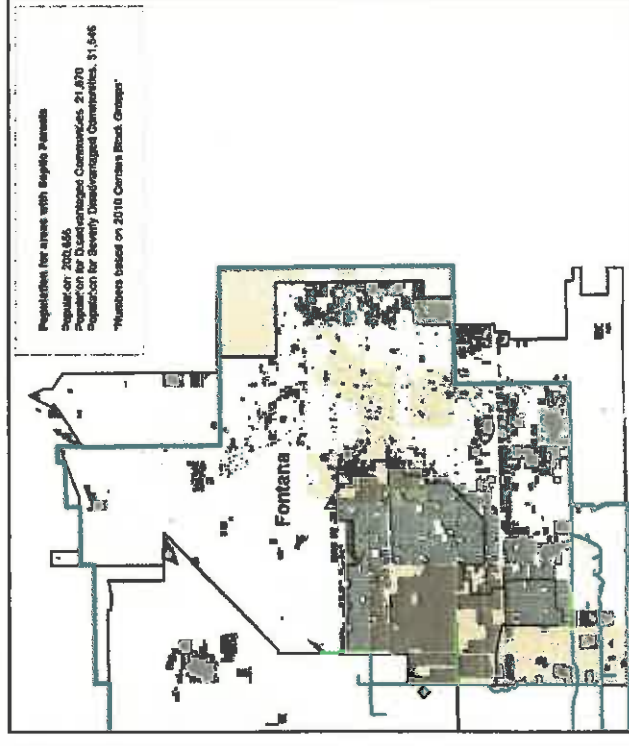
- Conversion of septic users to sewer system
- Enhancement of groundwater quality
- Provide local development benefits
- Provide sewer service reliability
- Provide water supply benefits



Project Goals

■ Feasibility Study Goals & plan of implementation:

- Cost effectiveness – ranked based on grant funding
- Groundwater quality benefits
- Sewer Capacity Analysis
- Analysis of Associated Costs
- Low Impact Development Considerations
- Overall Economic Benefits to Region
- IEUA Recycled Water Program impacts



Consultant Proposals/Selection

- Request for Proposal (RFP) posted on January 7, 2016
- Two proposals were received on February 23, 2016
 - RMC Water & Environment (RMC)
 - TKE Engineering, Inc.
- Selection Panel: Cities of Fontana, Ontario, Montclair & IEUA
- RMC was selected
- Potential planning grant of \$500,000

Project Cost and Schedule

- Projected costs of feasibility study is \$286,813.

Project Milestone	Date
Receipt of Professional Services Proposals	February 2016
Proposal Selection	March 2016
Feasibility Contract Award	April 2016
Feasibility Study Completion	September 2016



Recommendation

Staff recommends the Board of Directors approve the professional services contract award for Feasibility Study for Providing Sewer Service to Septic Users in the IEUA Service Area (Project No. PL16015) to RMC Water and Environment for the not-to-exceed amount of \$286,813 and authorize the General Manager to execute the contract.

The feasibility study aligns with the *Agency's Business Goal of Water Reliability* by protecting groundwater quality and supporting new water supplies, the recycled water program, and the groundwater recharge program



CONTRACT NUMBER: 4600002090

FOR

PROFESSIONAL CONSULTING SERVICES FOR THE FEASIBILITY STUDY FOR PROVIDING SEWER SERVICE TO SEPTIC USERS IN THE IEUA AREA

THIS CONTRACT (the "Contract"), is made and entered into this 20 day of April, 2016, by and between the Inland Empire Utilities Agency, a Municipal Water District, organized and existing in the County of San Bernardino under and by virtue of the laws of the State of California (hereinafter referred to as "Agency"), and RMC Water and Environment, Inc. with offices located in Irvine, California (hereinafter referred to as "Consultant") to provide professional engineering consulting services for the feasibility study for providing sewer service to septic users.

NOW, THEREFORE, in consideration of the mutual promises and obligations set forth herein, the parties agree as follows:

1. **PROJECT MANAGER ASSIGNMENT:** All technical direction related to this Contract shall come from the designated Project Manager. Details of the Agency's assignment are listed below.

Project Manager: Kenneth Tam
Address: 6075 Kimball Avenue
Chino, California 91708
Telephone: (909) 993-1917
Facsimile: (909) 993-1987
Email: ktam@ieua.org

2. **CONSULTANT ASSIGNMENT:** Special inquiries related to this Contract and the effects of this Contract shall be referred to the following:

Consultant: Rich Bichette
Address: 515 South Flower Street, 36th Floor.
Los Angeles, California 90071
Telephone: (213) 236-3665
Facsimile: (949) 420-5301
Email: rbichette@mcwater.com

3. **ORDER OF PRECEDENCE:** The documents referenced below represent the Contract Documents. Where any conflicts exist between the General Terms and Conditions, or addenda attached, then the governing order of precedence shall be as follows:

- A. Amendments to Contract Number 4600002090.
- B. Contract Number 4600002090 General Terms and Conditions.
- C. Consultant's Scope of Work dated February 23, 2016, **Attachment A**.
- D. Agency's Request for Proposal RFP-KB-16-002

4. **SCOPE OF WORK AND SERVICES:**

- A. Consultant services and responsibilities shall include and be in accordance with tasks identified in Consultant's Scope of Work, dated February 23, 2016, which is attached hereto, incorporated herein and made a part hereof as **Attachment A**.
- B. Optional Scope of Work identified as Task 8 to develop outreach strategies to the public, shall be authorized in writing by an Amendment to this Contract.
- C. An additional optional Task 9 for a geotechnical feasibility evaluation shall also be authorized in writing by an Amendment to this Contract.

Consultant shall not proceed to work on the optional tasks without a fully-executed contract amendment and a notice to proceed from the Project Manager.

TERM: The term of this Contract shall extend from the date of the Notice to Proceed, and terminate on December 31, 2016, unless agreed to by both parties and amended to this contract.

6. **COMPENSATION:** Consultant's Invoice must be submitted according to milestones achieved by Consultant and accepted by the Agency's Project Manager, and shall include a breakdown by tasks completed, the current monthly amount due, and the cumulative amount invoiced to date against this contract. Consultant shall not be paid more than eighty (80) percent of the contract price for less than 80 percent of the milestones achieved during the course of this contract. Invoicing shall be submitted electronically to apgroup@ieua.org, using the Agency's standard Excel-based invoicing template (**Attachment B**). Invoicing shall not be submitted in advance of, or shall not be dated earlier than, the actual date of submittal.

Agency may at any time make changes to the work including additions, reductions, and changes to any or all of the work, as directed in writing by the Agency. Such changes shall be made by a written Amendment to the Contract. The NOT-TO-EXCEED Amount and Work Schedule of the RFP shall be equitably adjusted, if required, to account for such changes and shall be set forth in the Amendment.

In compensation for the work represented by this Contract, Agency shall pay Consultant a **NOT-TO-EXCEED maximum total of \$286,813.00**, inclusive of the optional tasks identified above, for all services provided in accordance with Consultant's Fee proposal, attached hereto, made a part hereof, and referenced herein as **Attachment C**. Payment shall be made according to milestones achieved by Consultant and accepted by the Agency's Project Manager.

7. **CONTROL OF THE WORK:** Consultant shall perform the Work in compliance with the work schedule. If performance of the Work falls behind schedule, the Consultant shall accelerate the performance of the Work to comply with the work schedule as directed by the Project Manager. If the nature of the Work is such that Consultant is unable to accelerate the Work, Consultant shall promptly notify the Project Manager of the delay, the causes of the delay, and submit a proposed revised work schedule.
8. **FITNESS FOR DUTY:**
 - A. **Fitness:** Consultant and its SubConsultant personnel on the Jobsite:
 1. Shall report for work in a manner fit to do their job;
 2. Shall not be under the influence of or in possession of any alcoholic beverages or of any controlled substance (except a controlled substance as prescribed by a physician so long as the performance or safety of the Work is not affected thereby); and
 3. Shall not have been convicted of any serious criminal offense which, by its nature, may have a discernible adverse impact on the business or reputation of Agency.
 - B. **Compliance:** Consultant shall advise all personnel and associated third parties of the requirements of this Contract ("Fitness for Duty Requirements") before they enter on the Jobsite and shall immediately remove from the Jobsite any employee determined to be in violation of these requirements. Consultant shall impose these requirements on its sub-consultants. Agency may cancel the Contract if Consultant violates these Fitness for Duty Requirements.
9. **INSURANCE:** During the term of this Contract, the Consultant shall maintain at Consultant's sole expense, the following insurance.
 - A. **Minimum Scope of Insurance:**
 1. **General Liability:** \$1,000,000 combined single limit per occurrence for bodily injury, personal injury and property damage. Coverage shall be at least as broad as Insurance Services Office form number CG 00 01 10 01 covering Comprehensive General Liability. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this

Project/location, or the general aggregate limit shall be twice the required occurrence limit.

2. **Automobile Liability:** \$1,000,000 combined single limit per accident for bodily injury and property damage. Coverage shall be at least as broad as Insurance Services Office form number CA 00 01 10 01, covering Automobile Liability, including "any auto."
 3. **Workers' Compensation and Employers Liability:** Workers' compensation limits as required by the Labor Code of the State of California and employers Liability limits of \$1,000,000 per accident.
 4. **Professional Liability insurance** in the amount of \$1,000,000 per claim.
- B. **Deductibles and Self-Insured Retention:** Any deductibles or self-insured retention must be declared to and approved by the Agency. At the option of the Agency, either: the insurer shall reduce or eliminate such deductibles or self-insured retention as respects the Agency, its officers, officials, employees and volunteers; or the Consultant shall procure a bond guaranteeing payment of losses and related investigations, claims administration and defense expenses.
- C. **Other Insurance Provisions:** The policies are to contain, or be endorsed to contain, the following provisions:
1. **General Liability and Automobile Liability Coverage**
 - a. The Agency, its officers, officials, employees, volunteers, property owners and any engineers under contract to the Agency are to be covered as additional insureds, endorsements CG 20 10 11 85, as respects: liability arising out of negligent activities performed by or on behalf of the Consultant, products and completed operations of the Consultant, premises owned, occupied or used by the Consultant, or automobiles owned, leased, hired or borrowed by the Consultant. The coverage shall contain no special limitations on the scope of protection afforded to the Agency, its officers, officials, employees or volunteers. If Form CG 20 10 10 93 or CG 20 10 03 97 are issued in place of the CG 20 10 11 85, then it is also necessary to issue a Form CG 20 31 10 01 in addition to Form CG 20 10 10 93 or CG 20 10 03 97.
 - b. The Consultant's insurance coverage shall be primary insurance as respects the Agency, its officer, officials, employees and volunteers. Any insurance or self-insurance maintained by the Agency, its officers, officials, employees, or volunteers shall be excess of the Consultant's insurance and shall not contribute with it.

- c. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the Agency, its officers, officials, employees or volunteers.
- d. The Consultant's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
- e. The Consultant may satisfy the limit requirements in a single policy or multiple policies. Any Such additional policies written as excess insurance shall not provide any less coverage than that provided by the first or primary policy.

2. Workers' Compensation and Employers Liability Coverage

The insurer shall agree to waive all rights of subrogation against the Agency, its officers, officials, employees and volunteers for losses arising from work performed by the Consultant for the Agency.

3. All Coverages

Prior to cancellation of any policy required herein, the policies shall be endorsed to state, 30 days advanced cancellation notice will be mailed to the Agency, except if policies cancelled for non-payment of premium, then 10 days advance notice will be mailed.

- D. Acceptability of Insurers: With the exception of Professional Liability Insurance, all insurance is to be placed with insurers with a Best's rating of no less than A:VII, and who are admitted insurers in the State of California.
- E. Verification of Coverage: Consultant shall furnish the Agency with certificates of insurance and with original endorsements effecting coverage required by the Agency for themselves and all sub-consultants prior to commencing work or allowing any sub-consultant to commence work under any subcontract. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and endorsements are to be approved by the Agency before work commences. The Agency reserves the right to require complete, certified copies of all required insurance policies, at any time.
- F. Submittal of Certificates: Consultant shall submit all required certificates and endorsements to the following:
 - Inland Empire Utilities Agency
 - Attn: Angela Witte
 - P.O. Box 9020
 - Chino Hills, California 91709-0902

10. LEGAL RELATIONS AND RESPONSIBILITIES

- A. Professional Responsibility: The Consultant shall be responsible, to the level of competency presently maintained by other practicing professionals performing the same or similar type of work.
- B. Status of Consultant: The Consultant is retained as an independent Consultant only, for the sole purpose of rendering the services described herein, and is not an employee of the Agency.
- C. Observing Laws and Ordinances: Consistent with the standard of skill and care set forth in 10.A, Professional Responsibility, the Consultant shall keep itself fully informed of all relevant existing state and federal laws and all relevant county and city ordinances and regulations which pertain to structural engineering services or tasks performed under this Contract, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. The Consultant shall at all times observe and comply with all such existing laws, ordinances, regulations, orders and decrees, and shall to the extent of Consultant's negligence, protect and indemnify, as required herein, the Agency, its officers, employees and agents against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by the Consultant or its employees.
- D. Grant Funded Project: This is a grant funded project. Consultant shall comply with all requirements related to the grant. Requirements are attached hereto and made a part hereof as **Attachment D**.
- E. Subcontract Services: Any subcontracts for the performance of any services under this Contract shall be subject to the written approval of the Project Manager.
- F. Travel and Subsistence Pay: The Consultant shall make payment to each worker for travel and subsistence payments which are needed to execute the work and/or service, as such travel and subsistence payments are defined in the applicable collective bargaining agreements with the worker.
- G. Conflict of Interest: No official of the Agency who is authorized in such capacity and on behalf of the Agency to negotiate, make, accept or approve, or to take part in negotiating, making, accepting or approving this Contract, or any subcontract relating to services or tasks to be performed pursuant to this Contract, shall become directly or indirectly personally interested in this Contract.
- H. Equal Opportunity and Unlawful Discrimination: During the performance of this Contract, the Consultant shall not unlawfully discriminate against any employee or employment applicant because of race, color, religion, sex, age, marital

status, ancestry, physical or mental disability, sexual orientation, veteran status or national origin. The Agency is committed to creating and maintaining an environment free from harassment and discrimination.

- I. Non-Conforming Work and Warranty: Consistent with the standard of skill and care set forth in Section 10.A, Professional Responsibility, Consultant represents and warrants that the Work and Documentation shall be adequate to serve the purposes described in the Contract. If the Project Manager rejects all or any part of the Work or Documentation as unacceptable, and agreement to correct such Work or Documentation cannot be reached without modification to the Contract, Consultant shall notify the Project Manager, in writing, detailing the dispute and reason for Consultant's position. Any dispute that cannot be resolved between the Project Manager and the Consultant, shall be resolved in accordance with the Dispute Section of this Contract.

- J. Disputes:
 1. All disputes arising out of or in relation to this Contract shall be determined in accordance with this section. The Consultant shall pursue the work to completion in accordance with the instruction of the Agency's Project Manager notwithstanding the existence of dispute. By entering into this Contract, both parties are obligated, and hereby agree, to submit all disputes arising under or relating to the Contract, which remain unresolved after the exhaustion of the procedures provided herein, to independent arbitration. Except as otherwise provided herein, arbitration shall be conducted under California Code of Civil Procedure Sections 1280, et. seq, or their successor.

 2. Any and all disputes during the pendency of the work shall be subject to resolution by the Agency Project Manager and the Consultant shall comply, pursuant to the Agency Project Manager instructions. If the Consultant is not satisfied with any such resolution by the Agency Project Manager, they may file a written protest with the Agency Project Manager within seven (7) calendar days after receiving written notice of the Agency's decision. Failure by Consultant to file a written protest within seven (7) calendar days shall constitute waiver of protest, and acceptance of the Agency Project Manager's resolution. The Agency's Project Manager shall submit the Consultant's written protests to the General Manager, together with a copy of the Agency Project Manager's written decision, for his or her consideration within seven (7) calendar days after receipt of said protest(s). The General Manager shall make his or her determination with respect to each protest filed with the Agency Project Manager within ten (10) calendar days after receipt of said protest(s). If Consultant is not satisfied with any such resolution by the General Manager, they may file a written request for arbitration with

the Project Manager within seven (7) calendar days after receiving written notice of the General Manager's decision.

3. In the event of arbitration, the parties hereto agree that there shall be a single neutral Arbitrator who shall be selected in the following manner:
 - a. The Demand for Arbitration shall include a list of five names of persons acceptable to the Consultant to be appointed as Arbitrator. The Agency shall determine if any of the names submitted by Consultant are acceptable and, if so, such person will be designated as Arbitrator.
 - b. In the event that none of the names submitted by Consultant are acceptable to Agency, or if for any reason the Arbitrator selected in Step (a) is unable to serve, the Agency shall submit to Consultant a list of five names of persons acceptable to Agency for appointment as Arbitrator. The Consultant shall, in turn, have seven (7) calendar days in which to determine if one such person is acceptable.
 - c. If after Steps (a) and (b), the parties are unable to mutually agree upon a neutral Arbitrator, the matter of selection of an Arbitrator shall be submitted to the San Bernardino County Superior Court pursuant to Code of Civil Procedure Section 1281.6, or its successor. The costs of arbitration, including but not limited to reasonable attorneys' fees, shall be recoverable by the party prevailing in the arbitration. If this arbitration is appealed to a court pursuant to the procedure under California Code of Civil Procedure Section 1294, et. seq., or their successor, the costs of arbitration shall also include court costs associated with such appeals, including but not limited to reasonable attorneys' fees which shall be recoverable by the prevailing party.
4. Joinder in Mediation/Arbitration: The Agency may join the Consultant in mediation or arbitration commenced by a Consultant on the Project pursuant to Public Contracts Code Sections 20104 et seq. Such joinder shall be initiated by written notice from the Agency's representative to the Consultant.
11. **INDEMNIFICATION:** Consultant shall indemnify the Agency, its directors, employees and assigns, and shall defend and hold them harmless from all liabilities, demands, actions, claims, losses and expenses, including reasonable attorneys' fees, which arise out of or are related to the negligence, recklessness or willful misconduct of the Consultant, its directors, employees, agents and assigns, in the performance of work under this contract.

12. **OWNERSHIP OF MATERIALS AND DOCUMENTS/CONFIDENTIALITY:** The Agency retains ownership of any and all partial or complete reports, drawings, plans, notes, computations, lists, and/or other materials, documents, information, or data prepared by the Consultant and/or the Consultant's SubConsultant(s) pertaining to this Contract. Said materials and documents are confidential and shall be available to the Agency from the moment of their preparation, and the Consultant shall deliver same to the Agency whenever requested to do so by the Project Manager and/or Agency. The Consultant agrees that same shall not be made available to any individual or organization, private or public, without the prior written consent of the Agency.
13. **TITLE AND RISK OF LOSS:**
- A. **Documentation:** Title to the Documentation shall pass, subject to payment therefore, to Agency when prepared; however, a copy may be retained by Consultant for its records and internal use. Consultant shall retain such Documentation in a controlled access file, and shall not reveal, display or disclose the contents of the Documentation to others without the prior written authorization of Agency or for the performance of Work related to the project.
 - B. **Material:** Title to all Material, field or research equipment, subject to payment therefore, and laboratory models, procured or fabricated under the Contract shall pass to Agency when procured or fabricated, and such title shall be free and clear of any and all encumbrances. Consultant shall have risk of loss of any Material or Agency-owned equipment of which it has custody.
 - C. **Disposition:** Consultant shall dispose of items to which Agency has title as directed in writing by the Agreement Administrator and/or Agency.
14. **PROPRIETARY RIGHTS:**
- A. **Rights and Ownership:** Agency's rights to inventions, discoveries, trade secrets, patents, copyrights, and other intellectual property, including the Information and Documentation, and revisions thereto (hereinafter collectively referred to as "Proprietary Rights"), used or developed by Consultant in the performance of the Work, shall be governed by the following provisions:
 - 1. Proprietary Rights conceived, developed, or reduced to practice by Consultant in the performance of the Work shall be the property of Agency, and Consultant shall cooperate with all appropriate requests to assign and transfer same to Agency.
 - 2. If Proprietary Rights conceived, developed, or reduced to practice by Consultant prior to the performance of the Work are used in and become integral with the Work or Documentation, or are necessary for Agency to have complete enjoyment of the Work or Documentation, Consultant shall grant to Agency a non-exclusive, irrevocable, royalty-free license, as may be required by Agency for the complete enjoyment of the Work

and Documentation, including the right to reproduce, correct, repair, replace, maintain, translate, publish, use, modify, copy or dispose of any or all of the Work and Documentation and grant sublicenses to others with respect to the Work and Documentation.

3. If the Work or Documentation includes the Proprietary Rights of others, Consultant shall procure, at no additional cost to Agency, all necessary licenses regarding such Proprietary Rights so as to allow Agency the complete enjoyment of the Work and Documentation, including the right to reproduce, correct, repair, replace, maintain, translate, publish, use, modify, copy or dispose of any or all of the Work and Documentation and grant sublicenses to others with respect to the Work and Documentation. All such licenses shall be in writing and shall be irrevocable and royalty-free to Agency.

B. No Additional Compensation: Nothing Set forth in this Contract shall be deemed to require payment by Agency to Consultant of any compensation specifically for the assignments and assurances required hereby, other than the payment of expenses as may be actually incurred by Consultant in complying with this Contract.

15. INFRINGEMENT: Consultant represents and warrants that the Work and Documentation shall be free of any claim of trade secret, trade mark, trade name, copyright, or patent infringement or other violations of any Proprietary Rights of any person.

Consultant shall defend, indemnify and hold harmless, Agency, its officers, directors, agents, employees, successors, assigns, servants, and volunteers free and harmless from any and all liability, damages, losses, claims, demands, actions, causes of action, and costs including reasonable attorney's fees and expenses to the extent of Consultant's negligence for any claim that use of the Work or Documentation infringes upon any trade secret, trade mark, trade name, copyright, patent, or other Proprietary Rights.

Consultant shall, at its expense and at Agency's option, refund any amount paid by Agency under the Contract, or exert its best efforts to procure for Agency the right to use the Work and Documentation, to replace or modify the Work and Documentation as approved by Agency so as to obviate any such claim of infringement, or to put up a satisfactory bond to permit Agency's continued use of the Work and Documentation.

16. LIENS: Consultant represents that the Work and Documentation shall be free of any claim of trade secret, trade mark, trade name, copyright, or patent infringement or other violations of any Proprietary Rights of any person.

Consultant shall pay all sums of money that become due for any labor, services, materials, or equipment furnished to Consultant on account of said services to be

rendered or said materials to be furnished under this contract and that may be secured by any lien against the Agency. Consultant shall fully discharge each such lien at the time performance of the obligation secured matures and becomes due.

17. **NOTICES:** Any notice may be served upon either party by delivering it in person, or by depositing it in a United States Mail deposit box with the postage thereon fully prepaid, and addressed to the party at the address set forth below:

Agency: Warren T. Green
Manager of Contracts and Facilities Services
Inland Empire Utilities Agency
6075 Kimball Avenue, Building A
Chino, California 91708

Consultant: Scott Goldman, P.E., BCEE
Principal, Senior Environmental Engineer
RMC Water and Environment, Inc.
15510-C Rockfield Blvd., Suite 200.
Irvine, CA 92618

Any notice given hereunder shall be deemed effective in the case of personal delivery, upon receipt thereof, or, in the case of mailing, at the moment of deposit in the course of transmission with the United States Postal Service.

18. **SUCCESSORS AND ASSIGNS:** All of the terms, conditions and provisions of this Contract shall inure to the benefit of and be binding upon the Agency, the Consultant, and their respective successors and assigns. Notwithstanding the foregoing, no assignment of the duties or benefits of the Consultant under this Contract may be assigned, transferred or otherwise disposed of without the prior written consent of the Agency; and any such purported or attempted assignment, transfer or disposal without the prior written consent of the Agency shall be null, void and of no legal effect whatsoever.
19. **PUBLIC RECORDS POLICY:** Information made available to the Agency may be subject to the California Public Records Act (Government Code Section 6250 et seq.) The Agency's use and disclosure of its records are governed by this Act. The Agency shall use its best efforts to notify Consultant of any requests for disclosure of any documents pertaining to Consultant.

In the event of litigation concerning disclosure of information Consultant considers exempt from disclosure; (e.g., Trade Secret, Confidential, or Proprietary) Agency shall act as a stakeholder only, holding the information until otherwise ordered by a court or other legal process. If Agency is required to defend an action arising out of a Public Records Act request for any of the information Consultant has marked "Confidential," "Proprietary," or "Trade Secret," Consultant shall defend and indemnify Agency from

all liability, damages, costs, and expenses, including attorneys' fees, in any action or proceeding arising under the Public Records Act.

20. **RIGHT TO AUDIT:** The Agency reserves the right to review and/or audit all Consultants' records related to the Work. The option to review and/or audit may be exercised during the term of the Contract, upon termination, upon completion of the Contract, or at any time thereafter up to twelve (12) months after final payment has been made to Consultant. The Consultant shall make all records and related documentation available within three (3) working days after said records are requested by the Agency.
21. **INTEGRATION:** The Contract Documents represent the entire Contract of the Agency and the Consultant as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered by the Contract Documents. This Contract may not be modified, altered or amended except by written mutual agreement by the Agency and the Consultant.
22. **GOVERNING LAW:** This Contract is to be governed by and constructed in accordance with the laws of the State of California.
23. **TERMINATION FOR CONVENIENCE:** The Agency reserves and has the right to immediately suspend, cancel or terminate this Contract at any time upon written notice to the Consultant. In the event of such termination, the Agency shall pay Consultant for all authorized and Consultant-invoiced services up to the date of such termination.
24. **CHANGES:** The Agency may, at any time, make changes to this Contract's Scope of Work; including additions, reductions and other alterations to any or all of the work. However, such changes shall only be made via written amendment to this Contract. The Contract Price and Work Schedule shall be equitably adjusted, if required, to account for such changes and shall be set forth within the Contract Amendment.
25. **FORCE MAJEURE:** Neither party shall hold the other responsible for the effects of acts occurring beyond their control; e.g., war, riots, strikes, natural disasters, etcetera.
26. **NOTICE TO PROCEED:** No services shall be performed or furnished under this Contract unless and until this document has been properly signed by all responsible parties and a Notice to Proceed order has been issued to the Consultant.

IN WITNESS WHEREOF, the parties hereto have caused the Contract to be entered as of the day and year written above.

INLAND EMPIRE UTILITIES AGENCY:
**A MUNICIPAL WATER DISTRICT*

RMC WATER AND ENVIRONMENT, INC:

P. Joseph Grindstaff (Date)
General Manager

 4-7-16

Scott Goldman (Date)
Principal-In-Charge


**ACTION
ITEM
1D**





Date: April 20, 2016

To: The Honorable Board of Directors

Through: Public, Legislative Affairs, and Water Resources Committee (04/13/16)
Engineering, Operations, and Biosolids Mgmt. Committee (04/13/16)
Finance, Legal, and Administration Committee (04/13/16)

From:  P. Joseph Grindstaff
General Manager

Submitted by: Chris Berch 
Executive Manager of Engineering/Assistant General Manager

Shaun J. Stone 
Manager of Engineering

Subject: East Declez Property Acquisition

RECOMMENDATION

It is recommended that the Board of Directors:

1. Authorize the General Manager to purchase the East Declez property for the sum of \$3.0 million on behalf of Chino Basin Watermaster (Watermaster); contingent upon the approval by the Watermaster Board of Directors;
2. Authorize the General Manager to spend up to \$100,000 on behalf of Watermaster for necessary fees related to the purchase of the property; and
3. Approve a \$3.1 million budget amendment for Project No. EN18007 in FY 2015/16 through an inter-fund loan from the Regional Wastewater Capital Improvement (RC) fund to the Recharge Water (RW) fund.

BACKGROUND

In early 2015, the undeveloped 85-acre property, adjacent to the existing Declez Basin in Riverside County, was identified as a potential site for a new recharge basin for Watermaster. Following an initial field investigation from the Jurupa Community Services District and a preliminary level design evaluation from Wildermuth Environmental, Inc. (WEI), Inland Empire Utilities Agency (IEUA) and Watermaster made a determination that although the site appeared promising for recharge purposes, additional due diligence was required prior to site acquisition.

In November 2015, the IEUA Board authorized execution of the Purchase and Sale Agreement with the property owner, SLPR, LLC. The key terms within the agreement provided the following:

- Allow time to complete a 180 day feasibility study to validate the site’s potential recharge benefit; ending on May 17, 2016.
- Open escrow with a \$50,000 deposit which is fully refundable before the end the feasibility period.
- Establish an agreed property purchase price of \$3.0 million.
- IEUA can terminate the agreement any time before May 17, 2016.

In January 2016, Thomas Harder and Co. (THC) completed a feasibility report which evaluated the site groundwater recharge viability consistent with the direction provided by Watermaster parties. THC’s efforts included examining subsurface geology, describing the results of field investigation, and characterizing and analyzing the area’s infiltration and mounding potential for groundwater recharge. THC’s final “Subsurface Investigation-East Declez Basin Site” report was made available for review and presented to Watermaster’s Appropriative Pool Meeting on March 10, 2016. THC, with support from WEL, conducted an analysis for recharge potential on two conceptual recharge basin configurations: 1) a shallow basin and 2) an expanded Declez Basin. Both concepts were developed based on the subsurface findings where the site revealed a shallow impermeable layer which prevented a deeper or wider new basin.

Unfortunately, the shallow basin concept was deemed unfeasible because it required an extensive pumping and conveyance system to receive stormwater. Therefore, only the expanded basin option was considered and evaluated. The evaluation looked into two potential construction alternatives.

Construction Alternatives	Projected Benefits		Estimated Cost	
	Additional Storage acre-feet (AF)	Additional Recharge acre-feet per year (AFY)	Estimated Capital Cost*	Total Annual Unit Cost (per AF)
Expand Declez eastward	130	144	\$11,210,000	\$5,099
Expand Declez eastward with upstream stormwater improvements	130	414	\$15,090,000	\$2,420

*The capital cost shown assumes a 90% reduction on excavation and hauling cost

In parallel with the feasibility report, staff began initial inquiries into the necessary CEQA requirements for the purchase of the property. IEUA’s environmental consultant, Tom Dodson & Associates opined that the acquisition of this property falls under the following exemption:

the “General Rule” Statutory Exemption (State CEQA Guidelines Section 15061(b)(3) which states that “*where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.*”

As such, IEUA will compile a more detailed environmental determination to comply with CEQA when a specific project is defined in the future. Thus, the property purchase will not incur any adverse environmental effects until a subsequent environmental finding is made by the IEUA Board for a site specific project.

Following the review and presentation of the report to the Appropriative Pool, the Committee Members requested having until April 2016 to recommend one of the following actions:

1. Proceed with the purchase of the property through IEUA; or
2. Cancel the property purchase.

The Watermaster Board will take action on the purchase of the East Declez property at the April 28, 2016, meeting. However, in order to meet the execution date of May 17, 2016, one day before IEUA's May Board of Directors meeting, staff is requesting contingent approval of the property purchase. In the event that the Watermaster Board elects not to purchase the property, IEUA will exercise the option to cancel the Purchase and Sale Agreement prior to the May 17, 2016, cancellation date. Staff will inform the IEUA Board of Watermaster's decision immediately following their action.

The East Declez property site is not currently planned to receive recycled water, or any other supplemental waters; therefore all cost associated with the property purchase, design and construction will be fully funded by Watermaster. Project EN18007 originally budgeted the property purchase in FY 2017/18; however, the decision to accelerate the acquisition to this fiscal year is to take advantage of the availability of the property and avoid losing it to potential developers as was the case with the lower San Sevaine property. IEUA will carry the property purchase until the Recharge Master Plan Update (RMPU) financing plan is implemented which is anticipated to be summer of 2017.

Staff has discussed the property purchase and project with several of the Watermaster Parties and has participated in discussions at the Appropriative Pool meetings. Based on these discussions, there is concern among the group about the value of the project itself due to the yield and associated unit costs. However, there seems to be some level of agreement that purchasing the property may be the right course of action based on its location next to an existing recharge basin. The concern, as noted above, is a repeat of losing a potential site to developers.

The efforts towards the potential purchase of the East Declez property for groundwater recharge are consistent with the IEUA business goal of *Water Reliability*, namely development and investigation of groundwater recharge.

PRIOR BOARD ACTION

On April 15, 2015, the Board of Directors approved the first Amendment to the Recharge Master Plan Task Order No. 1 with Watermaster. This authorized IEUA to conduct preliminary investigations on the East Declez Basin Project.

East Declez Property Acquisition
April 20, 2016
Page 4 of 4

On June 17, 2015, the Board of Directors approved the Letter of Intent to Purchase the East Declez property.

On November 18, 2015, the Board of Directors approved the Purchase and Sale Agreement with SLPR, LLC for the East Declez property.

IMPACT ON BUDGET

If approved, IEUA will fund the purchase of the East Declez property with an inter-fund loan from the Regional Wastewater Capital Improvement (RC) fund to the Recharge Water (RW) fund to be repaid by Watermaster at the completion of the RMPU financing plan in the summer of 2017.

The RMPU Construction (hard cost), Project No. EN18007 under the RW fund budgeted for the land purchase in FY 2017/18 through the TYCIP. This will be reduced if the purchase is approved for this fiscal year.

Attachments:

Attachment 1: Feasibility Study

PJG:CB:SS:ji

East Declez - Property Purchase Update

Project No. EN18007
April 2016



Joel Ignacio, P.E.
Senior Engineer



Project Request

- Authorize the General Manager to purchase the property for the sum of \$3.0 million on behalf of Chino Basin Watermaster, contingent upon the approval of the Watermaster Board of Directors;
- Authorize the General Manager to spend up to \$100,000 for necessary fees related to the purchase;
- Approve a \$3.1 million budget amendment for EN18007 through an inter-fund loan from the NR Fund to the RW Fund.



85 acres of new property east of Declaz Basin

Project Background

Jan. 2015

CBWM &
IEUA

Identified 85-acres east of Declez Basin as a potential new recharge basin

Apr. 2015

CBWM &
IEUA

Executed amendment to Task Order 1 to allow further evaluation on East Declez

Jun. 2015

IEUA

Establish a letter of intent with the property owner to begin discussions on purchasing the site

Jul. 2015

IEUA

Contracted consulting services with Thomas Harder & Co. to prepare the feasibility study and report

Nov. 2015

IEUA

Entered into agreement to establish the terms purchasing the property \$50K refundable deposit

Feb. 2016

IEUA

Completed the initial draft to the East Declez Feasibility Study and Report

- Initially presented Feasibility Report to RIPCom in February 2016
- Presented Feasibility Report to Watermaster's AP in March 2016
- 180 day feasibility study ends on May 17, 2016

Property Location



South of Fontana in the Riverside County

Feasibility Study - Findings

- Site revealed a shallow impermeable layer
- Soil layer limited the depth and width for a large new basin
- Analyzed two recharge design concepts: shallow basin & expand existing
- Shallow basin deemed unfeasible due to extensive SW pumping/pipes
- Evaluated the following potential basin construction approach:

Construction Alternatives	Projected Benefits			Estimated Cost	
	Additional Storage acre-feet (AF)	Additional Recharge acre-feet per year (AFY)	Estimated Capital Cost*	Total Annual Unit Cost (per AF)	
Expand Declez eastward	130	144	\$11,210,000	\$5,099	
Expand Declez eastward with upstream stormwater improvements	130	414	\$15,090,000	\$2,420	

*The capital cost shown assumes a 90% reduction on excavation and hauling cost



Recommendation

- Authorize the General Manager to purchase the property for the sum of \$3.0 million on behalf of Chino Basin Watermaster, contingent upon the approval of the Watermaster Board of Directors;
- Authorize the General Manager to spend up to \$100,000 for necessary fees related to the purchase;
- Approve a \$3.1 million budget amendment for EN18007 through an inter-fund loan from the NR Fund to the RW Fund.

The efforts towards the potential purchase of the East Declez property for groundwater recharge are consistent with the IEUA business goal of *Water Reliability*, namely development and investigation of groundwater recharge.

Subsurface Investigation - East Declez Basin Site



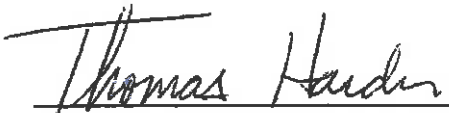


Subsurface Investigation - East Declez Basin Site

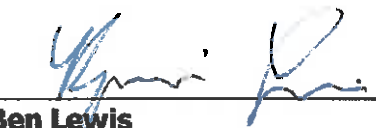
2/5/2016

Prepared for
Inland Empire Utilities Agency

Prepared by



Thomas Harder
Principal Hydrogeologist



Ben Lewis
Project Geologist

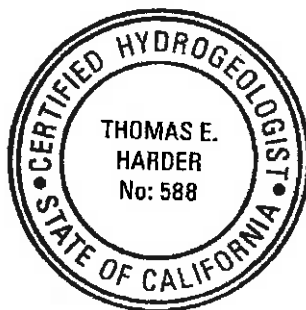
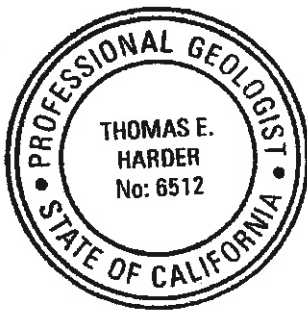


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- B. Cone Penetrometer Testing Logs
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- E. Wildermuth Environmental – Assessment of Additional Alternatives for Potential Storm Water Recharge Project East of Declez Basin



1 Introduction

This report describes the results of subsurface field investigations to determine the feasibility of artificial recharge at a parcel of private property referred to herein as the East Declez Site (the Site). The Site covers approximately 22 acres and is located immediately east of Inland Empire Utilities Agency's (IEUA's) existing Declez Basin recharge site on the north slope of the Jurupa Mountains in Riverside County, California (see Figure 1).

The purpose of the field investigations was to characterize the infiltration and mounding potential of subsurface sediments beneath the Site, identify laterally extensive fine-grained layers that could prevent recharge of the regional aquifer system, assess the liquefaction potential of the currently unsaturated sediments in the upper 50 ft beneath the Site, and determine the depth to bedrock. The data collected during the investigation was used to develop estimates of the Site's recharge capacity, subsurface storage potential, and useable area for recharge basins.

Characterization of subsurface sediments was accomplished through the collection and analysis of soil samples. Soil samples were collected from exploratory boreholes. Additional subsurface characterization was conducted using Cone Penetrometer Tests (CPTs).



2 Site Background and Setting

2.1 Site Description

The Site consists of approximately 22 acres of private property located immediately east of the existing Declez Basin recharge site on the north slope of the Jurupa Mountains in Riverside County, California (see Figures 1 and 2). The land surface is relatively flat in the northern two-thirds of the Site. The southern third of the Site slopes up to the south towards the Jurupa Mountains.

2.2 Previous Investigations

The East Declez Site was originally identified for consideration as a recharge basin site by the Jurupa Community Services District (JCSD). As part of an initial due diligence program in consideration of purchasing the property, a borehole drilling and infiltration testing program was conducted in September 2014. The drilling and testing program included two boreholes (BH-1 and BH-2) that were drilled to bedrock and infiltration testing in three test pits (TP-1 through TP-3; see Figure 2).

Based on results from the initial September 2014 investigations, the Chino Basin Watermaster (the Watermaster) and IEUA agreed to consider the East Declez property for purchase and eventual improvements for use as an artificial recharge site. While the September 2014 initial investigation results appeared favorable, there was a desire by stakeholders within the Watermaster to obtain additional subsurface hydrogeological data and refine the cost of recharge basin construction prior to committing to purchase the property.

2.3 Hydrogeologic Conditions

The Site is located along the northern slope of the Jurupa Mountains within the Chino Groundwater Basin. The surface geology of the Site is characterized by young alluvial deposits in the northern and western portions of the Site adjacent to old alluvial fan deposits and crystalline bedrock in the eastern and southern portions of the Site (see Figure 2). Young alluvial valley deposits were reported by Geoscience (2014) to extend between approximately 36 ft and 52 ft below ground surface (bgs) beneath the Site based on boreholes drilled along the northern boundary of the Site (BH-1 and BH-2; see Figure 2 and Appendix A). The young alluvial valley deposits were reported to consist predominantly of sand with minor gravel, silt and clay layers. Older alluvium, which consists of a higher percentage of silt and clay, was reported by Geoscience (2014) between the younger alluvium and bedrock surface. Bedrock, consisting of weathered granite, was observed in previous boreholes along the northern Site boundary at depths from 125 ft bgs (BH-1) to 182 ft bgs (BH-2).



The bedrock that forms the Jurupa Mountains along the southern boundary of the Site consists of granitic and metamorphic (i.e. crystalline) rock that is relatively impermeable. This bedrock extends beneath the Site, as observed in Boreholes BH-1 and BH-2.

During borehole drilling in 2014, groundwater was initially observed in the northwest borehole (BH-2) at a depth of 175 ft bgs but later rose to approximately 153 ft bgs within the borehole, indicating that the aquifer at depth in this area is under pressure. Groundwater was not observed in BH-1 in the northeast portion of the Site. Groundwater has been measured at a depth of approximately 130 ft bgs in the monitoring well adjacent to the existing Declez Basin, located approximately 900 ft west of the Site (DCZ-1; see Figure 3 for location).

2.4 Data Gaps before this Investigation

Although the initial 2014 investigation provided valuable information regarding the characteristics of subsurface conditions along the northern boundary of the Site, the subsurface conditions beneath most of the rest of the Site remained unknown. Specific data gaps included:

1. The thickness of alluvial sediments available for groundwater storage.
2. The lithologic characteristics of sediments beneath the majority of the Site and the lateral extent of fine-grained sediments observed in existing boreholes along the northern boundary of the Site.
3. The lithologic characteristics of the older alluvium mapped at the surface in the southeastern portion of the Site (see Figure 2).
4. The permeability of alluvial sediments, knowledge of which will allow for an estimate of potential groundwater mounding and subsurface flow during artificial recharge conditions.
5. The liquefaction potential of the upper 50 ft of subsurface sediments.



3 Site Investigation

The site investigation to address the data gaps identified in Section 2.4 included data collection from six CPTs and seven boreholes (see Figure 2). The number and location of CPT and exploratory borehole locations were identified to:

1. Provide adequate subsurface data in areas of the Site not explored by previous investigations.
2. Provide a sufficient number of samples for characterization of subsurface sediments.
3. Enable the identification and correlation of fine-grained sediment layers across the Site.
4. Enable estimates of the thickness of alluvial sediments conducive to recharge and subsurface storage of water.
5. Assess the liquefaction potential of the upper 50 ft of sediments.

In general, CPTs and boreholes were located on the portions of the Site where surface sediments consist of younger alluvium, to coincide with the most likely area of future basin bottom. One borehole (BH-6) was drilled directly on the older alluvium in order to assess the potential for this formation to recharge and store water.

3.1 CPT Investigation

3.1.1 CPT Methodology

Cone Penetrometer Testing (CPT) was conducted by Kehoe Testing and Engineering of Huntington Beach, California. Each CPT provided a continuous subsurface soil profile based on the pressure and resistance observed from pushing an instrumented steel rod into the ground. Six CPTs were conducted, as shown on Figure 2.

Shear wave testing was conducted at 10-ft intervals at each CPT location. Shear wave testing involves sending shock waves through the subsurface using a strike plate and measuring the shear wave velocities. This data was used to assess the liquefaction potential of shallow sediments.

3.1.2 CPT Results

The six CPTs were completed to the maximum depth possible with the equipment. The total depths attained ranged from 17 to 39 ft bgs and were limited by the density and characteristics of the soil.



CPT	Total Depth (ft)
CPT-1	37
CPT-2	23
CPT-3	39
CPT-5	23
CPT-7	23
CPT-8	17

Results from the CPTs indicate soils in the upper approximately 20 to 40 ft bgs consist primarily of sand and silty sand (Appendix B). These sediments are likely very permeable and conducive to the percolation of surface water. The inability to extend the CPT probes deeper was likely due to the presence of gravel in the formation and/or the density of the formation.

3.2 Borehole Drilling and Soil Sample Collection

3.2.1 Borehole Drilling and Soil Sample Collection Methodology

A total of seven boreholes (BH-3 through BH-7; BH-4B and BH-5B) were drilled by J&H Drilling of Fullerton, California using a CME 85 truck-mounted hollow-stem auger drilling rig. During drilling, soil samples of the alluvium were collected on a continuous basis in 5-ft long, 2-inch diameter barrel samplers. In addition, the driller conducted Standard Penetration Tests (SPTs) at 10-ft intervals within the upper 50 ft of each borehole. The SPT consists of driving a split barrel sampler 18 inches into undisturbed formation using a 140-pound hammer falling 30-inches for each blow. Blow counts for every 6 inches driven were recorded in the field.

A split spoon sampler with stainless steel tubes collected a total of six 6-inch long, 2-inch diameter samples from six different boreholes. Two of these samples were obtained from the upper 50 ft and four samples were obtained from below 50 ft. Samples collected in the tubes were capped, properly labeled, and submitted to a geotechnical laboratory for analysis of vertical and horizontal permeability, grain size distribution, bulk density, and porosity.

All cuttings generated during drilling were spread evenly onsite. Upon completion of drilling, boreholes were backfilled from the total depth to the land surface using drill cuttings placed through the augers.

A TH&Co geoscientist provided full-time onsite inspection during all aspects of borehole drilling, testing and sample collection. Soil samples were logged in the field according to ASTM D 2488 (2000), Standard Practice for Description and Identification of Soils. Soil cores were



photo-logged and representative samples were stored and retained in sealable plastic bags for future inspection and analysis, as necessary.

3.2.2 Laboratory Analysis of Soil Samples

Six soil samples collected during drilling were submitted to PTS Laboratories in Santa Fe Springs, California for physical properties testing. Two samples were from the younger alluvium and four samples were from the older alluvium. All samples were analyzed for the following:

- Vertical hydraulic conductivity (API RP40/EPA 9100)
- Horizontal hydraulic conductivity (API RP40/EPA 9100)
- Grain size distribution (ASTM D4464 and ASTM D422)
- Bulk density (API RP40/ASTM D2937)
- Effective Porosity (Modified ASTM D425)

All samples were submitted to PTS Laboratories by a TH&Co geoscientist under chain-of-custody protocol. Results of the soil physical properties testing are summarized in Table 1. Soil laboratory reports are provided in Appendix C.



4 Investigation Results

4.1 Subsurface Sediment/Lithologic Characteristics

Subsurface geology at the Site is characterized by young alluvial deposits, older alluvial deposits, and crystalline bedrock (in order from shallowest to deepest; see Figures 4a through 4e). The lithologic logs of boreholes BH-3, BH-4, BH-5, and BH-7 show that sediments in the upper 30 to 50 feet generally consist of brown to gray sand with lesser amounts of gravel and silt (see Appendix D). These sediments are unconsolidated and correlate with the young alluvium observed at the land surface. Based on the sediment characteristics, the young alluvium is expected to be relatively permeable and conducive to the recharge and storage of water. These findings are consistent with the infiltration test results obtained by Geoscience (2014).

The young alluvial deposits are differentiated from the underlying older alluvium primarily by consistency, color, and grain size. The older alluvial deposits are characterized by dense, reddish brown silt and clay with lesser amounts of sand. Due to the dense, fine-grained nature of the older alluvium, it is assumed that this formation would not facilitate the storage and transmission of significant amounts of groundwater.

Crystalline bedrock was encountered beneath the older alluvium in BH-3, BH-4, and BH-5. In BH-3 (west side of the Site), the bedrock consisted of weathered granitic bedrock at approximately 75 ft bgs and hard consolidated granitic bedrock at 105 ft bgs. At BH-4 and BH-5, hard crystalline bedrock consisting of quartzite was encountered at depths of 146 ft bgs and 126 ft bgs, respectively.

4.2 Thickness of Younger Alluvium Available for Groundwater Storage

The thickness of the younger alluvium at the Site ranges from 0 ft at the surface contact with the older alluvium along the south side of the Site to over 50 ft thick in the northwestern portion of the Site (see Figure 5). Depths to the tops of the older alluvium and crystalline bedrock at each borehole are summarized as follows:



Borehole	Total Depth (ft bgs)	Depth to Top of Older Alluvium (ft bgs)	Depth to Crystalline Bedrock (ft bgs)
BH-1	126.5	36	125
BH-2	183	52	181.5
BH-3	108	54	Weathered at 75 Unweathered at 105
BH-4	146.5	40	146
BH-5	130	30	126
BH-6	45	0	Not encountered
BH-7	87	38	Not encountered

The thickness of younger alluvium available for groundwater recharge generally increases to the north and northwest beneath the Site.

4.3 Groundwater

Groundwater was not encountered during drilling to the extent that it collected in the open boreholes. Wet soil conditions were observed during the drilling of BH-3 at a depth of approximately 50 ft bgs, which corresponds approximately with the top of the older alluvium. As the older alluvium is less permeable than the upper alluvium, this water is likely localized perched groundwater that has collected from the infiltration of precipitation through the younger alluvium.

4.4 Analysis of Liquefaction Potential

Liquefaction is defined as the transformation of a granular material from a solid to a liquefied state as a consequence of increased pore-water pressure and reduced effective stress (Yould and Idriss, 2001). Potential for liquefaction in any area is based on the following criteria:

1. Sediment type
2. Potential for strong earthquakes, and
3. A groundwater table within 50 ft of the land surface

Sediment properties from the CPTs and boreholes were used to assess the first criterion. The second criterion is consistent with the Southern California region. The third criterion would be



possible at the Site during artificial recharge operations as a result of the groundwater mound that would develop in the younger alluvium.

Sediment properties from the CPTs were used to estimate liquefaction potential using the method by Juang et al., 2003. Liquefaction potential, using this method, is a function of depth-specific vertical effective stress, total overburden stress, measured cone tip resistance, and sleeve friction, all estimated based on data from the CPT. These variables are used to determine the “loading” to a soil induced by an earthquake which is defined as the cyclic stress ratio (CSR). The method also estimates the “resistance” of the soil to triggering of liquefaction, which is defined as the cyclic resistance ratio (CRR). The CRR is estimated using depth-specific vertical effective stress and total overburden stress from the CPT as well as an assumed peak ground acceleration and earthquake magnitude. The assumed peak ground acceleration for this analysis was 0.6 g (USGS, 2014) and the assumed earthquake magnitude was 7.5 (Juang et al., 2003). The ratio of CRR to CSR is defined as the factor of safety where liquefaction is “predicted” when the ratio is less than one. Applying this method and assumptions to the CPT results specific to the Site, the factor of safety for all sediments encountered was above one (see Figure 6). Accordingly, based on the results of this analysis, it does not appear that the younger alluvial soils beneath the Site are at risk for liquefaction during saturated conditions.

A second method was used to estimate liquefaction potential by using the shear wave velocities and the CSR as described by Kayabali, 1996. Shear wave velocities less than 200 meters per second (m/s) are typically more susceptible to liquefaction during an earthquake, particularly at a CSR above 0.1. The shear wave velocities measured from the CPT data at the Site ranged from 222 to 266 m/s and averaged 246 m/s with a CSR of 0.04. Results of this analysis also suggest that the younger alluvial soils beneath the Site are not at risk for liquefaction.

4.5 Estimated Recharge Capacity

The potential recharge capacity of the Site was evaluated using two different Site configuration options:

1. The first option assumed construction of a shallow recharge basin (or multiple basins) with a bottom elevation of approximately 852 ft above mean sea level (amsl; approximately 10 ft below existing grade). This option would allow for high infiltration rates but limited subsurface storage capacity due to the relatively thin younger alluvium beneath the basin.
2. The second option assumed deep excavation of the East Declez site to form an eastern extension of the existing Declez Basin. This option would create additional surface storage for the combined Declez Basin but recharge beneath the East Declez site



would be minimal as the bottom of the basin would be in the low permeability older alluvium.

4.5.1 Shallow Recharge Basin Option

TH&Co developed a conceptual shallow recharge basin layout in consideration of the findings of the drilling and sampling investigation. The conceptual basin area, as shown on Figure 7, is located over the area of permeable younger alluvium and incorporates a 10-ft wide perimeter road and 3:1 side slopes. The resulting active recharge area is approximately 11 acres. In consideration of the available thickness of younger alluvium, the conceptual basin invert elevation was as shallow as 10 ft below the existing land surface (see Figure 8).

Potential groundwater mounding associated with recharge of water in the conceptual Site basin was evaluated using a two-dimensional analytical groundwater flow model. The analysis incorporated the following assumptions:

- Water was applied to the basin at a rate of 1 ft/day.
- The hydraulic conductivity of the younger alluvium is 12 to 50 ft/day.
- The sediments in the subsurface are homogeneous.

The recharge rate of 1 ft/day is lower than obtained during testing by Geoscience (2014) but consistent with recharge rates for the existing Declez Basin adjacent to the Site. A range of hydraulic conductivity values was used for the analysis. The low end of the range was based on soil physical properties results of samples from the borehole drilling and testing program (see Table 1). The high end was based on hydraulic conductivity estimates for area aquifers as published in Wildermuth (2014).

Given these assumptions, the analysis shows that recharge within the conceptual Site basin at a surface infiltration rate of 1 ft/day will result in a groundwater mound that will rise to the bottom of the basin within 10 days (see Figures 9 and 10). Further recharge, at that point, would have to stop until the mound relaxed in accordance with the rate of subsurface outflow, which is dictated by the hydraulic conductivity (i.e. permeability) of the younger alluvium. Model analyses suggest that the time necessary to allow the mound to decline to near static conditions after the recharge event is approximately 30 to 80 days.

Based on this analysis, the conceptual shallow recharge basin could theoretically recharge between 260 and 1,100 ac-ft/yr if water was available on demand. As storm water is not available on demand, the actual average annual recharge would likely be closer to the lower end of this range.

It is noted that a review of the shallow recharge basin concept by Wildermuth Environmental (Wildermuth, 2016; Appendix E), indicated that it was not feasible to deliver water to the



shallow recharge basins from the Declez Channel due to the shallow elevation of the basin bottom. As such, this option is not considered viable. However, the analysis was conducted prior to the Wildermuth Environmental review and is presented herein for reference.

4.5.2 Expanded Declez Basin Option

A second analysis of recharge potential was based on expanding the existing Declez Basin Cell 1 to the east through a deep excavation of the East Declez site (see Figures 11 and 12). The conceptual basin area, as shown on Figure 13, is located over the area of permeable younger alluvium and incorporates a 10-ft wide perimeter road and 2:1 side slopes. The conceptual basin invert elevation (825 ft amsl) was assumed to be the same as the existing Declez Basin Cell 1 (see Figure 12). Maximum surface storage capacity of the East Declez portion of the expanded Declez Basin area would be limited by the elevation of the spillway at the southwest end of the Declez Basin, which is approximately 841 ft amsl. In consideration of this, the maximum surface storage capacity of the expanded East Declez area is approximately 130 acre-ft.

The recharge potential of the expanded Declez Basin option was estimated by Wildermuth Environmental using their surface water simulation model (see Appendix E). The net increase in average annual recharge was a function of the amount of storm water that can be delivered to the site, the increased surface storage potential of the expanded Declez Basin area, and the infiltration rate of the existing Declez Basin. The amount of storm water available for delivery to the expanded Declez Basin area was evaluated using two alternatives:

- 1a. Delivery of storm water using existing diversion structures (no new diversion improvements).
- 1b. Improvements for the increased diversion of water from San Sevaine Channel to the Jurupa Basin and then conveyance of this water to the expanded Declez Basin.

Based on the analysis presented in Wildermuth (2016), the range of potential net increase in recharge at the expanded Declez Basin is 144 acre-ft/yr to 414 acre-ft/yr for alternatives 1a and 1b, respectively.



5 Findings and Conclusions

The following summarizes the findings of the investigation of the East Declez Site:

- Subsurface sediments beneath the East Declez Site consist of upper younger alluvium that overlies older alluvial deposits that overlie metamorphic and granitic bedrock.
- The younger alluvium is 30 to 40 ft thick and consists predominantly of sand and gravel that is loose, permeable and conducive to the infiltration of surface water. The younger alluvium is not expected to be a liquefaction risk.
- The underlying older alluvium consists predominantly of dense clay with some sand and gravel. This formation has low permeability and would not facilitate significant infiltration of water.
- Infiltration of surface water at the Site will perch on the older alluvial deposits and mound within the younger alluvium.
- Given the limited thickness of permeable younger alluvium for subsurface storage of water, a recharge basin at the Site would have to be designed with a shallow bottom.
- Hydraulic analysis of potential storm water conveyance to the East Declez Site presented in Wildermuth (2016) showed that it is not feasible to deliver storm water from the East Declez Channel to a shallow recharge basin due to the high elevation of the basin bottom relative to the Declez Channel diversion point.
- An alternative use for the Site is to expand the existing Declez Basin to the east, which would create additional surface storage capacity. Preliminary estimates indicate a potential increase in surface storage capacity of approximately 130 acre-ft.
- Hydraulic analysis presented in Wildermuth (2016) estimates that the net increase in recharge to the groundwater basin from an expanded Declez Basin option could range from approximately 144 to 414 acre-ft/yr. The lower end of the range assumes no additional diversion or storm water supply improvements. The high end of the range assumes upstream storm water diversion improvements that increase the amount of water available for delivery to the expanded Declez Basin.



6 References

- ASTM (2000). Standard Practice for Description and Identification of Soils. D 2488-00.
- Geoscience, 2014. Technical Memorandum – Hydrogeological Evaluation of Riverside County, California Parcel Nos. 173-020-020 and 173-020-021 as Potential Ground Water Recharge Site.
- Juang, C., Yuan, H., Lee, D., and Lin, P., 2003. Simplified CPT-Based Method for Evaluating Liquefaction Resistance of Soils. J. of Geotechnical and Geoenvironmental Engineering: V. 129, Issue 1.
- Kayabali, K. 1996. Soil liquefaction evaluation using shear wave velocity. J. of Engineering Geology, V. 44, Issue 1-4.
- USGS, 2014. Peak Horizontal Acceleration with 2 Percent Probability of Exceedance in 50 Years (Sheet 2 of 6), shapefile containing polygons. Published with Open-File Report 2014-1091, Documentation for the 2014 Update of the United States National Seismic Hazard Maps.
- Wildermuth Environmental, 2014. 2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peach Agreement.
- Wildermuth Environmental, 2016. Assessment of Additional Alternatives for Potential Storm Water Recharge Project East of Declez Basin. Letter Report Dated January 28, 2016.
- Yould, T.L. and Idriss, I.M., 2001. Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils. J. of Geotechnical and Geoenvironmental Engineering: V. 127, Issue 4.



Table



Soil Physical Properties Testing Summary

Borehole	Depth (ft bgs) ¹	Geologic Unit	Sample Orientation	Vertical Hydraulic Conductivity (ft/day) ²	Horizontal Hydraulic Conductivity (ft/day)	Total Porosity	Effective Porosity	Dry Bulk Density (g/cc) ³
BH-3	56.0 - 56.5	Older Alluvium	Vertical	0.01	N/A ⁴	N/A	N/A	N/A
BH-4	52.5 - 53.0	Older Alluvium	Vertical	0.01	N/A	N/A	N/A	N/A
BH-5	76.0 - 76.5	Older Alluvium	Vertical	0.01	N/A	N/A	N/A	N/A
BH-6	44.5 - 45.0	Older Alluvium	Vertical	0.01	N/A	N/A	N/A	N/A
BH-3	56.0 - 56.5	Older Alluvium	Horizontal	N/A	0.01	N/A	N/A	N/A
BH-4	52.5 - 53.0	Older Alluvium	Horizontal	N/A	0.01	N/A	N/A	N/A
BH-5	76.0 - 76.5	Older Alluvium	Horizontal	N/A	0.01	N/A	N/A	N/A
BH-6	44.5 - 45.0	Older Alluvium	Horizontal	N/A	0.02	N/A	N/A	N/A
BH-4B	21.0 - 21.5	Younger Alluvium	Vertical	0.50	N/A	34.1%	N/A	1.77
BH-5B	21.0 - 21.5	Younger Alluvium	Vertical	0.44	N/A	32.0%	N/A	1.83
BH-4B	21.0 - 21.5	Younger Alluvium	Horizontal	N/A	0.15	26.3%	N/A	1.99
BH-5B	21.0 - 21.5	Younger Alluvium	Horizontal	N/A	11.71	32.2%	N/A	1.83

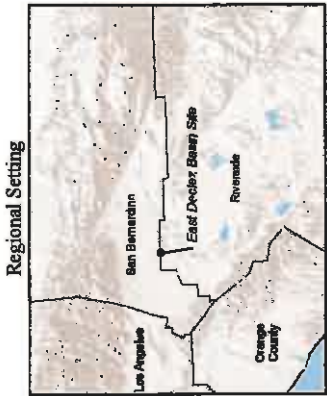
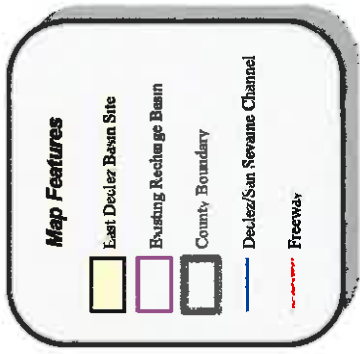
Notes:

- ¹ ft/bgs = feet below ground surface.
- ² ft/day = feet per day.
- ³ g/cc = grams per cubic centimeter.
- ⁴ N/A = not analyzed.

Figures



**East Declez Basin Improvements
Subsurface Investigations**



Study Area

Figure 1

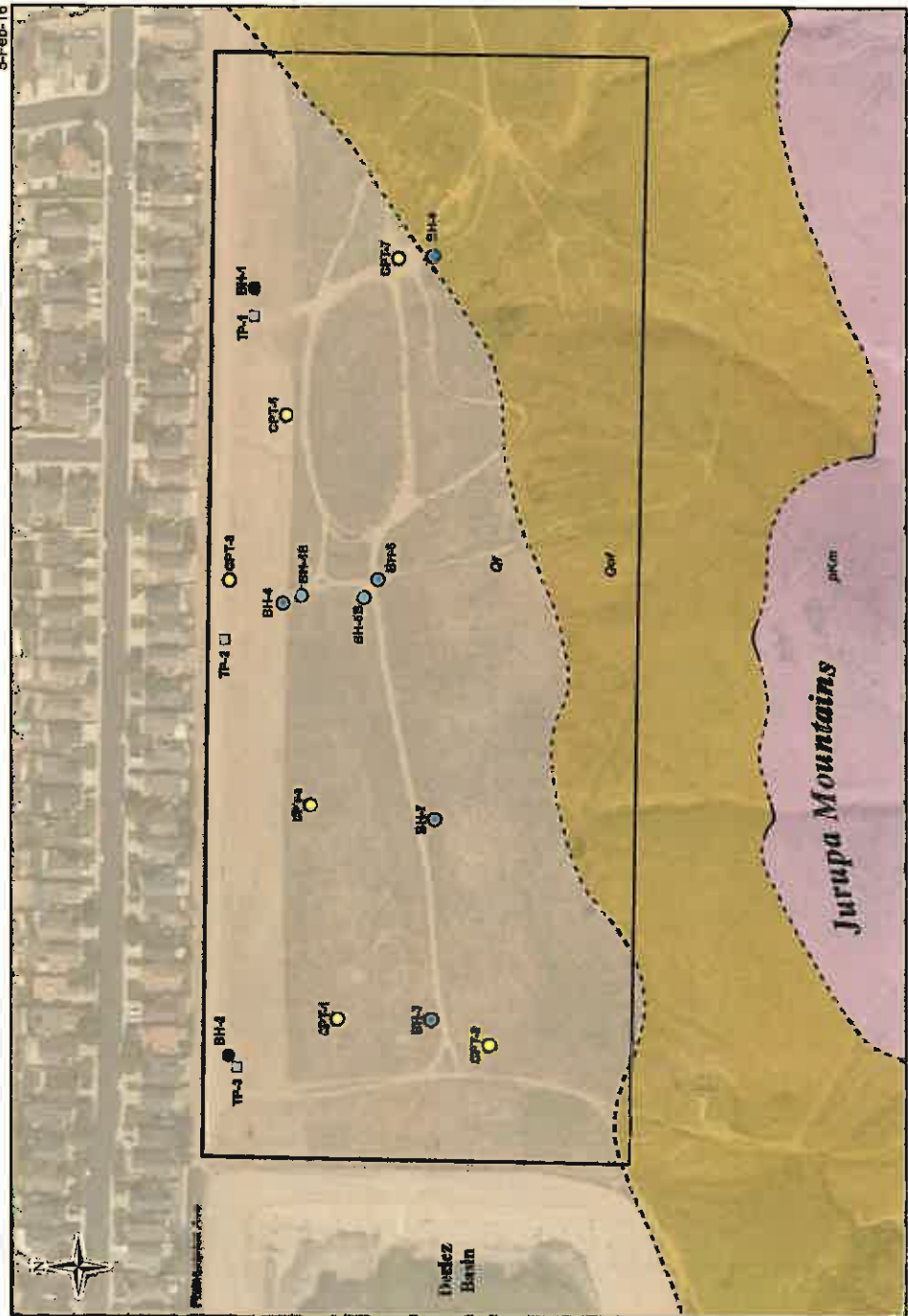
East Declez Basin Improvements Subsurface Investigation

Map Features

- Borehole Location
- Shallow Borehole Location
- CPT Location
- Previous Borehole (Geosciences, 2014)
- Infiltration Test Pit (Geosciences, 2014)
- East Declez Basin Site
- Geologic Contact (Dashed Where Approximate)
- Young Alluvial Deposits
- Older Alluvial Deposits
- Crystalline Bedrock

East Declez Basin site boundary from Riverside County Geographic Information Services' Parcel Database <http://gis.rivcoit.org/GISData.aspx>

Geology from field mapping, September 2015 and modified from Morton and Miller, Geologic Map of the San Bernardino and Santa Ana 30' x 60' quadrangles, USGS Open File Report 2006

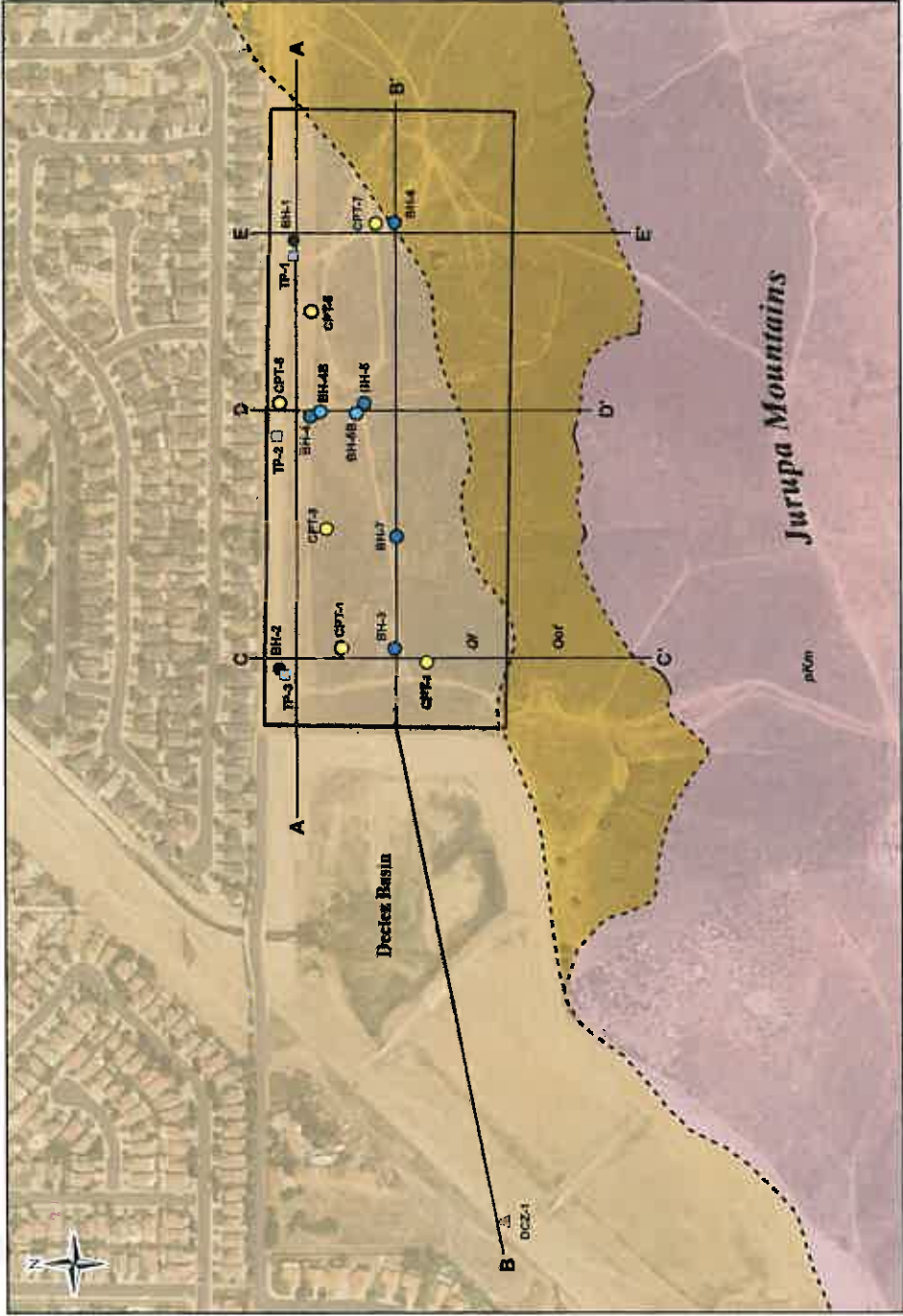


East Declez Basin Site

Figure 2

East Declez Basin Improvements Subsurface Investigation

5-Feb-16



Map Features

- Borehole Location
- Shallow Borehole Location
- CPT Location
- Previous Borehole (Geoscience, 2014)
- Infiltration Test Pit (Geoscience, 2014)
- Existing Monitoring Well
- Cross Section Location
- East Declez Basin Site
- Geologic Contact (Dashed Where Approximate)
- Young Alluvial Deposits
- Older Alluvial Deposits
- Crystalline Bedrock

East Declez Basin site boundary from Riverside County Geographic Information Services' Parcel Database <http://gis.rivcoit.org/GISData.aspx>

Geology map from field mapping, September 2015 and modified from Morton and Miller, Geologic Map of the San Bernardino and Santa Ana 30' x 60' quadrangles, USGS Open File Report 2006

Cross Section Locations

Figure 3

**East Declez Basin Improvements
Subsurface Investigation**

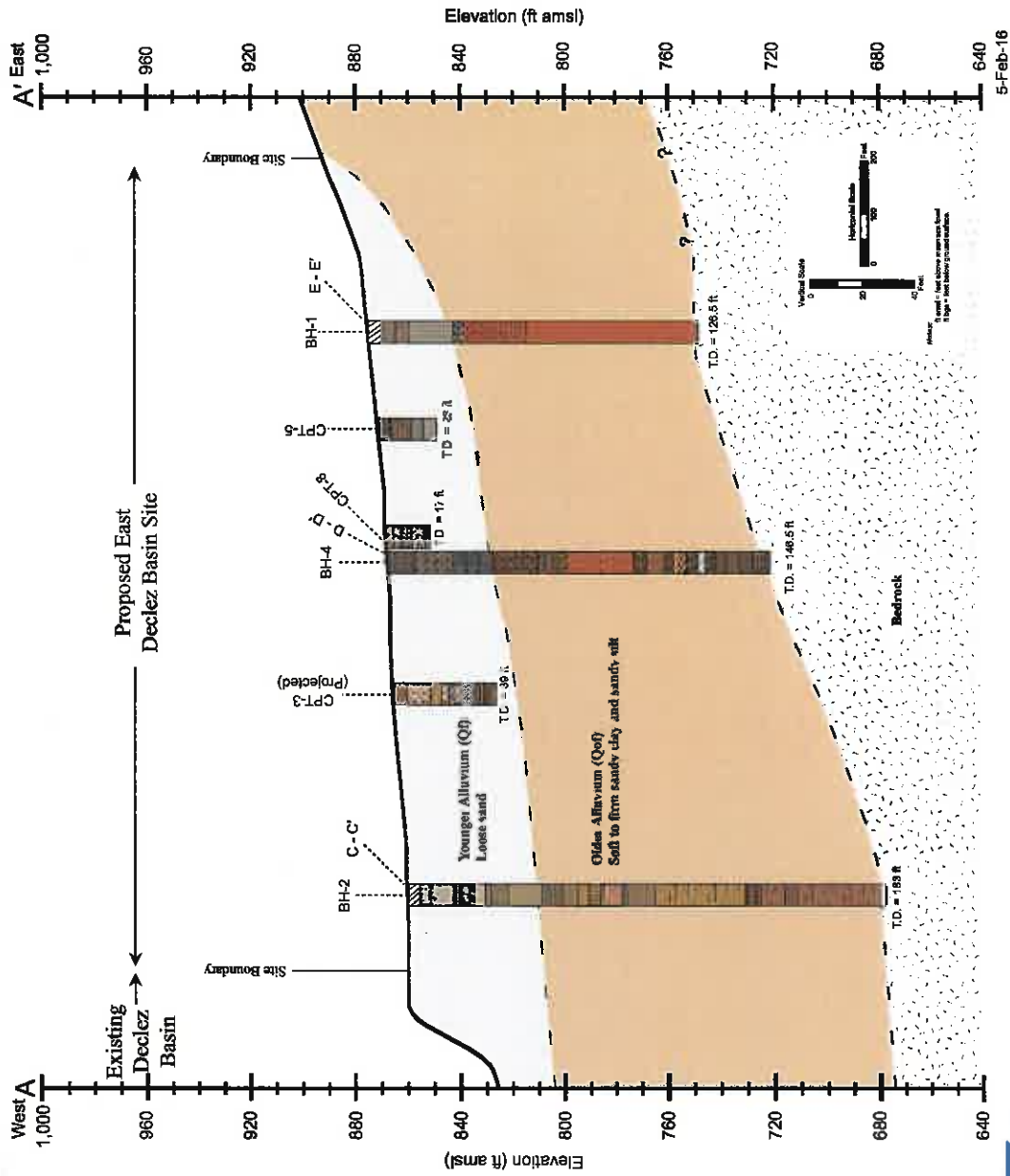
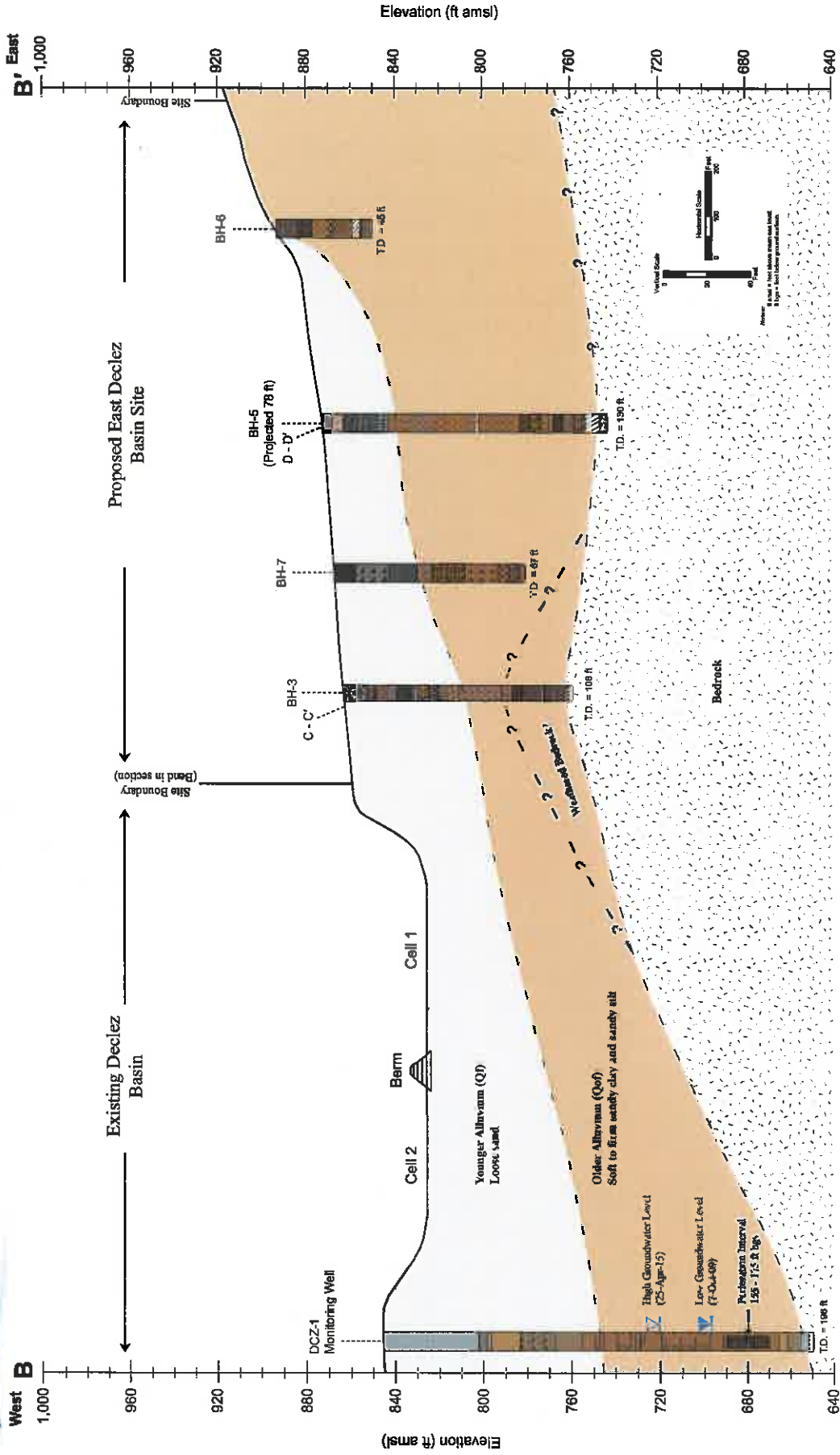


Figure 4a

**East Declez Basin Improvements
Subsurface Investigation**



5-Feb-16

Figure 4b

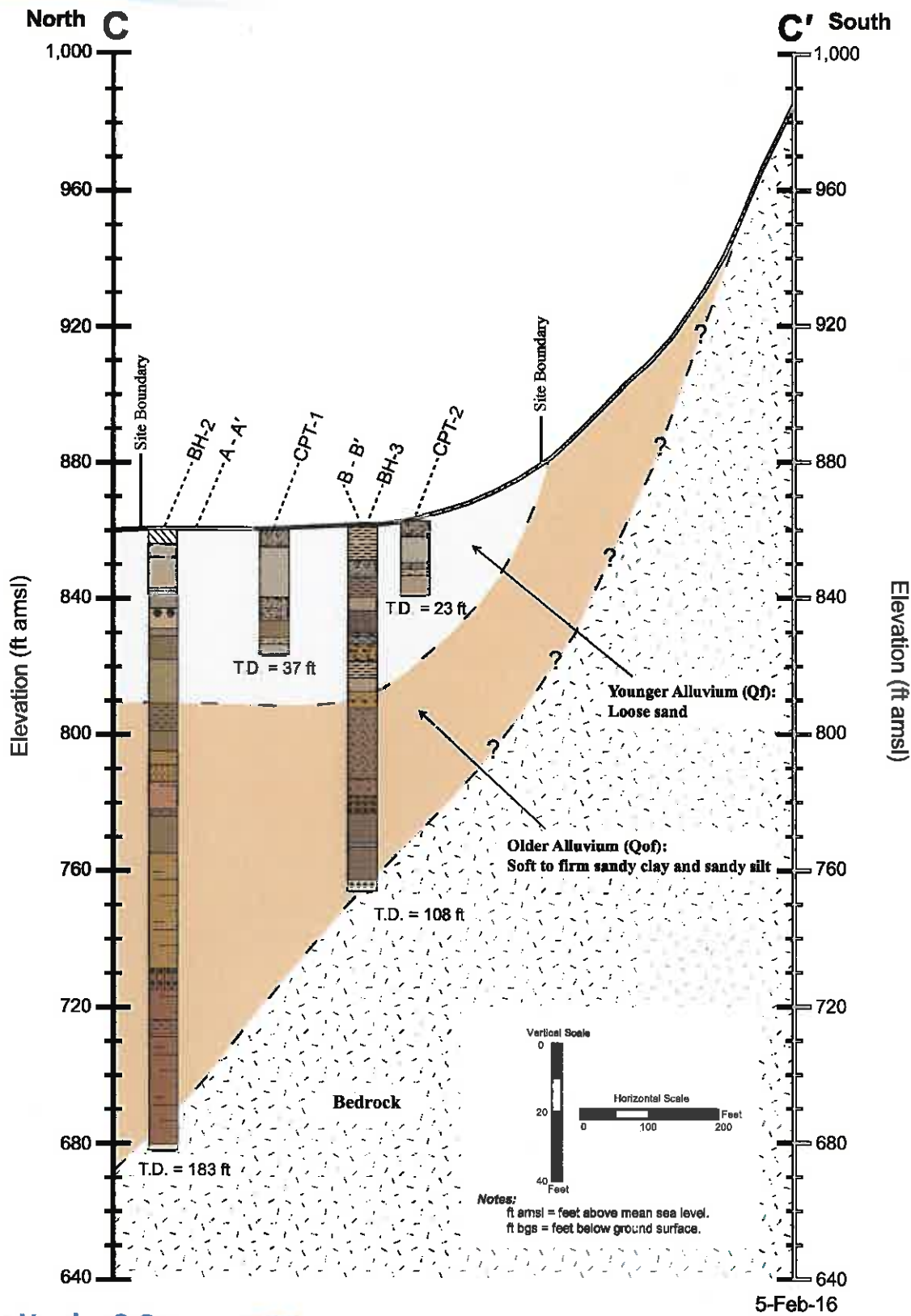
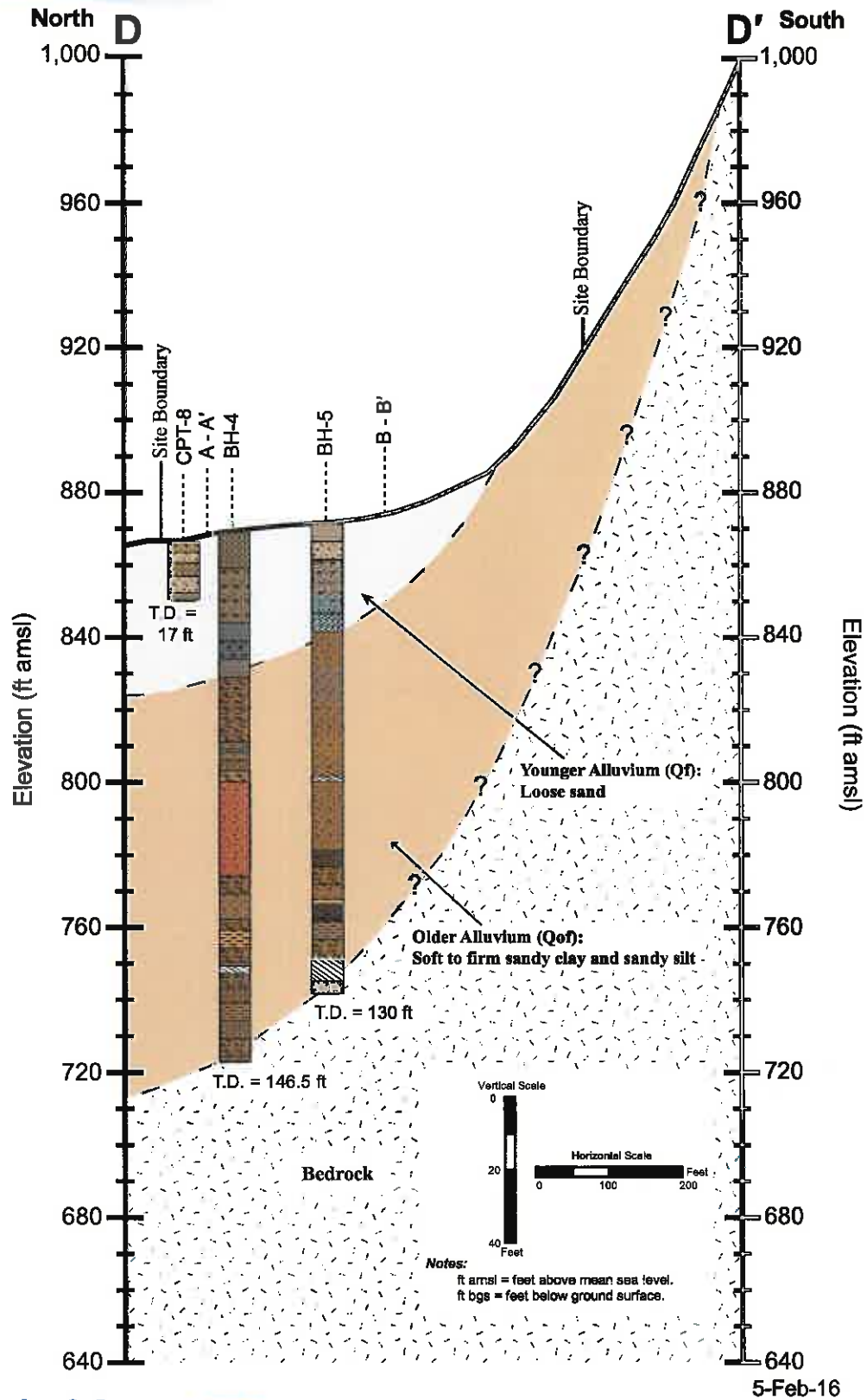


Figure 4c



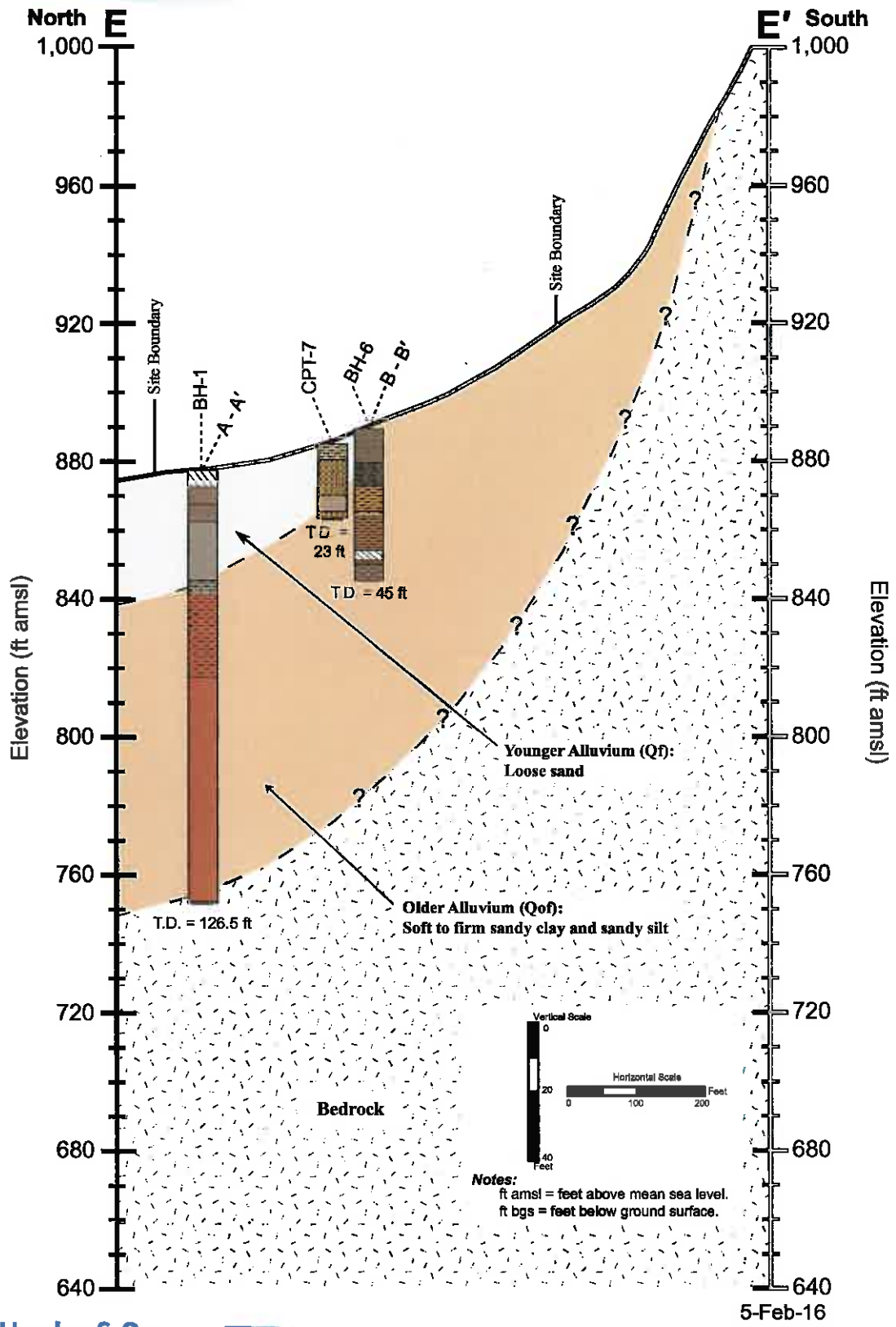
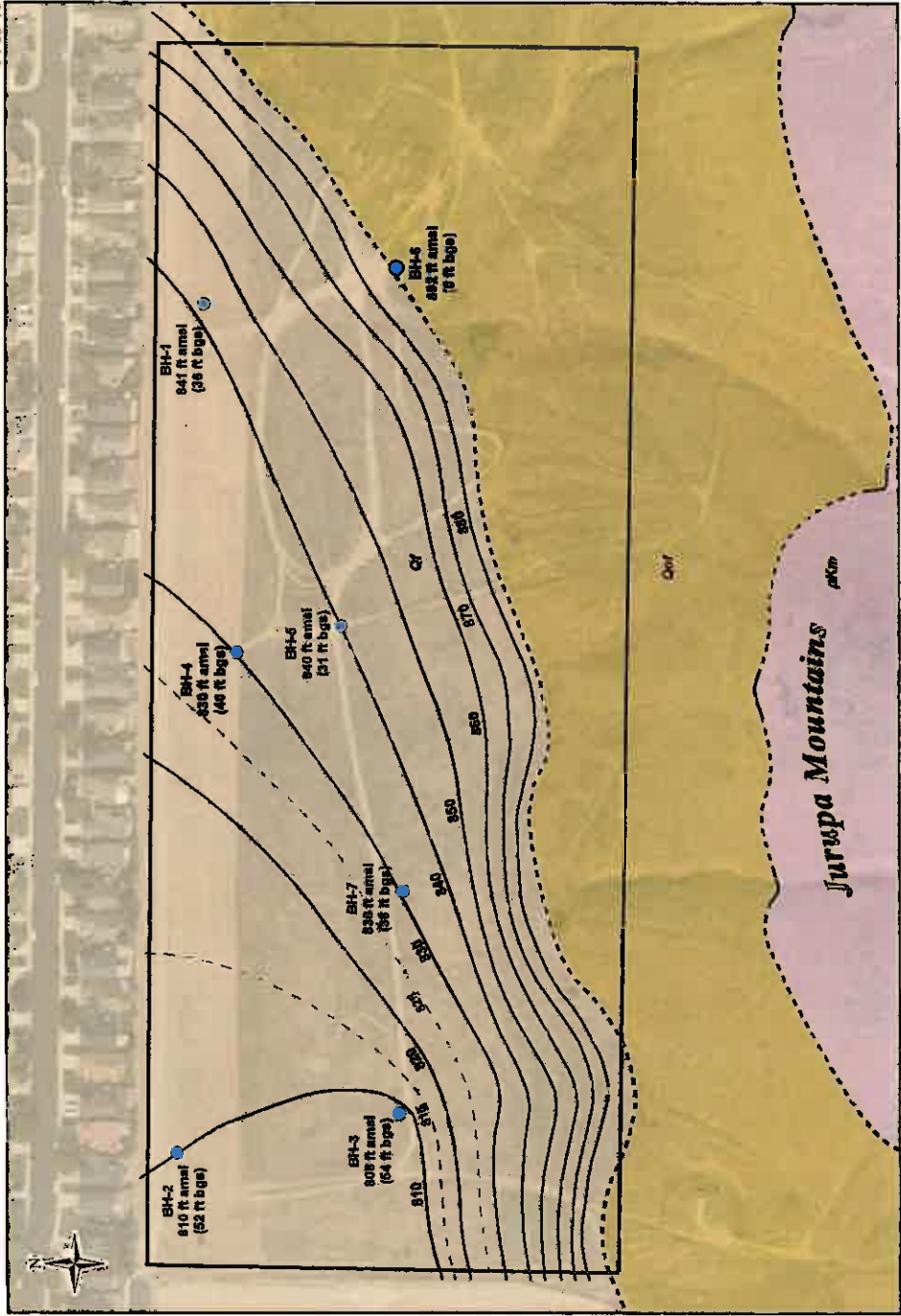


Figure 4e

**East Declez Basin Improvements
Subsurface Investigation**

5-Feb-16



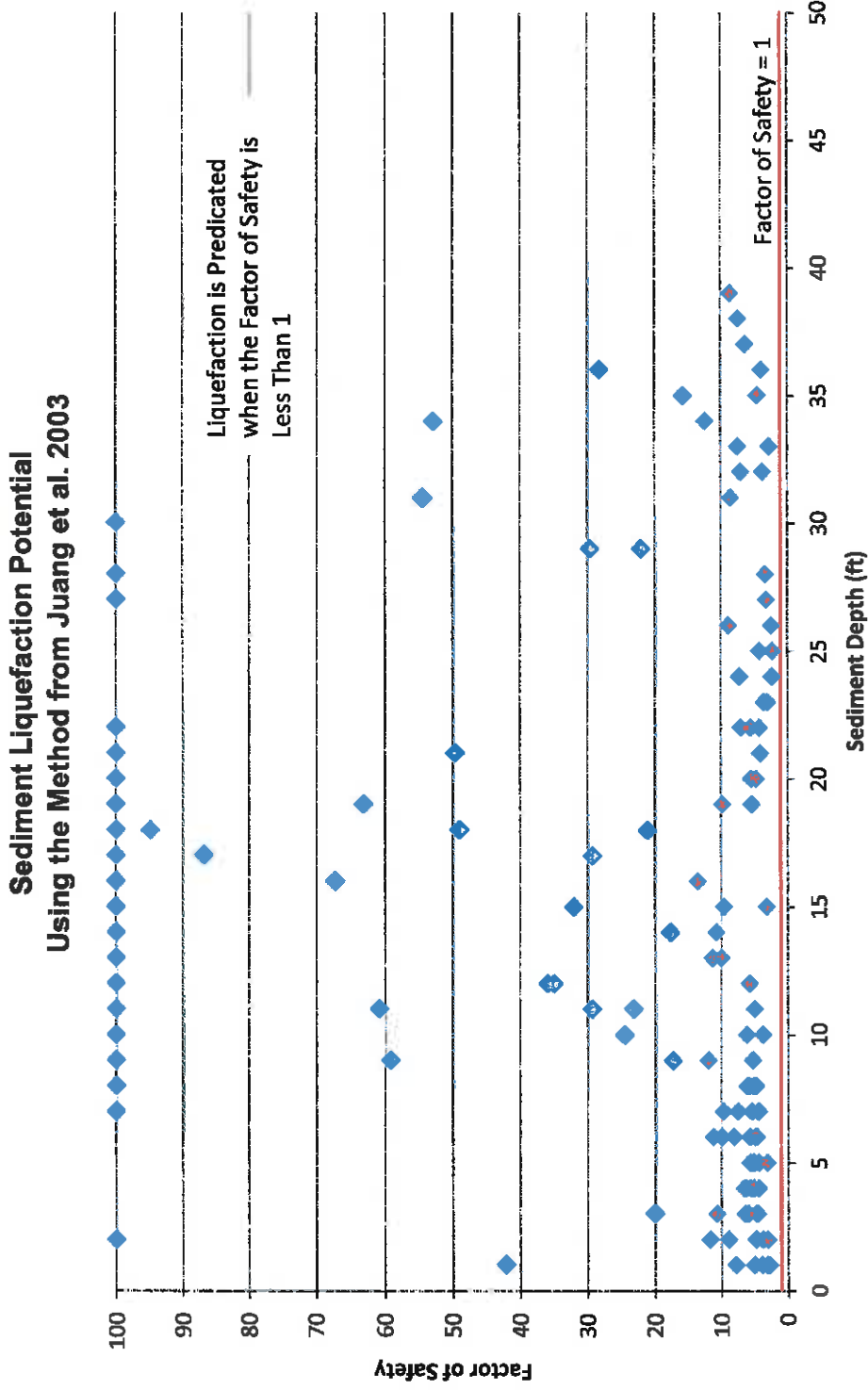
East Declez Basin site boundary from Riverside County
Geographic Information Services' Parcel Database
<http://gis.rivcoct.org/GISData.mpx>

Geology from field mapping, September 2015 and
modified from Morton and Miller, Geologic Map of the
San Bernardino and Santa Ana 30' x 60' quadrangles,
USGS Open File Report 2006

ft amsl = feet above mean sea level
ft bgs = feet below ground surface

**Contours of Equal Elevation
Bottom of Younger Alluvium** Figure 5

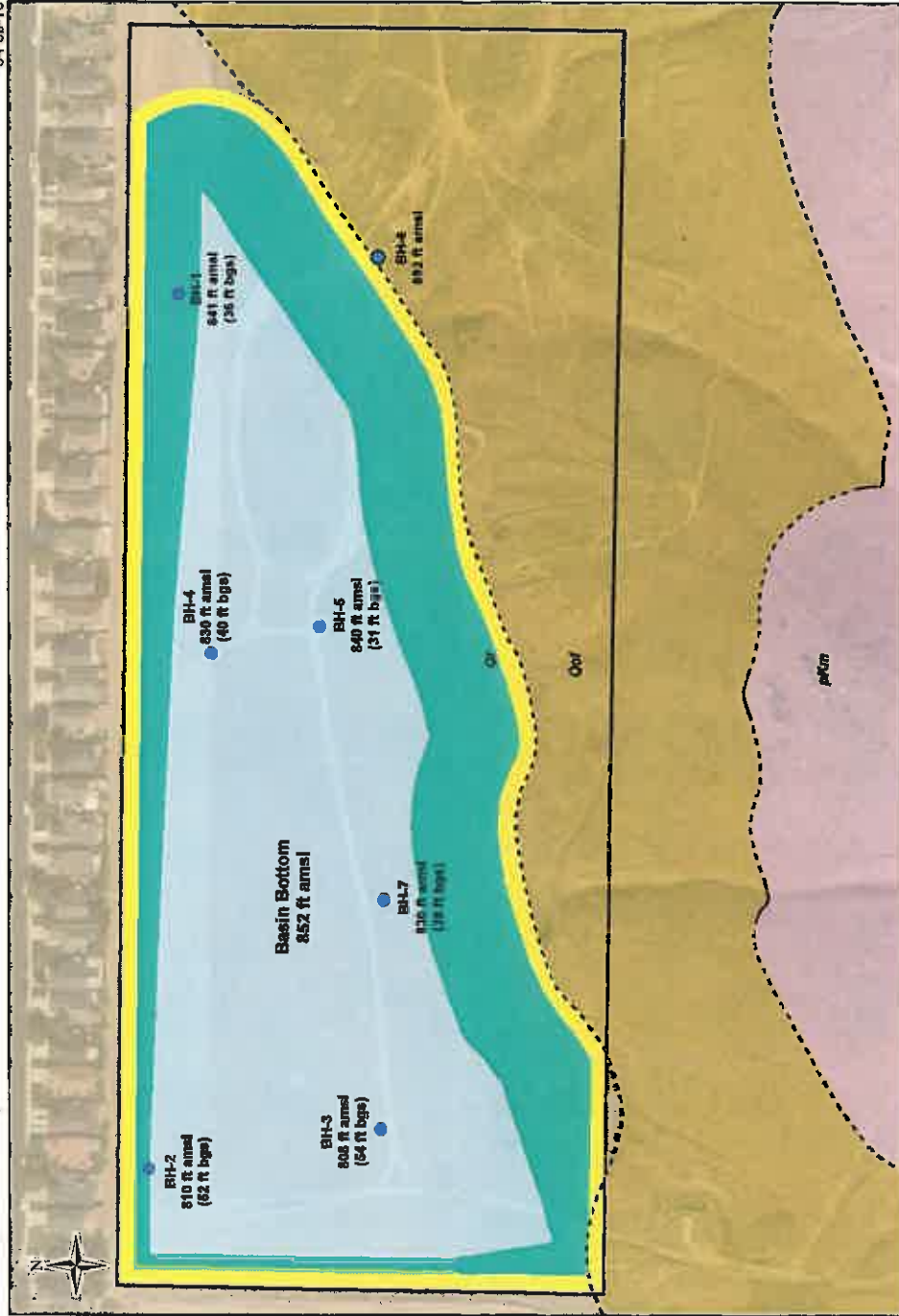




Note: Values with a factor of safety greater than 100 shown as 100.

**East Declez Basin Improvements
Subsurface Investigation**

5-Feb-16



East Declez Basin site boundary from Riverside County Geographic Information Services' Parcel Database <http://gis.rivcoit.org/GISData.aspx>

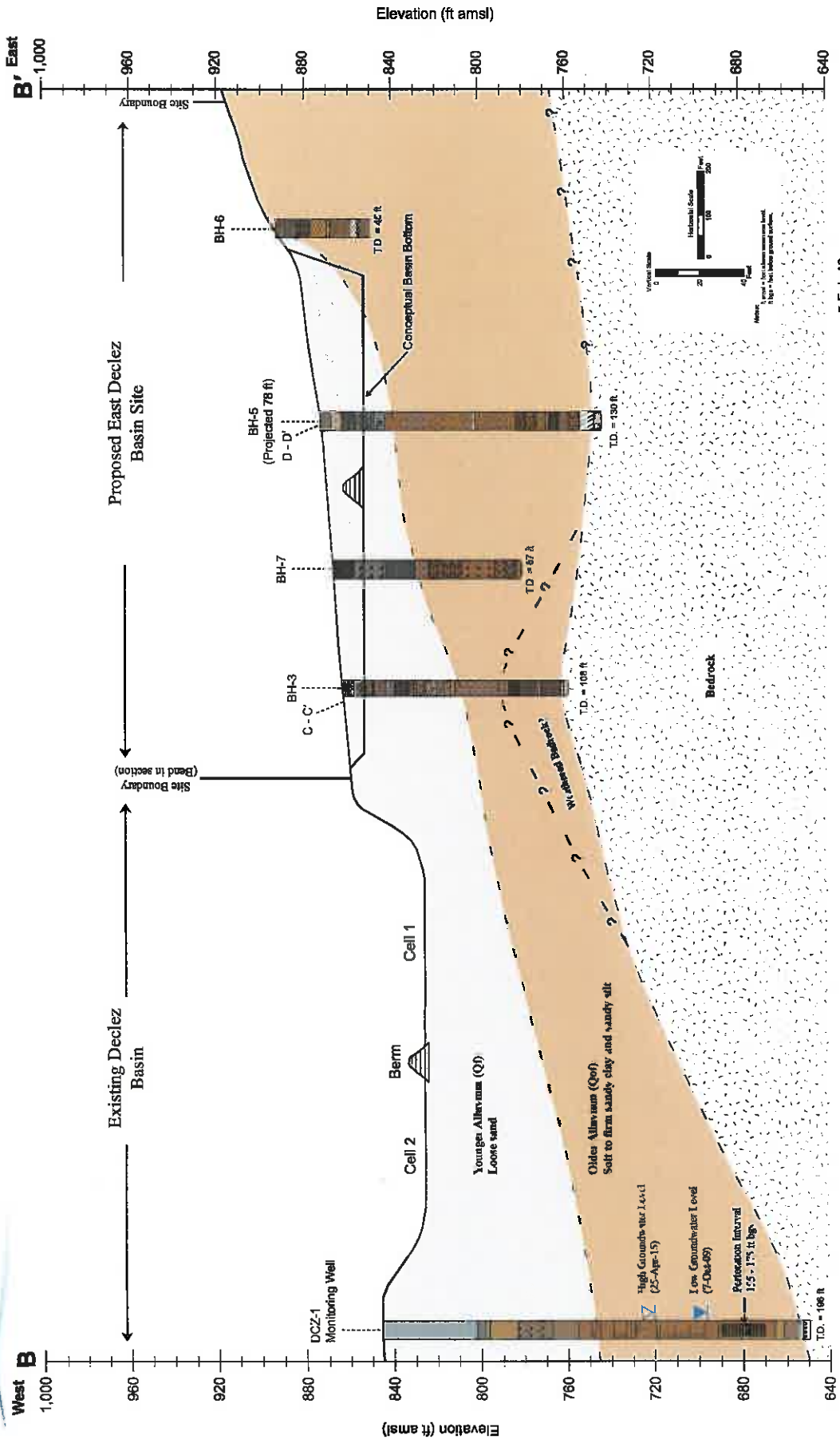
Geology from field mapping, September 2015 and modified from Morton and Miller, Geologic Map of the San Bernardino and Santa Ana 30' x 60' quadrangles, USGS Open File Report 2006

ft amsl = feet above mean sea level
ft bgs = feet below ground surface

**Conceptual Basin Layout -
Shallow Recharge Basin Option**

Figure 7

**East Declez Basin Improvements
Subsurface Investigation**

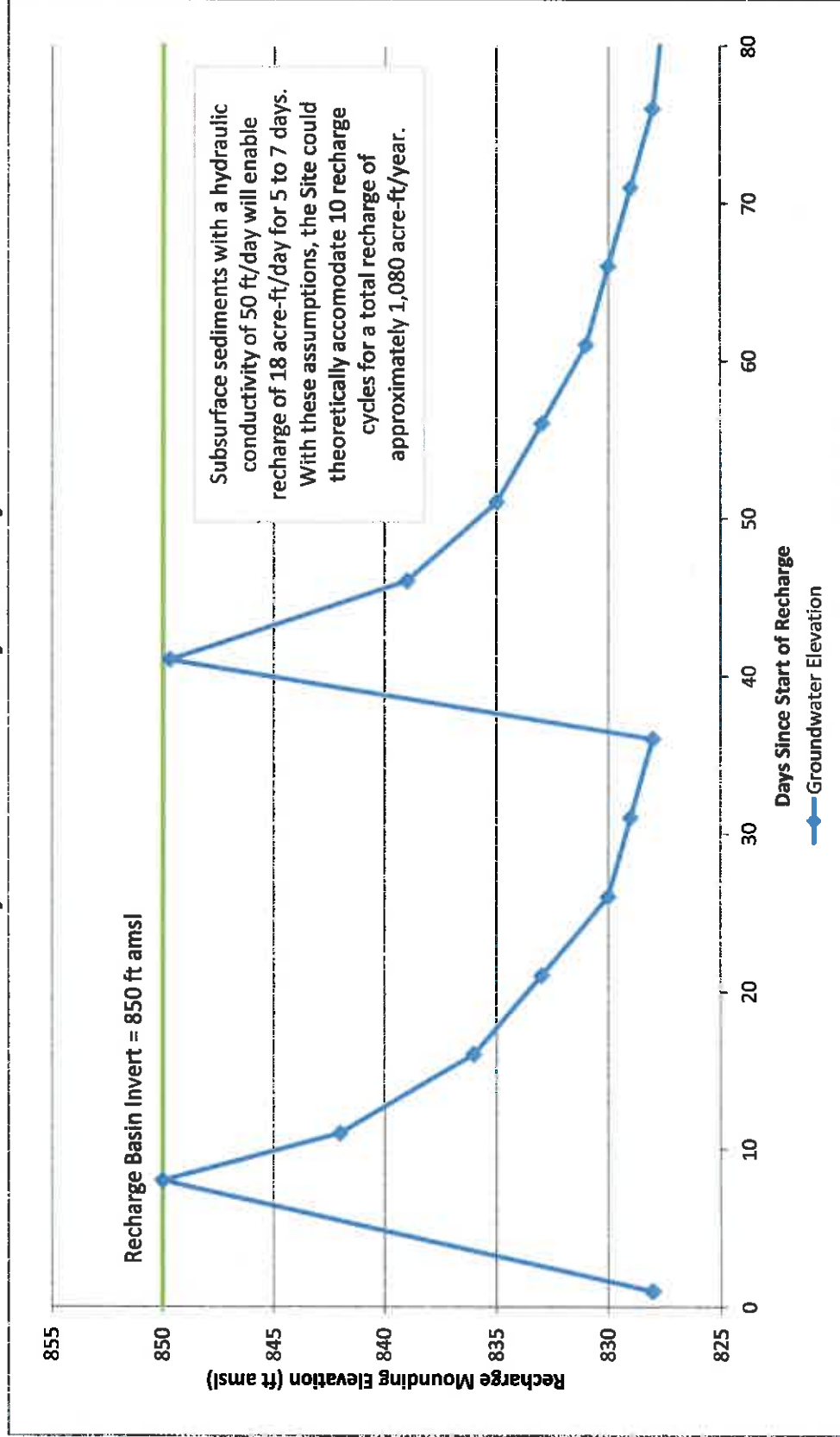


5-Feb-16

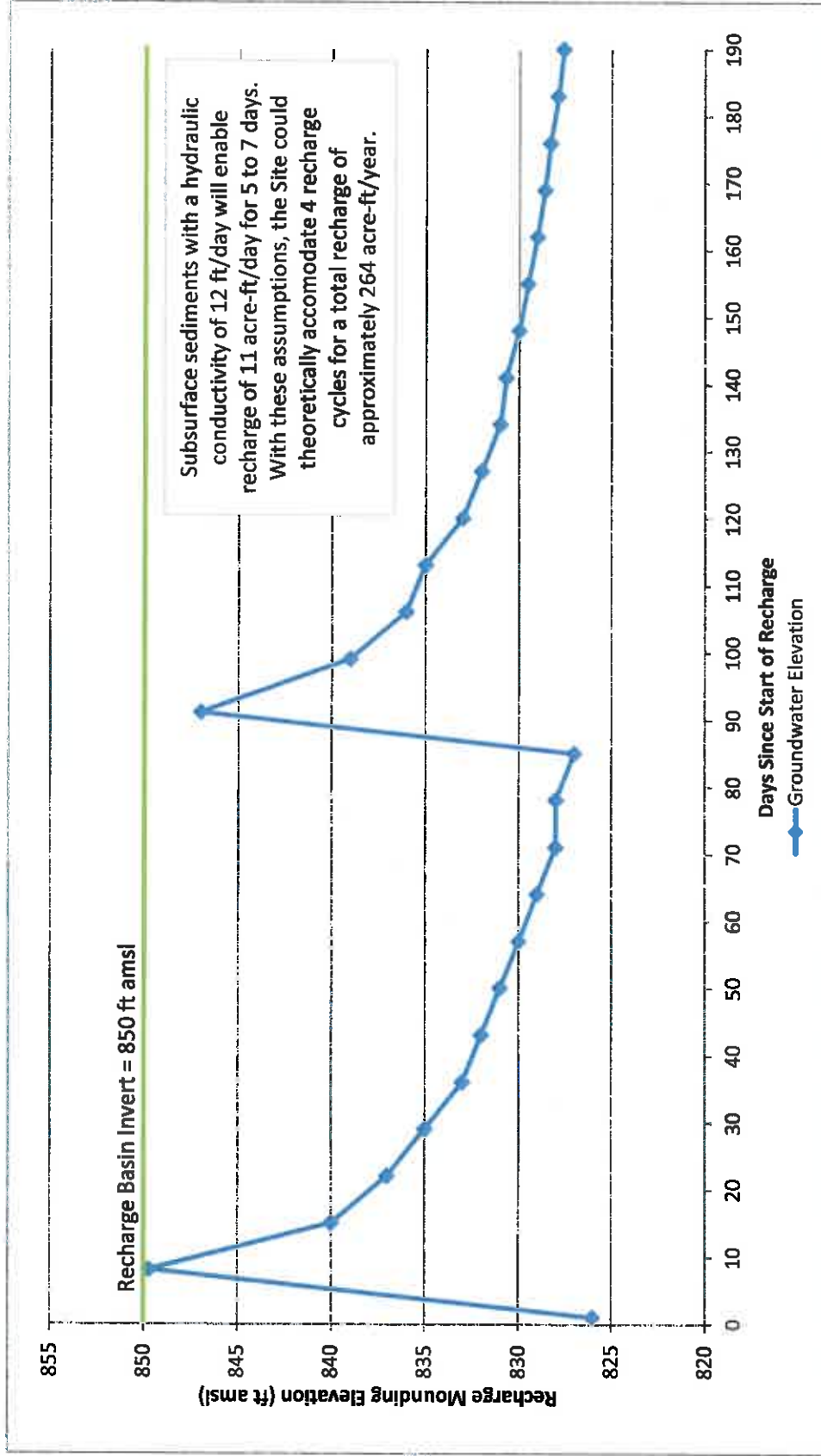
Figure 8

Figure 9

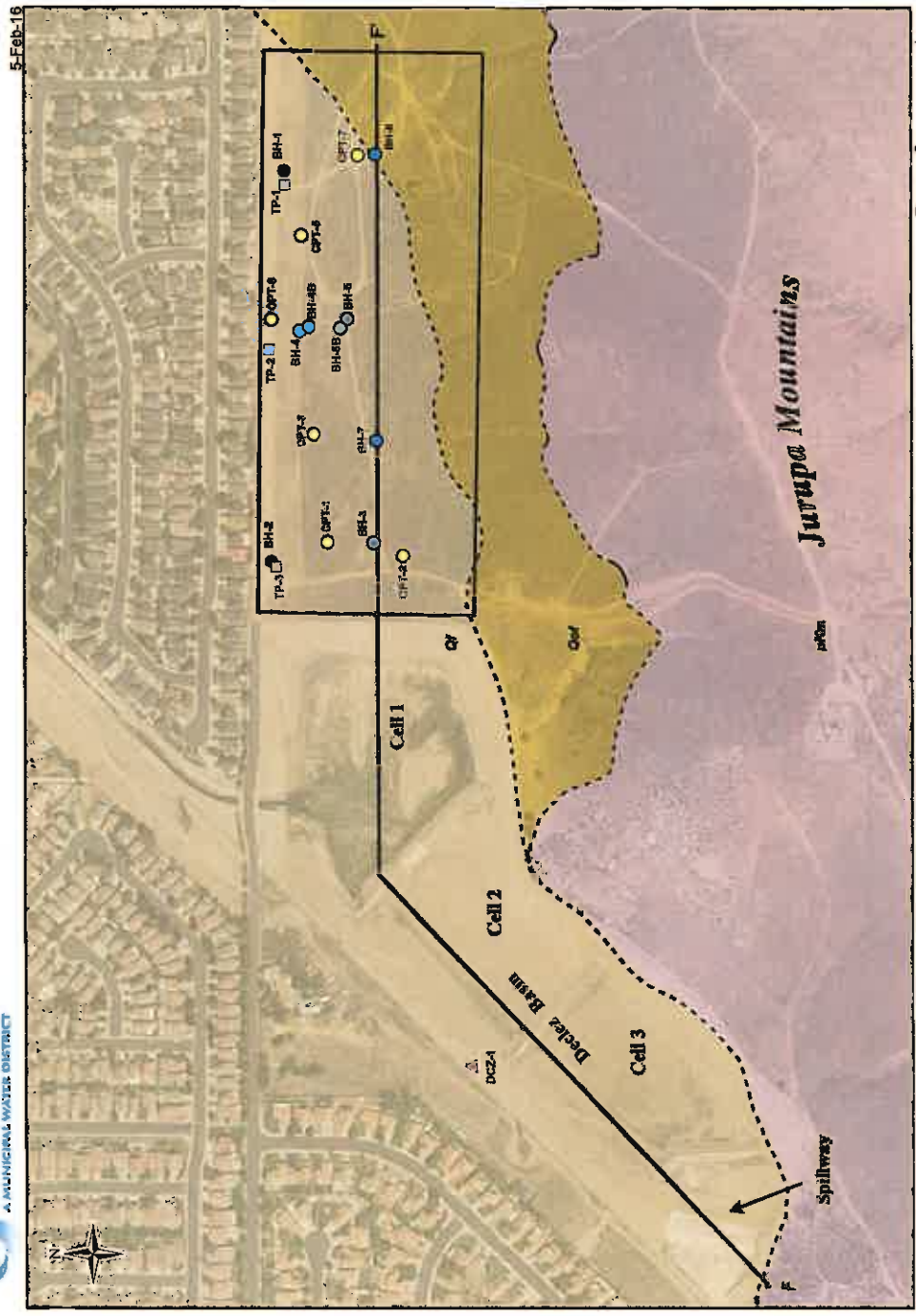
Model-Generated Recharge Scenario Hydrograph
Hydraulic Conductivity = 50 ft/day



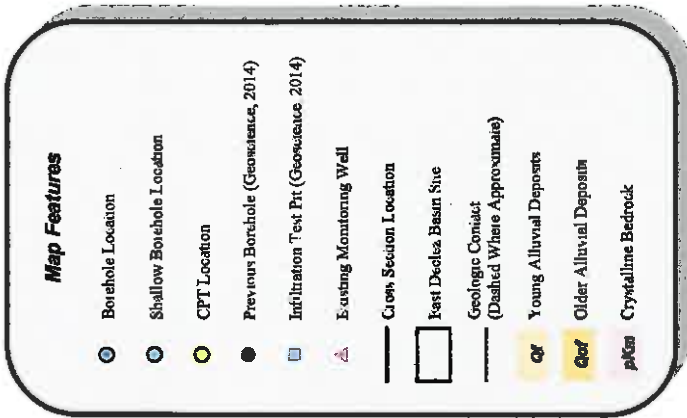
Model-Generated Recharge Scenario Hydrograph
Hydraulic Conductivity = 12 ft/day



**East Declez Basin Improvements
Subsurface Investigation**



Basemap Source: www.esri.com

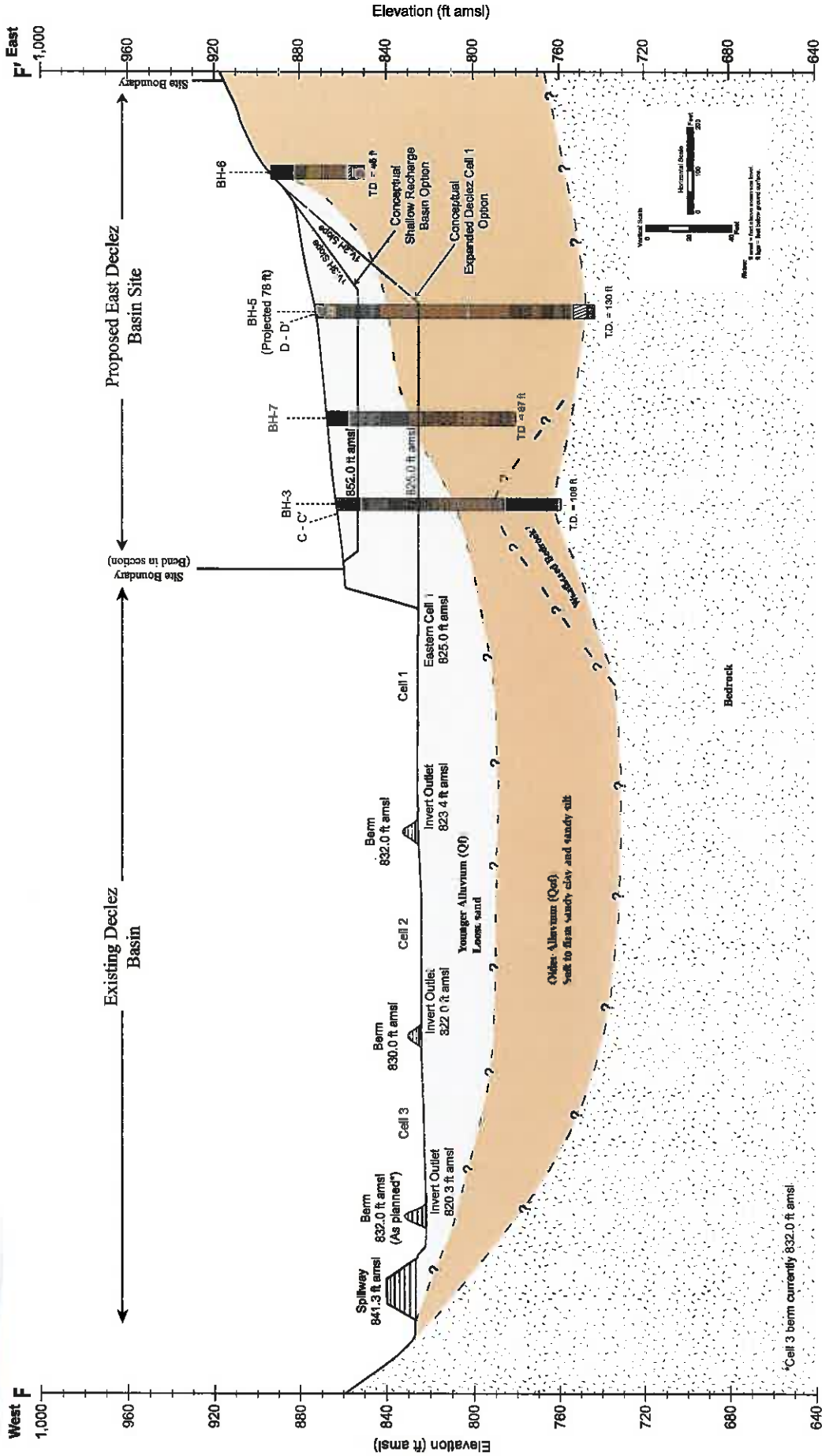


East Declez Basin site boundary from Riverside County Geographic Information Services' Parcel Database <http://gis.rivcoit.org/GISData.aspx>

Geology map from field mapping, September 2015 and modified from Morton and Miller, Geologic Map of the San Bernardino and Santa Ana 30' x 60' quadrangles, USGS Open File Report 2006

**Cross Section Location
F - F'**
Figure 11

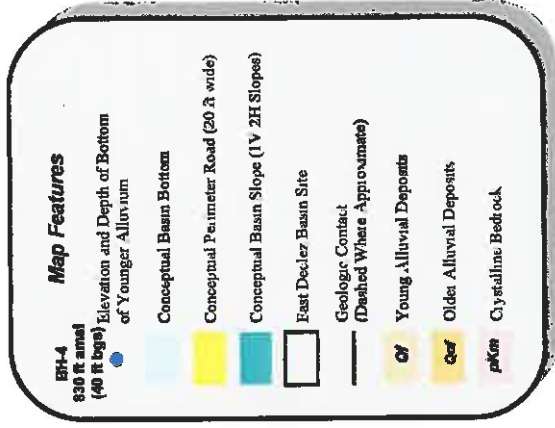
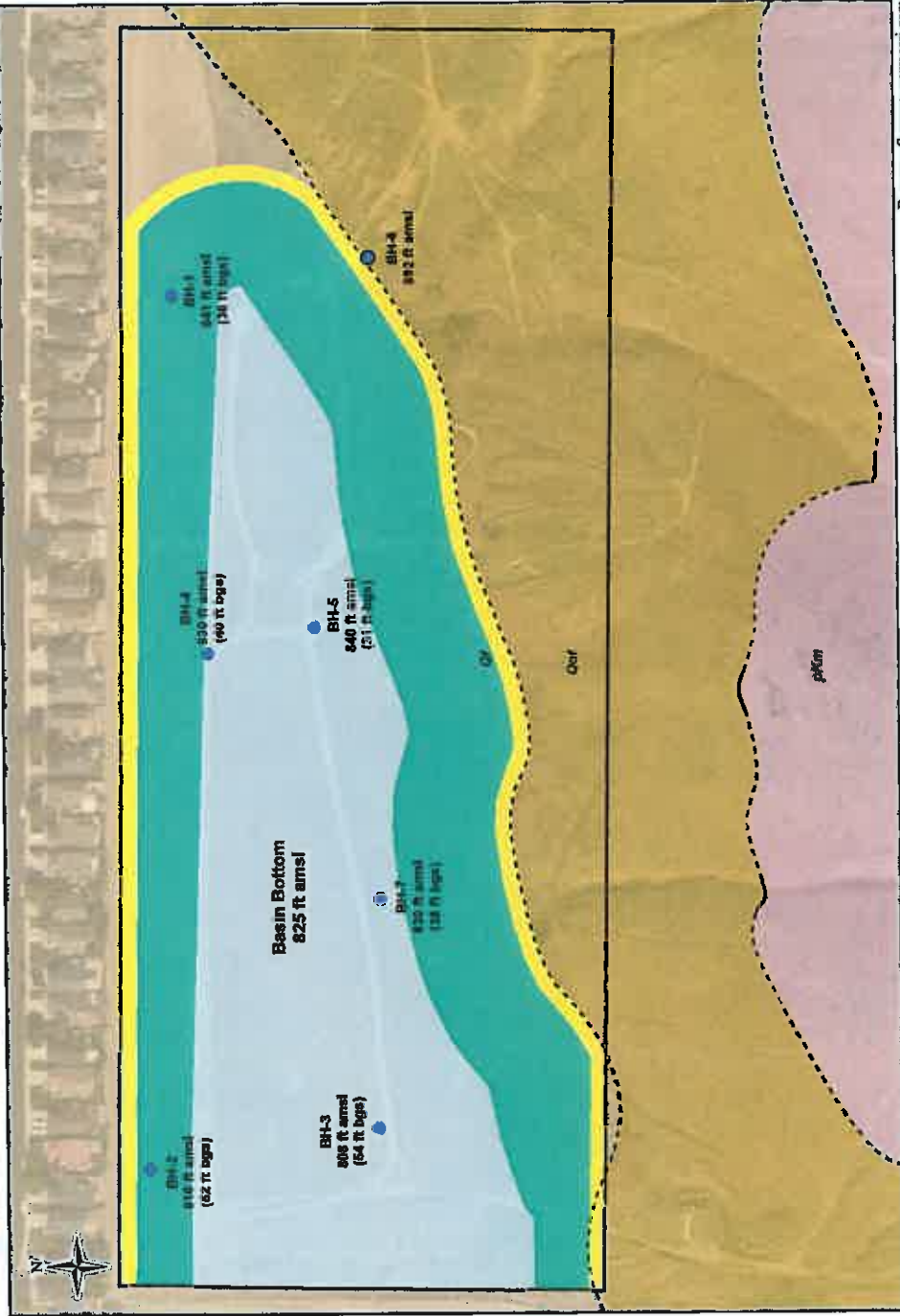
East Declez Basin Improvements Subsurface Investigation



5-Feb-16

Figure 12

**East Declez Basin Improvements
Subsurface Investigation**



East Declez Basin site boundary from Riverside County Geographic Information Services' Parcel Database <http://gis.rivcoit.org/GISData.aspx>

Geology from field mapping, September 2015 and modified from Morton and Miller, Geologic Map of the San Bernardino and Santa Ana 30' x 60' quadrangles, USGS Open File Report 2006

ft amsl = feet above mean sea level
ft bgs = feet below ground surface

**Conceptual Basin Layout -
Expanded Declez Cell 1 Option**
Figure 13

Appendix A

Previous Investigation Borehole Lithologic Logs





Oak Tree Group
Recharge Feasibility
 GEOSCIENCE Project No. 13055-14

LOG OF BORING BH-1

SHEET 1 OF 5

Location	34.033369 -117.493857	Date(s) Drilled	8/26/14 - 8/27/14	Drilling Contractor	ABC Liovin Drilling	Bearing (Azimuth)	NA
Ground Surface Elevation (ft)	882	Logged by	J. Sobolew	Drill Rig Type	CME - 85	Plunge (Degrees)	-90
Horizontal/Vertical Datum	NAD83/NAVD88	Reviewed by	J. Kingsbury	Borehole Diameter (in)	6	Total Depth (ft)	126.5

Depth (ft)	Notes	Sample Information					Geologic Unit	MATERIAL DESCRIPTION
		Core Run No.	Penetration (Graphite)	Type and No.	Blows per 6 in.	Penetration (in)		

0							No Sample
5		R1			60	12	SAND (SW): brown (7.5YR 5/4); 95% fine to medium grained sand, subangular to subrounded; 5% silt; dry sample; very loose.
10		R2			60	12	SILT (ML): brown (7.5YR 5/4); 95% silt; trace fine to coarse gravel up to 11mm, subangular; trace fine to medium grained sand, subangular; dry sample, very loose.
15		R3			60	15	SAND WITH GRAVEL (SP): grayish brown (10YR 5/2); 85% fine to coarse grained sand, angular to subangular; 35% fine to coarse gravel up to 26mm, angular to subangular; trace silt; poorly sorted; dry sample, loose.
20		R4			60	15	@25 ft bgs increase in fine to coarse gravel.
25		R5			60	24	
30							



Oak Tree Group
Recharge Feasibility
 GEOSCIENCE Project No. 13055-14

LOG OF BORING BH-1

SHEET 3 OF 5

Location	34.033369 -117.493857	Date(s) Drilled	8/26/14 - 8/27/14	Drilling Contractor	ABC Liovin Drilling	Bearing (Azimuth)	NA
Ground Surface Elevation (ft)	882	Logged by	J. Sobolew	Drill Rig Type	CME - 85	Plunge (Degrees)	-90
Horizontal/Vertical Datum	NAD83/NAVD88	Reviewed by	J. Kingsbury	Borehole Diameter (in)	6	Total Depth (ft)	126.5

Depth (ft)	Notes	Core Run No.	Sample Information				Geologic Unit	MATERIAL DESCRIPTION
			Penetration (Graphite) Type and No.	Blows per 6 in.	Penetration (in)	Recovery (in)		

60		R12		60	56.4	SAND WITH GRAVEL (SP); red (2.5YR 5/8); 85% fine to coarse grained sand, subangular to subrounded; 15% fine to coarse gravel up to 45mm, subangular to subrounded; trace silt; poorly sorted; contains weathered clasts
65		R13		60	48.48	
70		R14		60	24	SAND WITH GRAVEL (SP); red (2.5YR 5/8); 85% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel, subangular to subrounded; 5% silt; poorly sorted; dense, dry
75		R15		60	6	
80		R16		60	27.96	
85		R17		60	31.5	
90						



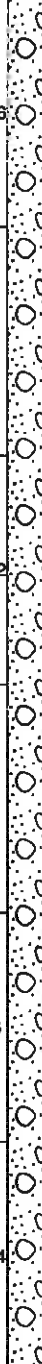
Oak Tree Group
Recharge Feasibility
 GEOSCIENCE Project No. 13055-14

LOG OF BORING BH-1

SHEET 4 OF 5

Location	34.033369 -117.493857	Date(s) Drilled	8/26/14 - 8/27/14	Drilling Contractor	ABC Liovin Drilling	Bearing (Azimuth)	NA
Ground Surface Elevation (ft)	882	Logged by	J. Sobolew	Drill Rig Type	CME - 85	Plunge (Degrees)	-90
Horizontal/Vertical Datum	NAD83/NAVD88	Reviewed by	J. Kingsbury	Borehole Diameter (in)	6	Total Depth (ft)	126.5

Depth (ft)	Notes	Core Run No.	Sample Information				Geologic Unit	MATERIAL DESCRIPTION
			Penetration (Graphs)	Type and No.	Blows per 6 in.	Penetration (in)		

90		R18			60	45.96	 <p>SAND WITH GRAVEL (SP): red (2.5YR 5/8); 85% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel, subangular to subrounded; 5% silt; poorly sorted; dense, dry</p>	
95		R19			60	18		@97 ft bgs large cobble, rig chatter.
100		R20			60	55.92		
105		R21			60	39		
110		R22			60	51.6		@110 ft bgs driller added water.
115		R23			60	32.04		@113 ft bgs fine to coarse grained sand stringer.
120								



Oak Tree Group
Recharge Feasibility
 GEOSCIENCE Project No. 13055-14

LOG OF BORING BH-1

SHEET 5 OF 5

Location	34.033369 -117.493857	Date(s) Drilled	8/26/14 - 8/27/14	Drilling Contractor	ABC Liovin Drilling	Bearing (Azimuth)	NA
Ground Surface Elevation (ft)	882	Logged by	J. Sobolew	Drill Rig Type	CME - 85	Plunge (Degrees)	-90
Horizontal/Vertical Datum	NAD83/NAVD88	Reviewed by	J. Kingsbury	Borehole Diameter (in)	6	Total Depth (ft)	126.5

Depth (ft)	Notes	Core Run No.	Sample Information				Geologic Unit	MATERIAL DESCRIPTION
			Penetration (Graphic)	Type and No.	Blows per 6 in.	Penetration (in)		

120		R24			60	29.52		SAND WITH GRAVEL (SP): red (2.5YR 5/8); 85% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel, subangular to subrounded; 5% silt; poorly sorted; dense, dry
125		R25			18			Decomposing Granite

Total Depth 126.5 FT.



Oak Tree Group
Recharge Feasibility
 GEOSCIENCE Project No. 13055-14

LOG OF BORING BH-2

SHEET 1 OF 7

Location	34.033373 -117.497266	Date(s) Drilled	8/25/14 - 8/26/14	Drilling Contractor	ABC Liovin Drilling	Bearing (Azimuth)	NA
Ground Surface Elevation (ft)	866	Logged by	J. Sobolew	Drill Rig Type	CME - 85	Plunge (Degrees)	-90
Horizontal/Vertical Datum	NAD83/NAVD88	Reviewed by	J. Kingsbury	Borehole Diameter (in)	6	Total Depth (ft)	183

Depth (ft)	Notes	Core Run No.	Sample Information				Geologic Unit	MATERIAL DESCRIPTION	WELL CONSTRUCTION
			Penetration (Graphic)	Type and No.	Blows per 6 In.	Penetration (in)			

0							NO SAMPLE	
5		R1			60	12	SAND (SW): light brownish gray (10YR 6/2); 95% fine grained sand, subangular to subrounded; trace fine gravel up to 6mm, subangular to subrounded; trace silt; dry sample, very loose.	
10		R2			60	8	SAND WITH GRAVEL (SP): light brownish gray (10YR 6/2); 75% fine to coarse grained sand, subangular to subrounded; 25% fine to coarse gravel up to 27mm, subangular to subrounded; trace silt; dry sample; poorly sorted.	
15		R3			60	10	SAND WITH GRAVEL (SP): pale brown (10YR 6/3); 60% fine to coarse grained sand, subangular to subrounded; 35% fine to coarse gravel up to 41mm, subangular to subrounded; 5% silt; dry sample; poorly sorted.	
20		R4			60	22	SILTY SAND WITH GRAVEL (SM): light gray (10YR 7/2); 55% fine to coarse grained sand, subangular to subrounded; 25% silt; 20% fine to coarse gravel up to 20mm, subangular to subrounded; dry sample; poorly sorted.	
25		R5			60	10	SILT (ML): grayish brown (10YR 5/2); 100% silt; trace fine grained sand, subrounded; dry sample.	
30							GRAVEL WITH SAND (GP): light yellowish brown (2.5Y 6/3); 55% fine to coarse gravel up to 47mm, subangular to subrounded; 40% fine to coarse grained sand, subangular to subrounded; 5% silt; dry sample; poorly sorted.	



Oak Tree Group
Recharge Feasibility
 GEOSCIENCE Project No. 13055-14

LOG OF BORING BH-2

SHEET 6 OF 7

Location		34.033373 -117.497266	Date(s) Drilled	8/25/14 - 8/26/14	Drilling Contractor	ABC Liovin Drilling	Bearing (Azimuth)	NA	
Ground Surface Elevation (ft)		866	Logged by	J. Sobolew	Drill Rig Type	CME - 85	Plunge (Degrees)	-90	
Horizontal/Vertical Datum		NAD83/NAVD88	Reviewed by	J. Kingsbury	Borehole Diameter (in)	6	Total Depth (ft)	183	
Depth (ft)	Notes	Core Run No.	Sample Information				Geologic Unit	MATERIAL DESCRIPTION	WELL CONSTRUCTION
			Penetration (Sample)	Type and No.	Blows per 6 in.	Penetration (in)			

150									SANDY SILT (ML): yellowish red (5YR 4/6); 55% silt; 35% fine to coarse grained sand, subangular to subrounded; 10% fine gravel up to 5mm, subangular to subrounded; wet sample. @155 ft bgs increase in fine to coarse grained sand. @158 ft bgs increase in fine to coarse grained sand.
		R30			60	52.08			
155									
		R31			60	54.96			
160									
		R32			60	47.88			
165									
		R33			60	57.96			
170									
		R34			60	47.52			
175									
		R35			60	51			
180									



**Oak Tree Group
Recharge Feasibility
GEOSCIENCE Project No. 13055-14**

LOG OF BORING BH-2

SHEET 7 OF 7

Location:	34.033373 -117.497266	Date(s) Drilled	8/25/14 - 8/26/14	Drilling Contractor	ABC Liovin Drilling	Bearing (Azimuth)	NA
Ground Surface Elevation (ft)	866	Logged by	J. Sobolew	Drill Rig Type	CME - 85	Plunge (Degrees)	-90
Horizontal/Vertical Datum	NAD83/NAVD88	Reviewed by	J. Kingsbury	Borehole Diameter (in)	6	Total Depth (ft)	183

Depth (ft)	Notes	Core Run No.	Sample Information				Geologic Unit	MATERIAL DESCRIPTION	WELL CONSTRUCTION
			Penetration (Graphical)	Type and No.	Blows per 6 in.	Penetration (in)			

180		R36			36	43.66		Decomposed Granite	
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Total Depth 183.0 FT.

Appendix B

Cone Penetrometer Testing Logs

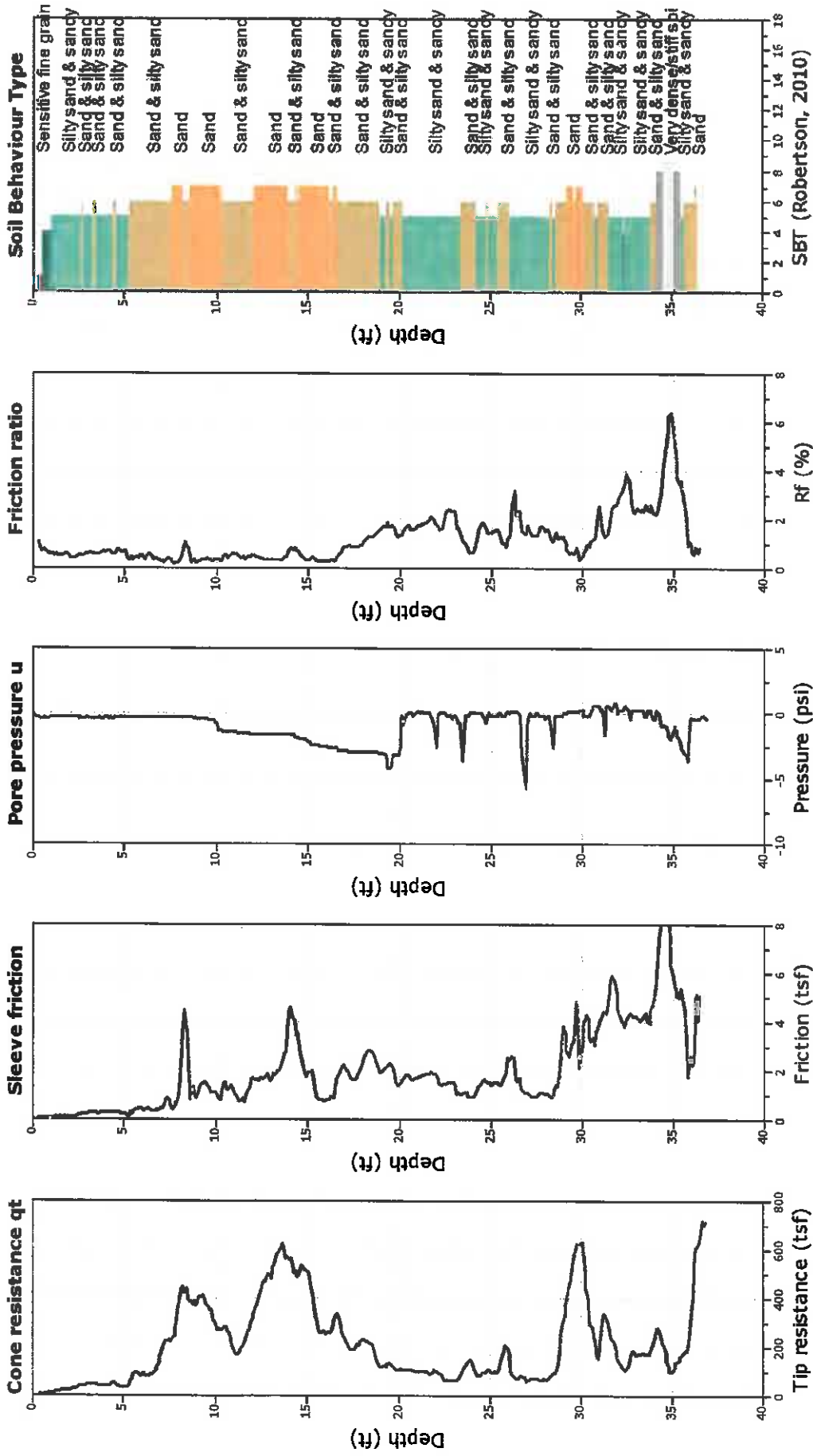




Kehoe Testing and Engineering
 714-901-7270
 rich@kehoetesting.com
 www.kehoetesting.com

Project: Thomas Harder & Company, Inc.
Location: 9998 Philadelphia Ave Mira Loma, CA

CPT: CPT-1
 Total depth: 36.81 ft, Date: 9/22/2015
 Cone Type: Vertek





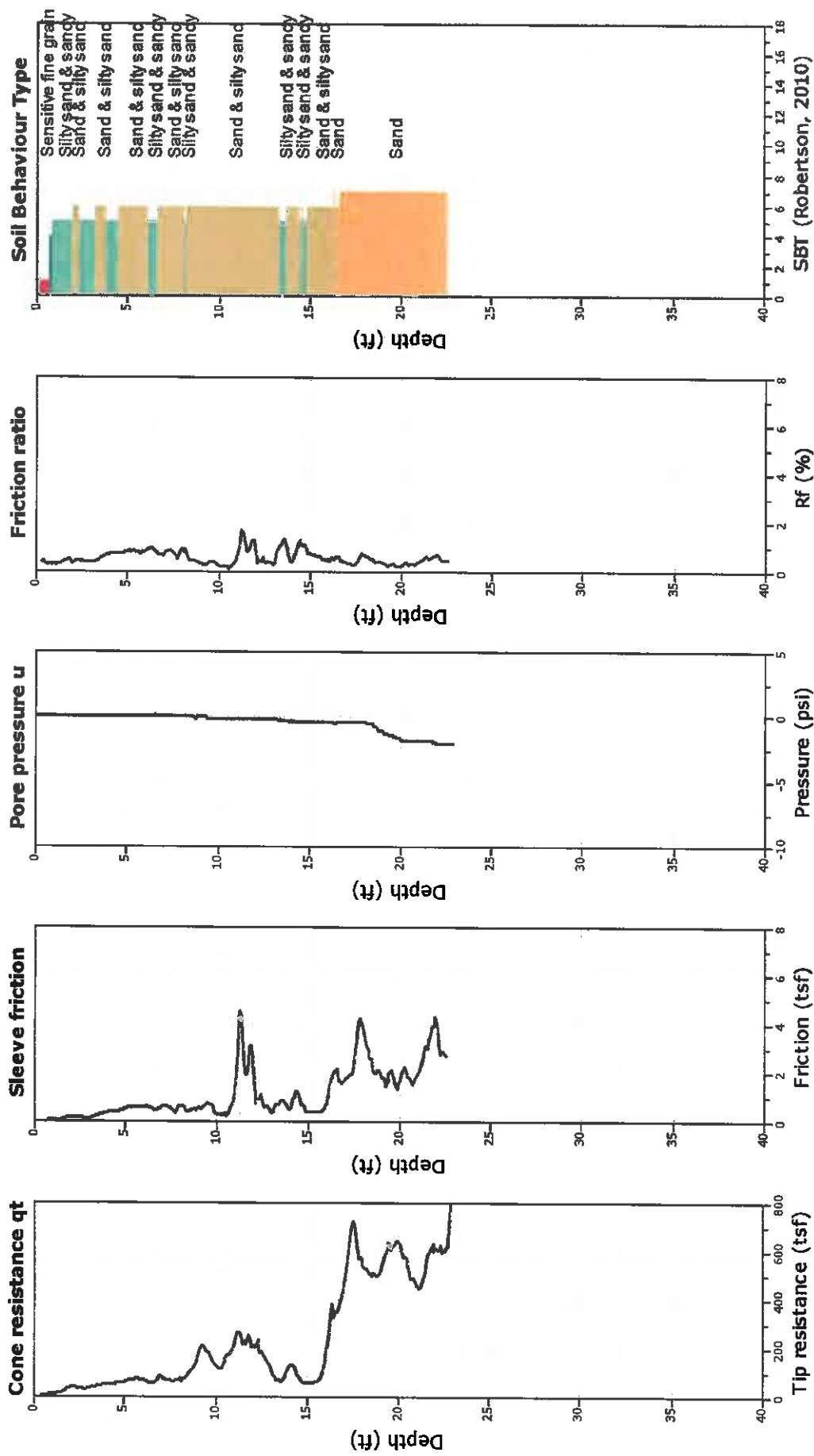
Kehoe Testing and Engineering
714-901-7270
rich@kehoetesting.com
www.kehoetesting.com

Project: Thomas Harder & Company, Inc.
Location: 9998 Philadelphia Ave Mira Loma, CA

CPT: CPT-2

Total depth: 22.90 ft, Date: 9/22/2015

Cone Type: Vertek



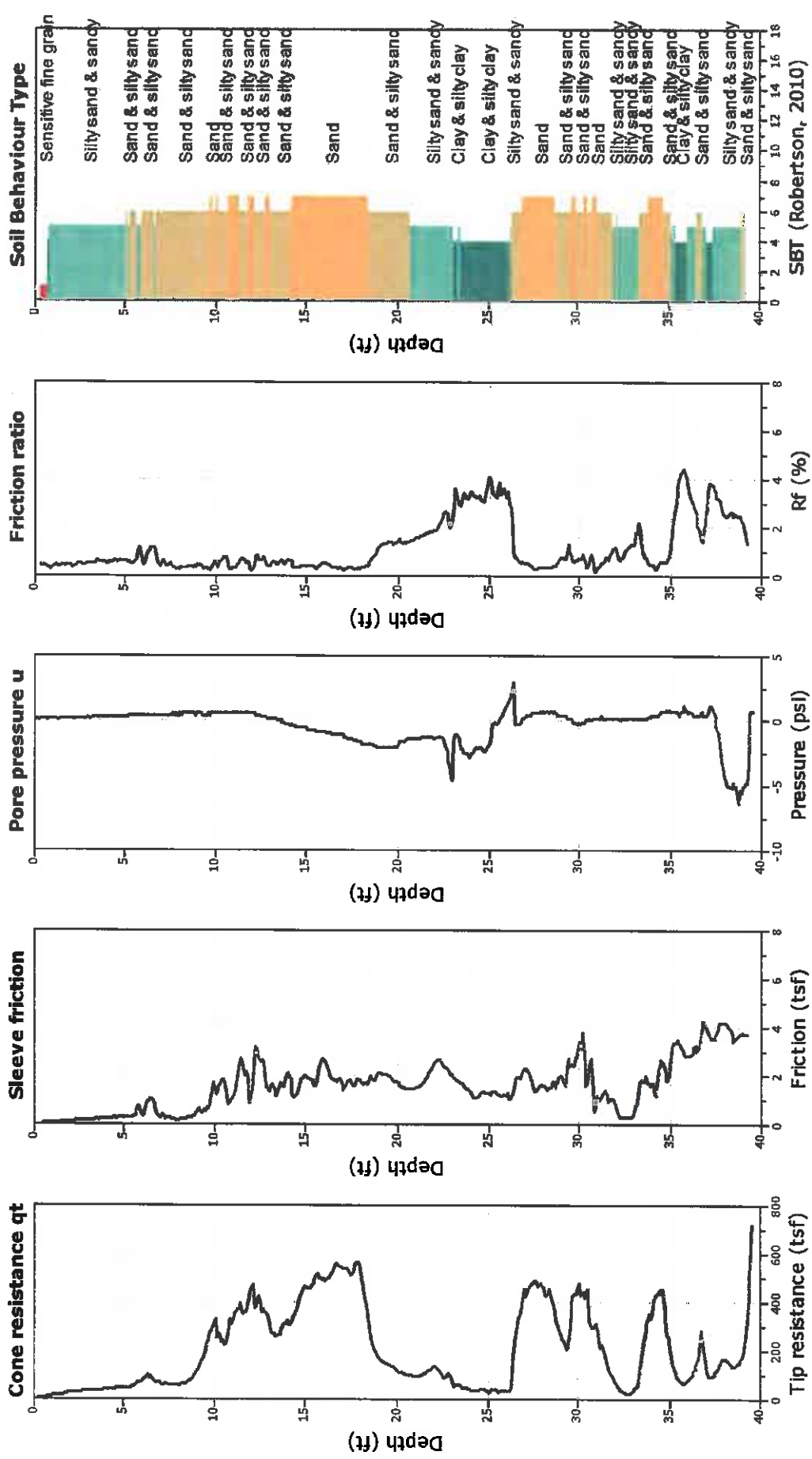


Kehoe Testing and Engineering
 714-901-7270
 rich@kehoetesting.com
 www.kehoetesting.com

Project: Thomas Harder & Company, Inc.
Location: 9998 Philadelphia Ave Mira Loma, CA

CPT: CPT-3

Total depth: 39.56 ft, Date: 9/22/2015
 Cone Type: Vertek

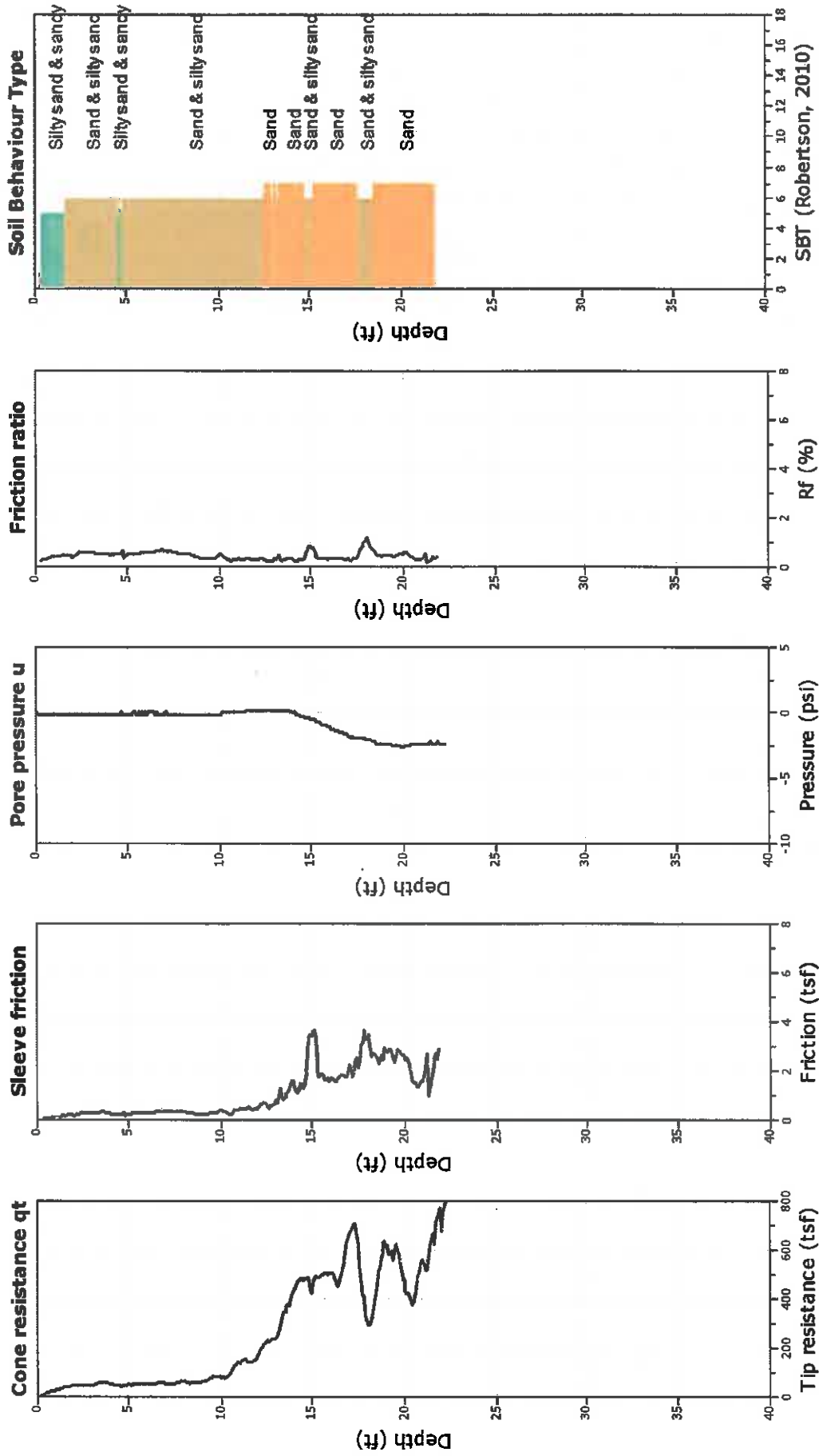




Kehoe Testing and Engineering
714-901-7270
rich@kehoetesting.com
www.kehoetesting.com

Project: Thomas Harder & Company, Inc.
Location: 9998 Philadelphia Ave Mira Loma, CA

CPT: CPT-5
Total depth: 22.23 ft, Date: 9/22/2015
Cone Type: Vertek





Kehoe Testing and Engineering

714-901-7270

rich@kehoetesting.com

www.kehoetesting.com

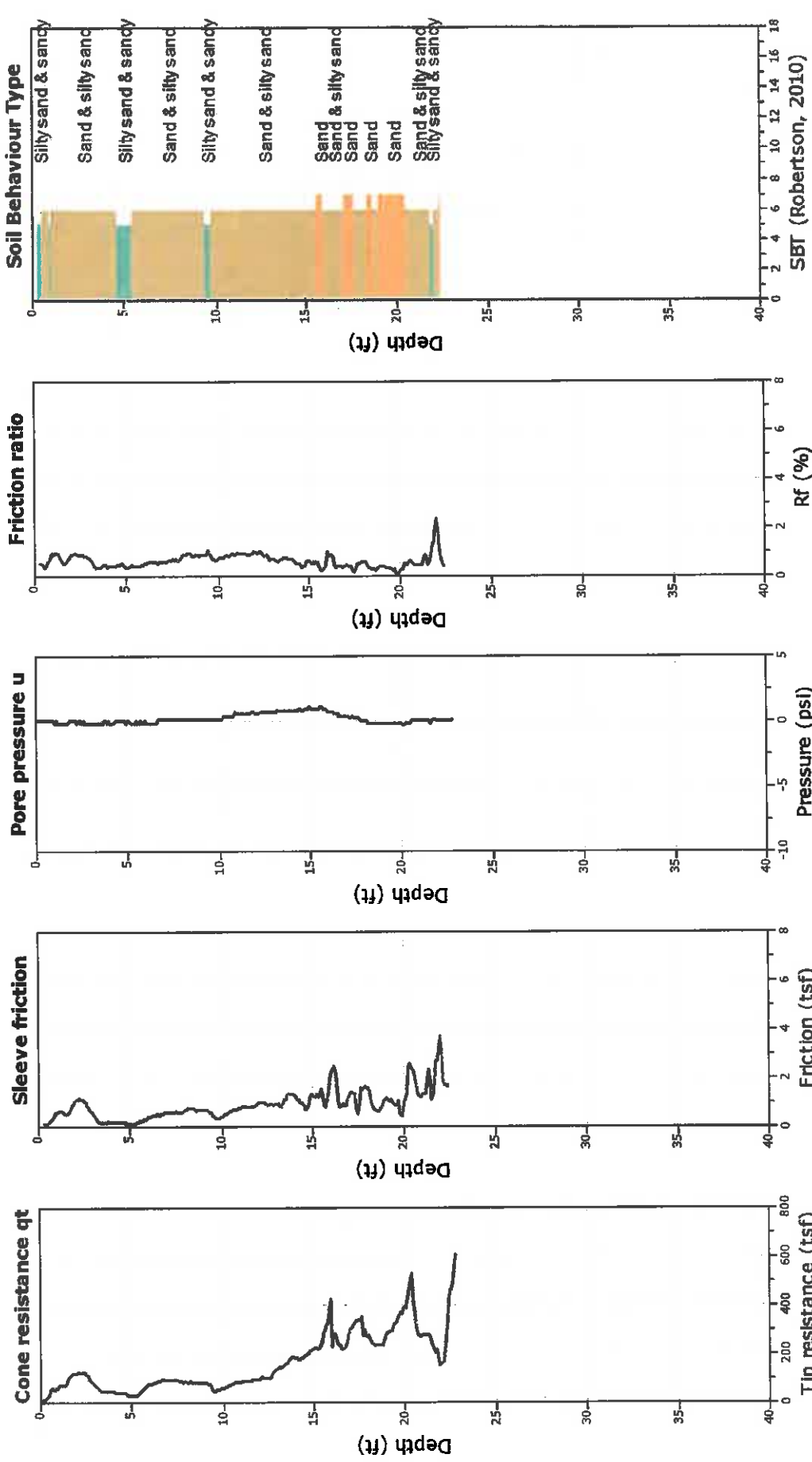
Project: Thomas Harder & Company, Inc.

Location: 9998 Philadelphia Ave Mira Loma, CA

CPT: CPT-7

Total depth: 22.80 ft, Date: 9/22/2015

Cone Type: Vertek



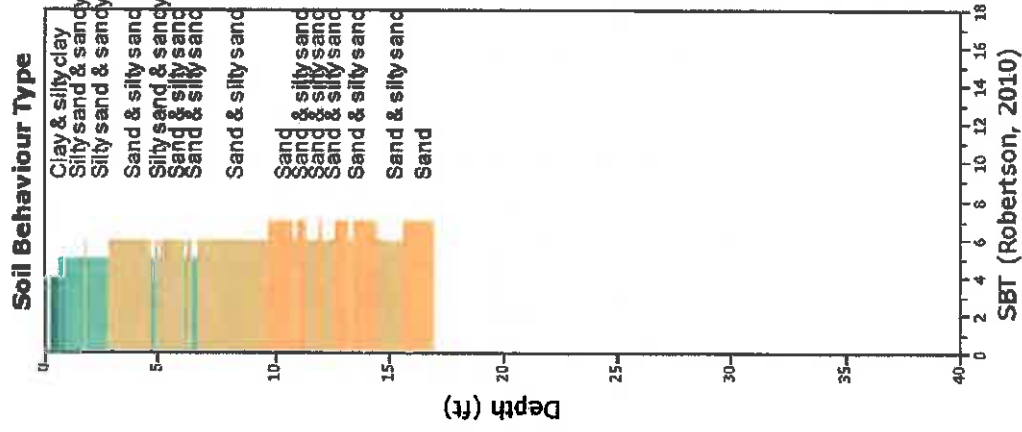
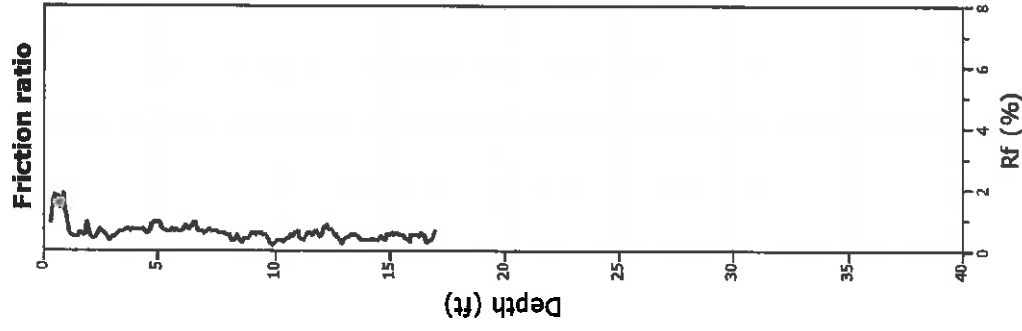
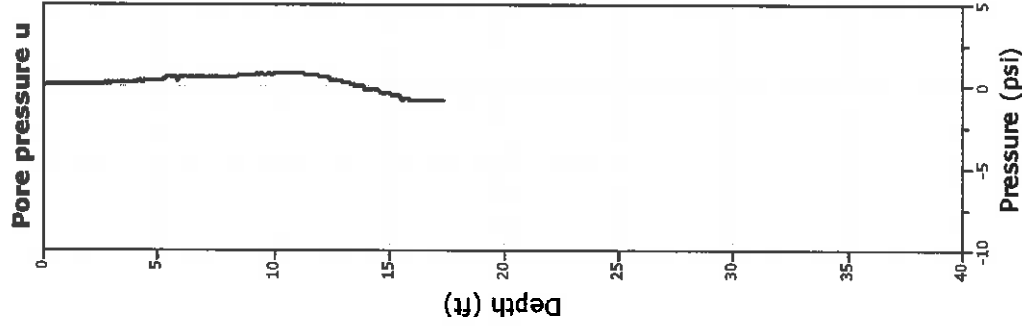
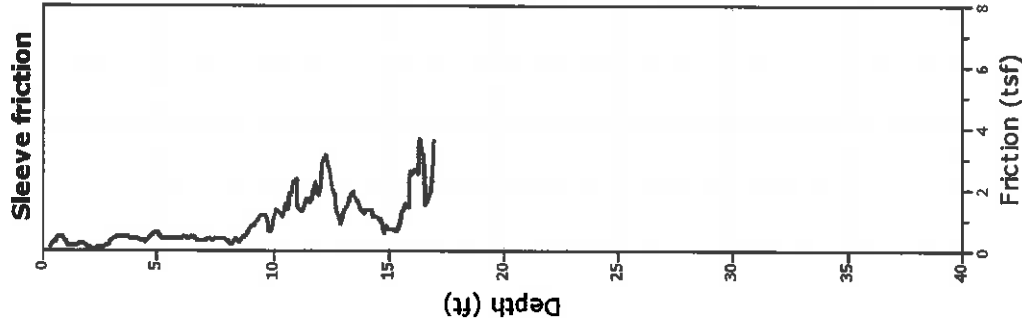
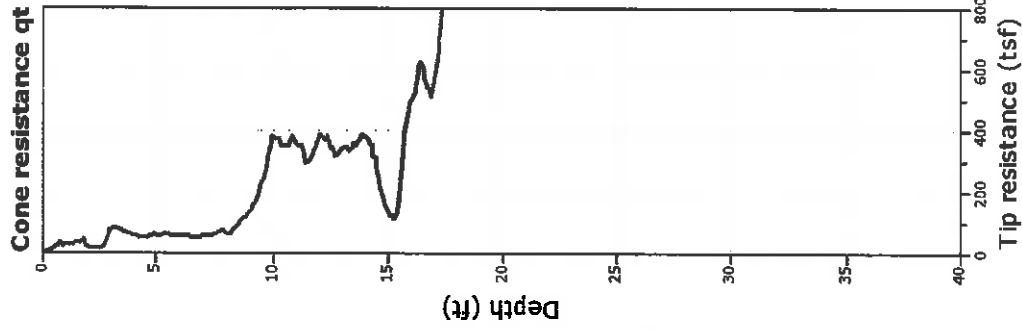


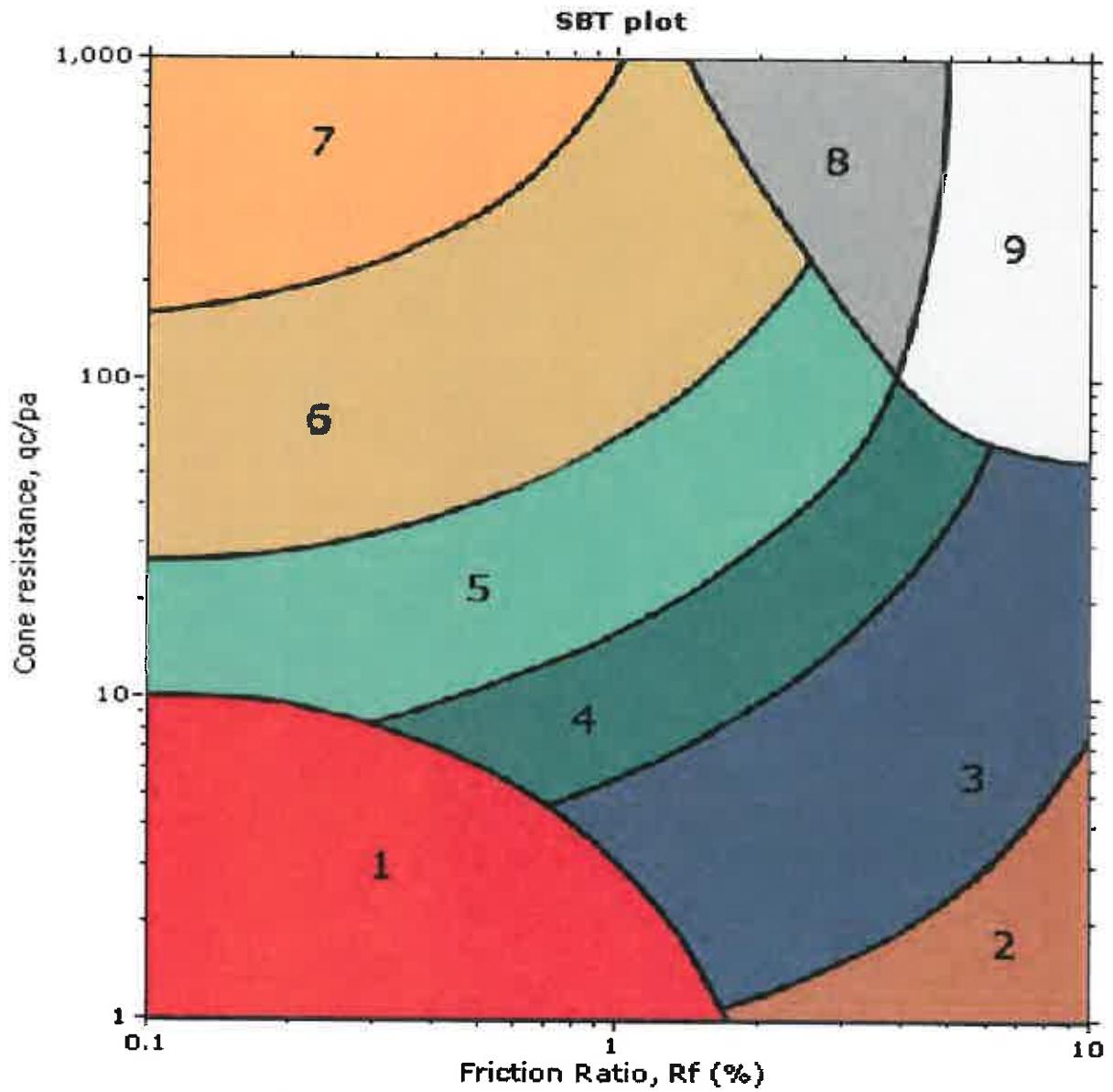
Khoe Testing and Engineering
714-901-7270
rich@kchoetesting.com
www.kchoetesting.com

Project: Thomas Harder & Company, Inc
Location: 9998 Philadelphia Ave Mira Loma, CA

CPT: CPT-8

Total depth: 17.37 ft, Date: 9/22/2015
Cone Type: Vertek





SBT legend

- | | | |
|---------------------------|------------------------------|-----------------------------------|
| 1. Sensitive fine grained | 4. Clayey silt to silty clay | 7. Gravely sand to sand |
| 2. Organic material | 5. Silty sand to sandy silt | 8. Very stiff sand to clayey sand |
| 3. Clay to silty clay | 6. Clean sand to silty sand | 9. Very stiff fine grained |

Appendix C

Soil Physical Properties Testing Laboratory Reports





8100 Secura Way • Santa Fe Springs, CA 90670
Telephone (562) 347-2500 • Fax (562) 907-3610

November 2, 2015

Benjamin Lewis
Thomas Harder & Co.
1260 N. Hancock St., Suite 109
Anaheim, CA 92807

Re: PTS File No: 45627
Physical Properties Data
East Declez

Dear Mr. Lewis:

Please find enclosed report for Physical Properties analyses conducted upon samples received from your East Declez project. All analyses were performed by applicable ASTM, EPA, or API methodologies. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal, or return of the samples.

PTS Laboratories Inc. appreciates the opportunity to be of service. If you have any questions or require additional information, please contact Morgan Richards at (562) 347-2509.

Sincerely,
PTS Laboratories, Inc.

Michael Mark Brady, P.G.
Laboratory Director

Encl.

Project Name: East Declez
Project Number: N/A

PTS File No: 45627
Client: Thomas Harder & Co.

TEST PROGRAM - 20151015

CORE ID	Depth ft.	Cora Recovery fl.	Hydraulic		Effective Porosity Mod. ASTM D425 Vert. 1.5"	Dry Bulk Density API RP40 Vert. 1.5"	Grain Size Analysis ASTM D422 Grab	Comments
			API RP40/EPA 9100 Vert. 1.5"	API RP40/EPA 9100 Horiz. 1.5"				
Date Received: 20151015								
BH-3	56-56.5	0.50	X	X				
BH-4	52.5-53	0.50	X	X				
BH-4B	21-21.5	0.50	X	X	X	X	X	
BH-5B	21-21.5	0.50	X	X	X	X	X	
BH-5	76-76.5	0.50	X	X				
BH-6	44.5-45	0.50	X	X				
TOTALS:	6 Cores	3.00	6	6	2	2	2	6

Laboratory Test Program Notes

Contaminant Identification: _____

Standard TAT for basic analysis is 10 business days.

Effective Porosity: Includes Total Porosity.

ASTM D422: Dry Sieve only, Hydrometer analysis must be requested prior to initiating tests. Additional costs would apply.

PTS File No: 45627
 Client: Thomas Harder & Co.
 Report Date: 11/02/15

PHYSICAL PROPERTIES DATA - DRAINAGE (EFFECTIVE) POROSITY

Project Name: East Declez
 Project No: N/A

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	METHODS:			
				API RP 40 / ASTM D2216 MOISTURE CONTENT, % weight	API RP40 DENSITY BULK, g/cc	Mod. ASTM D425 TOTAL POROSITY (2), %Vb	Mod. ASTM D425 EFFECTIVE POROSITY, %Vb
BH-4B	21.3	V	20151026	--	1.77	20.9	15.7
BH-5B	21.3	V	20151026	--	1.83	20.0	15.6

(1) Sample Orientation: H = horizontal; V = vertical; R = remold

(2) Total Porosity = all interconnected pore channels.

Vb = Bulk Volume, cc; ND = Not Detected

PTS File No: 45627
 Client: Thomas Harder & Co.
 Report Date: 11/02/15

PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY

(Methodology: API RP 40; EPA 9100)

Project Name: East Declez
 Project No: N/A

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	25 PSI CONFINING STRESS		
				EFFECTIVE PERMEABILITY TO WATER (2,3), millidarcy	HYDRAULIC CONDUCTIVITY (3), cm/s	INTRINSIC PERMEABILITY TO WATER (3), cm ²
BH-3	56.3	V	20151027	2.63	2.66E-06	2.59E-11
BH-4	52.8	V	20151027	2.07	2.10E-06	2.05E-11
BH-4B	21.3	V	20151027	76.7	7.75E-05	7.57E-10
BH-5B	21.3	V	20151027	78.5	7.98E-05	7.75E-10
BH-5	76.3	V	20151027	3.91	4.02E-06	3.86E-11
BH-6	44.8	V	20151028	2.99	3.01E-06	2.95E-11

(1) Sample Orientation: H = horizontal; V = vertical; R = remold
 (2) Effective (Native) = With as-received pore fluids in place.
 (3) Permeability to water and hydraulic conductivity measured at saturated conditions.
 Water = filtered Laboratory Fresh (tap) or Site water.

PTS File No: 45627
 Client: Thomas Harder & Co.
 Report Date: 11/02/15

PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY
 (Methodology: API RP 40; EPA 9100)

Project Name: East Declez
 Project No: N/A

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	25 PSI CONFINING STRESS		
				EFFECTIVE PERMEABILITY TO WATER (2,3), millidarcy	HYDRAULIC CONDUCTIVITY (3), cm/s	INTRINSIC PERMEABILITY TO WATER (3), cm ²
BH-3	56.45	H	20151028	3.01	3.07E-06	2.98E-11
BH-4	52.95	H	20151028	2.40	2.43E-06	2.37E-11
BH-4B	21.45	H	20151028	81.8	8.35E-05	8.07E-10
BH-5B	21.45	H	20151028	464	4.70E-04	4.58E-09
BH-5	76.45	H	20151028	4.27	4.29E-06	4.21E-11
BH-6	44.95	H	20151028	5.71	5.78E-06	5.64E-11

(1) Sample Orientation: H = horizontal; V = vertical; R = remold
 (2) Effective (Native) = With as-received pore fluids in place.
 (3) Permeability to water and hydraulic conductivity measured at saturated conditions.
 Water = filtered Laboratory Fresh (tap) or Site water.

PARTICLE SIZE SUMMARY
(METHODOLOGY: ASTM D422M)

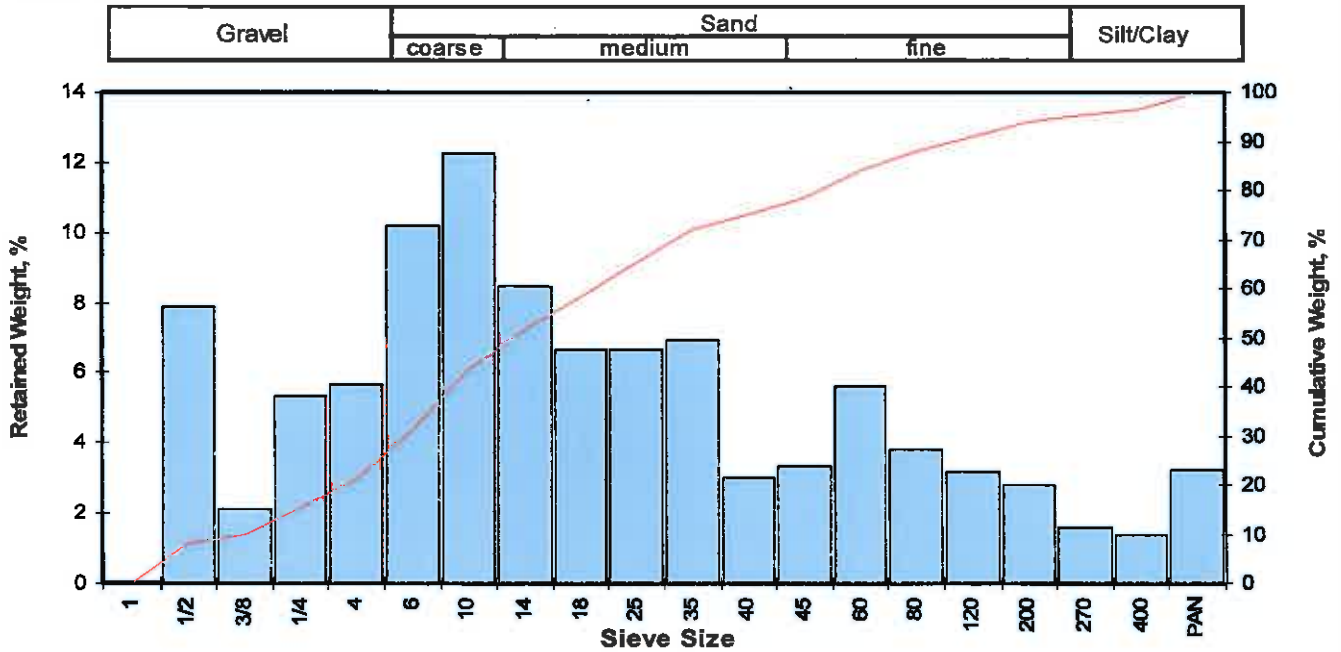
PROJECT NAME: East Declez
PROJECT NO: N/A

Sample ID	Depth, ft.	Mean Grain Size Description USCS/ASTM (1)	Median Grain Size, mm	Particle Size Distribution, wt. percent				
				Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt/Clay
BH-4B	21.1	Coarse sand	1.526	20.97	22.42	31.73	18.75	6.14
BH-5B	21.1	Coarse sand	1.901	26.27	22.51	29.16	14.95	7.11

(1) Based on Mean from Trask

Client: Thomas Harder & Co.
 Project: East Declez
 Project No: N/A

PTS File No: 45627
 Sample ID: BH-4B
 Depth, ft: 21.1



Opening		Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
Inches	Millimeters					
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	15.54	7.85	7.85
0.3740	9.500	-3.25	3/8	4.15	2.10	9.95
0.2500	6.351	-2.67	1/4	10.57	5.34	15.29
0.1873	4.757	-2.25	4	11.22	5.67	20.97
0.1324	3.364	-1.75	6	20.15	10.18	31.15
0.0787	2.000	-1.00	10	24.21	12.24	43.39
0.0557	1.414	-0.50	14	16.76	8.47	51.86
0.0394	1.000	0.00	18	13.15	6.65	58.50
0.0278	0.707	0.50	25	13.16	6.65	65.16
0.0197	0.500	1.00	35	13.74	6.94	72.10
0.0166	0.420	1.25	40	5.97	3.02	75.12
0.0139	0.354	1.50	45	6.63	3.35	78.47
0.0098	0.250	2.00	60	11.12	5.62	84.09
0.0070	0.177	2.50	80	7.53	3.81	87.89
0.0049	0.125	3.00	120	6.24	3.15	91.05
0.0029	0.074	3.75	200	5.57	2.82	93.86
0.0021	0.053	4.25	270	3.10	1.57	95.43
0.0015	0.037	4.75	400	2.69	1.36	96.79
			PAN	6.35	3.21	100.00
TOTALS				197.85	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	-4.01	0.6332	16.082
10	-3.24	0.3727	9.486
16	-2.62	0.2412	6.127
25	-2.05	0.1633	4.147
40	-1.21	0.0909	2.309
50	-0.61	0.0601	1.526
60	0.11	0.0364	0.925
75	1.24	0.0167	0.423
84	1.99	0.0099	0.251
90	2.83	0.0055	0.140
95	4.11	0.0023	0.058

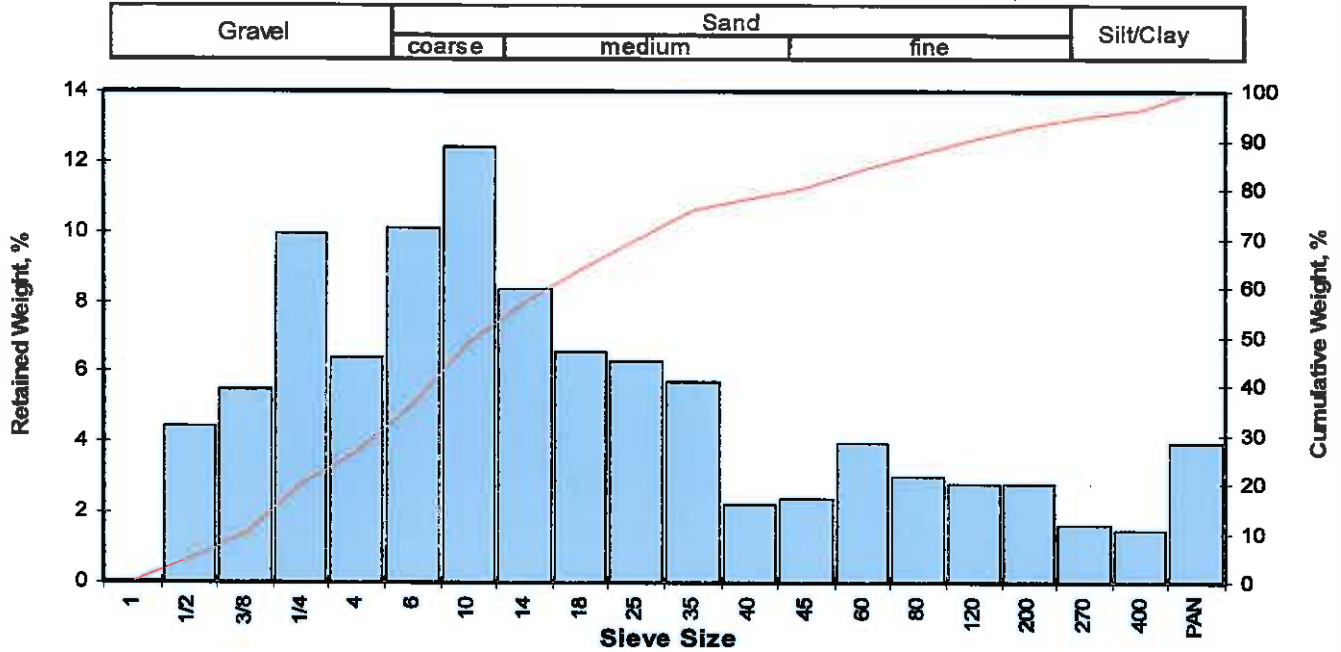
Measure	Trask	Inman	Folk-Ward
Median, phi	-0.61	-0.61	-0.61
Median, in.	0.0601	0.0601	0.0601
Median, mm	1.526	1.526	1.526
Mean, phi	-1.19	-0.31	-0.41
Mean, in.	0.0900	0.0489	0.0523
Mean, mm	2.285	1.241	1.330
Sorting	3.130	2.304	2.382
Skewness	0.868	0.129	0.146
Kurtosis	0.200	0.762	1.011

Grain Size Description (ASTM-USCS Scale) Coarse sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	20.97
Coarse Sand	10	22.42
Medium Sand	40	31.73
Fine Sand	200	18.75
Silt/Clay	<200	6.14
Total		100

Client: Thomas Harder & Co.
 Project: East Declez
 Project No: N/A

PTS File No: 45627
 Sample ID: BH-5B
 Depth, ft: 21.1




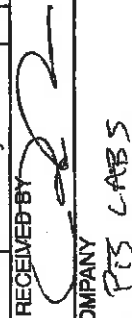
Opening		Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
Inches	Millimeters					
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	9.12	4.45	4.45
0.3740	9.500	-3.25	3/8	11.24	5.49	9.94
0.2500	6.351	-2.67	1/4	20.33	9.93	19.87
0.1873	4.757	-2.25	4	13.11	6.40	26.27
0.1324	3.364	-1.75	6	20.64	10.08	36.35
0.0787	2.000	-1.00	10	25.46	12.43	48.78
0.0557	1.414	-0.50	14	17.11	8.35	57.13
0.0394	1.000	0.00	18	13.47	6.58	63.71
0.0278	0.707	0.50	25	12.86	6.28	69.99
0.0197	0.500	1.00	35	11.73	5.73	75.71
0.0166	0.420	1.25	40	4.56	2.23	77.94
0.0139	0.354	1.50	45	4.84	2.36	80.30
0.0098	0.250	2.00	60	8.10	3.95	84.26
0.0070	0.177	2.50	80	6.19	3.02	87.28
0.0049	0.125	3.00	120	5.78	2.82	90.10
0.0029	0.074	3.75	200	5.71	2.79	92.89
0.0021	0.053	4.25	270	3.38	1.65	94.54
0.0015	0.037	4.75	400	3.07	1.50	96.04
			PAN	8.11	3.96	100.00
TOTALS				204.81	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	-3.60	0.4789	12.164
10	-3.24	0.3731	9.478
16	-2.89	0.2925	7.430
25	-2.33	0.1983	5.037
40	-1.53	0.1137	2.887
50	-0.93	0.0748	1.901
60	-0.28	0.0479	1.216
75	0.94	0.0206	0.522
84	1.97	0.0101	0.256
90	2.98	0.0050	0.127
95	4.40	0.0019	0.047

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.93	-0.93	-0.93
Median, in.	0.0748	0.0748	0.0748
Median, mm	1.901	1.901	1.901
Mean, phi	-1.47	-0.46	-0.62
Mean, in.	0.1094	0.0543	0.0604
Mean, mm	2.780	1.378	1.534
Sorting	3.106	2.430	2.428
Skewness	0.853	0.191	0.261
Kurtosis	0.241	0.847	1.004

Grain Size Description (ASTM-USCS Scale) Coarse sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	26.27
Coarse Sand	10	22.51
Medium Sand	40	29.16
Fine Sand	200	14.95
Silt/Clay	<200	7.11
Total		100

COMPANY THOMAS HARDER AND COMPANY CITY SUITE ZIP CODE 1260 N. LINCOLN ST., ANAHEIM, CA, 109 92807 PROJECT MANAGER email BEN LEWIS b.lewis@thomasharder.com PROJECT NAME PHONE NUMBER East Decade 714-779-3875 PROJECT NUMBER FAX NUMBER - -		ANALYSIS REQUEST NUMBER OF SAMPLES SOIL PROPERTIES PACKAGE HYDRAULIC CONDUCTIVITY PACKAGE PORE FLUID SATURATIONS PACKAGE THERMOGRAVIMETRIC ANALYSIS PACKAGE CAPILLARITY PACKAGE FLUID PROPERTIES PACKAGE PHOTOLOG: CORE PHOTOGRAPHY VAPOR TRANSPORT PACKAGE POROSITY: TOTAL AIR FILLED, WATER FILLED POROSITY: EFFECTIVE, ASTM D425M SPECIFIC GRAVITY, ASTM D854 BULK DENSITY (DRY), API RP40 or ASTM D2937 AIR PERMEABILITY, API RP40 HYDRAULIC CONDUCTIVITY, EPA8100/API RP40 or D5084 GRAIN SIZE DISTRIBUTION, ASTM D422 or 4494M TOC: WALKLEY-BLACK ATTERBERG LIMITS, ASTM D4318 VAPOR INTRUSION PACKAGE FREE PRODUCT MOBILITY PACKAGE												PO# TURNAROUND TIME 24 HOURS <input type="checkbox"/> 5 DAYS <input type="checkbox"/> 72 HOURS <input type="checkbox"/> NORMAL <input checked="" type="checkbox"/> OTHER: SAMPLE INTEGRITY (CHECK): INTACT <input checked="" type="checkbox"/> TEMP (F) 56 PTS QUOTE NO. PTS FILE: 45627 COMMENTS		
SITE LOCATION SAMPLER SIGNATURE																
SAMPLE ID	DATE	TIME	DEPTH, FT													
BH-3																
BH-4																
BH-4B																
BH-5B																
BH-5																
BH-6																
1. RELINQUISHED BY  COMPANY THOMAS HARDER + CO. DATE TIME 10/15/15 11:00 AM		2. RECEIVED BY  COMPANY PTS LABS DATE TIME 10/15/15 11:00		3. RELINQUISHED BY COMPANY DATE TIME												4. RECEIVED BY COMPANY DATE TIME



8100 Secura Way • Santa Fe Springs, CA 90670
Telephone (562) 347-2500 • Fax (562) 907-3610

November 23, 2015

Benjamin Lewis
Thomas Harder & Co.
1260 N. Hancock St., Suite 109
Anaheim, CA 92807

Re: PTS File No: 45627
Physical Properties Data – selected test reruns
East Declez

Dear Mr. Lewis:

Please find enclosed report for Physical Properties analyses conducted upon samples received from your East Declez project. This report covers the retesting made at your request on samples BH-4B and BH-5B; hydraulic conductivity was remeasured on the two samples and total porosity was measured using Helium porosimetry via Boyle's Law principle of gas expansion.

PTS Laboratories Inc. appreciates the opportunity to be of service. If you have any questions or require additional information, please contact Morgan Richards at (562) 347-2509.

Sincerely,
PTS Laboratories, Inc.

Michael Mark Brady, P.G.
Laboratory Director

Encl.

PTS File No: 45627
 Client: Thomas Harder & Co.
 Report Date: 11/23/15

PHYSICAL PROPERTIES DATA

Project Name: East Declez
 Project No: N/A

SAMPLE ID.	DEPTH, ft.	METHODS: SAMPLE ORIENTATION (1)	MOISTURE CONTENT, % weight	API RP 40 / ASTM D2216		API RP 40		
				DENSITY		POROSITY, %Vb (2)		
				DRY BULK, g/cc	GRAIN, g/cc	TOTAL	AIR-FILLED	WATER-FILLED
BH-4B	21.30	V	2.6	1.77	2.68	34.1	29.4	4.7
BH-5B	21.30	V	2.9	1.83	2.69	32.0	26.8	5.2
BH-4B	21.45	H	2.1	1.99	2.69	26.3	22.1	4.1
BH-5B	21.45	H	1.8	1.83	2.70	32.2	28.9	3.3

Total Porosity by Helium Porosimetry (Boyle's Law).

(1) Sample Orientation: H = horizontal; V = vertical; R = remold

(2) Total Porosity = all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids.

Vb = Bulk Volume, cc; -- = Analysis not requested.

PTS File No: 45627
 Client: Thomas Harder & Co.
 Report Date: 11/23/15

PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY

(Methodology: API RP 40; EPA 9100)

Project Name: East Declez
 Project No: N/A

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	25 PSI CONFINING STRESS		
				EFFECTIVE PERMEABILITY TO WATER (2,3), millidarcy	HYDRAULIC CONDUCTIVITY (3), cm/s	INTRINSIC PERMEABILITY TO WATER (3), cm ²
Remeasure Hydraulic Conductivity using same sample.						
BH-4B	21.3	V	20151118	177	1.76E-04	1.74E-09
Remeasure Hydraulic Conductivity using same sample.						
BH-5B	21.3	V	20151118	153	1.54E-04	1.51E-09

Note: vertical samples were dried during initial testing phase. Samples were resaturated with water and hydraulic conductivity measured.

(1) Sample Orientation: H = horizontal; V = vertical; R = remold
 (2) Effective (Native) = With as-received pore fluids in place.
 (3) Permeability to water and hydraulic conductivity measured at saturated conditions.
 Water = filtered Laboratory Fresh (tap) or Site water.

PTS File No: 45627
 Client: Thomas Harder & Co.
 Report Date: 11/23/15

PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY

(Methodology: API RP 40; EPA 9100)

Project Name: East Declez
 Project No: N/A

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	25 PSI CONFINING STRESS		
				EFFECTIVE PERMEABILITY TO WATER (2,3), millidarcy	HYDRAULIC CONDUCTIVITY (3), cm/s	INTRINSIC PERMEABILITY TO WATER (3), cm ²
Remeasure Hydraulic Conductivity using same sample.						
BH-4B	21.45	H	20151118	55.0	5.43E-05	5.42E-10
Remeasure Hydraulic Conductivity using same sample.						
BH-5B	21.45	H	20151118	4200	4.13E-03	4.15E-08

(1) Sample Orientation: H = horizontal; V = vertical; R = remold
 (2) Effective (Native) = With as-received pore fluids in place.
 (3) Permeability to water and hydraulic conductivity measured at saturated conditions.
 Water = filtered Laboratory Fresh (tap) or Site water.

Appendix D

Borehole Lithologic Logs



Lithologic Log

Client: IEUA	Drilling Contractor: J & H Drilling Co., Inc.
Borehole/ Well No: BH-3	Drilling Method: Hollow Stem Auger
Project Number: 15-010-102	Borehole Diameter: 8 inches
Project: East Declez	Location of boring/ Well (State Plane, NAD 83): X: 6183762 (approximate) Y: 2321637 (approximate)
Start Date: 1-Oct-15	
Finish Date: 2-Oct-15	
Logged By: JB and MH	

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
-------	-------------	---------------------------	-------------	-------	--------------------

0	SM	100		7.5 YR 6/4 Light Brown	SILTY SAND: Dry. Fine-grained sand, trace medium-grained sand and coarse-grained sand, less than 5 percent gravel up to 20 mm; subrounded; 20-30 percent silt.
-5		20		7.5 YR 6/4 Light Brown	Trace gravel up to 55 mm.
-10	SW-SM	40	25, 50 (8-inch)	7.5 YR 6/2 Pinkish Gray	WELL-GRADED SAND WITH SILT AND GRAVEL: Dry. Fine-grained sand, 20-30 percent gravel up to 20 mm; rounded; 10-15 percent silt.
-15	SM	20		7.5 YR 5/3 Brown	SILTY SAND WITH GRAVEL: Dry. Fine-grained sand, with medium-grained sand, trace coarse-grained sand, 10-15 percent gravel up to 25 mm; subrounded to rounded; 15-20 percent silt.
-20	SF	40	17, 23, 37	7.5 YR 6/3 Light Brown	POORLY GRADED SAND: Moist. Medium-grained sand, with fine-grained sand, some coarse-grained sand, less than 5 percent gravel up to 10 mm, 5-10 percent silt; subrounded to rounded; 5-10 percent silt.
-25					



Borehole Lithologic Log

Borehole/ Well No.: BH-3
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
-25	SW-SM	10		7.5 YR 5/3 Brown	WELL-GRADED SAND WITH SILT: Moist. Medium-grained sand, with fine-grained sand, some coarse-grained sand, less than 5 percent gravel up to 50 mm; rounded; 10-15 percent silt.
-30			22, 27, 35		
	ML	90		10 YR 5/1	SILT: Moist, very soft consistency. Less than 5 percent fine-grained sand. Silt: low dry strength, rapid dilatency, medium toughness, medium plasticity.
	SM	50		10 YR 5/2 Grayish Brown	SILTY SAND WITH GRAVEL: Moist. Fine-grained sand, with medium-grained sand, trace-coarse grained sand, 15-20 percent gravel up to 55 mm; subrounded to rounded; 20-30 percent silt.
-35	ML	50		10 YR 5/4 Yellowish Brown	SILT: Moist, firm consistency. Trace fine-grained sand. Silt: no dry strength, rapid dilatency, medium toughness, medium plasticity.
-40	SM	80	42, 54 (6-inch)	7.5 YR 6/3 Light Brown	SILTY SAND WITH GRAVEL: Moist, weakly cemented. Medium-grained sand, with fine-grained sand, some coarse-grained sand, 10-15 percent gravel up to 20 mm; subrounded to rounded; 15-20 percent silt.
-45	SP	30		10 YR 6/4 Light Yellowish Brown	POORLY-GRADED SAND: Moist, Medium-grained sand, with coarse-grained sand, trace fine-grained sand, 5-10 percent gravel up to 10 mm; subrounded to rounded; 5-10 percent silt.
-50	SP-CL	100	18, 23, 35	10 YR 5/6 Yellowish Brown	CLAYEY SAND/SANDY CLAY: Wet, hard consistency. 50 percent very fine-grained sand, 50 percent clay. Clay: high dry strength, slow dilatency, low toughness, high plasticity.
-55	CL	40		7.5 YR 4/4 Brown	LEAN CLAY: Wet, hard consistency. 80-90 percent clay, 10-20 percent medium-grained sand, trace coarse-grained sand, some fine-grained sand. Clay: high dry strength, slow dilatency, medium toughness, medium plasticity.
		100			
		90	SAMPLE FOR LAB (56-56.5)	7.5 YR 4/4 Brown	LEAN CLAY WITH SAND: Wet, hard consistency. 75-85 percent clay, 15-25 percent medium-grained sand, trace coarse-grained-sand, some fine-grained sand, less than 5 percent gravel up to 30 mm; subangular to angular. Clay: high dry strength, slow

Borehole Lithologic Log

Borehole/ Well No.: BH-3
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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-60		80			dilatency, medium toughness, medium plasticity.
-65		70			
-70		10			
-75	SP-SC	20	7.5 YR 4/4 Brown		LEAN CLAY WITH SAND: Wet, hard consistency. 75-85 percent clay, 15-25 percent medium-grained sand, trace coarse-grained sand, some fine-grained sand, less than 5 percent gravel up to 48 mm; subangular to angular. Clay: high dry strength, slow dilatency, medium toughness, medium plasticity. Trace gravel up to 30 mm.
-80		10	7.5 YR 5/8 Strong Brown		POORLY GRADED SAND WITH CLAY AND GRAVEL (Weathered Bedrock?): Wet, weakly cemented, granitic. Medium-grained sand, with coarse-grained sand, some fine-grained sand, 20 percent gravel up to 25 mm; subangular to angular; 10-15 percent clay.
-85	SP	20	7.5 YR 4/4 Brown		WELL-GRADED GRAVEL WITH SAND (Weathered Bedrock?): Wet, strongly cemented, granitic. 55-60 percent gravel up to 50 mm; subrounded to angular; 5-10 percent silt.
-90		10	7.5 YR 4/4 Brown		POORLY GRADED SAND (Weathered Bedrock?): Moist, moderately cemented, granitic. Fine-grained sand, with medium-grained sand, coarse-grained sand, 10-15 percent gravel up to 15 mm; rounded to subrounded; less than 5 percent silt.
					POORLY-GRADED SAND (Weathered Bedrock?): Moist, moderately cemented, granitic. Fine-grained sand, with medium-grained and coarse-grained sand, 10-15 percent gravel up to 35 mm; rounded to subangular; less than 5 percent silt.



Borehole Lithologic Log

Borehole/ Well No.: BH-3
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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-95		100			
		5	7.5 YR 6/2		POORLY-GRADED GRAVEL WITH SAND (Weathered Bedrock?): Moist, weakly cemented, granitic. 60-70 percent gravel up to 45 mm; subrounded to subangular; less than 5 percent silt.
			7.5 YR 4/4 Brown		POORLY-GRADED SAND WITH GRAVEL (Weathered Bedrock?): Moist, weakly cemented, granitic. Fine-grained sand, with medium-grained sand, trace coarse grained sand, 20-25 percent gravel up to 35 mm; rounded to subangular; less than 5 percent silt.
-100		10	7.5 YR 4/4 Brown		10-15 percent gravel up to 10 mm.
-105		20	10 YR 8/2 Very Pale Brown		POORLY GRADED GRAVEL (Bedrock?): Moist, strongly cemented, granitic. Gravel up to 70 mm, some medium-grained sand; angular; less than 5 percent silt.

Notes:

Grain size distribution and percentages are approximate based on visual inspection of samples.
 Soil types classified based on Unified Soil Classification System.
 Soil color based on Munsell Soil Color Charts.
 "Trace" equals to 0-5 percent, "some" equals to 5-10 percent, and "with" equals to 10-15 percent.

Lithologic Log

Client: IEUA	Drilling Contractor: J & H Drilling Co., Inc.
Borehole/ Well No: BH-4	Drilling Method: Hollow Stem Auger
Project Number: 15-010-102	Borehole Diameter: 8 inches
Project: East Declez	Location of boring/ Well (State Plane, NAD 83): X: 6184347 (approximate) Y: 2321842 (approximate)
Start Date: 29-Sep-15	
Finish Date: 30-Sep-15	
Logged By: JV and BL	

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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0	SP-SM	100		10 YR 4/4 Dark Yellowish Brown	POORLY GRADED SAND WITH SILT: Dry. Fine-grained sand, some medium-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 10 mm; subangular to subrounded; 5-10 percent silt.
-5		0			
-10	SW	50	35, 50 (6-inch)	10 YR 4/4 Dark Yellowish Brown	WELL-GRADED SAND: Dry. Medium-grained sand, with coarse-grained sand, some fine-grained sand, 5 percent gravel up to 20 mm; subrounded to subangular; less than 5 percent silt.
-15		0			
-20		5			
-25		20	41, 50 (6-inch)		

Borehole Lithologic Log

Borehole/ Well No.: BH-4
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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-25	SP	60		5 Y 4/2 Dark Reddish Gray	POORLY GRADED SAND: Moist. Fine-grained sand, trace medium-grained sand, less than 5 percent gravel up to 10 mm; subrounded to rounded; less than 5 percent silt.
-30	SP	25	50 (6- Inch)	5 Y 4/1 Dark Gray	POORLY GRADED SAND WITH GRAVEL: Moist. Fine-grained sand, some medium-grained sand, trace coarse-grained sand, 20 percent gravel up to 35 mm; subangular to subrounded; less than 5 percent silt.
		25			
-35	SP	50		5 Y 4/4 Reddish Brown	POORLY GRADED SAND: Dry, weakly cemented. Fine-grained sand, with medium-grained sand, trace coarse-grained sand, 10 percent gravel up to 15 mm; subangular to subrounded; less than 5 percent silt. Lean clay from 35.0-35.5 feet.
-40	ML	40	41, 50 (5-inch)	7.5 YR 4/6 Strong Brown	CLAYEY SILT WITH SAND: Moist, hard consistency. 70-80 percent fines, 20-30 percent fine-grained sand, less than 5 percent gravel up to 15 mm. Silt: medium dry strength, slow dilatancy, high toughness, medium plasticity.
		80			
-50	ML	100	19, 21, 44	7.5 YR 4/6 Strong Brown	Increase in fines from 50 to 52 feet.
		80	13, 18, 21		
-55		80	SAMPLE FOR LAB (52.5-53)	7.5 YR 4/6 Strong Brown	Increase in sand from 53 to 54 feet, trace gravel.
	SM			10 YR 4/6	SILTY SAND: Moist, weak cementation. Medium-grained sand, with fine-grained



Borehole Lithologic Log

Borehole/ Well No.:	BH-4
Client:	IEUA
Project No.:	15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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-60	SP-SM	100			sand, some coarse-grained sand, less than 5 percent gravel up to 8 mm; subangular; 20-30 percent silt. Drilling rate slows at 59 feet.
	CL	80	10 YR 4/6		
		80	10 YR 4/4		POORLY GRADED SAND WITH SILT: Moist, moderate cementation. Fine-grained sand, trace medium-grained sand; sub-rounded; less than 10 percent silt.
	SP-SM	80	7.5 YR 4/6 Strong Brown		LEAN CLAY: Moist, firm consistency. 95 percent clay, 5 percent fine-grained sand. Clay: high dry strength, slow dilatancy, medium toughness, medium plasticity.
-65					POORLY GRADED SAND WITH SILT: Moist, moderate cementation. Fine-grained sand, some medium-grained sand, trace coarse-grained sand; subangular to angular; less than 10 percent silt.
	ML	100	10 YR 5/8 Yellowish Brown		SILT: Moist, hard consistency. 95 percent silt, 5 percent fine-grained sand. Silt: low dry strength, rapid dilatancy, medium toughness, high plasticity.
	CL	90	5 YR 4/6 Yellowish Red		LEAN CLAY: Moist, hard consistency. Greater than 95 percent clay, less than 5 percent fine-grained sand, trace medium-grained sand. Clay: high dry strength, slow dilatancy, medium toughness, high plasticity.
-70		100			
-75		100			
-80		100			
-85		100	5 YR 4/6 Yellowish Red		Increase in gravel from 85 to 89 feet.
-90		100			



Borehole Lithologic Log

Borehole/ Well No.: BH-4
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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-95	ML	100			7.5 YR 4/6 Strong Brown SILT WITH SAND: Moist, soft consistency. 90 percent silt, 10 percent fine-grained sand, trace medium-grained sand, trace coarse-grained sand, trace gravel to 20 mm. Silt: low dry strength, rapid dilatancy, low toughness, low plasticity.
-100	CL	30			7.5 YR 5/6 Strong Brown LEAN CLAY: Moist, soft to firm consistency. 90-95 percent clay, 5-10 percent medium-grained sand, coarse-grained sand, fine-grained sand, less than 5 percent gravel up to 10 mm. Clay: high dry strength, slow to none dilatancy, medium toughness, medium plasticity.
-105		30			
-110	SM	40			7.5 YR 4/6 Strong Brown SANDY SILT: Moist, very soft consistency. 50-60 percent silt, 40-50 percent fine-grained sand, with medium-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 30 mm. Silt: low dry strength, slow dilatancy, low toughness, low plasticity.
-115	ML	30			7.5 YR 6/8 Reddish Yellow SILTY SAND: Moist, moderate cementation. Fine-grained sand, some medium-grained sand, trace coarse-grained sand, less than 5 percent gravel to 35 mm; subrounded to subangular; 20-30 percent silt.
-120	SM-ML	100			7.5 YR 5/6 Strong Brown SANDY SILT: Moist, firm consistency. 60-70 percent silt, 30-40 percent fine-grained sand, some medium-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 25 mm. Silt: low dry strength, slow to no dilatancy, medium toughness, medium plasticity.
	NR	0			7.5 YR 5/6 SANDY SILT/SILTY SAND: Moist, firm consistency. 40 percent fine-grained sand, 40 percent silt, 20 percent gravel up to 40 mm. Silt: low dry strength, slow dilatancy, low toughness, low to medium plasticity.
-125	ML	100			7.5 YR 5/6 Strong Brown No recovery
		40			7.5 YR 4/6 SILT: Moist, soft consistency. 60-70 percent silt, 30-40 percent fine-grained sand, trace medium-grained sand, less than 5 percent gravel up to 25 mm. Silt: low dry strength, slow dilatancy, low toughness, low plasticity. Lean clay from 122.0 to 122.5 feet, high toughness, high plasticity.



Borehole Lithologic Log

Borehole/ Well No.: BH-4
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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-130	SM	30		Strong Brown	SILTY SAND: Moist, soft consistency. Fine-grained sand, some medium-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 12 mm; subrounded to angular; 10-15 percent silt.
-135	SP SM	30		7.5 YR 5/6 Strong Brown	POORLY GRADED SAND WITH SILT: Moist, strongly cemented. Fine-grained sand, with medium-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 50 mm; subrounded to angular; 10-15 percent silt.
-140	ML	30		7.5 YR 5/6 Strong Brown	SANDY SILT WITH GRAVEL: Moist, soft consistency. 50-60 percent silt, 25-30 percent fine-grained sand, with medium-grained sand, trace coarse-grained sand, 15-20 percent gravel up to 55 mm. Silt: Low dry strength, rapid dilatancy, medium toughness, low plasticity.
-145	CL	100		7.5 YR 4/6	LEAN CLAY WITH SAND: Moist, soft consistency. 50-60 percent clay, 25-30 percent sand, 5-10 percent gravel up to 12 mm; subrounded to angular. Clay: high dry strength, slow dilatancy, medium toughness, high plasticity.
	SM	100		7.5 YR 4/4 Brown	SILTY SAND WITH GRAVEL (Bedrock?): Moist, weakly cemented. Coarse-grained sand, with medium-grained sand, trace-fine grained sand, 30-40 percent gravel up to 50 mm; angular to subrounded; 40-50 percent silt. Very slow drilling.

Notes:

Grain size distribution and percentages are approximate based on visual inspection of samples.

Soil types classified based on Unified Soil Classification System.

Soil color based on Munsell Soil Color Charts.

"Trace" equals to 0-5 percent, "some" equals to 5-10 percent, and "with" equals to 10-15 percent.

Lithologic Log

Client: IEUA	Drilling Contractor: J & H Drilling Co., Inc.
Borehole/ Well No: BH-5	Drilling Method: Hollow Stem Auger
Project Number: 15-010-102	Borehole Diameter: 8 inches
Project: East Declez	Location of boring/ Well (State Plane, NAD 83): X: 6184380 (approximate) Y: 2321712 (approximate)
Start Date: 2-Oct-15	
Finish Date: 5-Oct-15	
Logged By: JB	

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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0	SP	100		7.5 YR 6/4 Light Brown	POORLY GRADED SAND: Dry. Fine-grained sand, with medium-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 10 mm; subrounded to subangular; 5-10 percent silt.
-5	SP-SM	10		7.5 YR 6/4 Light Brown	POORLY GRADED SAND WITH SILT: Dry. Fine-grained sand, with medium-grained sand, 5-10 percent gravel up to 30 mm; subrounded to rounded; 10-15 percent silt.
-10	SW-SM	90	26, 50 (6-inch)	7.5 YR 6/3 Light Brown	WELL-GRADED SAND WITH SILT: Dry. Medium-grained sand, with fine-grained sand, some coarse-grained sand, 5-10 percent gravel up to 50 mm; subrounded to rounded; 10-15 percent silt.
-15		90			
-20		10			
-25		30	40, 50 (6-inch)	7.5 YR 7/1 Light Gray	WELL-GRADED SAND WITH SILT: Dry. Medium-grained sand, with fine and coarse-grained sand, 15-20 percent gravel up to 40 mm; subrounded to rounded; 10-15 percent silt.



Borehole Lithologic Log

Borehole/ Well No.:	BH-5
Client:	IEUA
Project No.:	15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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-25	SP-SM	30		7.5 YR 6/1 Gray	POORLY GRADED SAND WITH SILT: Dry. Fine-grained sand; subrounded to rounded; 10-15 percent silt.
-30	CL	90	20, 22, 40	7.5 YR 4/6 Strong Brown	LEAN CLAY WITH SAND: Dry, hard consistency. 80 percent clay, 15-20 percent fine-grained sand, with medium-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 20 mm; subrounded to rounded. Clay: high dry strength, slow dilatancy, medium toughness, low plasticity.
		90			
-35		90			
-40		90	29, 50 (6-inch)	7.5 YR 4/4 Brown	LEAN CLAY: Dry, hard consistency. 90-95 percent clay, 5-10 percent medium-grained sand, with fine-grained sand. Clay: high dry strength, slow dilatancy, medium toughness, low plasticity.
-45		90			
-50		90	20, 29 (6-inch)	7.5 YR 5/6 Strong Brown	LEAN CLAY: Dry, firm consistency. 90-95 percent clay, 5-10 percent medium-grained sand, with fine-grained sand. Clay: high dry strength, slow dilatancy, medium toughness, low plasticity.
-55		100		7.5 YR 5/6	LEAN CLAY: Moist, hard consistency. 90-95 percent clay, 5-10 percent medium-grained sand, with fine-grained sand. Clay: high dry strength, slow dilatancy, medium toughness, low plasticity.
		40		7.5 YR 4/6 Strong Brown	LEAN CLAY: Moist, hard consistency. 90-95 percent clay, 5-10 percent medium-grained sand, with fine-grained sand. Clay: high dry strength, slow dilatancy, medium toughness, low plasticity.

Borehole Lithologic Log

Borehole/ Well No.: BH-5
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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-60	GL	60		5 YR 4/6 Yellowish Brown	Trace gravel up to 10 mm.
-65		10		7.5 YR 5/6 Strong Brown	SANDY LEAN CLAY: Moist, very soft consistency. 70-80 percent clay, 10-15 percent medium-grained sand, with coarse-grained sand, some fine-grained sand, 10-15 percent gravel up to 50 mm; subrounded to rounded. Clay: medium dry strength, slow dilatancy, medium toughness, medium plasticity.
-70		100	25, 50 (4-inch)		Lined sample collected.
-75		40		7.5 YR 4/6 Strong Brown	LEAN CLAY: Moist, hard consistency. 90-95 percent clay, 5-10 percent medium-grained sand, trace coarse-grained sand. Clay: high dry strength, slow dilatancy, medium toughness, medium plasticity.
		100		7.5 YR 5/6 Strong Brown	SANDY LEAN CLAY WITH GRAVEL: Moist, very soft consistency. 50-60 percent clay, 30-35 percent medium-grained sand, with coarse-grained sand, with fine-grained sand, 20-25 percent gravel up to 40 mm; subangular to angular. Clay: medium dry strength, slow dilatancy, medium toughness, low plasticity.
		100		7.5 YR 4/6 Strong Brown	LEAN CLAY: Moist, very soft consistency. 90 percent clay, 5-10 percent fine-grained sand, less than 5 percent gravel up to 5 mm; subangular to angular. Clay: high dry strength, slow dilatancy, medium toughness, medium plasticity.
-80		10	35, 50 (5-inch) SAMPLE FOR LAB (76-76.5)		
-85		10			
-90		100		5 YR 4/6	SANDY LEAN CLAY WITH GRAVEL: Wet, hard consistency. 50-60 percent clay, 30-35 percent medium-grained sand, with coarse-grained sand, with fine-grained sand, 20-25 percent gravel up to 70 mm, subangular to angular. Clay: High dry strength, slow dilatancy, medium toughness, medium plasticity.
		50		5 YR 3/4 Dark Reddish Brown	

Borehole Lithologic Log


Borehole/ Well No.: BH-5
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
-95	ML	50		5 YR 4/6 Yellowish Brown	<p>SANDY LEAN CLAY: Wet, very soft consistency. 50-60 percent clay, 30-45 percent medium-grained sand, with fine-grained sand, with coarse-grained sand, 5-10 percent gravel up to 60 mm; subangular to angular. Clay: high dry strength, slow dilatancy, medium toughness, medium plasticity.</p> <p>SILT WITH SAND: Moist, very soft consistency. 80 percent silt, 15-20 percent medium-grained sand, with fine-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 50 mm; subangular to angular. Silt: medium dry strength, rapid dilatancy, low toughness, low plasticity.</p>
-100	Cl	10		7.5 YR 5/6 Strong Brown	<p>LEAN CLAY WITH SAND: Moist, very soft consistency. 75-80 percent clay, 20-25 percent fine-to medium-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 30 mm; subangular to angular. Clay: high dry strength, slow dilatancy, medium toughness, high plasticity.</p>
-105	Silt	100		7.5 YR 6/6	<p>SILTY SAND WITH GRAVEL: Moist, weakly cemented. Fine-grained sand, with medium-grained sand, with coarse grained sand, 15-20 percent gravel up to 40 mm; subangular to angular; 35-50 percent silt.</p>
		10		5 YR 3/3 Dark Reddish Brown	<p>SILTY SAND: Moist, moderately cemented. Medium-grained sand, with fine-grained sand, some coarse-grained sand, less than 5 percent gravel up to 60 mm; subangular to angular; 20-30 percent silt.</p>
-110	ML	100		5 YR 3/4	<p>SANDY SILT: Moist, very soft. 60-70 percent silt, 30-40 percent fine-grained sand, less than 5 percent gravel up to 20 mm; subangular to angular. Silt: low dry strength, rapid dilatancy, low toughness, low plasticity.</p>
	Silt	10		5 YR 4/4 Reddish Brown	<p>SILTY SAND WITH GRAVEL: Moist, no cementation. Fine-grained sand, some coarse-grained sand, 10-20 percent gravel up to 70 mm, 30-40 percent silt; subangular to angular; 30-40 percent silt.</p>
-115	ML	60		5 YR 4/6 Yellowish Brown	<p>SANDY SILT: Moist, very soft. 70-80 percent silt, 20-30 percent fine-grained sand, with medium-grained sand, trace-coarse grained sand, less than 5 percent gravel up to 45 mm; angular. Silt: low dry strength, rapid dilatancy, low toughness, low plasticity.</p>
-120		0			No Recovery
-125					



Borehole Lithologic Log

Borehole/ Well No.: BH-5
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
-130				10 YR 6/4 Light Yellowish Brown	CLAYEY SAND: Moist, moderately cemented, granitic. Fine-grained sand, with medium-grained sand, trace coarse-grained sand, less than 5 percent gravel up to 50 mm; angular; 30-40 percent silt. Mica plates up to 3 mm.

Notes:

Grain size distribution and percentages are approximate based on visual inspection of samples.
 Soil types classified based on Unified Soil Classification System.
 Soil color based on Munsell Soil Color Charts.
 "Trace" equals to 0-5 percent, "some" equals to 5-10 percent, and "with" equals to 10-15 percent.

Lithologic Log

Client:	IEUA	Drilling Contractor:	J & H Drilling Co., Inc.
Borehole/ Well No:	BH-6	Drilling Method:	Hollow Stem Auger
Project Number:	15-010-102	Borehole Diameter:	8 inches
Project:	East Declez	Location of boring/ Well (State Plane, NAD 83): X: 6184834 (approximate) Y: 2321636 (approximate)	
Start Date:	28-Sep-15		
Finish Date:	28-Sep-15		
Logged By:	JV & BL		

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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0	SP	100		2.5 Y 4/4 Olive Brown	SAND: Dry. Fine-grained sand, trace medium-grained sand, trace coarse-grained sand; subrounded to rounded; less than 10 percent silt.
-5		10			
-10	MU	70	48, 50 (6-inch)	10 YR 3/3 Dark Brown	SILT: Dry to moist, hard consistency. Less than 10 percent fine-grained sand.
-15		30			
-20	SM	80		10 YR 5/4 Yellowish Brown	SILTY SAND: Dry, moderate to strongly cemented. Fine-grained sand, trace medium-grained sand, trace gravel up to 25 mm; subrounded to rounded; 10-20 percent silt.
-22		10	50 (3-inch)		
-25		30			



Borehole Lithologic Log

Borehole/ Well No.: BH-6
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
-25	CL	100			LEAN CLAY WITH SAND: Moist, very hard consistency. Less than 20 percent fine-grained sand, trace medium-grained sand.
	SM	50			SILTY SAND: Dry, weakly cemented. Fine-grained sand, some medium-grained sand, trace gravel to 50 mm; sub-rounded to rounded; 10-20 percent silt. Increase gravel at 28 feet and from 30 to 31 feet.
-30			37, 50 (4-inch)		
-35		0			No recovery
-40	GM	100			SILTY GRAVEL WITH SAND: Dry, weakly cemented. 60 percent gravel up to 50 mm, 20-30 percent fine-grained sand; subangular to angular; 10-20 percent silt.
	SM	90			SILTY SAND: Dry, moderately cemented. Fine-grained sand, some medium-grained sand; subangular to subrounded; 10-20 percent silt.
-45					

Notes:

- Grain size distribution and percentages are approximate based on visual inspection of samples.
- Soil types classified based on Unified Soil Classification System.
- Soil color based on Munsell Soil Color Charts.
- "Trace" equals to 0-5 percent, "some" equals to 5-10 percent, and "with" equals to 10-15 percent.

Lithologic Log

Client: IEUA	Drilling Contractor: J & H Drilling Co., Inc.
Borehole/ Well No: BH-7	Drilling Method: Hollow Stem Auger
Project Number: 15-010-102	Borehole Diameter: 8 inches
Project: East Declez	Location of boring/ Well (State Plane, NAD 83): X: 6184044 (approximate) Y: 2321631 (approximate)
Start Date: 9-Oct-15	
Finish Date: 9-Oct-15	
Logged By: BL	

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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0		100		10 YR 2/2 Very Dark Brown	POORLY-GRADED SAND: Dry. Fine-grained sand, some medium-grained sand, less than 5 percent gravel up to 20 mm; subangular to subrounded; 5-10 percent silt.
-5		0			
-10	SW-GW	70	12, 18, 27	7.5 YR 4/1 Dark Gray	POORLY-GRADED SAND WITH GRAVEL: Dry. Medium-grained sand, with coarse-grained sand, some fine-grained sand, 40-50 percent gravel up to 20 mm; angular to subangular; less than 5 percent silt.
-15		0			
-20		20		7.5 YR 4/1 Dark Gray	Fine sand at 16 feet and 19 feet.
-25		30	38, 50.5 (5-inch)	7.5 YR 4/1 Dark Gray	Gravel to 50 mm at 24 feet.
-25		5			

Borehole Lithologic Log

Borehole/ Well No.: BH-7
 Client: IEUA
 Project No.: 15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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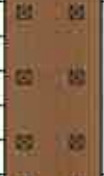

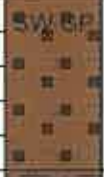

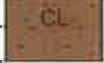
-25	SP	10		5Y 4/1 Dark Gray	POORLY-GRADED SAND: Moist. Fine-grained sand, trace medium-grained sand, trace gravel to 35 mm; subrounded to subangular; less than 5 percent silt.
-30		80	12, 13, 14	5Y 4/1 Dark Gray	Gravel to 45 mm at 34 feet. Rig chatter at 38 feet.
-35		30			
-40	CL	90	15, 25, 50	7.5 YR 4/4 Brown	LEAN CLAY: Dry to moist, firm consistency. 90 percent clay, 10 percent fine-grained sand, trace medium-grained sand, less than 5 percent gravel up to 25 mm; subrounded to rounded. Clay: very high dry strength, slow dilatancy, medium toughness, medium plasticity. Gravel up to 50 mm at 42 feet.
-45		100			
-50	ML	50		7.5 YR 5/6 Strong Brown	SILT: Dry to moist, hard consistency. 90 percent silt, 10 percent fine-grained sand, trace medium-grained sand, less than 5 percent gravel up to 30 mm. Silt: High dry strength, slow dilatancy, low toughness, low plasticity. Increase in gravel 49-50 feet.
-55		5	22, 29, 34	7.5 YR 5/6 Strong Brown	Driller reports "tight" drilling at 53 feet. Gravel up to 40 mm at 54 feet.
-60		70			
-65		70			



Borehole Lithologic Log

Borehole/ Well No.:	BH-7
Client:	IEUA
Project No.:	15-010-102

Depth	Graphic Log	Sample Recovery (Percent)	Blow Counts	Color	Sample Description
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-60		30		7.5 YR 4/6 Strong Brown	GRAVELY SILT: 70-80 percent silt, 10 percent fine-grained sand, 20-30 percent gravel up to 50 mm; subangular to subrounded. Silt: low dry strength, rapid dilatancy, low toughness, low plasticity. Slow drilling 60 to 64 feet. Very slow drilling at 64 feet.
-65		30		7.5 YR 4/6 Strong Brown	
-70		30		7.5 YR 4/6 Strong Brown	Gravel at 74 feet. Very slow drilling from 70 to 87 feet.
-75		30		7.5 YR 5/6 Strong Brown	WELL GRADED SAND WITH GRAVEL: Moist, weakly cemented. Fine-grained and medium-grained sand, with coarse-grained sand, 20-30 percent gravel up to 35 mm; angular to subangular; 10 percent silt. Increase of gravel at 79 feet.
-80		30		7.5 YR 4/4 Brown	SILT WITH SAND: Moist, soft consistency. 80-90 percent silt, 10-20 percent fine-grained sand with medium-grained sand, trace gravel up to 25 mm; angular to subangular. Silt: low dry strength, slow dilatancy, low toughness, low plasticity.
-85		100		7.5 YR 4/6 Strong Brown	SANDY LEAN CLAY: Moist, soft consistency. 60-70 percent clay, 30-40 percent fine-grained sand, medium-grained sand, coarse-grained sand, trace gravel up to 40 mm; subangular to angular. Clay: Very high dry strength, no dilatancy, medium toughness, medium plasticity.

Notes:

Grain size distribution and percentages are approximate based on visual inspection of samples.

Soil types classified based on Unified Soil Classification System.

Soil color based on Munsell Soil Color Charts.

"Trace" equals to 0-5 percent, "some" equals to 5-10 percent, and "with" equals to 10-15 percent.

Appendix E

Wildermuth Environmental - Assessment of Additional Alternatives for Potential Storm Water Recharge Project East of Declez Basin





January 28, 2016

Chino Basin Watermaster
Attn: Peter Kavounas, General Manager
9641 San Bernardino Road
Rancho Cucamonga, CA 91730

Subject: Assessment of Additional Alternatives for Potential Storm Water Recharge Project East of Declez Basin

Dear Mr. Kavounas:

On December 16, 2015, Watermaster met with staff from WEI, IEUA, and Thomas Harder & Company (THC) to discuss additional alternative project designs for the potential East Declez Basin (EDB) recharge project. As a result of this meeting, Watermaster directed WEI to quantify storm water yields and cost opinions for four new project alternatives consistent with the methods used in the 2013 Amendment to the 2010 Recharge Master Plan Update (2013 RMPU). Descriptions of the alternatives, potential new recharge, and reconnaissance-level cost opinions are provided below.

Description of Alternatives

Two new basin design concepts were developed: 1) a basin with a roughly 11-acre footprint that is graded as an expansion of cell 1 of the existing Declez Basin at the same bottom elevation as the existing cell 1, and 2) a basin with roughly the same footprint as basin 1, but only eight feet deep as a separate basin adjacent to Declez. The infiltration rate for the new portion of the expanded Declez Basin cell 1 was assumed to be zero.

Two stormwater management concepts were developed for each new basin concept, yielding four alternatives for evaluation. They are referred to herein as Alternatives 1a, 1b, 2a, and 2b and are described below. Figure 1 depicts the layouts of alternatives 1a and 1b, and Figure 2 depicts the layouts of alternatives 2a and 2b.

- **Alternative 1a** – This alternative includes the expanded Declez Basin cell 1 without any new diversion works.
- **Alternative 1b** – This alternative is identical to alternative 1a, except that a rubber dam would be constructed in San Sevaine Channel to increase the amount of stormwater that can be diverted into Jurupa Basin. The pump station in Jurupa Basin would be expanded from 40 to 70 cfs to convey up to 30 cfs to the Declez Channel via a connection to an existing 72-inch storm drain that discharges to the Declez Channel near the southerly crossing with Cherry Avenue.
- **Alternative 2a** – This alternative uses the shallow and separate basin design. It involves the construction of a rubber dam diversion in the Declez Channel about 400' upstream of the

southerly crossing with Cherry Avenue to divert up to 30 cfs of storm water to the EDB. Storm water will be conveyed in a 42-inch pipe constructed in the channel access road parallel to the existing channel alignment and then due east along the north side of Declez Basin and then discharge to the EDB. This project would reduce the inflow and recharge into the Declez Basin.

- Alternative 2b – This alternative is identical to alternative 2a, except it includes the rubber dam in San Sevaine Channel and increased pump size in Jurupa describes in alternative 1b.

WEI performed a hydrologic analysis to estimate the net new stormwater yield of the four project alternatives with the same methodology used in the 2013 RMPU. Then, a hydraulic analysis was performed to design the necessary diversion and water conveyance structures for each alternative, and it was determined that there was no feasible hydraulic design to divert water from Declez Channel into the shallow EDB design. Therefore, alternatives 2a and 2b were determined infeasible.

New Recharge and Cost Opinion

The following table shows the results of our modeling and cost opinions.

Alternative	Net New Recharge (acre-ft/yr)	Annual Unit Cost (\$/acre-ft)	Annual Unit Cost with 90% Excavation Cost Reduction (\$/acre-ft)
1a	144	\$11,152	\$5,099
1b	414	\$4,527	\$2,420

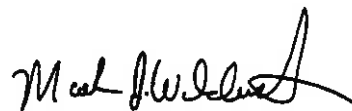
Reconnaissance-level (Level-Five) cost opinions were developed for alternatives 1a and 1b and are included in Tables 1 and 2, respectively. In these cost opinions it was assumed that the land acquisition cost would cover the entire 85 acres considered for purchase by JCSD. These cost opinions assume that the cost to improve the Jurupa Basin inlet (other than the rubber dam in alternative 1b) is included as part of the 2013 RMPU 23a project. The net new recharge is calculated based on the recharge additional to what is already realized in the 2013 RMPU projects at RP3 and Declez Basins.

We appreciate the opportunity to serve the Chino Basin Watermaster on this important and timely project.

Wildermuth Environmental, Inc.



Garrett Rapp, EIT
Staff Engineer



Mark J. Wildermuth, PE
President and Principal Engineer

Encl.: Tables 1 and 2, and Figures 1 and 2.

Table 1
Cost Opinion for the East Declez Basin - Alternative 1a

Description	Quantity	Unit	Unit Cost	Total Cost	Total Cost ¹
Direct Construction Costs					
1 <u>Mobilization @ 5% Other Direct Construction Cost</u>	1	Job	Lump Sum	\$745,000	\$745,000
2 <u>Spreading Basin Excavation</u>					
Excavate & Haul Offsite	820,000	Cu. Yds.	\$18.17	\$14,899,400	\$1,489,940
3 <u>Land Acquisition Cost</u>					
Land Costs	85	\$/acre	\$35,300	\$3,000,500	\$3,000,500
Subtotal Direct Construction				\$18,640,000	\$5,240,000
Contingency > \$2 million@ 10%				<u>\$1,864,000</u>	<u>\$1,864,000</u>
Construction Management > \$2 million@ 10%				<u>\$1,864,000</u>	<u>\$1,864,000</u>
Total Construction				\$22,368,000	\$8,968,000
Engineering and Administration Costs					
Engineering and Admin > \$2 million@ 10%				<u>\$2,237,000</u>	<u>\$2,237,000</u>
Total Engineering and Administration				\$2,237,000	\$2,237,000
Total Estimated Cost				\$24,605,000	\$11,205,000
Total Estimated Cost - Rounded				\$24,610,000	\$11,210,000
Annual Cost - 30 Years @ 5% Interest				\$1,600,600	\$728,900
CBWMs Share of Annual Project Cost				\$1,600,600	\$728,900
<u>Annual Operations and Maintenance</u>	144	AF	\$37	\$5,328	\$5,328
Total Operational Costs				\$5,328	\$5,328
Total Annual Cost				\$1,605,928	\$734,228
Total Annual Unit Cost				\$11,152	\$5,099

¹The capital cost shown assumes that the project's excavation costs would be reduced by 90%. The material excavated could be used for another construction site or leased to a mining operator.

Table 2
Cost Opinion for the East Declez Basin - Alternative 1b

Description	Quantity	Unit	Unit Cost	Total Cost	Total Cost ¹
Direct Construction Costs					
1 <u>Mobilization @ 5% Other Direct Construction Cost</u>	1	Job	Lump Sum	\$885,000	\$885,000
2 <u>Spreading Basin Excavation</u>					
Excavate & Haul Offsite	820,000	Cu. Yds.	\$18.17	\$14,899,400	\$1,489,940
3 <u>Land Acquisition Cost</u>					
Land Costs	85	\$/acre	\$35,300	\$3,000,500	\$3,000,500
4 <u>Rubber Dam for San Sevaine Channel Diversion to Jurupa</u>					
Rubber Dam Capturing up to 100 cfs	1	Job	\$100,000	\$100,000	\$100,000
5 <u>Pump expansion to 70 cfs</u>					
30 cfs pump capacity increase	300	\$/HP	\$5,000	\$1,500,000	\$1,500,000
6 <u>Conveyance to Declez Channel</u>					
36" Diameter CMLC to existing storm drain	2,800	Lin. Ft.	\$429	\$1,201,200	\$1,201,200
Subtotal Direct Construction				\$21,590,000	\$8,180,000
Contingency > \$2 million@ 10%				<u>\$2,159,000</u>	<u>\$2,159,000</u>
Construction Management > \$2 million@ 10%				<u>\$2,159,000</u>	<u>\$2,159,000</u>
Total Construction				\$25,908,000	\$12,498,000
Engineering and Administration Costs					
Engineering and Admin > \$2 million@ 10%				<u>\$2,591,000</u>	<u>\$2,591,000</u>
Total Engineering and Administration				\$2,591,000	\$2,591,000
Total Estimated Cost				\$28,499,000	\$15,089,000
Total Estimated Cost - Rounded				\$28,500,000	\$15,090,000
Annual Cost - 30 Years @ 5% Interest				\$1,853,900	\$981,600
CBWMs Share of Annual Project Cost				\$1,853,900	\$981,600
<u>Annual Operations and Maintenance</u>	414	AF	\$37	\$15,318	\$15,318
<u>Annual Energy Cost</u>	32,000	KW-hr	\$0.15	\$4,800	\$4,800
Total Operational Costs				\$20,118	\$20,118
Total Annual Cost				\$1,874,018	\$1,001,718
Total Annual Unit Cost				\$4,527	\$2,420

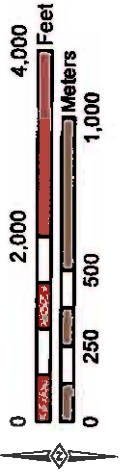
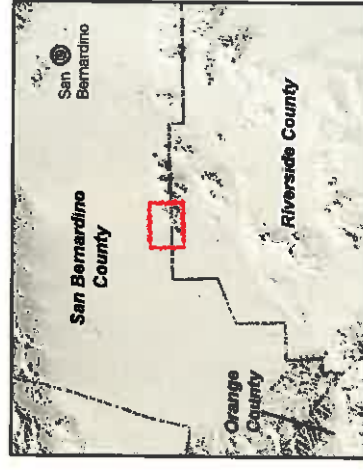
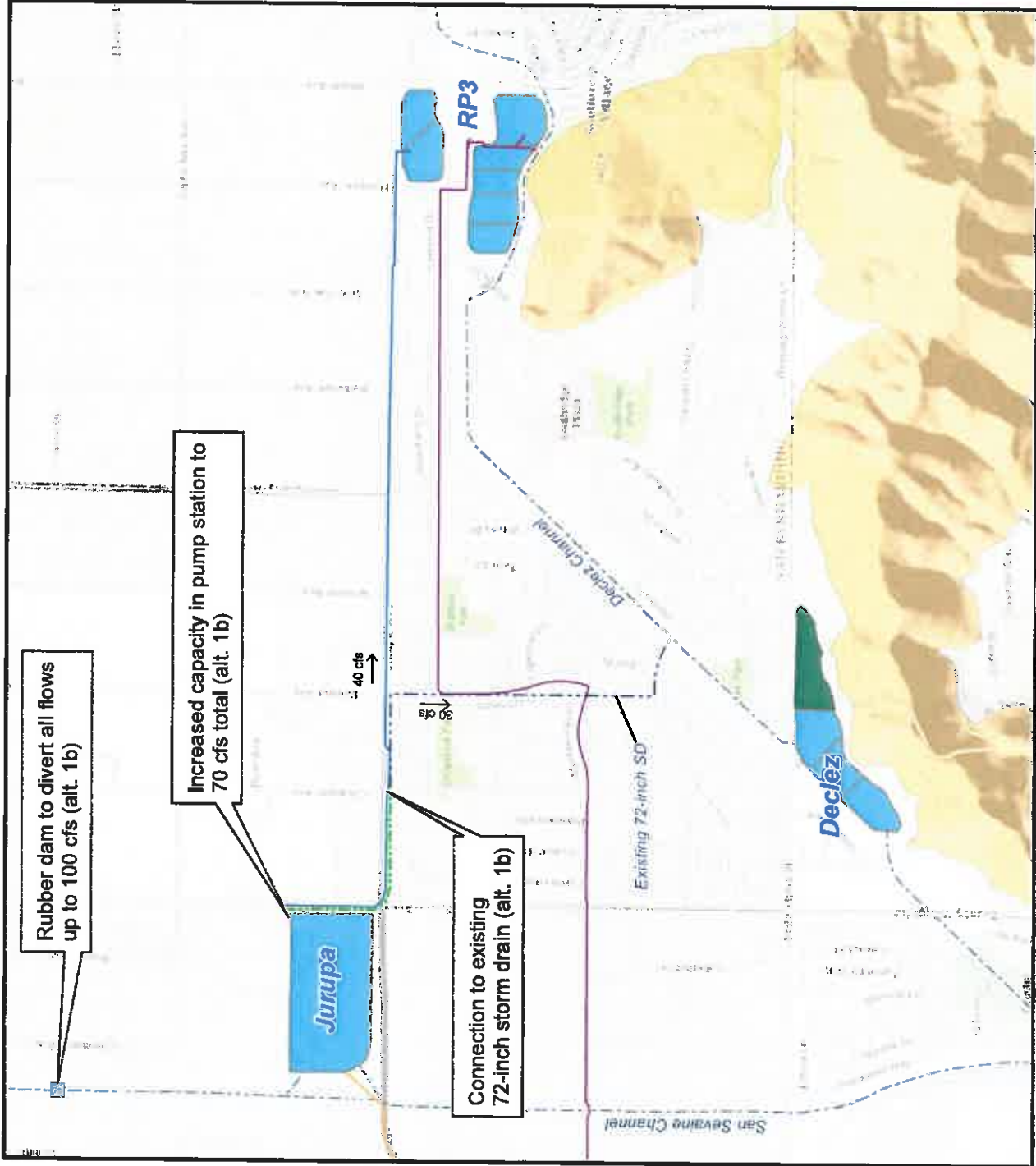
¹The capital cost shown assumes that the project's excavation costs would be reduced by 90%. The material excavated could be used for another construction site or leased to a mining operator.

Piping Infrastructure

-  Jurupa Force Main
-  Wineville Recycled Water Pipeline
-  Proposed Pipeline from Wineville Basin (PID 23a)
-  36" Pipeline from Jurupa Basin to Existing Storm Drain (alt. 1b)

Basins

-  Existing
-  Proposed Declez Basin Cell 1 Extension



Produced by:
 Author: GAR
 Date: 12/2/2016
 Name: EDeclez_2016_alt_1








**East Declez Basin
 New Project Alternatives 1a/1b**

Implementation of 2013 Amendment
 to the 2010 RMPU

Figure 1

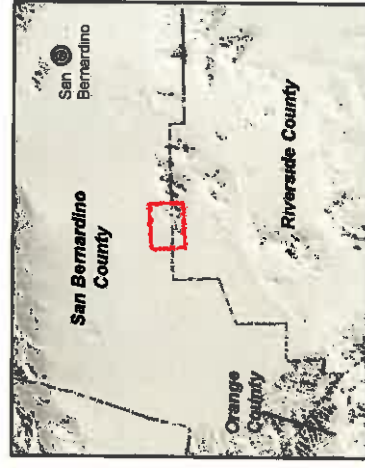
Planned Rubber Dams for the East Declez Basin Project

Piping Infrastructure

-  Jurupa Force Main
-  Wineville Recycled Water Pipeline
-  Proposed Pipeline from Wineville Basin (PID 23a)
-  42" Diversion Pipeline to the East Declez Basin
-  36" Pipeline from Jurupa Basin to Existing Storm Drain (alt. 2b)

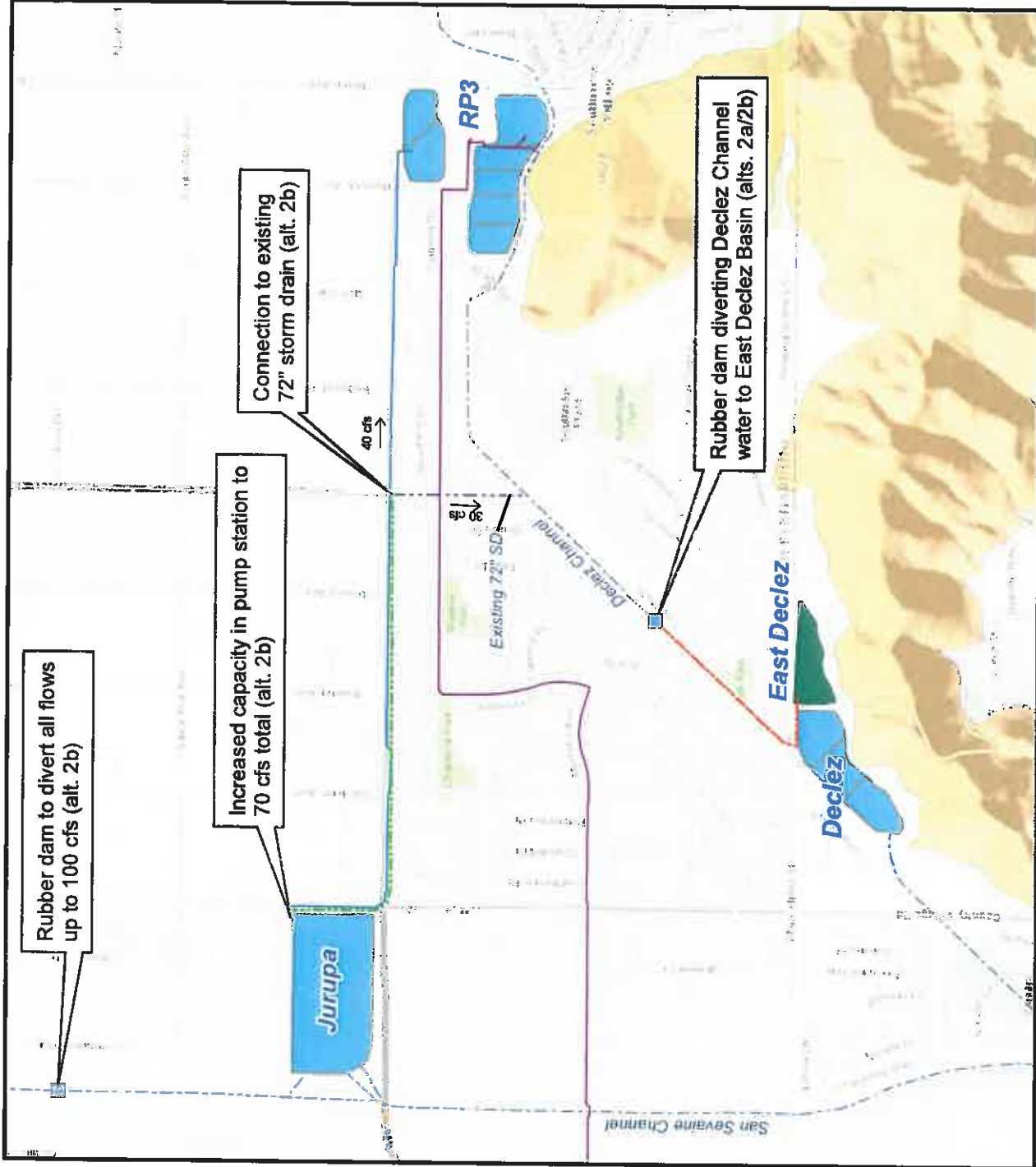
Basins

-  Existing
-  Proposed East Declez Basin

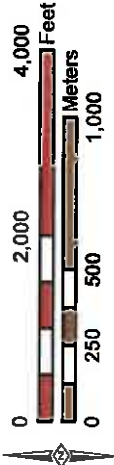


**East Declez Basin
New Project Alternatives 2a/2b**

Figure 2



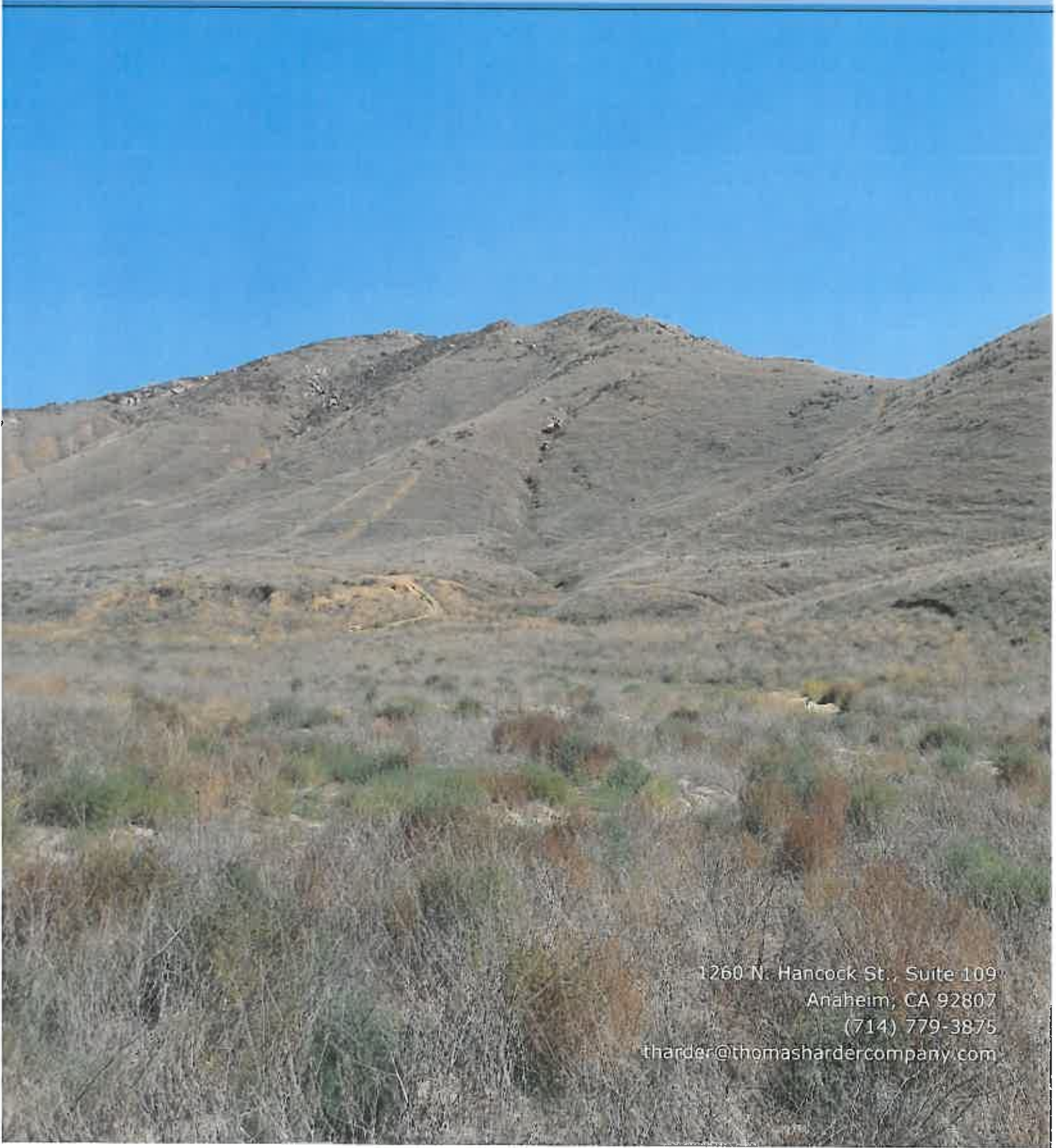
Implementation of 2013 Amendment to the 2010 RMPU



Produced by:
 Author: GAR
 Date: 1/28/2016
 Name: EDeclez_2016_alt_2



Thomas Harder & Co.
Groundwater Consulting



1260 N. Hancock St., Suite 109
Anaheim, CA 92807
(714) 779-3875
tharder@thomashardercompany.com


**ACTION
ITEM
1E**




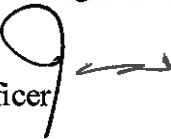
Date: April 20, 2016

To: The Honorable Board of Directors

Through: Public, Legislative Affairs, and Water Resources Committee (4/13/16)
Finance, Legal, and Administration Committee (4/13/16)

From:  P. Joseph Grindstaff
General Manager

Submitted by: Chris Berch 
Executive Manager of Engineering/Assistant General Manager

Jason Gu 
Grants Officer

Subject: Adoption of Resolutions for the USBR WaterSMART

RECOMMENDATION

It is recommended that the Board of Directors:

1. Adopt Resolution Nos. 2016-4-1, 2016-4-2, and 2016-4-3, authorizing the Agency to enter into financial assistance agreements with the U.S. Department of Interior – Bureau of Reclamation (USBR) for three grant applications submitted in April 2016: 1) Drought Contingency Planning Grant; 2) Drought Resiliency Implementation Grant, and 3) Agricultural Water Conservation Efficiency Grant; and
2. Authorize the General Manager to execute the financial assistance agreement, any amendments, and any grant related documents thereto.

BACKGROUND

USBR Drought Contingency Planning Grant:

In February 2016, the USBR announced the Drought Contingency Planning Grant under the USBR's WaterSMART Drought Response Program to provide assistance to local governments to prepare for and address a drought in advance of a crisis.

In April 2016, IEUA proposed the Integrated Resources Plan (IRP) Phase II Project for the Drought Contingency Planning Grant. The IRP Phase II Project will take a collaborative approach with

local stakeholders to address a drought in advance of a crisis. Funding through this grant would be used to cover approximately 50% of the expected plan development costs of \$400,000.

USBR Drought Resiliency Implementation Grant:

In April 2016, IEUA proposed the Project 23a Wineville, Jurupa and RP3 Basin Improvements Project for the Drought Resiliency Implementation Grant under the USBR’s WaterSMART Drought Response Program.

This project is one of the priority projects identified in the 2013 Recharge Master Plan Update (RMPU) and provides benefits to both IEUA and Chino Basin Watermaster. This grant program offers \$300,000 maximum per project and will be available for projects over a two-year period.

USBR Agricultural Water Conservation and Efficiency Grant:

In February 2016, the USBR announced a third grant opportunity – the Agricultural Water Conservation and Efficiency Grant. This grant program offers \$1,000,000 maximum per project with a 50% match funding requirement, and it seeks to foster water district and farmer partnerships to make federal funding available in California to improve the efficiency of agricultural water use throughout the state.

In late April 2016, IEUA will submit a grant application for the Chino Basin Agricultural Water Conservation and Water Use Efficiency Project, which would provide water supply and conservation benefits to the region by increasing recycled water supply for agricultural irrigation, and improve energy efficiency. ***Summary of the three grant applications submitted:***

USBR Grant	Grant Amount	Total Project Cost	IEUA Project
Drought Contingency	\$200,000	\$400,000	Integrated Resources Plan Phase II
Drought Resiliency	\$300,000	\$21,310,000	Wineville, Jurupa and RP-3 Basin Improvement
Agricultural Water Conservation & Efficiency	\$1,000,000	\$2,000,000	Chino Basin Agricultural Water Conservation and Water Use Efficiency Project

This action supports the Agency’s mission to increase sustainability through the development of reliable local water supplies and is consistent with the Agency’s mission of pursuing state and federal grants and low-interest financing.

PRIOR BOARD ACTION

On September 16, 2015, IEUA’s Board of Directors adopted Resolution No. 2015-9-2, approving the 2015 Drought Relief Recycled Water Supply Optimization Program, Phase I grant/SRF loan application, which included eight project components, to be submitted to the State Water Board.

The Recycled Water Pressure Sustaining Valve Project, for which approval is being recommended through Resolution No. 2016-4-3, was included as one of the eight 2015 Drought Relief Recycled Water Supply Optimization Program, Phase I grant/SRF loan application project components.

IMPACT ON BUDGET

USBR Drought Contingency Planning Grant:

The IRP Phase II Project has an estimated cost of \$400,000, and is within the WR16025 WW Planning Document Project budget of \$1,000,000 in the approved FY 2015/16 Ten-Year Capital Improvement Plan (TYCIP). There will be no impact to the Agency's current fiscal year budget, however, upon award of funding, the annual project appropriations will be revised to reflect the grant funding.

USBR Drought Resiliency Implementation Grant:

Project No. EN18007, RMPU Construction, has a total project budget of \$44,000,000, which includes \$21,310,000 for Project 23a Wineville, Jurupa and RP-3 Basin Improvements Project. There will be no impact to the Agency's current fiscal year budget, however, upon award of funding, the annual project appropriations will be revised to reflect the grant funding.

USBR Agricultural Water Conservation and Efficiency Grant:

Project No. EN12016, North CIM Lateral, has a total project budget of \$210,000 and Project No. EN16034, Recycled Water Pressure Sustaining Valve, has a total project budget of \$850,000 in the approved TYCIP. There will be no impact to the Agency's current fiscal year budget, however, upon award of funding, the annual project appropriations will be revised to reflect the grant funding.

Attachment:

Resolution No. 2016-4-1

Resolution No. 2016-4-2

Resolution No. 2016-4-3

RESOLUTION NO. 2016-4-1

RESOLUTION OF THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY*, SAN BERNARDINO COUNTY, CALIFORNIA, AUTHORIZING THE INLAND EMPIRE UTILITIES AGENCY TO ENTER INTO A FINANCIAL ASSISTANCE AGREEMENT UNDER THE WATERSMART: DROUGHT CONTINGENCY PLANNING GRANTS FOR FY 2016 WITH THE U.S. DEPARTMENT OF INTERIOR - BUREAU OF RECLAMATION AND DESIGNATING A REPRESENTATIVE TO EXECUTE THE FINANCIAL ASSISTANCE AGREEMENT, AND ANY AMENDMENTS THERETO FOR INTEGRATED RESOURCES PLAN PHASE II PLANNING PROJECT

BE IT RESOLVED, that the Inland Empire Utilities Agency* (IEUA) is authorized to enter into a financial assistance agreement under the WaterSMART: Drought Contingency Planning Grants for FY 2016 with the U.S. Department of Interior - Bureau of Reclamation (USBR) for the IRP Phase II Planning Project;

BE IT RESOLVED, that IEUA's Board of Directors authorizes the General Manager, or in his absence, his designees to execute the financial assistance agreement, any amendments, and any grant related documents thereto;

BE IT RESOLVED, that IEUA has the capacity to provide the amount of funding and/or in-kind contributions specified in the funding plan;

BE IT RESOLVED, that IEUA will work with the USBR to meet established deadlines for entering into a cooperative agreement, and;

BE IT FURTHER RESOLVED, that the IEUA Board of Directors hereby adopts Resolution No. 2016-4-1 on this 20th day of April, 2016.

Terry Catlin, President of the Inland Empire Utilities Agency* and of the Board of Directors thereof

ATTEST:

Steven J. Elie, Secretary/Treasurer of the Inland Empire Utilities Agency* and of the Board of Directors thereof

* A Municipal Water District

STATE OF CALIFORNIA)
) SS
 COUNTY OF SAN BERNARDINO)

I, Steven J. Elie, Secretary/Treasurer of the Inland Empire Utilities Agency*, DO
 HEREBY CERTIFY that the foregoing Resolution No. 2016-4-1 was adopted at a regular meeting
 on April 20, 2016 of said Agency* by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

 Steven J. Elie
 Secretary/Treasurer

(SEAL)

* A Municipal Water District

RESOLUTION NO. 2016-4-2

RESOLUTION OF THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY*, SAN BERNARDINO COUNTY, CALIFORNIA, AUTHORIZING THE INLAND EMPIRE UTILITIES AGENCY TO ENTER INTO A FINANCIAL ASSISTANCE AGREEMENT UNDER THE WATERSMART: DROUGHT RESILIENCY PROJECT GRANTS FOR FY 2016 WITH THE U.S. DEPARTMENT OF INTERIOR - BUREAU OF RECLAMATION AND DESIGNATING A REPRESENTATIVE TO EXECUTE THE FINANCIAL ASSISTANCE AGREEMENT, AND ANY AMENDMENTS THERETO FOR THE RECHARGE MASTER PLAN UPDATE (RMPU) PROJECT NO. 23A WINEVILLE, JURUPA AND RP-3 BASIN IMPROVEMENT PROJECT

BE IT RESOLVED, that the Inland Empire Utilities Agency* (IEUA) is authorized to enter into a financial assistance agreement under the WaterSMART: Drought Resiliency Project Grants with the U.S. Department of Interior - Bureau of Reclamation (USBR) for the Recharge Master Plan Update (RMPU) Project No. 23a Wineville, Jurupa and RP-3 Basin Improvements Project;

BE IT RESOLVED, that IEUA's Board of Directors authorizes the General Manager, or in his absence, his designees, to execute the financial assistance agreement, any amendments, and any grant related documents thereto;

BE IT RESOLVED, that IEUA has the capacity to provide the amount of funding and/or in-kind contributions specified in the funding plan;

BE IT RESOLVED, that IEUA will work with the USBR to meet established deadlines for entering into a cooperative agreement, and;

BE IT FURTHER RESOLVED, that IEUA's Board of Directors hereby adopts Resolution No. 2016-4-2 on this 20th day of April, 2016.

Terry Catlin, President of the Inland Empire Utilities Agency* and of the Board of Directors thereof

ATTEST:

Steven J. Elie, Secretary/Treasurer of the Inland Empire Utilities Agency* and of the Board of Directors thereof

* A Municipal Water District

STATE OF CALIFORNIA)
) SS
COUNTY OF SAN BERNARDINO)

I, Steven J. Elie, Secretary/Treasurer of the Inland Empire Utilities Agency*, DO
HEREBY CERTIFY that the foregoing Resolution No. 2016-4-2 was adopted at a regular meeting
on April 20, 2016 of said Agency* by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

Steven J. Elie
Secretary/Treasurer

(SEAL)

* A Municipal Water District

RESOLUTION NO. 2016-4-3

RESOLUTION OF THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY*, SAN BERNARDINO COUNTY, CALIFORNIA, AUTHORIZING THE INLAND EMPIRE UTILITIES AGENCY TO ENTER INTO A FINANCIAL ASSISTANCE AGREEMENT UNDER THE AGRICULTURAL WATER CONSERVATION AND EFFICIENCY GRANTS WITH THE U.S. DEPARTMENT OF INTERIOR - BUREAU OF RECLAMATION AND DESIGNATING A REPRESENTATIVE TO EXECUTE THE FINANCIAL ASSISTANCE AGREEMENT, AND ANY AMENDMENTS THERETO FOR CHINO BASIN AGRICULTURAL WATER CONSERVATION AND WATER USE EFFICIENCY PROJECT

BE IT RESOLVED, that the Inland Empire Utilities Agency* (IEUA) is authorized to enter into a financial assistance agreement under the Agricultural Water Conservation and Efficiency Grants with the U.S. Department of Interior - Bureau of Reclamation (USBR) for the Chino Basin Agricultural Water Conservation and Water Use Efficiency Project;

BE IT RESOLVED, that IEUA's Board of Directors authorizes the General Manager, or in his absence, his designees, to execute the financial assistance agreement, any amendments, and any grant related documents thereto;

BE IT RESOLVED, that IEUA has the capacity to provide the amount of funding and/or in-kind contributions specified in the funding plan;

BE IT RESOLVED, that IEUA will work with the USBR to meet established deadlines for entering into a cooperative agreement, and;

BE IT FURTHER RESOLVED, that IEUA's Board of Directors hereby adopts Resolution No. 2016-4-3 on this 20th day of April, 2016.

Terry Catlin, President of the Inland Empire Utilities Agency* and of the Board of Directors thereof

ATTEST:

Steven J. Elie, Secretary/Treasurer of the Inland Empire Utilities Agency* and of the Board of Directors thereof

* A Municipal Water District

STATE OF CALIFORNIA)
) SS
COUNTY OF SAN BERNARDINO)

I, Steven J. Elie, Secretary/Treasurer of the Inland Empire Utilities Agency*, DO
HEREBY CERTIFY that the foregoing Resolution No. 2016-4-3 was adopted at a regular meeting
on April 20, 2016 of said Agency* by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

Steven J. Elie
Secretary/Treasurer

(SEAL)

* A Municipal Water District

Grant Applications for Drought Response Program



U.S. Department of Interior, Bureau of Reclamation (USBR)



Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Jason H. Gu
Grants Officer

USBR Drought Response Program Grant Opportunities

- * Drought Contingency Grant (\$200,000)
- * Drought Resiliency Grant (\$300,000)
- * Agricultural Water Conservation and Efficiency Grant (\$1,000,000)

Drought Contingency Grant

Planning Grant:

- * Develop a new drought contingency plan or to update an existing plan

Project Proposed:

- * Integrated Resources Plan Phase II Project (IRP Phase II)



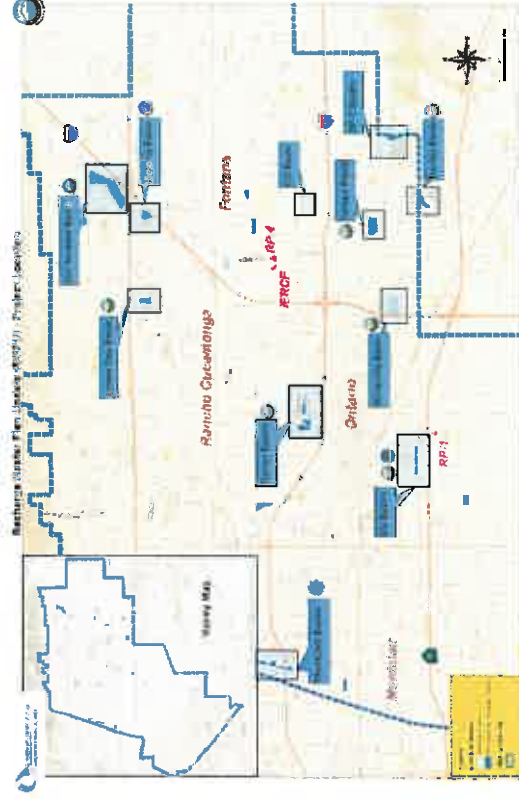
Drought Resiliency Grant

Construction Grant:

- * Support resiliency to cope with drought
- * A mitigation action responds to a Drought Plan

Project Proposed:

- * RMPU Wineville, Jurupa & RP-3 Basin Improvements Project



Agricultural Water Conservation & Efficiency Grant

Construction Grant:

- * Support water district and farmer partnerships
- * Improve agricultural water use efficiency to help communities build resiliency to drought

Project Proposed:

- * Chino Basin Agricultural Water Conservation & Water Use Efficiency Project:
 - RW Pressure Sustaining Valve for Agricultural Users
 - Chino Prison RW lateral for Farmers
 - Agricultural Drip Irrigation, and sensors



IEUA Grant Applications for USBR Drought Response Program

Program	Grant Max	Project Cost	IEUA Project
Drought Contingency	\$200,000	\$400,000	Integrated Resources Plan Phase II
Drought Resiliency	\$300,000	\$21,310,000	Wineville, Jurupa, and RP-3 Basin Improvements
Agricultural Water Conservation & Efficiency	\$1,000,000	\$2,000,000	Chino Basin Agricultural Water Conservation and Water Use Efficiency Project

Recommendation

- * Adopt Resolution Nos. 2016-4-1, 2016-4-2, and 2016-4-3 authorizing the Agency to enter into financial assistance agreements with the USBR for grant applications submitted in April 2016; and
- * Authorize the General Manager, or his designees, to execute the financial assistance agreements, and any grant related documents thereto.

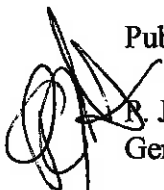
This action supports the Agency's mission to increase sustainability through the development of reliable local water supplies and is consistent with the Agency's mission of pursuing grants and low-interest financing.


INFORMATION
ITEM
2A

Date: April 20, 2016

To: The Honorable Board of Directors

Through: Public, Legislative Affairs and Water Resources Committee (4/13/16)

From:  R. Joseph Grindstaff
General Manager

Submitted by: Kathy Besser 
Manager of External Affairs

Subject: Public Outreach and Communication

RECOMMENDATION

This is an informational item for the Board of Directors to receive and file.

BACKGROUND

April

- April 20, IEUA Earth Day Event (Student Day), Chino Creek Park, 9:00 a.m. – 2:00 p.m.
- April 21, IEUA Earth Day Event (Community Day), Chino Creek Park, 4:00 p.m. – 7:00 p.m.
- April 22, Eagle Canyon Elementary GIES Dedication, 13435 Eagle Canyon Drive, Chino Hills, 1:00 p.m. – 2:00 p.m.
- April 28, 2016 Citrus Elementary GIES Dedication, 16041 Randall Avenue, Fontana, CA 92335, 4:30 p.m. – 5:30 p.m.

May

- May 1-7, International Compost Awareness Week
- May 4, Compost Giveaway, IEUA HQA Parking Lot, 9:00 a.m. – 2:00 p.m.
- May 5, Truman Middle School GIES Dedication, 16224 Mallory Drive, Fontana, 2:00 p.m. – 3:00 p.m.
- May 13-15, MWD Solar Cup Competition, Lake Skinner
- May 24, Cal Aero Preserve Academy GIES Dedication, 15850 Main St, Chino, CA 91708, 8:40 a.m. – 9:40 a.m.
- May 24, Cortez Elementary School GIES Dedication, 12750 Carissa Ave., Chino, 5:45 p.m.

Outreach/Education - Civic Publications Newspaper Campaign

- IEUA staff has been working in collaboration with Civic Publications to develop and distribute *Kick the Habit* display ads. The display ads are linked to the *Kick the Habit* micro-site, which displays IEUA's campaign message, tips and member agency links.
- IEUA sent an email blast to 157,000 households in the IEUA service area on March 25, 2016. The email blast led viewers to the *Kick the Habit* micro-site.

Media and Outreach

- The 2015 Annual Report can be found on the Agency's website. Additional copies have been distributed to stakeholders.
- IEUA staff began utilizing social media to market Earth Day and other events/topics via promo videos.
- IEUA staff placed a *Kick the Habit* ad in the Chino Champion Progress Edition to run on April 16.
- IEUA staff placed a ¼ page *Kick the Habit* ad in the Fontana Herald News for the month of April.
- Earth Day ads will be running on the La Opinion digital banner and will be placed on rack cards for the first two weeks in April.
- *Kick the Habit* bus advertisements in English and Spanish began on October 5, 2015 for an initial six month run and will continue to run for another six months.
- In March, 27 items were posted to Facebook and 28 tweets were sent under the @IEUAwater Twitter handle.
- Staff began implementing Friday Foliage as a weekly spot on IEUA's social media channels that highlight water efficient California native and drought tolerant plants. It also features pictures of the plants and information regarding the plant (i.e. good for slopes, attractive to butterflies, provides the location of where to locate them in the Chino Creek Park, etc.)

Education and Outreach Updates

- The Water Discovery Program is booked through the 2015/2016 school year. Water Discovery Program: 1,110 Girl Scout troop members, elementary, middle and high school students have taken part in the park field trip from July 1, 2015 through March 31, 2016. Fourteen additional Water Discovery Field Trips for school year 2015/16 have been scheduled. The Busing Mini-Grant program was extended through December 2020.
- The deadline for the 2016 "Water is Life" poster contest was March 3, 2016. Staff received over 400 art posters. Judging was held March 24, 2016.
- Student Day for Earth Day is booked. Staff is expecting over 1,300 students from eleven schools within our service area to attend. The Community Day will contain earth-friendly vendors, KOLA radio, a shredding company, environmental shows, giveaways, and education.
- The deadline for the 2016/17 GIES grant application is April 7, 2016.

PRIOR BOARD ACTION

None.

IMPACT ON BUDGET

The above-mentioned activities are budgeted in the FY 2015/16 Administrative Service Fund, External Affairs Services budget.

INFORMATION
ITEM
2B



April 1, 2016

To: Inland Empire Utilities Agency

From: Michael Boccadoro
President

RE: March Legislative Report

Overview:

March was a busy month in the Legislature. After March 19, all bills could be amended and acted upon, so lots of bills have been amended and set for hearing. Members have been working to fine-tune their legislation ahead of the April 22 deadline for bills to make it out of policy committees before heading to fiscal review.

Activity surrounding the California WaterFix has increased recently, which has resulted in the State Water Resources Control board putting a hold on all scheduled hearings and deadlines. Comments made by Felicia Marcus and Tam Doduc indicating potentially had drawn conclusions on the amount of water that should be delivered through the project resulted in several agencies filing or supporting petitions to disqualify both Marcus, the SRWCB chair, and Doduc, the presiding officer, from WaterFix hearings.

The March manual snowpack survey showed slight decline since the March 1 survey. The statewide snowpack's water content is 24.4 inches, 87 percent of average.

Bureau of Reclamation (BOR) recently released a report, "Reclamation Climate Change and Water 2016", looking at the likelihood of effects of climate change and specifically at eight rivers in the western United States including the Sacramento and San Joaquin Rivers. They suggested a variety of tactics including conservation, recycling, desalination, and building or expanding new dams to deal with climate change. While there was some good data on the rivers included in the report, the broad suggestions are nothing.

On March 1, Southern California Gas Company (SoCalGas) and San Diego Gas & Electric (SDG&E) filed a motion at the California Public Utilities Commission that, if approved, would temporarily move natural gas customers from a monthly 10 percent balancing, to a 5 percent daily balancing. SoCalGas stated reason for the significant change is the inability to store gas at Aliso Canyon, and therefore will not have the flexibility to respond to extreme heat events this summer.

As reported in past months, the new version of the net-energy metering (NEM) program has been approved at the California Public Utilities Commission. The new program does not make any significant changes to how future NEM projects at IEUA would be treated. However, the state's Investor Owned Utilities have filed a motion for a re-hearing of the new NEM program. While most believe they will not be successful, West Coast Advisors will continue to monitor the issue and report back on any changes.

The initiative filed by Senator Bob Huff (R-Chino) and State Board of Equalization Member George Runner (R-Lancaster) that would transfer funds from the high-speed rail to water storage projects has announced that they will suspend their signature gathering operations. With so many measures trying to qualify at the same time, the cost of gathering signatures is too high for the campaign.

Unfavorable voter response has also caused the Association of California Water Agencies, and their coalition partners, to suspend efforts to qualify a Constitutional Amendment for the November ballot that would create an alternate process for agencies to adopt conservation-based rates, lifeline rates, and rate-basing stormwater capture. An unfavorable ballot summary from the Attorney General was the driving factor for the lack of voter support.

Results from a statewide voter survey conducted by the Public Policy Institute of California (PPIC) have found that water is no longer the most important issue to Californians. Recent rains are likely the reason voters are slightly less concerned about water supply than they were in September. The economy is once again the top issue for Californians.

Inland Empire Utilities Agency Status Report – March 2016

WaterFix Update

California WaterFix discussion and debate has picked up in the last month following initial procedural hearings in February. The following are a few of the most recent developments that have led to additional delays for the project.

- The San Luis & Delta-Mendota Water Authority (SLDMWA) filed a petition on March 21st to disqualify State Water Resources Control Board (SWRCB) chairwoman Felicia Marcus and board member Tam Doduc from WaterFix hearings. Doduc is the presiding officer of the hearings. SLDMWA is taking issue with the written comments which may suggest both have already made up their minds about the amount of water necessary for environmental flows.

During a procedural hearing last month to set rules and scheduling details, Marcus and Doduc indicated in their ruling that water flows through the Delta would “be more stringent” than what is currently allowed. The comments raised concerns for Delta exporters who are on the hook to pay the \$15.5 billion price tag of the project.

The U.S. Bureau of Reclamation and the Department of Water Resources also asked Marcus and Doduc to rewrite the ruling and remove comments directed at premature determinations of Delta flows. The State Water Contractors expressed similar feelings in a letter stating that the ruling “appears to be biased and constitutes an abuse of discretion and should be rescinded”. Marcus and Doduc responded in a subsequent ruling

explaining that previous comments, “should not be considered a final determination... We have not prejudged this issue.”

- Earlier this month, The Howard Jarvis Taxpayers Association raised issue with methods water agencies, including the Santa Clara Valley Water District, may use to fund their portion of the \$15.5 billion California WaterFix price tag. Santa Clara Valley Water District’s share is estimated to be as much as \$1.2 billion. District staff maintains that that it can raise property taxes on homeowners without the 2/3 public vote required by Proposition 13, because the project is an addition to the State Water Project authorized by voters in 1960. HJTPA argues that WaterFix is a separate project and should be subject to a vote before raising local property taxes. At least five of the seven district board members have gone on record saying they would support an advisory measure on next year’s ballot to gauge voter support of a property tax increase in favor of WaterFix.
- On March 28th, the Department of Water Resources and the U.S. Bureau of Reclamation filed a continuance, requesting a 60-day extension to the SWRCB’s May WaterFix hearing. The agencies claim they need more time to address the protests from numerous environmental groups and Delta and Northern California water agencies. SWRCB staff has said that the request is under review.
- The Department of Water Resources (DWR) announced that the agency has reached an agreement with the Contra Costa Water District (CCWD) regarding water quality impacts associated with WaterFix. Modeling shows that the operation of new intakes on the Sacramento River, as proposed by WaterFix, could at times change water quality in the south Delta near four intakes that CCWD uses to help supply its 500,000 customers. All of CCWD’s intakes are subject to variations in water quality caused by salinity intrusion, Delta hydrodynamics, and discharges into the Delta and its tributary streams.

Under the agreement, DWR would deliver a portion of the district’s water supply from a new source on the Sacramento River if and when the WaterFix becomes operational. In return, CCWD agrees to withdraw a pending protest over WaterFix and not sue DWR over the project. The agreement describes several options for providing CCWD water via the Sacramento River:

- Use the Sacramento River intake operated by the East Bay Municipal Utility District near Freeport, after CCWD reaches agreement with EBMUD;
- Build a connection between the proposed California WaterFix tunnels and a CCWD pipeline where the conveyance systems cross in the south Delta; or
- Build a short pipeline from Clifton Court Forebay in the south Delta under Victoria Island to connect with a CCWD pipeline.

March Snowpack Survey

On March 30, 2016, the Department of Water Resources (DWR) completed the winter’s third media-oriented manual snow survey. The survey is conducted at the Phillips Station in the Sierras, just east of Sacramento. The surveying team found snowpack water content at 26 inches, a 1-inch decline since the March 1 survey. The measurement indicates snowpack levels at

75% of historic average. The statewide snowpack's water content is 24.4 inches or 87 percent of average. Snowpack levels in the southern region were at just 73 percent of normal. While the April 1 snowpack levels show a marked improvement over 2015 (5 percent of historical average) they are not in the drought busting category.

Reclamation Climate Change and Water 2016

Bureau of Reclamation (BOR) recently released a report, "Reclamation Climate Change and Water 2016", looking at the likelihood of effects of climate change and specifically at eight rivers in the western United States including the Sacramento and San Joaquin Rivers. The report focused on the likelihood of climate change upsetting food production, the environment, and hydroelectric generation at dams. The report was based on BOR's research and peer-reviewed studies, acknowledging that potential impacts will vary based on terrain and uncertainties in weather.

According to BOR, higher temperatures associated with climate change could result in increased snowmelt and evaporation from reservoirs, with a significant impact on the water supply for farms, particularly in the Central Valley. Similarly, less water in reservoirs will put a strain on the ability to generate hydroelectric power. BOR suggested a variety of tactics including conservation, recycling, desalination, and building or expanding new dams. Other suggestions include updating hydropower plants to operate when reservoirs have less water, repairing leaky irrigation canals and replenishing underground aquifers.

Among the other potential effects of climate change, the reported found:

- Streamflow could drop by 8 percent in several river basins, including the San Joaquin in California; the Colorado, which runs from the Colorado Rockies to Southern California; and the Rio Grande, which flows from Colorado through New Mexico and along the Texas-Mexico border.
- On the Columbia River, a projected increase in winter flooding and decrease in summer flows would affect Coho and Chinook salmon and steelhead.
- A warmer climate could mean less water seeping into aquifers just as farms and cities will need to pump more groundwater make up for shortfalls in rivers.

Natural Gas Daily Balancing

On March 1, Southern California Gas Company (SoCalGas) and San Diego Gas & Electric (SDG&E) filed a motion at the California Public Utilities Commission that, if approved, would temporarily move natural gas customers from a monthly 10 percent balancing, to a 5 percent daily balancing. SoCalGas is blaming the loss of Aliso Canyon storage for the reduced flexibility to respond to extreme heat events this summer.

A significant number of parties filed protests to this motion on several grounds. First, the procedural route SoCalGas took by filing a motion provides little opportunity for stakeholder

input and transparency. Using a motion eliminates the crucial fact finding and testimony aspects a formal application requires.

Additionally, parties argued that because of the nature of some natural gas use, a 5 percent daily balancing would impose significant operational and financial burdens on end use customers.

Due to the strong opposition to the motion, SoCalGas held a brief conference call to discuss next steps with parties. Parties continue to demand SoCalGas withdraw their motion and open a more transparent proceeding. SoCalGas has refused requests due to timing concerns heading into summer months. They did state that they will communicate with the judge that there is a stakeholder process underway and the first meeting is scheduled for next week. The CPUC is not expected to act on the motion while that process is ongoing.

West Coast Advisors will participate in the workshop and continue to monitor the situation.

Net Energy Metering

The existing NEM program is scheduled to sunset in June 2017 or when each of the utilities reaches the “NEM Cap,” which is 5 percent of their aggregate peak load. All projects that are interconnected before the program closes will stay on the current NEM tariff for 20 years after their interconnection date. Southern California Edison has 750.6 MWs remaining before they hit the 5 percent cap.

NEM 2.0

The CPUC has adopted the next version of NEM. As discussed in previous reports, with the current version of the NEM program set to expire soon, a lengthy and very detailed process to craft the next NEM program, NEM 2.0, was convened at the CPUC. Stakeholders, including WCA and IEUA, actively participated in the process.

While there were some changes to the program, overall, NEM 2.0 will ensure a viable net-energy metering program will be available for water agencies going forward.

Since the final decision was voted on, all three Investor Owned Utilities (IOUs) have filed applications with the CPUC to rehear the decision. They argue that the decision fails to implement state law and will burden their customers with exorbitant and unacceptable costs that should be paid for by solar customers. They go on to state that the commissions reasoning is contrary to law and that AB 327 (the law authorizing the continuation of NEM) was interpreted incorrectly.

Ballot Measure Update

Huff-Runner Initiative

Senator Bob Huff (R-Chino) and State Board of Equalization Member George Runner (R-Lancaster) were working to qualify an initiative that would divert unspent high-speed rail funds to water storage projects. While the campaign recently announced that they had collected 25 percent of the required signatures to qualify, they have also announced that the campaign will be suspended. With so many initiatives trying to qualify, the price of signature gathering has increased to as much as \$5 per signature, a price too high for the campaign. They may try again in 2018.

ACWA's Proposition 218 Fix

The Association of California Water Agencies (ACWA), along with the California League of Cities and the California State Association of Counties (CSAC) have proposed a Constitutional Amendment to create a new process for setting conservation rates, lifeline rates and rates for stormwater capture. As reported last month, the Attorney General wrote a ballot summary that is less than favorable to the measure. Essentially, the summary stated that passing the initiative would eliminate voter approval from the rate-setting process.

After testing the ballot title and summary, ACWA and the coalition have decided to not move forward with an initiative this year. They have indicated that they might try for a "Plan B" but they do not know what that other plan might be at this juncture.

PPIC Survey

The Public Policy Institute of California recently released results of a statewide survey that looked at many issues including water. It indicated that as California's record-setting drought has eased, residents are less likely to view water issues as a big problem. Fifty seven percent (57%) of adults say the supply of water in their part of the state is a big problem, compared to 70 percent in September 2015, just six months ago. While economy/jobs has reemerged as the number one concern facing Californians at 25 percent, water/drought issues comes in a close second at 20 percent.

Voters also support the Governor's California WaterFix. More than half of adults (54 percent) say building the tunnels is very important to the future of California. Residents in Los Angeles (61 percent) and the Inland Empire (61 percent) lead the way, followed by the Central Valley at 51 percent.

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Comprehensive Government Relations

MEMORANDUM

To: Joe Grindstaff and Kathy Besser, IEUA

From: Letitia White, Jean Denton, and Drew Tatum

Date: March 31, 2016

Re: March Monthly Legislative Update

Without Budget Framework, Appropriators Begin Year in Earnest Before Recess

House Republican leaders hoped to have a budget framework in place before the Easter recess, but scrapped plans for floor consideration during the final week of the month. While the House Budget Committee approved the fiscal year 2017 budget resolution on March 16 on a vote of 20-16, members of the conservative House Freedom Caucus have come out in opposition to the plan, making its success in a floor vote uncertain. Two Republicans, Dave Brat (R-VA) and Marlin Stutzman (R-IN), and all 14 Democrats voted no. The conservative defections caused House Majority Leader Kevin McCarthy (R-CA) to postpone consideration of the budget resolution until after the Easter recess to give Republican leaders an opportunity to chart a path forward.

During the recess, 15 organizations headlined by the Competitive Enterprise Institute praised a policy statement in the budget that, among other things, urges Congress to create a regulatory budget that would set annual costs of regulations and allocate those costs among federal regulatory agencies. "Congress should act now to require better reporting, more accountability and cost reductions," says the letter, which also was signed by Americans for Tax Reform, FreedomWorks and the National Taxpayers Union. The letter calls on Congress to adopt a budget resolution "that includes the regulatory budget put forward by House Budget Committee Chairman Tom Price," the Georgia Republican who wrote the tax and spending framework. The letter calls Price's budget resolution "remarkable" for including the statement on regulations. The endorsement could be a shot in the arm for the budget resolution.

Despite the setback on consideration of the budget resolution, the House Appropriations Subcommittee on Military Construction and Veterans Affairs moved forward with the markup of its FY17 spending bill, advancing it for consideration by the full committee. Additional FY17 spending bills are expected to be considered during the months of April and May at the subcommittee level.

At least one subcommittee chairman is expressing concern that despite movement of the appropriations bills at the subcommittee level, a continuing resolution may be necessary in the fall to avoid a government shutdown. "I think that's more likely than not," Representative Tom Cole (R-OK) chairman of the House Appropriations Labor-HHS-Education Subcommittee, said

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in an interview before the recess. That stark admission marks a major turnaround in thinking since January, when House Speaker Paul Ryan (R-WI) and Senate Majority Leader Mitch McConnell (R-KY) vowed to rescue Congress from its state of dysfunction and pass regular spending bills on time for the first time since 1994.

House and Senate Agree to a Short Term FAA Extension

The Federal Aviation Administration short-term extension is off to the White House after the Senate-amended version of the bill was approved on the House floor by voice vote Monday, March 21. The House originally passed a short term reauthorization that provided the necessary authority for the administration through mid-July, but extended the authority to collect certain revenue until early next year. In an effort to keep pressure on lawmakers to advance a long-term authorization, the Senate stripped the provisions allowing the FAA to continue collecting revenue beyond the expiration of its regulatory authority, meaning both provisions now expire on July 15, 2016.

"I would hope that this is the last extension," ranking Transportation and Infrastructure Committee Democrat Peter DeFazio (D-OR) declared on the House floor, adding that July 15 is now the "drop-dead date." After that point, he said, "Congress will be out for the longest summer break since probably the '50s" and it would be impossible to take meaningful action for another year. Representative Bill Shuster (R-PA), Chairman of the Transportation and Infrastructure Committee did not see quite the same urgency. He insisted nailing down a long-term bill would be high on the agenda after the House returns from its two-week break. "We'll be working very hard" through the summer, Shuster said, but once they reach July, "we'll see what happens after that." Shuster would not rule out the possibility that the debate would continue past July.

Before the Easter recess, the Senate Commerce Committee advanced a reauthorization that would expire on September 30, 2017. The plan received overwhelming bipartisan support, and there is optimism that the legislation will be brought to the floor in early April to avoid the need for another temporary extension this summer. The House has not indicated how quickly it might take up the Senate legislation, if it considers it at all. Representative Shuster still hopes his air traffic control overhaul language will be considered.

Republicans Promise to Block Merrick Garland's Appointment to the Supreme Court

President Obama fulfilled his promise to nominate someone to fill the vacancy created by the death of Justice Antonin Scalia on the United States Supreme Court. On March 16, the president announced that he had chosen the chief judge of the United States Court of Appeals for the District of Columbia Circuit, Merrick Garland. The president opted to pick a more centrist jurist in an effort to place additional public pressure on the Republican-controlled Senate to hold confirmation hearings and a vote on the nominee.

The nomination sets in motion what will likely be a standoff between the White House and the Senate that is likely to remain unresolved through the election. President Obama said, "Presidents do not stop working in their final year or their term; neither should a senator." Republicans quickly rejected the president's nominee, with Senator McConnell going to the floor announcing that Republicans would continue to employ the same strategy, regardless of who the

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nominee was. He said that Senate Republicans maintain the position that the American people should have a voice in selecting a new nominee through the election of a president.

For his part, Senator McConnell has opted to utilize pro-forma sessions in the Senate during periods where the Senate had scheduled to be out of session. Pro-forma sessions will keep the president from nominating Garland to sit on the bench through a recess appointment. President Obama has said he has no intention to make a recess appointment, as the appointment would still require confirmation of the Senate, otherwise his term would only last through the end of the next session of Congress.

The confirmation of a new justice could have an impact on several of the administration's regulations. A challenge to the regulatory definition of the "waters of the United States" is expected to be heard by a Federal Circuit Court this summer in Ohio. Any appeals could end up being heard by the Supreme Court. Additional challenges to carbon emission regulations could also end up at the Supreme Court.

House Forms Municipal Bonds Caucus

In response to tax plans introduced during the last few years that have targeted the tax exempt status of municipal bonds, Members of Congress, led by Representatives Randy Hultgren (R-IL) and Dutch Ruppersberger (D-MD), are forming a Municipal Finance Caucus. Citing that municipal bonds have been tax-exempt since the federal income tax was first introduced, the members of the caucus will seek to protect them if tax reform legislation is introduced. Municipal bonds have built four million miles of roads, 500,000 bridges, 16,000 airports, 900,000 miles of pipe in water systems and thousands of libraries, health clinics and public transportation systems. A coalition of local governments, airport authorities, utility companies, and development associations have formed a coalition that will work closely with the caucus to educate other Members of Congress on the importance of municipal finance issues.

Outlook for April

The House is in the middle of a two-and-a-half-week recess for Easter. House lawmakers will return the week of April 11. Senators will return from their own two-week recess on April 4. The Senate may return to consideration of a longer-term FAA reauthorization.

The House Appropriations Subcommittees are expected to continue markup of the 12 annual appropriations bills during the month of April. Republican leaders have continued to insist that they hope to move all appropriations bills this summer in advance of the beginning of the new fiscal year that begins October 1, 2017.

Agricultural Resources

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April 1, 2016

Legislative Report

**TO: Joe Grindstaff
General Manager, Inland Empire Utility Agency**

**FR: David M. Weiman
Agricultural Resources
LEGISLATIVE REPRESENTATIVE, IEUA**

SU: Legislative Report, March 2016

Expectations were sky high that the El Nino, as being predicted, would be a drought-buster. It didn't happen. California had a strong winter, with significant precipitation, especially in Northern California, but not in Southern California. According to recent summary report from Accuweather.Com:

Much-needed mountain snow and rain returned to California this winter, but fell short of expectations amid a super El Niño.

The official snow season for California's Sierra Nevada came to an end at the start of April on a below-normal note and one that AccuWeather Senior Meteorologist Ken Clark called "disappointing."

The amount of water stored in the snow for the entire mountain chain averaged 14 percent below normal on April 1, according to the California Cooperative Snow Surveys.

The northern Sierra fared better than the southern Sierra with the

amount of water in the snow averaging only 5 percent below normal, compared to the 27 percent below normal in the south.

"The numbers are not anywhere near what many had wanted going into the winter," Clark said. "The much-heralded El Niño brought more snow than the previous four years, but that was not hard to accomplish."

Snapshots

- For California, December was not a wet month. January was a wet month. February was not. March was. The El Nino "yo-yo'd" throughout the Winter months and until the end of March (and conclusion to the winter season).
- BuRec initial water allocations were announced on April 1 with "*North of Delta, Sacramento River Settlement Contractors, San Joaquin Exchange and Settlement contractors to receive 100%; Friant to receive 30% of Class 1 water; South of Delta 5%*". The Agency said that "*this allocation is based on a cautious estimate of the amount of water that will be available for delivery to CVP water users and reflects current reservoir storages, precipitation and snowpack in the Central Valley and Sierra Nevada.*"
- BuRec, in their announcement, provided a 2015-2016 comparison stating, "*the California Department of Water Resources (DWR) reports that as of March 30, 2016, the statewide average snow water equivalent in the Sierra Nevada is 24.4 inches, as compared to two inches on this date last year, and rainfall is currently at 125 percent of the historical average. However, in 2015 California experienced its fourth year of drought, and although conditions have greatly improved, Gov. Jerry Brown's Emergency Drought Proclamation, issued January 17, 2014, remains in effect.*"
- San Joaquin Valley irrigators (Westlands and others) are extremely upset and are demanding more water be released for them (which creates a series of complicated issues for existing and more senior water right holders, environmental needs and pumping capacity limitations).
- The Drought Monitor, throughout the entire Winter, continued to show ALL of California in drought and about half the State (including the San Joaquin Valley and parts of Southern California still in the highest category of drought "extreme" and "exceptional."
- According to BuRec, "*in 2015, Reclamation undertook extraordinary actions to provide public health and safety supplies to our M&I contractors, meet our obligations to the San Joaquin River Exchange Contractors and South-of-Delta refuges, and facilitate water transfer and water sharing agreements throughout the Central Valley. The CVP began the water year last October with only 47 percent of average storage overall and just 27 percent of average storage in the Federal share of San Luis Reservoir. This compares to*

85 percent of average overall for the CVP and 53 percent of average storage in the Federal share of San Luis Reservoir today. Dry conditions in the fall of 2015 also hampered the filling of San Luis Reservoir. Further, throughout the fall and most of the winter, Reclamation held releases to minimal levels to conserve storage in upstream.”

- As reported last month, Senator Feinstein formally introduced her long-awaited Drought Bill (S. 2553, The California Long-Term Provisions for Water Supply and Short-Term Provisions for Emergency Drought Relief Act), but Senator Boxer did not co-sponsor it. Congressman John Garamendi introduced a House version of the same bill.
- The Senate Energy Committee took no action on the bill. No hearings were held. No markup was scheduled (or is pending). A westwide water bill has not been introduced (but could, with relative ease, be drafted). The Chair, Senator Lisa Murkowski, has repeatedly stated that (a) she would not get into the middle of the California debate; and (b) challenged Californians to provide her with an agreed-upon legislative package.

2016 Agenda – Passing Annual Funding Top Priority

- Last month, I reported that *“House Speaker Paul Ryan (R-WI) and Senate Majority Leader Mitch McConnell (R-KY) jointly decided that considering, marking up, passing and then conferencing all 12 funding (appropriations) bills was their top priority (which hasn’t been done in years)”* and that *“the House-Senate leadership wanted to avoid the need and use of a Continuing Resolution (CR) or Omnibus bill as has almost routinely occurred in recent years.”*
- Little progress has occurred. The House Freedom Caucus has effectively blocked the budget/funding process by telling Speaker Ryan that they will not support the proposed budget (which sets an overall spending ceiling which is then “allocated” to the twelve appropriations subcommittees). Those allocations are the critical first step in the annual funding (budget/appropriations) process. Like last year, the process is slowed again this year.
- The funding subcommittees will have to begin marking up their bills in April, but the hope of conferencing with the Senate and actually passing annual funding bills is all but history. That means Congress likely faces another Continuing Resolution (CR) or other massive funding bill. Appropriators are not happy. House and Senate leadership has been forced to back down and internal gridlock continues. More gridlock.

Supreme Court Hears Challenge to Waters of the United States (WOTUS)

- The highly controversial “Waters of the United States” issue reached the High Court this month.
- Based on the oral arguments and questions from Justices (now eight with the death of Justice Scalia), Court watchers are predicting that the Court will rule against EPA (it’s always dicey “guessing” how the Court will rule) and it’s also possible that a decision

may be postponed until after a new Justice is confirmed.

Administration Submits Budget

- In February, the Administration submitted its proposed budget to the Congress for all departments and all agencies.
- Both the House and Senate Appropriation's subcommittee began holding hearings on an agency-by-agency basis. Hearings were held in both the House and Senate on the Energy and Water Development Appropriations bills. Hearings were also held on the Interior Department's budget (note: all Interior Department programs are funded in the Interior Appropriations bill except funding for BuRec and its programs). Both programs impact water policy.

Tax Reform Agenda

- As reported last month, while House Republican leadership (in the House and in the Ways and Means Committee) continue to say the tax reform is a central issue, no bill has been introduced and no hearings have been held.
- Tax reform has become a "prepare in 2016, act in 2017" issue.
- The Municipal Bonds for America coalition continues to submit letters detailing support for the deductibility of muni bonds and further builds support to protect the funding instrument. IEUA signed the most recent communication to the House.
- There is a largely unrecognized policy contradiction unfolding. That is, WRDA created a new bonding authority and others (even the WH) are turning to the bond market for expanded funding of water and infrastructure funding. At the same time, legislative changes to deductibility of bonding authority is under consideration for tax reform policy that could potentially negate or reduce the new WRDA policy. I anticipate this being raised in the near term.

Water/Weather/Drought

Feinstein Bill Introduced – Fate Unclear

- In monthly reports, I almost always avoid "speculative" reporting. This month I make an exception.
- Informal discussions with Members, congressional staff, agency officials and fellow reps reveal that no one believes a drought bill can emerge – be finalized – this year (certainly not before the election). If a Lame Duck is held all bets are off and whatever happens will be influenced by the outcome of the election.
- The past month has seen a surge of negative or highly critical press (Westlands being fined by the SEC for altering financial statements and putting bond investors at risk combined with the revelation that, in the Board meeting minutes/transcripts, their

manager joked about using “Enron” accounting). Local, statewide and national press stories followed. These developments do not support a drought bill even being considered.

Drought Relief Funding – IEUA Grant Application Pending

- BuRec is expected to announce grant funding awards – sometime late in April or in May resulting from the \$100 million for drought relief appropriated last December at Senator Feinstein’s request and leadership.
- IEUA submitted applications and your congressional delegation supported the request.

Unanticipated Drought-Related Federal Tax Issue

- As previously reported, the “unintended tax penalty” resulting from the Governor’s Drought Orders (from MWD’s turf rebates) remains unresolved. A request for a clarification from Treasury/IRS is still pending.

Drought Status – CA and Rest of the West (unchanged)

- **Drought Conditions – California.** Even with El Nino storms, the Drought Monitor indicates that all 58 counties remained in various levels of drought.
- **El Nino.** Drought Monitor also reports that westwide, that drought conditions are lessening in most western states (Nevada is an exception)
- **Lake Mead.** BuRec is projecting that Lake Mead remains at risk (even with storms in the Rocky Mountains) and 2017 remains highly problematic.

2016 – An Election Year

- It’s an election year. As of April 1:
 - * R nominee unclear and highly contested
 - * D nominee unclear and highly contested
 - * Party conventions, beginning in mid-July, could be deadlocked
 - * 14 of the 17 R candidates have dropped out.
 - * Trump, Cruz and Kasich are vying for the nomination
 - * If the “stop-Trump” effort is successful (regardless of delegate count), Trump is threatening to run as an independent (of some kind)
 - * Speculation, openly discussed daily, is the House and Senate are both “in play” and either or both could switch control back to the Ds
- If there was a theme for the 2016 cycle, it’s “uncertainty.” Nothing is certain. Little is predictable.
- Add to the above that the President nominated Judge Garland to the High Court and the Senate is tied up in knots – refusing to even consider the nomination.

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CALIFORNIA STRATEGIES, LLC

Date: March 31, 2016
To: Inland Empire Utilities Agency
From: John Withers, Jim Brulte
Re: March Activity Report

Listed below is the California Strategies, LLC monthly activity report. Please feel free to call us if you have any questions or would like to receive any more information on any of the items mentioned below.

- **Met with IEUA Executive staff to review priority issues and to discuss activities for March that Executive Staff wanted accomplished.**
- **Discussed ways to highlight the customer return on investment for the building of recharge basins in our service territory.**
- **Discussed LAFCO and made recommendations to staff about upcoming issues. Support and advise on IEUA/SBVMWD transfer transaction on an as needed basis. Review and comment on Webb Engineering Plan of Services Scope of Work.**
- **Provided a progress update on the recent request for documents from the CVWRD.**
- **Continue to monitor statewide water issues including the BDCP, water bond, and drought relief act activate. Made recommendation regarding the request for money from various state special funds.**
- **Monitor Santa Ana Regional Board agenda and issues of interest to IEUA.**

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Federal Legislation of Significance

Bill Number	Sponsor	Title and/or Summary	Summary/Status
H.R. _____ / S. _____	Rep. Mike Simpson / Sen. Lamar Alexander	FY 17 Energy and Water Development and Related Agencies	<p>The President's budget request to Congress was released on February 9, 2016.</p> <p>The president requested the following funding levels for water recycling and conservation programs:</p> <p>Title XVI: \$21.5 million, \$1.5 million above the FY16 request, but \$1.8 million below the FY16 enacted level</p> <p>WaterSMART: \$23.4 million, \$35,000 above the FY16 request, and \$3.4 million above the FY16 enacted level</p>
S.2533	Sen. Dianne Feinstein	California Long-Term Provisions for Water Supply and Short-Term Provisions for Emergency Drought Relief Act	<p>The House Appropriations Committee officially began working on fiscal year 2017 legislation in March, marking up the Military Construction and Veterans Affairs bill before the April Recess.</p> <p>At this time, the Energy and Water Appropriations Subcommittee has not official noticed a hearing, but we anticipate a markup in April. At that time, we will know how Congress will respond to the budget request for Title XVI and WaterSMART grants. IFS has undertaken two efforts on your behalf and submitted appropriations requests for both Title XVI and WaterSMART that together equal an additional \$22.6 million in requested additional funds for FY17. Additionally, we anticipate that Senator Feinstein will attempt to include additional funding for western drought relief in the Senate's FY17 legislation. <u>That funding typically has not been included in the House's</u> legislation. <u>With her original legislation not gaining traction at the committee level,</u> Senator Feinstein reintroduced drought legislation in February after receiving additional feedback from stakeholders in California. The bill also comes after House Republicans attempted to insert their own drought provisions into the Consolidated Appropriations Act, 2016.</p> <p>Feinstein said that she has continued to work with local, state, and federal partners to create her new legislation, though California Republicans in the House have said they were not involved in the latest discussions. California House Republicans have reiterated that they have already passed a drought bill this year, and they believe it is the only legislation that can be passed until the Senate moves legislation that can be conferenced between the two chambers.</p>

H.R.2898	Rep. David Valadao	Western Water and American Food Security Act of 2015	<p>The Senator has been placing additional pressure on federal agencies to allow for more pumping during periods where additional water is available due to rain events. It is unclear if this pressure would turn into language to be included in her drought bill later in the year either by an amendment or compromise with the California Republican delegation.</p> <p>Passed the House.</p> <p>First Legislative Committee Hearing was held in early October 2015 in the Senate. As mentioned above, Senator Feinstein has reintroduced drought legislation in the Senate in an effort to conference a bill with the House before the end of the 114th Congress.</p>
S.2012	Sen. Lisa Murkowski	Energy Policy Modernization Act of 2015	<p>The Senate is considering its first broad energy reform policy bill in eight years. The bill includes a number of policy priorities from both Republicans and Democrats and came as a result of months of negotiations, meetings outreach and other activities aimed at a truly bipartisan bill. The bill instead on fossil fuels and infrastructure: natural gas pipeline permitting, authorizing the main federal conservation fund, job training, updating the grid, as well as a push on energy efficiency.</p> <p>The legislation was pulled from the floor in February after amendments related to the water crisis in Flint, Michigan caused procedural delays. While they were initially hopeful to bring the legislation back to the floor in March, no agreement has been reached on the water crisis in Flint, Michigan. The bill is a major priority for Chairwoman Murkowski, and it is unlikely other legislation from her committee (including the drought bill) will receive floor time before this legislation passes the Senate.</p>
H.R.4470	Rep. Dan Kildee (D-MI) / Rep. Fred Upton (R-MI)	Safe Drinking Water Act Improved Compliance Awareness Act	<p>The House has approved legislation to clarify the Environmental Protection Agency's authority to notify the public about danger from lead in their drinking water. The bill is the first approved by Congress to respond to the water crisis in Flint, Michigan. The legislation requires the Environmental Protection Agency to notify the public when concentrations of lead in drinking water rise above mandated levels and to create a plan to improve communication between the agency, utilities, states, and consumers. While the bill's authors admit that the new legislation will not prevent future water contamination, they contend that it will prevent the situation from dragging out as has happened in Flint.</p>

H.R.3143 / S.886	Rep. Jerry McNerney (D-CA) / Sen. Tom Udall (D-MN)	Smart Energy and Water Efficiency Act of 2015	<p>The legislation has not been taken up in the Senate, but it is expected to receive bipartisan support when Senators vote.</p> <p>Directs the Department of Energy (DOE) to establish and carry out a smart energy and water efficiency management pilot program to award grants to three to five eligible entities (authorities that provide water, wastewater, or water reuse services) to demonstrate advanced and innovative technology-based solutions that will: (1) increase and improve the energy efficiency of water, wastewater, and water reuse systems to help communities make significant progress in conserving water, saving energy, and reducing costs; (2) support the implementation of innovative processes and the installation of advanced automated systems that provide real-time data on energy and water; and (3) improve energy and water conservation, water quality, and predictive maintenance of energy and water systems, through the use of Internet-connected technologies, including sensors, intelligent gateways, and security embedded in hardware.</p> <p>The legislation has not advanced in the House, but a hearing has been held at the committee level in the Senate.</p>
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State Legislation to Watch

Bill Number	Sponsor	Title and/or Summary	Summary/Status	IEUA Position
AB 1704	Dodd	Water Rights	Current law requires applicants for appropriation of water for small domestic, small irrigation, or livestock stockpond use to register with the State Water Resources Control Board, as specified. Current law requires the registration to include a certification that the registrant has contacted a representative of the Department of Fish and Wildlife and has agreed to comply with conditions set forth by the Department of Fish and Wildlife. This bill would, instead, require the registrant to provide a copy of the registrant's registration form to the Department of Fish and Wildlife and agree to general conditions, as specified.	
AB 1713	Eggman	Sacramento-San Joaquin Delta: peripheral canal	Current law requires various state agencies to administer programs relating to water supply, water quality, and flood management in the Sacramento-San Joaquin Delta. The bill would prohibit the construction of a peripheral canal, as defined, unless expressly authorized by an initiative voted on by the voters of California on or after January 1, 2017, and would require the Legislative Analyst's Office to complete a prescribed economic feasibility analysis prior to a vote authorizing the construction of a peripheral canal.	SUPPORT
AB 1738	McCarty	Building Standards: Dark Graywater	Would define "dark graywater" as a specified wastewater that comes from kitchen sinks and dishwashers. This bill would require the Department of Housing and Community Development, at the next triennial building standards rulemaking cycle, to adopt and submit for approval building standards for the construction, installation, and alteration of dark graywater systems for indoor and outdoor uses. This bill contains other existing laws.	
AB 1749	Mathis	California Environmental Quality Act: exemption: recycled water pipelines	CEQA exempts from its requirements projects consisting of the construction or expansion of recycled water pipeline and directly related infrastructure within existing rights of way, and directly related groundwater replenishment, if the project does not affect wetlands or sensitive habitat, and where the construction impacts are fully mitigated, and undertaken for the purpose of mitigating drought conditions for which a state of emergency was proclaimed by the Governor on a certain date. CEQA provides that this exemption remains operative until the state of emergency has	

			<p>expired or until January 1, 2017, whichever occurs first. This bill would extend that date to January 1, 2022.</p>	
AB 1755	Dodd	The Open and Transparent Water Data Act	<p>Would enact the Open and Transparent Water Data Act. The act would require the Department of Water Resources to establish a public benefit corporation that would create and manage (1) a statewide water information system to improve the ability of the state to meet the growing demand for water supply reliability and healthy ecosystems, that, among things, would integrate existing water data information from multiple databases and (2) an online water transfer information clearinghouse for water transfer information that would include a database of historic water transfers and transfers pending responsible agency approval and a public forum to exchange information on water market issues.</p>	
AB 1842	Levine	Water Pollution: Fines	<p>Current law imposes a maximum civil penalty of \$25,000 on a person who discharges various pollutants or other designated materials into the waters of the state. This bill would impose an additional civil penalty of not more than \$10 for each gallon or pound of polluting material discharged. The bill would require that the civil penalty be reduced for every gallon or pound of the illegally discharged material that is recovered and properly disposed of by the responsible party.</p>	
AB 1925	Chang	Desalination: Statewide Goal	<p>The Cobey-Porter Saline Water Conversion Law, states the policy of this state that desalination projects developed by or for public water entities be given the same opportunities for state assistance and funding as other water supply and reliability projects, and that desalination be consistent with all applicable environmental protection policies in the state. This bill would establish a goal to desalinate 300,000 acre-feet of drinking water per year by the year 2025 and 500,000 acre-feet of drinking water per year by the year 2030.</p>	
AB 2206	Williams	Biomethane: interconnection and injection into common carrier pipelines: research	<p>Would request the California Council on Science and Technology to undertake and complete a study analyzing the regional and gas corporation specific issues relating to minimum heating value and maximum siloxane specifications adopted by the Public Utilities Commission for biomethane before it can be injected into common carrier gas pipelines. If the California Council on Science and Technology</p>	

			agrees to undertake and complete the study, the bill would require each gas corporation operating common carrier pipelines in California to proportionately contribute to the expenses to undertake the study with the cost recoverable in rates.	
AB 2304	Levine	California Market Water Exchange	Would establish the California Water Market Exchange, governed by a 5-member board, in the Natural Resources Agency. This bill would require the market exchange, on or before December 31, 2017, to create a centralized water market platform on its Internet Web site that provides ready access to information about water available for transfer or exchange.	
AB 2313	Williams	Renewable Natural Gas	The California Global Warming Solutions Act of 2006 establishes the State Air Resources Board as the state agency responsible for monitoring and regulating sources emitting greenhouse gases. This bill would require the state board to study and evaluate a strategy or strategies to increase the in-state production and use of renewable natural gas, as defined, to further specified goals.	
AB 2488	Dababneh	Protected species: unarmored threespine stickleback: taking or possession.	Would permit the Department of Fish and Wildlife to authorize, under the California Endangered Species Act, the take of the unarmored threespine stickleback (<i>Gasterosteus aculeatus williamsoni</i>) attributable to the periodic dewatering, inspection, maintenance, or repair of the Metropolitan Water District of Southern California's Foothill Feeder water supply facility from Castaic Dam to the Joseph Jensen Treatment Plant in the County of Los Angeles, as specified, if certain conditions are satisfied.	
AB 2583	Frazier	Sacramento-San Joaquin Delta Reform Act of 2009	Would add a definition of the California Water Fix to the Sacramento-San Joaquin Delta Reform Act of 2009. This bill would eliminate certain provisions applicable to the BDCP and would revise other provisions to instead refer to a new Delta water conveyance project for the purpose of exporting water. This bill would require new Delta water conveyance infrastructure to be considered as interdependent parts of a system and to be operated in a way that maximizes benefits for each of the coequal goals. This bill contains other related provisions and other existing laws.	
AB 2702	Atkins	Climate Change	Would state the intent of the Legislature to enact legislation that would continue the work with local governments, state agencies, and others to meet the goals set forth in Governor Brown's Under 2 MOU, which brings together subnational governments willing	

			<p>to commit to either reducing the emissions of greenhouse gases 80% to 95% below 1990 levels by 2050 or achieving a per capita annual emissions target of less than 2 metric tons of carbon dioxide equivalent by 2050.</p>	
ACA-8	Bloom	<p>Local government financing: water facilities and infrastructure: voter approval</p>	<p>Would create an additional exception to the 1% limit for a rate imposed by a city, county, city and county, or special district to service bonded indebtedness incurred to fund the construction, reconstruction, rehabilitation, or replacement of wastewater treatment facilities and related infrastructure, potable water producing facilities and related infrastructure, nonpotable water producing facilities and related infrastructure, and stormwater treatment facilities and related infrastructure, that is approved by 55% of the voters of the city, county, city and county, or special district, as applicable, if the proposition meets specified requirements, and would authorize a city, county, city and county, or special district to levy a 55% vote ad valorem tax. This bill contains other related provisions and other existing laws.</p>	
SB 163	Hertzberg	<p>Wastewater treatment: recycled water</p>	<p>Would declare that the discharge of treated wastewater from ocean outfalls, except in compliance with the bill's provisions, is a waste and unreasonable use of water in light of the cost-effective opportunities to recycle this water for further beneficial use. This bill, on or before January 1, 2026, would require a wastewater treatment facility discharging through an ocean outfall to achieve at least 50% reuse of the facility's actual annual flow, as defined, for beneficial purposes.</p>	
SB 1043	Allen	<p>Renewable gas: biogas and biomethane</p>	<p>Would require the State Air Resources Board to consider and adopt policies to significantly increase the sustainable production and use of renewable gas, as defined, and, in so doing, would require the state board, among other things, to ensure the production and use of renewable gas provides direct environmental benefits and identify barriers to the rapid development and use of renewable gas and potential sources of funding.</p>	
SB 1318	Wolk	<p>Local government: drinking water infrastructure or services:</p>	<p>Would prohibit a local agency formation commission from authorizing a city or a district to extend drinking water infrastructure or services or wastewater infrastructure or services until it has extended those services to all disadvantaged</p>	

		wastewater infrastructure or services	communities within or adjacent to its sphere of influence, as specified, or has entered into an agreement to extend those services to those disadvantaged communities, unless specified conditions are met. This bill contains other related provisions and other existing laws.	
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INFORMATION


ITEM


2F


Date: April 20, 2016

To: The Honorable Board of Directors

Through: Public, Legislative Affairs, and Water Resources Committee (04/13/16)

From:  P. Joseph Grindstaff
General Manager

Submitted by:  Chris Berch
Executive Manager of Engineering/Assistant General Manager

 Sylvie Lee
Manager of Planning and Environmental Resources

Subject: 2015 Integrated Water Resources Plan

RECOMMENDATION

This is an informational item for the Board of Directors to receive and file.

BACKGROUND

With the adoption of the Chino Basin Optimum Basin Management Plan in 2000, the region embarked on a new era of water management. Over the past fifteen years, more than \$500 million was invested by our agencies to drought-proof the region by expanding groundwater, stormwater, recycled water and conservation programs and facilities. These investments also leveraged the region's ability to secure hundreds of millions of dollars in state and federal grants and loans.

As a result, when the record-breaking drought of 2012 began, the region was prepared. Throughout this unprecedented time, sufficient water supply was available to meet the water needs of the region without constraining new development or economic growth. These local water resources provided the flexibility and resiliency needed to adapt, and became the foundation for identifying future water resources for the region.

Climate change is now creating uncertain conditions and new water management challenges for the region's future. IEUA in partnership with member agencies initiated its first Integrated Water Resources Plan (IRP) to anticipate these challenges and to ensure that continued investments in water resources and water use efficiency meet the future water needs of the region. The key findings of the IRP include:

- The region's past investments in local water supplies and the diversification of the available water resources have positioned the region well to deal with the future impacts of climate change. If no further actions were taken beyond the currently planned investments in regional supplies and water use efficiency, the region would be able to meet 80-90% of its projected water needs by 2040.
- Established a regional water demand forecast that identified 45,400 acre-feet per year (AFY) of additional water supply will be needed by 2040 to accommodate regional growth and other environmental and/or contractual stream flow obligation.
- Identified over 70 potential regional and local water supply projects and opportunities
- Portfolios that combined water supply and water efficiency actions yielded the most adaptive strategies for the region
- Climate scenarios reveal that the addition of very modest levels of water use efficiency (such as 10% reduction in water use) improved the performance of all portfolios and yielded significant benefits the region.
- Recycled water is the region's most climate resilient water supply because the amount of available water to the region is not impacted by dry years.
- Highlight the importance of securing supplemental water – surface, imported, and external recycled water supplies – when it is available to build a stronger supply buffer for dry years or when State Water Project availability is limited
- Groundwater reserves help address future climate uncertainties or catastrophic events, such as a major facility or pipeline break or a loss in supplies. A broader regional benefit is the role that these reserves can play when managed as a regional water bank to enhance water supply reliability within the Santa Ana Watershed and across Southern California.

The IRP will also ensure that our agencies are prepared for the next round of funding opportunities. The Agency is anticipating approximately \$675 million to be available to the region over the next 25 years. In order to meet the schedule for upcoming grant funding opportunities and establish planning priorities, the IRP process was divided into two phases:

Phase 1 – Analysis and Recommendations: Phase 1 focused on an extensive analysis of future projected water needs and water supply strategies under conditions of climate change and growth. Results from Phase 1 include summaries of the recommended regional water resource strategies; corresponding ranges of costs for the various supply categories; and a regionally developed, all-inclusive list of potential supply projects (local and regional). This information will be used to complete a Programmatic Environmental Impact Report (PEIR), which is needed to ensure that projects are grant eligible. The 2015 IRP report is the culmination of Phase 1.

Phase 2 - Implementation and Capital Improvement Program (CIP): Phase 2 will address additional detailed project level analysis including project scopes, costs, prioritization, and implementation scheduling. Phase 2 will also include the disaggregation of the regional demand and supplies to the local retail level. Continued discussions will be facilitated through a Regional Water Forum. Phase 2 is anticipated to begin in summer 2016.

project level analysis including project scopes, costs, prioritization, and implementation process. IEUA staff greatly appreciated the engagement and assistance of member agency staff through the development of the 2015 IRP.

The item will be brought forward in May 2016 to obtain consensus on the core recommendations and commence the PEIR. At the conclusion of the PEIR, the IRP will then be brought back in fall 2016 for adoption by the Board of Directors.

The development of the 2015 IRP is consistent with the *Agency's Business Goal* of increasing *Water Reliability* by meeting the region's need to develop reliable, drought-proof and diverse local water resources in order to reduce dependence on imported water supplies.

PRIOR BOARD ACTION

None.

IMPACT ON BUDGET

There is no direct impact on the budget as a result of the adoption of the IRP.

Attachment: Integrated Water Resources Plan available at:

<https://ieua.hostedftp.com/JAQQ0uObxqTZ2KDZY0oLIZa6E>

2015 Integrated Water Resources Plan



Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Elizabeth Hurst

IEUA Board of Directors Meeting
April 2016

Goals Established for the 2015 IRP

Resilience • Water Efficiency • Sustainability • Cost Effectiveness

- **Resilience:**
 - Regional water management flexibility to adapt to climate change and economic growth, and any changes that limit, reduce or make water supplies unavailable.
- **Water Efficiency:**
 - Meet or exceed rules and regulations for reasonable water use.
- **Sustainability:**
 - Provide environmental benefits, including energy efficiency, reduced green house gas emissions, and water quality improvements to meet the needs of the present without compromising the ability of future generations meeting their own needs.
- **Cost-Effectiveness:**
 - Supply regional water in a cost effective manner and maximize outside funding.

Integrated Water Resources Plan

- **Phase 1 – Identification and Vision of IRP:**
 - 2040 demand forecast
 - Climate change modeling of water supplies
 - Resiliency testing of resource strategies
 - Regional resources strategies development

- **Phase 2 – Implementation/Capital Investment Program:**
 - Disaggregation of regional demand and supplies
 - Capital project scope, costs, and prioritization
 - Implementation schedule development

Phase 1 Key Findings

- Past investments help minimize climate change impacts
- 45,400 AFY of additional water supply needed by 2040
- Identified +70 potential regional and local water projects
- Strategies including WUE yielded most resilient strategies for the region
- Recycled Water is the region's most climate resilient supply
- Importance of maintaining and increasing groundwater storage for future use

Structure of IRP Report

FIVE SECTIONS

- Section 1 – Overview and Purpose
- Section 2 – Water Demands
- Section 3 – Water Resources Inventory
- Section 4 – Supply Portfolio Themes
- Section 5 – Conclusions & Next Steps



Core Recommendations from Phase 1

Resilience • Water Efficiency • Sustainability • Cost Effectiveness

- Continue to invest in recycled water projects
- Acquire supplemental water to enhance groundwater quality
- Reduce demand by 10% to enhance water supply resiliency
- Strategically purchase supplemental water for recharge
- Pursue external supplies to augment recharge, RW and build storage.
- Maximize stormwater recharge projects.

Next Steps for 2016


- Adopt IRP Phase 1 Report
- Complete Programmatic EIR – summer 2016
- Establish General Manager Water Forum
 - Identify funding opportunities & project priorities
 - Chino and Chino Hills – budget Based Rate Structure Track
 - JCSD External RW Supplies
 - Pomona/MVWWD RW Intertie
 - SARRCCUP
- Commence Phase 2


INFORMATION
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Date: April 20, 2016

To: The Honorable Board of Directors

Through: Public, Legislative Affairs, and Water Resources Committee (04/13/16)

From:  P. Joseph Grindstaff
General Manager

Submitted by: Chris Berch 
Executive Manager of Engineering/Assistant General Manager

Sylvie Lee 
Manager of Planning and Environmental Resources

Subject: Regional Water Use Efficiency Business Plan (2015-2020)

RECOMMENDATION

This is an informational item for the Board of Directors to receive and file.

BACKGROUND

As the regional wholesale supplier of water for the area, IEUA has assumed the role of coordinating the region's activities and programs to reduce demand. IEUA has worked closely with its member agencies to facilitate the application of thousands of water saving technologies throughout the region. IEUA member agencies, whose direct contact with retail customers is crucial to the implementation of water use efficiency measures, have co-funded these efforts with IEUA and taken a proactive approach in educating and working with their customers to conserve water.

In September 2009, the Agency completed an interim Regional Water Use Efficiency Business Plan (Plan) developed in-house by staff and the members to provide a limited assessment of existing conditions and establish an agreed upon work plan to implement short-term initiatives. The first long-term Plan (2010-2015) was completed in September 2010, and was fundamental in providing more expertise and in-depth technical analysis delivering the needed guidance for developing new cost-effective water use efficiency (WUE) programs to target limited financial and program resources for those activities yielding the highest water savings return.

The 2010 Plan provided a blueprint that assisted IEUA and its members in comprehensively planning for and implementing WUE activities and programs over the last five years. The 2010 Plan served as a working document and, as such, must be modified and updated as changes occur

and program years roll out. Changes and/or reviews of the Plan occur every five years to align with the Urban Water Management Planning Act reporting cycle.

The 2015 Plan was completed in January 2016 and presented to members in February 2016 for review and comment. The 2015 Plan provides more in-depth research and technical analysis on past, present and potential future programming. It includes detailed sector analyses based on economics, end-use data, saturation based on implemented WUE programs, identification of active and passive water savings within the region, cost-benefit analyses for existing and potential WUE programs, and potential water savings opportunities.

The Plan is intended to assist member agencies with voluntary and regulatory compliance strategies over the next five years and provides a pathway by which IEUA and its members ensure state grants and loans eligibility. The Plan also includes a topic on a Sustainable Communities Strategy which addresses watershed-wide project planning that considers regional collaboration and multi-beneficial objectives such as a water-energy nexus, stormwater capture and retention, and low impact development, that will allow IEUA to consistently maintain eligibility for accessing the highest level of grant and/or loan opportunities. The following table provides a summary of the Plan Highlights:

Plan Overview	
Regional IEUA Cost per Acre-foot	\$52 per acre-foot
Five-Year Water Savings (<i>active programs</i>)	33,554 acre-feet
Lifetime Water Savings (<i>active programs</i>)	147,836 acre-feet
Avoided Costs (NVP)	\$152.7 Million
Five-Year Total Budget*	\$7.5 Million

**Budget includes IEUA regional program costs exclusive of outside funding.
 Budget includes \$300,000 per year for education and outreach programs.

Lastly, the Plan provides a detailed pathway that directly links to the core recommendations outlined in the Agency’s Phase I - Integrated Resources Plan (IRP). The IRP establishes a goal of reducing current urban water use by at least 10% by 2040 through the implementation of water use efficiency actions. Phase II of the IRP Process will expand the regional focus of supply to the specifics of implementation and projects recommended in the Plan and will be evaluated and incorporated into the IRP Phase II Project List.

The Plan is consistent with the Agency’s Business Goal of increasing *Water Reliability* by promoting water use efficiency and education to enhance water supplies within the region; and meeting the region’s need to develop reliable and diverse local water resources in order to reduce dependence on imported water supplies.

PRIOR BOARD ACTION

On November 19, 2014, the IEUA Board of Directors awarded a services contract to A&N Technical Services, Inc. for the Regional Water Use Efficiency Business Plan update revised scope of work (2010-2015).

IMPACT ON BUDGET

Programs that are identified in the WUE Business Plan for regional implementation are included or will be included as part of the water conservation budget in the Water Fund for FY 2016/17 and subsequent years. Several programs are also eligible for partial reimbursement to IEUA under MWD's Conservation Credits Program and the Department of Water Resources.

Attachment: Regional Water Use Efficiency Business Plan (2015-2020) available at
<https://ieua.hostedftp.com/JGh8VPTKL5BUMPgEboPB3DRHC>

Regional Water Use Efficiency Business Plan Update



Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Lisa Morgan-Perales

IEUA Board of Directors Meeting
April 2016

IEUA Regional Water Use Efficiency Business Plan - Historical Timeline

- September 2009 – Interim Water Use Efficiency Business Plan
 - 1 – Year (Establish Goals & Objectives–implement short-term initiatives)
- September 2010 – Long-Term Water Use Efficiency Business Plan
 - 5-Year Plan – 2010 - 2015 – Blueprint for implementing WUE Programs
- April 2016 – Regional Water Use Efficiency Business Plan
 - 5-Year Plan – 2015-2020 – synergized with IRP Process



IEUA

**Member
Agencies**

Conservation Past, Present, Future



*Water Use Efficiency remains
the LEAST EXPENSIVE means
of finding “new” water*

*It is estimated that 2 million acre feet of water
could be saved at costs below what it would be
to tap new sources.*

(Waste Not, Want Not: pg. 18)



2015 Regional Business Plan New Strategy

- Target inefficient water users, not just any customer
- Utilize new technologies: data analytics, budget-based water rate structures and technology-based information systems
- Re-think traditional programming and implement new approaches
- Include programming scalability to meet changing water supply conditions
- Water Resource Strategy: Treat water use efficiency and conservation as a component of the regional water supply portfolio



2010 Regional WUE Business Plan Program Performance

IEUA Performance

Total Water Savings: FY 10 - 14

1,174
Acre-feet

Original Plan

2,339
Acre-feet

Actual

200% of Goal

585
Acre-feet

Avg./Year

IEUA Performance

Total Expenditures: FY 10 - 14

\$1.47
Million

Original Plan

\$790
Hundred
Thousand

Actual

50% Saved

\$683
Hundred
Thousand

Savings

*Savings are attributed to obtaining external funding (MWD, DWR, USBR).

5-Year Plan Overview

Plan Overview

Regional IEUA Cost per Acre-foot	\$52 per acre-foot
Five-Year Water Savings (active programs)	33,554 acre-feet
Lifetime Water Savings (active programs)	147,836 acre-feet
Avoided Costs (NVP)	\$152.7 Million
Five-Year Total Budget*	\$7.5 Million

*Budget includes IEUA regional program costs exclusive of outside funding.

*Budget includes \$300,000 per year for education and outreach programs.

Next Steps

- Adopt the 2015 Regional Water Use Efficiency Business Plan (May 18, 2016)

INLAND EMPIRE UTILITIES AGENCY

REGIONAL WATER USE EFFICIENCY

BUSINESS PLAN
2015–2020

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Section 1 – Executive Summary

Introduction

Inland Empire Utilities Agency (IEUA) and its regional water use efficiency (WUE) partners actively strive to increase regional sustainability through the development of local water supplies and reduced dependence on costly and increasingly unreliable imported water.

These efforts focus on using water more efficiently, eliminating water waste, and drought proofing the region through increased use of recycled water, groundwater, storm water and other local water supplies.

Water use efficiency is universally regarded as the most cost effective method in which to reduce water demand. As such, the region has heavily invested in water use efficiency initiatives over the years.

Water Conservation VS Water Use Efficiency

There is a major difference between **water conservation** and **water use efficiency** and it is important to understand the dissimilarity.

The objective of this plan is **not** to focus on **water conservation** with its short-term focus on current emergency conditions. This approach will not provide sustainable savings. As drought restrictions are lifted, per capita water use will gradually rebound upwards, although not as high as previously levels, as people breath a sigh of relief that the crisis is over and return to life as usual.

Instead the regional goal is to achieve **water use efficiency**, a sustainable reduction in water use, by creating a new resource value for water in the eyes of the end user.

For the most part, customers do not yet "get" water use efficiency. They believe that they're using water efficiently because they only water when requirements allow or don't wash their car. The State and the region must create a new reality about reasonable water usage for customers and show them the path to achieving it.

Optimizing Results

Traditional Water Use Efficiency (WUE) efforts characteristically offer programs to all customers without regard to their efficiency level. Often these program respondents are more sophisticated and aware of efficiency methods and measures – and are actually some of the most efficient users in the system.

IEUA Regional Water Use Efficiency Business Plan

The actual target should ***not be the “general responders”***, but instead, ***the inefficient water users***. To hit these target customers, the more sophisticated and effective strategies employ the rigorous use of data and analytics from GIS mapping, satellite imaging and disciplined water budget protocols, along with diligent measurement to ensure results. The results are broader and longer lasting across all market segments.

State Efficiency Standards Effectively Facilitate WUE

IEUA supports the reasonable and efficient use of water as defined by State standards. By creating broadly stated, but absolute, standards, the regional WUE partners can design programs that are tailored specifically to their customer base.

State water use efficiency standards are imbedded in both the SB X7-7 – requiring 20 percent per capita water use reduction by 2020 and Assembly Bill 1881, the Model Water Efficiency Landscape Ordinance (MWELO). Indoor efficiency is deemed to be 55 gallons per person per day (55 GPCD). Outdoor efficiency is levels are set at 80% of the local ET for existing landscapes.

This standard is supported by numerous agencies because it:

- Offers a more equitable method for considering conservation levels during drought.
- Will enable the State to consolidate the various conservation codes or actions into a single, impartial measurement.
- Provides a clear message to the public about what a reasonable amount of water to use is given their local conditions.
- Creates a single water management tool where efficiency targets can be ratcheted up or down as needed.

The use of water efficiency performance-based standards provides the foundation for more efficient regional and statewide water use that improves the resiliency of California’s water supplies as we deal with population growth, future droughts and the serious impacts of climate change.

The Regional Water Use Efficiency Business Plan

The objective of the Regional WUE plan is to deliver a prolonged, increased level of water efficiency for a price far less than the region’s cost to purchase water. To accomplish this, it is recommended IEUA and its regional partners seek out inefficient water use customers, educate them about WUE attainment, and provide a “road map” to accomplish this.

IEUA Regional Water Use Efficiency Business Plan

To create the WUE Business Plan, a thorough review of current, past and potential new programs was conducted, with calculations performed for costs, savings and overall benefits to the region. In addition, there was an evaluation of developing WUE trends, including emerging technologies such as Budget-Based Water Rates and Customer Engagement Software and Analytics. Potential Metropolitan Water District's (MWD) WUE funding availability and potential grants were additionally factored into the evaluation. A portfolio of recommended programs is presented in the WUE Business Plan. These are directly quantifiable and provide cost-effective water savings below the region's cost to purchase water from Metropolitan Water District.

It is important to recognize that IEUA's member agencies may elect to modify the design of one or more of the programs presented in the WUE plan. Each agency may choose to participate in all programs or opt in for a limited number only. IEUA will collaborate with all of the member agencies to continually evaluate and modify the plan to meet the goals and objectives of the region.

While it is up to each member agency to determine their specific course of action, IEUA encourages each agency to adapt new approaches and new technologies in order to increase the collective knowledge of *where* and *how* to best help end-users to use water efficiently and to keep water bills affordable.

Water Reduction Goals and Regulatory Compliance

The Regional Water Use Efficiency Business Plan is to be used as a blueprint to help the region to plan and implement WUE activities and programs over the next five years. The strategies and programs included in the plan are designed to meet the requirements of the:

- Assembly Bill 1420 Statute requiring BMP compliance
- SB X7-7 requiring 20 percent per capita water use reduction by 2020
- Governor's Executive Order and Emergency Regulation mandating a 25 percent statewide reduction in water use including individual targets set for each agency

Table 1 on the following page highlights these regulatory statutes, their general requirements, the local approach to meeting the requirements and the current status.

WUE Regulatory Compliance Requirements

Table 1: WUE Regulatory Compliance

Regulatory Statute	Requirements	Approach	Status
Assembly Bill 1420	Mandatory BMP Compliance.	Lines up with actions taken to meet CUWCC BMP compliance	In compliance – requirement sunsets July 1, 2016.
20x2020 (SB X7-7)	Reduce per capita water use by 10% by 2015. AND Reduce per capita water use by 20% by 2020.	By implementing active WUE programs and policy Initiatives the Regional Alliance is projected to be on track to meet per capita reduction goals.	2015 Target = 226 2015 Reported = 188 2020 Target = 201 2020 Projected = 182
Governor’s Executive Order Regulations	Mandatory statewide reduction of 25% of residential per capita water use. Each agency assigned local target of 4 – 36%.	Implement active WUE programs, enforce mandatory watering days and eliminate water waste.	Most agencies at or near mandated %. Collective % Goal = 28% Collective % Saved = 29.5%

The region is in compliance with the AB 1420 BMP requirements. Most agencies are currently at or near mandated conservation levels under the Governor’s Executive Order. It is also expected that the region will exceed the 20x2020 goal. This will be accomplished through regional and local actions utilizing:

- **Water Use Efficiency Active Programs** – offering customers a program portfolio with cost-effective water efficiency measures,
- **WUE Passive Policy Initiatives** – including building codes and landscape ordinances,
- **Recycled Water Supply** – reducing demand for potable water by increasing recycled water supply.

Table 2 on the following page shows the anticipated GPCD reduction from the WUE activities and recycled water supply. The 2020 GPCD reduction estimates from WUE activities is shown as a range to represent the reduction with and without Budget-based Water Rate implementation. It is estimated that with 2 agencies implementing Budget-based Water Rates will represent a GPCD reduction of 11 by 2020 and without any agencies implementing the new rate it will be a reduction of 6.

Impact of WUE Activities and Recycled Water Supply

Table 2: Impact of WUE Activities and Recycled Water Supply

	YEAR	
	GPCD Reduction by 2015	GPCD Reduction by 2020
Projected GPCD reduction from WUE Active and Passive Activities	3	6 – 11*
Projected GPCD reduction from Recycled Water Supply	21	35
TOTAL Projected GPCD Reduction	24	41 – 46*
10 Year Baseline GPCD	251	
Regional GPCD Target	226	201
Regional GPCD Projected Achievement**	188	169 – 174*

*Range represents GPCD reduction with and without Budget-based Water Rate implementation.

** 2015 GPCD numbers are reported actuals

In order to achieve the WUE active programs’ goal, it is recommended IEUA and its regional partners implement nine active programs. The programs will deliver water savings through 2020 and beyond due to the life of the measures being offered. Table 3 below provides an overview of the lifetime water savings for each of the programs:

Lifetime Water Savings by WUE Active Programs

Table 3: Lifetime Water Savings by WUE Active Programs

WUE Active Program	Estimated Lifetime Water Savings (AF)
Budget-Based Water Rates	116,390
Turf Removal	16,900
FreeSprinklerNozzles.com Program	5,689
SoCal Water\$mart Regional Rebate Program	3,262
Customer Engagement Software	3,093
High Efficiency Nozzle Direct Installation Program	1,101
Residential Smart Controller Upgrade Program	828
Residential Landscape Retrofit Program	447
Landscape Evaluations	126
Total	147,836

IEUA Regional Water Use Efficiency Business Plan

The plan, as designed with 2 agencies implementing Budget-based Water Rates, is estimated to save nearly 148,000 acre-feet of water at an expected cost to the region of \$52 per acre-foot. This falls well below the region's avoided cost to purchase water from Metropolitan Water District of \$1,122 per acre-foot¹ (MWD's Tier 1 rate for untreated water). The value of the avoided purchases of MWD imported equate to nearly \$153 Million to the member agencies. If none of the agencies chose to implement Budget-based Water Rates, the plan is estimated to save over 31,000 acre-feet at a cost of \$208 per acre-foot. This too falls well below the cost to purchase water from MWD.

Below are highlights of the plan with and without Budget-base Water Rate implementation:

Table 4: Plan Overview

Plan Overview		
	With Budget-Based Rates	Without Budget-Based Rates
Regional IEUA Cost per Acre-foot	\$52 per acre-foot	\$208 per acre-foot
Five-Year Water Savings (active programs)	33,554 acre-feet	16,095
Lifetime Water Savings (active programs)	147,836 acre-feet	31,446
Avoided Costs (NVP)	\$152.7 Million	\$28.9 Million
Five-Year Total Budget*	\$7.5 Million	\$7.5 Million

*Budget includes IEUA regional program costs exclusive of outside funding.

*Budget includes \$300,000 per year for education and outreach programs.

Selected Programs

The Regional WUE Business Plan makes a number of recommendations moving forward. It is advised that the following changes be made:

- Scale and modify most of the existing programs
- Sunset several programs
- Incorporate new technologies and approaches for program outreach
- Implement a number of pilot programs

¹ The project team applied the CUWCC/WaterRF Avoided Cost Model to develop a forecast of avoided supply costs for IEUA. These avoided costs include the avoided variable operating costs of MWD's 2015 Tier 1 rate for full service treated water (923\$/AF in 2015), an estimate of power costs past the point of imported water delivery (approximately 76\$/AF), plus MWD's Capacity Charge (approximately 67\$/AF) with all costs adjusted upward for system loss. Tier 2 rates apply in 2020 as MWD's stated long run supply development costs. MWD's treatment costs embedded in the full service rate pertain as a reasonable proxy for long run avoided treatment costs. Since these costs do not include avoided Greenhouse Gas Emissions they can be considered as a lower bound. These costs are projected to increase in real terms during the forecast horizon.

The portfolio of programs included in the plan are directly quantifiable and provide cost-effective water savings below the region's cost to purchase water from Metropolitan Water District.

With 66% of demand being outdoor water usage, program offerings focus predominantly on landscape opportunities. An overview of the selected programs is below.

Budget-Based Water Rates or allocation-based rates have proven to be one of the most cost effective WUE programs. Each individual account is allocated an amount that would be required for efficient indoor and outdoor water use, adjusted to real-time actual weather and customer characteristics such as size of landscape area. Budget-based rates are also designed to recover necessary agency costs recognizing that customers will be more water efficient over time. Customers are able to compare their individualized water budget with their actual usage. The appropriate economic signal rewards efficient use. With a clear financial incentive, the customer is motivated to maintain efficient use patterns. Budget-based rates also, when properly designed, target revenue generation specifically toward those inefficient customers who are causing higher costs. Budget-based rates are a legal method to increase the agency's ability to fund cost reducing and cost-effective WUE programs.

Customer Engagement Software and Data Analytics – Customer engagement software and data analytics provide tools for water agencies to more accurately identify customers with excess water usage and communicate with customers on how their usage compares against accepted water use efficiency standards. In addition, the software offers the ability for a customer to track their usage against a budget through web-based and mobile interfaces and presents them with practical options to become a more efficient water user.

Landscape Evaluations – Comprehensive landscape evaluations provide customers education and information on landscape and irrigation system upgrades specific to each individual site. Intended to motivate customers to make improvements in their landscape irrigation efficiency, the evaluations direct customers to applicable programs. Landscape evaluations would be targeted towards large landscape sites with the most potential to save water, as identified through water budget data.

High Efficiency Nozzle Vouchers, Rebates, and Installations – Retrofitting pop-up spray heads with high efficiency nozzles is a low cost measure and delivers high water savings. The saturation rate of high efficiency nozzles is extremely low, and the sheer volume of spray heads offers a prime market opportunity.

Smart Controller Installations and Rebates – Smart controllers are cost-effective for over irrigated sites, as well as large landscape areas. By offering direct installation for residential sites and rebates for large landscape sites, significant and cost-effective water savings can be achieved.

MWD's SoCal WaterSmart Regional Rebate Programs – The SoCal WaterSmart Program provides the region with continued funding and program administration for a variety of water use efficiency measures. Moving forward, IEUA and its regional partners would augment funding for landscape water use efficiency products to provide increased customer response.

Turf Removal – Although turf removal delivers extremely high water savings in most retrofit projects, it requires a significant incentive to motivate customers. At this time, turf removal has not been included in the program portfolio after fiscal year 2015/16. And although it is not yet deemed cost-effective for the region to fund the full incentive, IEUA and its regional partners will continue evaluating turf removal as a customer program. IEUA and its regional partners will seek MWD and other outside funding as available.

Education and Outreach Programs – IEUA and its regional partners will continue to provide regional educational and outreach programs. Current regional education and outreach programs include the following:

- National Theatre for Children Program
- Shows That Teach
- Regional Landscape Training Workshops
- Garden in Every School® Program
- WEWAC, The Water Education – Water Awareness Committee
- Water Saving Garden Friendly
- Water Softener Rebate Program

The table on the following pages lists the recommended programs, the reasoning for their selection and the associated savings. The list is ordered from highest volume of total water savings activity to lowest.

Table 5: Recommended Programs

Recommend Program and Water Savings	Reasoning for Selection
<p>Budget-Based Water Rates:</p> <p>116,390 Lifetime Water Savings 79% of Total Savings</p>	<ul style="list-style-type: none"> - Sends strong price signal, rewarding efficient users and penalizing inefficient users - Motivates over-allocation customers to consider changes - Proven effective for revenue stability, increased WUE and positive customer relations
<p>Turf Removal (All Measures):</p> <p>16,900 Lifetime Water Savings 11% of Total Savings</p>	<ul style="list-style-type: none"> - Targets large water use - Transforms landscape and irrigation market - Significant funding provided by MWD
<p>FreeSprinklerNozzles.com Program:</p> <p>5,689 Lifetime Water Savings 4% of Total Savings</p>	<ul style="list-style-type: none"> - Cost-effective - Targets large water use - Huge potential and scalability
<p>SoCal WaterSmart Regional Rebates:</p> <p>3,914 Lifetime Water Savings 3% of Total Savings</p>	<ul style="list-style-type: none"> - MWD funding and administration - Ease of implementation
<p>Customer Engagement Software:</p> <p>3,093 Lifetime Water Savings 2% of Total Savings</p>	<ul style="list-style-type: none"> - Customer-preferred communication method - Allows retailers to send messaging & program links to high water users - Proven effective
<p>High Efficiency Nozzle Direct Installation:</p> <p>1,101 Lifetime Water Savings 1% of Total Savings</p>	<ul style="list-style-type: none"> - Removes financial barrier of entry - Ensures quality installation - Huge potential and scalability
<p>Residential Smart Controller Upgrade:</p> <p>828 Lifetime Water Savings 1% of Total Savings</p>	<ul style="list-style-type: none"> - Offering direct installation to smaller customer provides bigger pool of potential customers - Site visit verifies there will be savings - Education workshop ensures customer can program and maintain controller and therefore sustain savings
<p>Residential Landscape Retrofit Program:</p> <p>447 Lifetime Water Savings 0.3% of Total Savings</p>	<ul style="list-style-type: none"> - Targets large water users - Site visit verifies there will be savings - Professional installation and programming of controller ensure savings

Recommend Program and Water Savings	Reasoning for Selection
<p>Landscape Evaluations:</p> <p><i>126 Lifetime Water Savings</i></p> <p><i>0.1% of Total Savings</i></p>	<ul style="list-style-type: none"> - Links customer with programs - Provides one-on-one customer education - Starts relationship with customer
<p>Education and Outreach Programs:</p> <p><i>Savings not estimated*</i></p>	<ul style="list-style-type: none"> - Provides education to students at all levels - Equips customers with foundational information regarding value of water, water use and efficiency opportunities

**Many of the programs have water savings, but due to the variability of the savings they were not included in the assessment.*

The following sections of the Regional Water Use Efficiency Business Plan provide details of the region’s usage patterns, specific market opportunities, strategies for reaching water savings goals, and recommended programs. The plan provides the following information:

Section 2 – Relevant Regulation and Policies provides a summary and analysis of current water use efficiency regulations and requirements expected to impact future water use within IEUA’s service area.

Section 3 – Market Condition and Potential assesses potential for water savings across customer classes and water uses. Specific opportunities are identified as well as barriers to market penetration for those measures.

Section 4 – Implementation Strategy outlines the recommended strategies and tactics needed in order for the region to drive down demand and increase water use efficiency.

Section 5 – Potential Programs and Analysis examines a comprehensive list of programs and measures that correspond to the region’s water demand and measure savings potential.

Section 6 – Selected Programs provides a final list of cost-effective programs recommended for implementation and includes the following: program descriptions, measure(s) offered, target customer segments, delivery mechanisms, annual activity, program costs, and economic evaluation results.

Section 7 – Five Year Plan presents the implementation details for the plan if two agencies implement Budget-Based Water Rates. This includes annual program activity estimates, annual budgets, water savings, cost and benefits, as well as energy savings and greenhouse emission reduction.

Section 2 – Relevant Regulations and Policies

As can be expected in a state with ongoing water resource issues, California’s governing entities have issued a number of regulatory requirements and policies over the past several decades.

Some of the regulations and policies have successfully driven down California’s per capita water usage and increased the manufacturing standards for a number of major water consuming products utilized across all markets. Other regulations are aimed at achieving a higher level of water conservation during times of severe drought through temporary water use cutbacks and associated reporting.

Listed in the charts below is a summary of the current state regulations and information about the designated implementer for each:

WUE Laws and Agreements

Table 6: WUE Laws and Agreements

Regulatory Statute	Requirements	Agency or Regional Implementation	Approach
Assembly Bill 1420	Mandatory BMP Compliance.	Implemented by Agencies & IEUA	Lines up with actions taken to meet CUWCC BMP compliance – sunsets July 1, 2016
20x2020 (SB X7-7)	Reduce per capita water use by 10% by 2015. AND Reduce per capita water use by 20% by 2020.	Implemented by the Regional Alliance	By implementing active water use efficiency programs and policy Initiatives the Regional Alliance are projected to be on track to meet per capita water reduction goals.
Governor’s Executive Order and Emergency Regulation	Mandatory statewide reduction of 25% of residential per capita water use. Each agency assigned local target of 4 – 36%.	Implemented by each Agency	Implement active WUE programs, enforce mandatory watering days and eliminate water waste. All agencies are at, or near, compliance.

WUE Codes, Standards and Regulations

Table 7: WUE Codes, Standards and Regulations

Regulatory Statute	Requirements	Agency or Regional Implementation	Approach
AB1881 - Model Water Efficiency Landscape Ordinance (MWELO)	ETo Allowances Residential 0.55 Commercial 0.45	Implemented locally by city and/or county	Agencies need to educate customers and developers about ordinance requirements
Assembly Bill 715	Requires any toilet or urinal sold or installed in California cannot have a flush rating exceeding 1.28 and 0.125 respectively	Manufacturers, distributors, retailers, plumbers and customers must all adhere to new standards	Supply chain removes non-conforming fixtures from marketplace and supplies only efficient and conforming fixtures
Senate Bill 407	Requires existing buildings comply with 1992 standards	Implemented locally by city and county	Difficult to enforce. Could be added to current criteria for change of ownership inspections and reporting
CalGreen	20% reduction of water use prescriptively designated Irrigation controllers shall be weather- or soil moisture-based	Implemented locally by city and county	Difficult to enforce. Could be added to current criteria for change of ownership inspections and reporting
Senate Bill 555	Requires water agencies to submit annual water loss reports	Implemented by Agencies	Agencies compile data and submit report to DWR
Assembly Bill 1	City or county cannot fine customers for failure to water	Local agencies to follow requirements of the bill	Agencies need to communicate requirements with cities and counties
Assembly Bill 349	HOAs cannot prohibit installation of artificial turf and allows for turf removal and installation of low water use plants	Local agencies to follow requirements of the bill	Agencies need to work with HOA's and community groups to educate about the bill

The following section details current water use efficiency regulations and requirements. Divided into two parts, the first presents a comprehensive review of agreements, codes, and regulations guiding conservation by California urban water suppliers. The second part provides an assessment of the region's current and expected compliance status for each of these codes and regulations.

Existing Codes, Regulations, and Agreements

Existing codes, regulations, and agreements affecting the efficiency of water using fixtures and landscapes, and establishing water use reduction targets for urban water suppliers will continue to reduce per capita residential and non-residential water demands over the coming decades. These codes, regulations, and agreements can be divided into three broad categories:

- Codes and standards that dictate the maximum acceptable level of water use by newly manufactured water using fixtures and appliances. Examples include statewide standards for toilet and urinal water use enacted under AB 715 and federal standards for residential and commercial clothes washer water use promulgated by the U.S. Department of Energy under the Energy Policy and Conservation Act.
- Regulations that govern the maximum acceptable level of water use by water using fixtures, appliances, and landscapes installed in existing and new residential and non-residential properties. Examples include SB 407, which enacted plumbing fixture efficiency requirements in new and existing buildings, and AB 1881, which established landscape design and water use requirements.
- Laws and agreements that establish water use reduction goals and targets for urban water supply agencies. An example is SB X7-7, which set maximum allowable GPCD targets for urban water suppliers.

The codes, regulations, and agreements, falling into one of the above three categories, are described in the following sections.

Requirements for Newly Manufactured Plumbing Fixtures and Appliances

Toilets, Urinals, and Showerheads – AB 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014, cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not consume more than 0.125 gallons per flush, 75% less than the standard set by AB 715.

The 1994 amendments to the Federal Energy Policy and Conservation Act established a maximum flow rate for newly manufactured showerheads of 2.5 gallons per minute. However, as will be discussed in the next section, California's Green Building Standards Code (CalGreen), which became effective January 1, 2011, mandates a maximum flow rate of 2.0 gallons per minute for showerheads in newly constructed residential and commercial buildings.

Clothes Washers and Dishwashers -- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. The maximum water factor for residential clothes washers under current federal standards is 9.5.² In March of this year, the federal standard will reduce the maximum water factor for top- and front-loading machines to 8.4 and 4.7, respectively. In 2018, the maximum water factor for top-loading machines will be further reduced to 6.5. For commercial washers, the maximum water factors were reduced in 2010 to 8.5 and 5.5 for top- and front-loading machines, respectively. Starting this year, the maximum water factor for Energy Star certified washers is 3.7 for front-loading and 4.3 for top-loading machines. EPA estimates that Energy Star washers comprised more than 60% of the residential market and 30% of the commercial market circa 2011.³ A new Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. Effective May 30, 2013, the federal standard for the maximum allowable water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.

Requirements for Existing and New Buildings and Landscapes.

Indoor Water Use -- SB 407, enacted in 2009, mandates all buildings in California come up to 1992 State plumbing fixture standards within this decade. This law establishes requirements that residential and commercial properties built and available for use on or before January 1, 1994, replace plumbing fixtures that are not water conserving, defined as "non-compliant plumbing fixtures" as follows:

- Any toilet manufactured to use more than 1.6 gallons of water per flush
- Any urinal manufactured to use more than one gallon of water per flush
- Any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute
- Any interior faucet that emits more than 2.2 gallons of water per minute

² Water factor equals the number of gallons used per cycle per cubic foot of capacity. Prior to 2000, the water factor for a typical new residential clothes washer was about 12.

³ Energy Star Unit Shipment and Market Penetration Report Calendar year 2011 Summary. Accessed on January 28, 2015 from:
http://www.energystar.gov/ia/partners/downloads/unit_shipment_data/2011_USD_Summary_Report.pdf

IEUA Regional Water Use Efficiency Business Plan

The compliance date for single family residential properties is January 1, 2017. For multi-family and commercial properties, the date is January 1, 2019. State law required, as of January 1, 2014, that when there are building alterations and improvements to residential and commercial properties, water-conserving plumbing fixtures replace all noncompliant plumbing fixtures as a condition for issuance of a certificate of final completion and occupancy or final permit approval by the local building department.

SB 407 also requires, effective January 1, 2017, that a seller or transferor of a single family residential property disclose to the purchaser or transferee, in writing, the specified requirements for replacing plumbing fixtures and whether the real property includes noncompliant plumbing. Similar disclosure requirements go into effect for multi-family and commercial transactions January 1, 2019. SB 837, passed in 2011, reinforces the disclosure requirement by amending the statutorily required transfer disclosure statement to include disclosure about whether the property is in compliance with SB 407 requirements. Through these two laws, California has effectively adopted a statewide retrofit-on-resale requirement for single family residential properties effective January 1, 2017, and for multi-family and commercial properties effective January 1, 2019.

Although SB 407 allows for replacement of noncompliant toilets with toilets flushing no more than 1.6 gallons, noncompliant urinals with urinals flushing no more than 1.0 gallons, and noncompliant showerheads with showerheads using no more than 2.5 gallons per minute, the more stringent requirements in AB 715 and CalGreen Code supersede the equipment flow standards included in SB 407. Therefore, as of January 1, 2014, noncompliant toilets must be replaced with toilets flushing no more than 1.28 gallons, noncompliant urinals must be replaced with urinals flushing no more than 0.5 gallons, and noncompliant showerheads must be replaced with showerheads using no more than 2.0 gallons per minute.⁴ As of January 1, 2016, noncompliant urinals must be replaced with urinals flushing no more than 0.125 gallons.

New construction and renovations in California are now subject to CalGreen Code requirements. Listed in Table 8 below are the CalGreen prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20% reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.

⁴ As noted above, the CEC adopted new standards for urinals in April setting a maximum allowable flush volume of 0.125 gallons.

Table 8: CalGreen Fixture Code Requirements

Fixture/Fitting	Baseline Consumption	Maximum Allowed Under CalGreen
Toilets	1.6 gal/flush	1.28 gal/flush
Urinals	1.0 gal/flush	0.5 gal/flush
Residential showerheads	2.5 gal/minute	2.0 gal/minute
Residential bathroom faucets	2.2 gal/minute	1.5 gal/minute ⁵
Kitchen faucets	2.2 gal/minute	1.8 gal/minute
Replacement faucet aerators	2.2 gal/minute	NA
Non-residential bathroom faucets	0.5 gal/minute	0.4 gal/minute
Metering faucets	0.25 gal/minute	0.2 gal/minute

Landscape Water Use -- For landscape water use, CalGreen requires that automatic irrigation system controllers, provided by the builder and installed at the time of final inspection, be weather- or soil moisture-based controllers designed to automatically adjust irrigation in response to changes in plant water needs as weather or soil conditions change.

In addition to CalGreen’s mandatory requirements, further efficiencies are possible through application of voluntary tiers, as follows:

- Tier 1 Residential – kitchen faucet flow rate not to exceed 1.5 gallons/minute; potable water use for landscape not to exceed 65% of ETo; and incorporation of at least one other measure from a list of measures provided by CalGreen (e.g. waterless toilet, rainwater capture system).
- Tier 2 Residential – kitchen faucet flow rate not to exceed 1.5 gallons/minute; potable water use for landscape not to exceed 60% of ETo; dishwashers be Energy Star qualified and use no more than 5.8 gallons per cycle; and incorporation of at least two other measures from a list of measures provided by CalGreen.
- Tier 1 Non-Residential – aggregate indoor water use reduction of 30% from the established baseline or 30% reduction in individual water use for each of the plumbing fixtures listed in Table 8; potable water use for landscape not to exceed 60% of ETo; and incorporation of at least one elective measure from a list of measures provided by CalGreen (e.g. efficient ice maker, graywater irrigation system).

⁵ On April 8, 2015, the California Energy Commission adopted new standards reducing the maximum flow rate of residential bathroom faucets to 1.2 gallons per minute.

- Tier 2 Non-Residential – aggregate indoor water use reduction of 35% from the established baseline or 35% reduction in individual water use for each of the plumbing fixtures listed in Table 8; potable water use for landscape not to exceed 55% of ETo; and incorporation of at least three elective measures from a list of measures provided by CalGreen.

Assembly Bill 1881 - The Water Conservation in Landscaping Act of 2006 - Assembly Bill 1881 has had several revisions in recent years. The initial requirements and current changes are chronicled below. AB 1881 requires cities and counties to either adopt the state's model landscape ordinance or their own ordinance that is at least as effective as the state's model ordinance by January 1, 2010. At that time, the Department of Water Resources prepared a Model Water Efficient Landscape Ordinance for use by local agencies. After January 1, 2010, the model ordinance (or the locally adopted ordinance) applies to all of the following landscape projects:

1. New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
2. New construction and rehabilitated landscapes which are developer-installed in single family and multi-family projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review; and
3. New construction landscapes which are homeowner-provided and/or homeowner-hired in single family and multi-family residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check, or design review.

For new and rehabilitated landscapes installed on or after January 1, 2010 and meeting the above requirements, the model ordinance establishes a maximum water use allowance equal to 70% of reference evapotranspiration. The maximum water use allowance for special landscape areas, which include recreational turf projects (parks, golf courses, ball fields), projects irrigated with recycled water, and edible landscapes is 100% of reference evapotranspiration.

For existing landscapes of one acre or more installed before January 1, 2010, the model ordinance also requires cities and/or counties to administer programs that may include irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for existing landscapes equal to 80% of reference evapotranspiration.

The model landscape ordinance is directed to cities and counties. However, a city or county may designate another agency, such as a water supplier, to assume some or all of

the responsibilities of enforcing the ordinance, provided the designated agency agrees to assume these responsibilities.

In 2006, IEUA and its regional partners developed the Inland Empire Landscape Alliance (IELA). The IELA spent two years working with local agencies to evaluate existing landscape policies and to provide information about all aspects of landscape water efficiency, through a series of educational newsletters, workshops and tours focused on plant palettes, irrigation materials and techniques, low impact development practices, and measures that cities are currently implementing within their communities to be wise water stewards.

When, in February 2008 the Department of Water Resources released the Model Water Efficient Landscape Ordinance, the IELA came together to evaluate and comment on the ordinance. Members found the February 2008 DWR Model Ordinance to be cumbersome. As a result, the IELA formed a Technical Committee that created the Chino Basin Water Efficient Landscape Ordinance in January 2009, incorporating the requirements of AB1881 while establishing regional consistency, and actively promoting the best interest of the region.

Governor Brown's Drought Executive Order of April 1, 2015 directed DWR to update the State's Model Water Efficient Landscape Ordinance (MWELo) through expedited regulation. The California Water Commission approved the revised MWELo Ordinance on July 15, 2015.

Local agencies had until December 1, 2015 to adopt the MWELo or to adopt a Local Ordinance which must be at least as effective in conserving water as MWELo. Local agencies working together to develop a regional ordinance had until February 1, 2016 to adopt, but they are still subject to the December 2015 reporting requirements. A local agency will either integrate MWELo into an existing ordinance or establish a new, separate program. To comply, a local agency must perform one of the following actions:

- Adopt by reference Sections 490-495, Chapter 2.7, Division 2, Title 23 in the California Code of Regulations
- Adopt the MWELo in detail - Sections 490-495, Chapter 2.7, Division 2, Title 23 in the California Code of Regulations
- Amend an existing or adopt a new local ordinance or regional ordinance to meet the requirements contained in the regulations
- Take no action and allow the MWELo to go into effect by default

A local agency may choose to allow MWELo to become effective by default and then adopt a local or regional ordinance at a later time. Subsequent reporting must include the details of local or regional ordinances.

Changes to MWELO

Projects Subject to the Ordinance - The size of landscapes subject to the ordinance has been lowered from 2,500 sq. ft. to 500 sq. ft. The size threshold applies to residential, commercial, industrial and institutional projects that require a permit, plan check or design review. To reduce the complexity and costs for the smaller landscapes now subject to ordinance, the revised MWELO has a prescriptive compliance approach for landscapes between 500 and 2,500 sq. ft. The size threshold for existing landscapes that are being rehabilitated has not changed, remaining at 2,500 square feet. Only rehabilitated landscapes that are associated with a building or landscape permit, plan check, or design review are subject to the Ordinance.

Water Efficient Worksheet and Water Budget - The maximum applied water allowance (MAWA) has been lowered from 70% of the reference evapotranspiration (ET_o) to 55% for residential landscape projects, and to 45% of ET_o for non-residential projects. This water allowance reduces the landscape area that can be planted with high water use plants such as cool season turf. For typical residential projects, the reduction in the MAWA reduces the percentage of landscape area that can be planted to high water use plants from 33% to 25%. In typical non-residential landscapes, the reduction in MAWA limits the planting of high water use plants to special landscape areas. The revised MWELO still uses a water budget approach and larger areas of high water use plants can be installed if the water use is reduced in the other areas provided the overall landscape stays within the budget. The use of special landscape areas was not changed in the revised MWELO.

ET_o Allowance in MAWA (Proportion of ET_o)

	MWELo 2010	MWELo 2015	Percentage Reduction
Residential	0.7	0.55	21.4%
Non-residential	0.7	0.45	35.7%

The revised ordinance also precludes the use of high water use plants in street median strips. Also because of the requirement to irrigate areas less than ten feet wide with subsurface irrigation or other means that produces no runoff or overspray, the use of cool season turf in parkways is limited.

Soil Management Report - For multi-lot projects, the revised MWELO added clarification that soil testing should be completed using a soil sampling rate of approximately 1 in 7 lots or 15 percent.

Landscape Design Plan - The following changes were made to Landscape Design Plan section: Prior to planting, 4 yards of compost must be incorporated per 1,000 sq. ft. of permeable area. Compacted soils must be transformed to a friable condition. The depth

of mulch required was increased from 2 to 3 inches. Graywater and storm retention components must be indicated on the landscape plan.

Irrigation Design Plan - Dedicated landscape water meters or submeters are required for residential landscapes over 5,000 square feet and non-residential landscapes over 1,000 square feet. Irrigation systems are required to have pressure regulation to ensure correct and efficient operation. All irrigation emission devices must meet the American National Standards Institute standard, American Society of Agricultural and Biological Engineers'/International Code Council's 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard". Flow sensors that detect and report high flow conditions due to broken pipes and/or popped sprinkler heads are required for landscape areas greater than 5,000 square feet. Master shut-off valves that prevent water waste in case of large failures of irrigation systems due to breakage or vandalism are required on all landscapes except where sprinklers can be individually controlled. The minimum width of areas that can be overhead irrigated was increased from 8 feet to 10 feet; areas less than 10 feet wide must be irrigated with subsurface drip or other technology that produces no over spray or runoff. The revised update requires the irrigation auditor to be a local agency auditor or third party auditor to reduce conflicts of interest. All landscape irrigation auditors must be certified by one of the U.S. EPA WaterSense labeled auditing programs.

Graywater Systems - The revised MWELo added a graywater section that specifies that landscapes less than 2,500 square feet that are irrigated entirely with graywater or captured rainwater are subject only to the irrigation system requirements of the Prescriptive Compliance Option. Graywater is allowed throughout the state under the California Plumbing Code.

Stormwater and Rainwater Retention - A requirement was added that landscape area should have friable soil to maximize stormwater infiltration. Additional stormwater measures were recommended, but not required.

Reporting - Executive Order and the revised ordinance require that local agencies report on the implementation and enforcement of their single agency Local Ordinances to DWR by December 31, 2015. Local agencies developing a Regional Ordinance must report on adoption by March 1, 2016. Reporting for all agencies is due by January 31st of each year thereafter. The reporting requirement is a new addition to the MWELo.

In addition to the revised MWELo requirements and ordinance changes, there are several bills designed to increase state-wide performance standards and enhance water efficiency policies. Below are highlights of those requirements.

Senate Bill 555

Senate Bill 555 requires retail water suppliers to submit annual water loss audit reports starting October 2, 2017. The bill requires the Department of Water Resources to post the results of each agency's audit report to allow for comparison amongst water

suppliers. In addition, the bill requires the State Water Resources Control Board to set performance standards for volume of water losses by July 1, 2020.

Assembly Bill 1

AB 1 prohibits a city or county from imposing fines for a failure to water a lawn or having a brown lawn during a time in which the Governor has declared a State of Emergency based upon drought conditions.

Assembly Bill 349

AB 349 amends the Civil Code to state that homeowner associations can no longer prohibit the use of artificial turf or other synthetic surface that resembles grass. In addition, AB 349 prohibits associations from requiring the removal or reversal of water-efficient landscaping measures once the drought is declared over.

Now, under California law, an association's governing documents must:

- Allow artificial turf or other synthetic surface that resembles grass
- Allow at least some with low water-using plants
- Allow the replacement of existing turf with low water-using plants
- Not restrict an owner's compliance with a water-efficient landscape ordinance adopted by a local government or other restrictions on the use of water imposed by the state, a water agency or local government
- Not impose "a fine or assessment" against an owner for reducing or eliminating the water of vegetation or lawns during any period for which either the Governor or a local government has declared an emergency due to drought.
- Not require the removal or reversal of water-efficient landscaping measures installed in response to the drought once the Governor of California declares that the drought is over.

Water Demand Reduction Requirements for Urban Water Suppliers

The primary laws and agreements establishing water use reduction goals and targets for urban water supply agencies are the Water Conservation Act of 2009 (SB X7-7) and the Memorandum of Understanding Regarding Urban Water Conservation in California (California Urban Water Conservation Council MOU). SB X7-7 set a requirement for urban water suppliers to reduce their per capita water use by the year 2020. The overall goal is to reach a statewide reduction in per capita urban water use of 20% by December 31, 2020. The MOU is a voluntary agreement. Signatories to the MOU agree to make a good faith effort to implement a prescribed set of urban water conservation best management practices (BMPs) or to take other actions resulting in an equivalent level of water savings. While the MOU is voluntary, state law (AB 1420) conditions eligibility for certain state grants and loans on compliance with it. AB 1420 sunsets in June of 2016 to be replaced by each agencies 20x2020 target for meeting the intent of AB 1420.

SB X7-7 – Under SB X7-7 urban water suppliers were required to provide a target for per capita water use in 2020 in their 2010 UWMPs. The target must be calculated using one of four methods specified by the legislation. The four methods are:

1. Set the target to 80% of baseline per capita water use. The legislation dictates the method for calculating baseline per capita water use.
2. Set the target based on efficient water use standards for indoor residential water use, commercial, industrial, and institutional water use, landscape water use, and (optionally) agricultural water use.
3. Set the target to 95% of the applicable state hydrologic region target developed by DWR and published in the state's 20x2020 Water Conservation Plan.
4. Set the target based on expected reductions in residential and non-residential water use due to implementation of the MOU BMPs and other actions.

Urban water suppliers are required to calculate an interim GPCD target for 2015 from the 2020 target. The interim target is also reported in the 2010 UWMP. Urban water suppliers must report their compliance status with their interim and 2020 GPCD targets in their 2015 and 2020 UWMPs. Effective July 1, 2016, urban water supplier eligibility for water grants or loans awarded or administered by the state is conditional on compliance with these targets. Additionally, effective January 1, 2021, failure to meet the 2020 target can be used in administrative or judicial proceedings to establish a violation of state law by the urban water supplier.

Executive Order B-29-15 - With California facing one of the most severe droughts on record, Governor Brown declared a drought State of Emergency in January 2014 and directed state officials to take all necessary actions to reduce water use.

On April 1, 2015, Governor Brown mandated a 25 percent water use reduction for cities and towns across California. In May 2015, the State Water Resources Control Board (SWRCB) adopted an emergency regulation requiring an immediate 25 percent reduction in overall potable urban water use. The regulation uses a sliding scale for setting conservation standards, so that communities that have already reduced their R-GPCD through past conservation will have lower mandates than those that have not made such gains since the last major drought.

The SWRCB tracks water conservation for each of the state's larger urban water suppliers on a monthly basis, but compliance with individual water supplier conservation requirements and the statewide 25 percent mandate is based on cumulative savings. Cumulative tracking means that conservation savings will be added together from one month to the next and compared to the amount of water used during the same months in 2013.

Table 9 below provides the reduction targets for each IEUA member agency.

Table 9: Retail Agency Emergency Regulation Mandatory Reduction %

Retail Agency	Mandatory Reduction Percent
Chino, City of	24%
Chino Hills, City of	28%
Cucamonga Valley Water District	32%
Fontana Water Company	28%
Monte Vista Water District	24%
Ontario, City of	24%
Upland, City of	36%

Regional Compliance Status

As stated, IEUA and its regional partners are committed to meeting or exceeding all compliance requirements put forth.

Governor’s Executive Order and Emergency Regulation Compliance

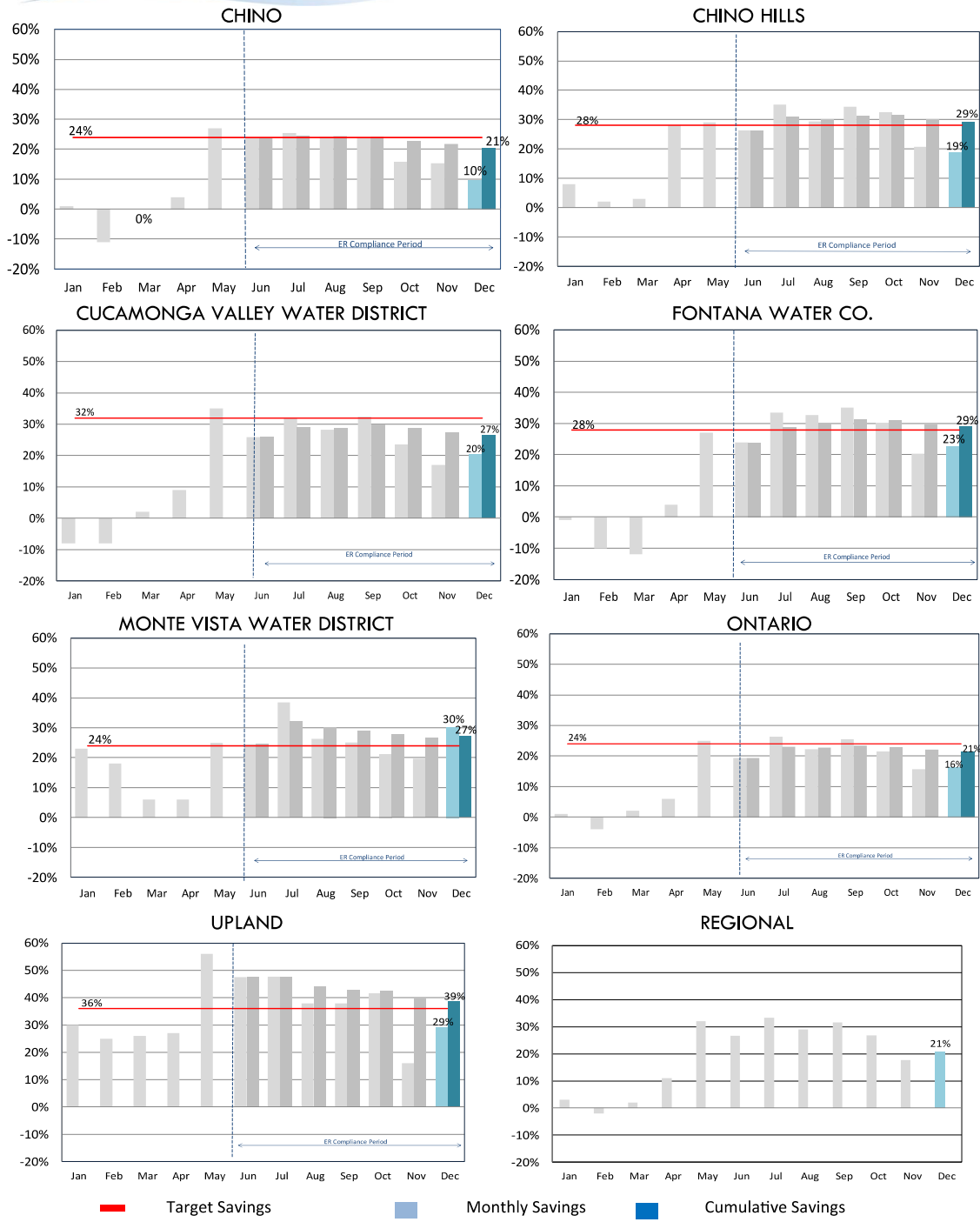
As stated above, the SWRCB approved an emergency regulation to implement a mandatory 25 percent statewide reduction in potable urban water use for the period between June 2015 and the end of February 2016. As of June 2015, member agencies are required to track monthly water use savings, as compared with 2013 water usage, and report the total potable water production to the SWRCB.

On the following page, Figure 1, is a copy of the December 2015 report submitted to the SWRCB. The report indicates that each water district exceeded or came close to meeting their respective reduction level for the June through December 2015 reporting period. The collective goal is 28% reduction and the collective saved through December is 29.5%.



EMERGENCY REGULATIONS WATER USE TRACKER

December 2015



- ◇ Monthly Savings compared to 2013 Water use
- ◇ Emergency Regulations of cumulative water use savings compliance begins June 2015

Figure 1: Retail Agency Emergency Regulation Water Use Tracker

SB X7-7 Compliance

IEUA and its regional partners, through their Regional Alliance, used method 1 to set its interim and 2020 GPCD targets. Because this method requires landscape area and population data in the compliance years (2015 and 2020) to calculate the targets, the targets reported in the Region’s 2010 Urban Water Management Plan (UWMP) are estimates that will be updated in its 2015 and 2020 UWMPs. The estimated targets for 2015 and 2020 are 226 and 201 GPCD respectively.⁶

As shown in Table 10, measured GPCD within the Regional Alliance service area for the last five years has averaged 220 gallons, 3% less than the 2015 target. 2015 estimates show per capita use at 188 well below the 226 target. It is certain the region will comply with its 2015 interim target and absent a sharp rebound in per capita water use in the next five years, the odds are strongly in its favor that it will meet its 2020 target. The current projection for 2020 is reported GPCD of 169 - 174, well below the target of 201. The current numbers being used by IEUA’s planning team shows a 6 GPCD reduction for WUE in 2020. The plan as projected in this document, assuming 2 agencies implement Budget-based Water Rates, estimates an 11 GPCD reduction for WUE.

Table 10 reports regional SB X7-7 compliance. In comparing per capita use to targets, the law allows accounting allowances for recycled water (RW) and water use efficiency (WUE) in the reported GPCD. Table 10 depicts this logic for showing how the per capita water use (Actual GPCD) is adjusted by WUE and RW to yield the reported GPCD.

Table 10: 20x2020 Regional Compliance

Fiscal Year	GPCD without WUE & Recycled Water	Water Use Efficiency	Recycled Water	Reported GPCD*
UWMP 2010 Baseline				251
2010	260	1	10	249
2011	215	1	12	202
2012	229	2	15	212
2013	237	2	18	217
2014	243	2	21	219
2015 Target				226
2015 Actual	212	3	21	188
2020 Target				201
2020 Projection*	215	6 - 11	35	169 - 174

**Projection: 2020 assumes 2.5% increase/year water use from FY2014/15.

⁶ IEUA updated its service area population estimates and GPCD calculations following the release of 2010 Census data. The targets reported here differ from the targets reported in IEUA’s 2010 UWMP. IEUA will be updating its baseline GPCD, interim, and compliance GPCD targets in its 2015 UWMP.

California Urban Water Conservation Council MOU Compliance

In December 1991, IEUA, along with 120 other urban water agencies and environmental groups signed a historic Memorandum of Understanding and since then the California Urban Water Conservation Council (Council) has grown to over 400 members. Those signing the MOU pledge to develop and implement urban water conservation practices to reduce the demand of urban water supplies. During its 20-year history, the Council has successfully established itself as a collaborative forum within which water agencies and the environmental community work together to advance urban water conservation throughout the state.

As a part of regional water use efficiency programming, IEUA and its regional partners agree to allocate funding annually to pay membership dues and to support Council activities. In addition, IEUA also has a designated staff person who serves as a Group 1 - Board Member.

AB 715, SB 407, CalGreen, AB 1881 Compliance

IEUA does not have statutory obligations under AB 715, SB 407, CalGreen, and AB 1881, which govern the manufacture, sale, installation, and replacement of toilets, urinals, and faucets and the installation and rehabilitation of landscaping in California. The property inspection, plan approval, and construction permitting obligations of SB 407 and AB 1881 fall to cities and/or counties, not special water districts. The same is also true for adoption and enforcement of CalGreen building codes.

IEUA and its regional partners will continue to support and pursue new building codes and landscape measures which drive water efficiency including adding irrigation and landscape measures to local and state retrofit on resale regulations.

In addition, IEUA and its regional partners will work with developers and push for installation of premium toilets and ultra-high efficient development projects. This will require that IEUA and its regional partners actively interact with developers, homeowner associations, and the real estate industry in order to educate all parties, focusing on single family projects and appropriate design and product choices for water efficient back yards.

The region should also consider focusing on efforts to drive up standards for irrigation equipment being sold in California including: pressure regulation spray bodies with built-in check valves, high efficiency sprinkler nozzles, smart controllers and other efficiency equipment.

Section 3 - Market Condition and Potential

One of the first tasks undertaken in the WUE planning process was to collect and compile a database in order to disaggregate end-use data within the IEUA service area. Analysis of the region’s customer demand is an important step in developing the WUE plan because it lays the foundation for understanding the potential for water savings from efficiency measures. For the purposes of this five-year plan, water consumption and inferred outdoor water use was used. The region’s recent efforts with GIS mapping and analytics will provide significantly more accuracy regarding landscape area and irrigation use.

In addition, evaluating what’s been achieved through past WUE activities helps assess the remaining potential. Lastly, appraising the market conditions and barriers to implementing WUE measures is necessary as they impact program feasibility and again potential to achieve water savings.

The following items were analyzed in order to determine remaining market potential in the IEUA’s service area:

- Current Water Consumption
- Indoor and Outdoor Water Use
- Past Conservation and Device Saturation
- Market Conditions
- High Level Measure Potential

Regional Water Consumption

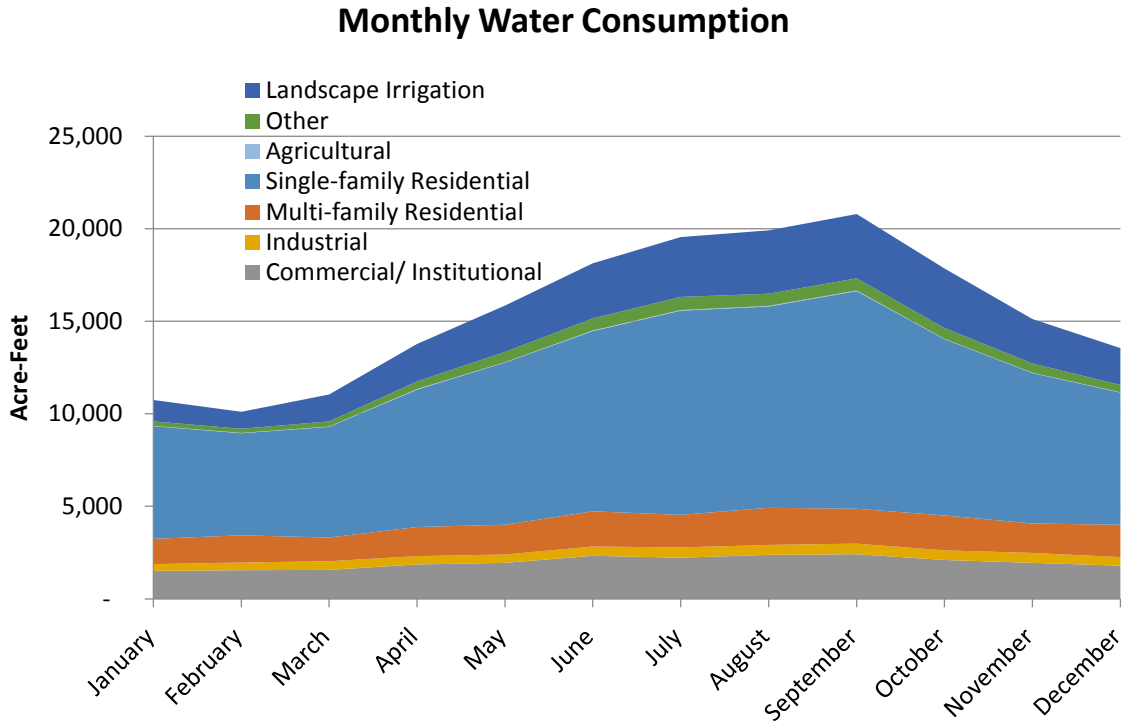
Table 11 shows the 2013 water consumption and number of water accounts by customer type for all seven IEUA member agencies combined.

Table 11: 2013 Regional Water Consumption

Customer Type	Number of Accounts in 2013 (PWSS)	Annual Consumption (Weather Normalized AF)	Customer Class Share of Total Demand
Single Family	171,309	112,171	48.5%
Multi-Family	7,286	27,818	12.0%
Commercial	12,912	25,668	11.1%
Industrial	870	6,342	2.7%
Landscape	5,332	31,119	13.5%
Other	599	27,893	12.1%
Total	198,308	231,092	

Figure 2 plots the monthly water consumption by month to reveal seasonal patterns by customer type. Note the pronounced seasonal variation with summer high deliveries approximately twice the level of winter deliveries. Single family and landscape irrigation show the largest seasonal variation. The graph is sorted with the highest seasonal variation presented on top. For example, landscape irrigation is the sector with the highest ratio of peak month to minimum month while commercial customers have the lowest.

Figure 2: Monthly Water Consumption by Customer Type



Indoor vs. Outdoor Water Use

WUE measures address either indoor or outdoor water use. For this reason, it is important to know how much water is used for each. Determining water usage indoors vs. outdoors can be difficult. Some outdoor end uses can be directly measured by dedicated irrigation meters. However, many types of water meters -- single family, multi-family, and commercial -- are “mixed,” measuring both indoor and outdoor end uses. Therefore, agencies are forced to rely on inference to determine outdoor water usage.

Two methods can be used to estimate outdoor use across customer classes. The first method is the minimum month method that has seen wide use due to its ease of implementation. This method assumes that the month of minimum water demand is completely made up of indoor end uses; thus, any water consumption greater than the minimum month would be outdoor water use. To be accurate, this method requires that

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at least one month per year (typically in the winter) has zero outdoor water usage. Because of the region’s location, irrigation occurs even in the winter and makes this method ineffective.

The second method, termed “seasonal variation,” develops an estimate of winter irrigation from dedicated irrigation meters and applies this seasonal variation to mixed meter customers. The seasonal variation method will result in a higher estimate of outdoor water use than using minimum month because it captures winter irrigation end uses. This method was chosen for the region’s planning process because it more accurately captures the winter irrigation occurring in the region’s arid climate.

Table 12 shows the estimated outdoor end use constituting **66%** (153,435 acre-feet) of the total volume of water use.

With this high percentage of outdoor water usage, it is important to recognize that, with just a 20% reduction each year, over 30,000 acre-feet of water can be saved annually.

Table 12 Inferred Outdoor Use

Inferred Outdoor Use			
Customer Class	Total Volume (AF/Year)	Seasonal Variation Method % Use	Estimated Outdoor Use (AF)
Single Family	112,171	62%	70,071
Multi-Family	27,818	33%	9,314
Commercial	32,010	47%	14,959
Landscape	31,199	100%	31,199
Other	27,893	100%	27,893
Total	231,092	66%	153,435

Past Achieved Conservation

It is necessary to understand past achieved conservation when determining remaining conservation potential. Data from the region’s locally administered programs, as well as MWD’s regional rebate programs, was collected from IEUA’s fiscal year reports 2002 through 2015. The data was entered into the AWE Tracking Tool and is summarized in the Table 13.

The total lifetime water savings for all of the measures is estimated at 89,161 acre-feet. Toilets, both HET and ULFT, have provided the most significant savings at 49,347 acre-feet over the life of measures. This represents over 55% of the total water savings. Smart controllers provide savings of 8,581 acre-feet representing over 9% of total savings. Over

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half of the smart controller savings came from central irrigation control system rebates through MWD's Public Agency Program.

Table 13: Lifetime Savings by Measure for Past Achieved Conservation

Measure	Lifetime Savings Acre-feet	% of Total Savings
High Efficiency and ULF Toilets (all markets)	49,347	55.35%
Smart Controllers (all markets)	8,581	9.62%
High Efficiency Clothes Washers (all markets)	6,669	7.48%
High Efficiency Nozzles (all markets)	5,966	6.69%
Fontana USD Retrofits	4,170	4.68%
Ultra Low Volume Urinals	4,155	4.66%
Residential Landscape Retrofits	4,104	4.60%
Turf Removal (all markets)	2,911	3.26%
Landscape Evaluations	1,855	2.08%
Water Brooms	416	0.47%
Pre-rinse Spray Valves	379	0.43%
X-ray Film Processors	304	0.34%
Cooling Tower Controllers	142	0.16%
Laminar Flow Restrictors	105	0.12%
Pool Cover	28	0.03%
Large Rotatory Nozzles	22	0.02%
Air-Cooled Ice Machines	5	0.01%
Rain Barrels	2	0.00%
Total	89,161	

Past Program Activity – Estimated Savings: FY2002 – 2015

In order to better understand activity and savings at a more granular level, Table 14 below displays the measures by market segment and delivery mechanism, if available. Of significance is that 23,395, or 26% of the total savings, came from ultra low flush toilets installed in multi-family sites through the region's locally administered program. Other local programs with significant savings are:

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- FreeSprinklerNozzles.com Program providing vouchers for free high efficiency sprinkler nozzles produced 4,696 acre-feet of savings.
- Fontana USD Retrofits, which provided free product and installation of high efficiency toilets and urinals as well as smart controllers and high efficiency sprinkler nozzles, shows savings of 4,170 acre-feet.
- Residential Landscape Retrofits providing free product and installation of smart controllers and high efficiency sprinkler nozzles delivered 4,104 acre-feet of savings.

Table 14: Lifetime Savings by Measure and Delivery Mechanism for Past Achieved Conservation

Measure	Lifetime Savings Acre-feet
Ultra Low Flush Direct Install (MF)	23,395
Ultra Low Flush Toilet Rebates (SF)	9,101
Smart Controllers Rebates (CII)	8,301
High Efficiency Clothes Washer Rebates (SF)	6,015
High Efficiency Toilets Rebates (MF and CII)	5,144
Fontana USD Retrofits	4,170
Ultra Low Volume Urinal Rebates	4,155
Residential Landscape Retrofits	4,104
High Efficiency Toilets Rebates (SF)	3,992
High Efficiency Toilet Direct Install (MF)	3,409
High Efficiency Toilet Direct Install (SF)	3,140
FreeSprinklerNozzles (MF and CII)	2,470
FreeSprinklerNozzles (SF)	2,226
Turf Removal Rebates (CII)	1,899
Phase III Landscape Evaluations	1,181
Ultra Low Flush Toilet Rebates (MF and CII)	1,166
High Efficiency Nozzles Rebates (CII)	1,111
Turf Removal Rebates (SF)	1,012
Landscape Evaluations	674
High Efficiency Clothes Washer Rebates (CII)	654
Water Brooms Rebates	416
Pre-rinse Spray Valves	379
X-ray Film Processors Rebates	304

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Measure	Lifetime Savings Acre-feet
Smart Controllers Rebates (SF)	280
High Efficiency Nozzles Rebates (SF)	159
Laminar Flow Restrictors Rebates	105
Cooling Tower Conductivity Controller Rebates	84
pH Controllers for Cooling Tower Rebates	58
Pool Covers	28
Large Rotatory Nozzle Rebates	22
Air-Cooled Ice Machine Rebates	5
Rain Barrel Rebates	2

Past Program Activity – Estimated Savings: FY2010 - 2015

When evaluating past performance, it's also important to view activity and performance in the most recent years. This allows for better identification of trends and assessment of a given program's ability to deliver results.

Below in Table 15 are the savings by program for the last five fiscal years, FY2009/10 – FY2014/15. The total lifetime water savings is estimated at 30,856 acre-feet. These savings are nearly double what was projected in the 2010 Water Use Efficiency Business Plan with estimated savings of 16,055 acre-feet.

Table 15: Savings by Program - Last Five Fiscal Years

Measure	Lifetime Savings Acre-feet	% of Total Savings
High Efficiency Toilets (all markets)	8,413	27.3%
FreeSprinklerNozzles.com	5,679	18.4%
Fontana USD Retrofits	4,170	13.5%
Residential Landscape Retrofits	4,105	13.3%
High Efficiency Clothes Washers	2,826	9.2%
Turf Removal (all markets)	2,059	6.7%
Smart Controllers (all markets)	1,973	6.4%
High Efficiency Nozzle Rebates (all markets)	983	3.2%
Ultra Low Volume Urinals	775	2.5%

Measure	Lifetime Savings Acre-feet	% of Total Savings
Landscape Evaluations	674	2.2%
Laminar Flow Restrictors	105	0.3%
Cooling Tower Conductivity Controllers	71	0.2%
Air-Cooled Ice Machines	5	0.0%
Rain Barrels	2	0.0%
Total	30,856	

As with previous years, toilets still represented the most significant savings (27.27%), however, the locally administered programs, FreeSprinkerNozzles.com, Fontana USD Retrofits, and Residential Landscape Retrofits represented over 45% of combined savings. Each of these programs provided landscape and irrigation measures and was implemented through voucher and direct install delivery mechanisms vs the standard rebate-style program.

In the last two years, savings from turf removal increased significantly (over 300%) due to the increased incentive available through MWD’s Regional Rebate Program.

Indoor Passive Water Savings and Saturation

Water agencies have promoted indoor water use efficiency since the early 90’s. Indoor WUE has focused on upgrading high water use fixtures such as toilets, showerheads, and clothes washers. Examples of common programs are rebates to upgrade fixtures and direct installation programs (active conservation). In addition, water agencies have supported upgrading plumbing codes that require high efficiency fixtures (passive conservation). Both passive and active conservation has contributed to saturation of indoor measures. For future program planning it is important to understand the saturation and thereby the remaining potential.

The passive conservation engine from the AWE Tracking Tool was used to calculate device saturation for residential toilets and clothes washers to assess remaining use efficiency potential. Unfortunately, at this time there is not sufficient market information to conduct this analysis for commercial measures without significant investment. The AWE Tracking Tool creates a year-by-year inventory of water-consuming devices and the transformation over time to efficient devices driven by plumbing and building code.

Active conservation was then subtracted and thus, the remaining potential was calculated.

Single Family Homes: Saturation of High Efficiency Toilets and Clothes Washers

Table 16 shows the current saturation of high efficiency toilets and clothes washers in single family residences. “Efficient” toilets are defined as ULFT or better (saturation includes anything 1.6 gpf or better). Recent active programs have focused on high efficiency toilets (1.28 gpf) and current programs focus on “premium” fixtures (1 gpf or less).

For toilets, the saturation rate is a significant 79% percent. Of the inventory of 390,324 fixtures in IEUA’s service area, there are approximately 83,383 non-efficient toilets remaining.

For high efficiency clothes washers, the saturation rate in single family homes is 53 percent. There are an estimated 161,925 clothes washers in the Region’s single family residential sector. Of the inventory of fixtures in the IEUA service area, there are approximately 75,000 non-efficient clothes washers remaining. “Efficient” clothes washers have a water factor of 8 or better, which includes all residential front loaders and the most efficient of the newer top loaders.

Table 16: Single Family Market Potential: Saturation of Efficient Toilets and Clothes Washers

Single Family	Toilets	Clothes Washers
Total Devices	390,324	161,925
Remaining (Non Efficient) Devices	83,383	75,932
Devices Actively Retrofitted	18,940	15,359
Devices Passively Retrofitted	288,001	70,633
Saturation	79%	53%
Total Water Savings Potential	3,544 AFY	8,163 AFY

Multi-family Homes: Saturation of High efficiency Toilets and Clothes Washers

Table 17 shows the saturation in the multi-family sector. High efficiency toilet saturation is even higher at nearly 100% and saturation of high efficiency clothes washers is 44%. One reason for the high saturation rate for toilets is that the IEUA and its regional partners have been extremely aggressive implementing direct install programs for more than a decade.

Table 17: Multi-Family Market Potential: Saturation of Efficient Toilets and Clothes Washers

Multi-Family	Toilets	Clothes Washers
Total Devices	117,559	29,771

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Remaining (Non Efficient) Devices	Very few	16,785
Devices Actively Retrofitted	31,534	Not categorized
Devices Passively Retrofitted	94,956	12,987
Saturation	Near 100%	44%
Total Water Savings Potential	NA	1,804 AFY

Remaining Potential for Toilets

Due to the high saturation rate of residential toilets as well as current code, it is recommended that the region no longer offer programs for toilet replacements.

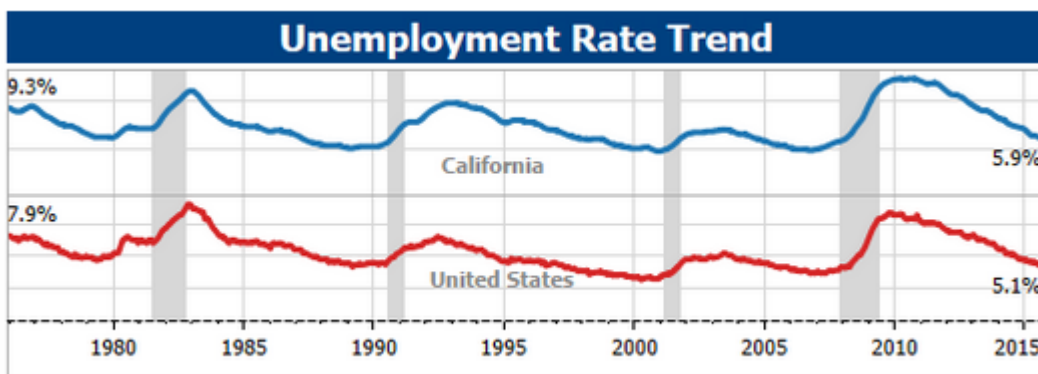
Remaining Potential for Clothes Washers

There is still some market for high efficiency clothes washers. Future programs should offer incentives for the highest efficiency models because many customers are already choosing efficient models without incentives.

Market Conditions

As economic outlooks shift, so too do attitudes about major purchasing and upgrade decisions regarding homes and businesses. When economic indicators such as unemployment, interest rates, and property values are favorable, customers are much more likely to make longer term investments in their properties including WUE upgrades.

Figure 3 shows unemployment rates over the years for California and San Bernardino County:



Unemployment Rate San Bernardino County

June '11	14.0%
June '12	12.8%
June '13	10.4%
June '14	8.4%
June '15	7.1%

Source: BLS via CA DOF

Figure 3: Regional Unemployment Trend

Besides weathering California's drought emergency, IEUA's service area, like much of California, has experienced small steady improvements in its unemployment rate since the peak of the great recession. Median household income has also exhibited improvements since bottoming out in the recession. The real estate market has shown

upturns, with an increasing median price for single family homes and multifamily buildings, increasing occupancy and rents for commercial properties, and increasing single family housing new development.

The improving economic and real estate market conditions affect the different market segments targeted by WUE programs, and their drivers need to be considered when designing water use efficiency programs. Figure 4 *Market Conditions* address each market segment—broken into multifamily and HOA, Commercial/Industrial/Institutional (CII), and Single Family—for insights as to how market conditions can influence WUE program considerations.

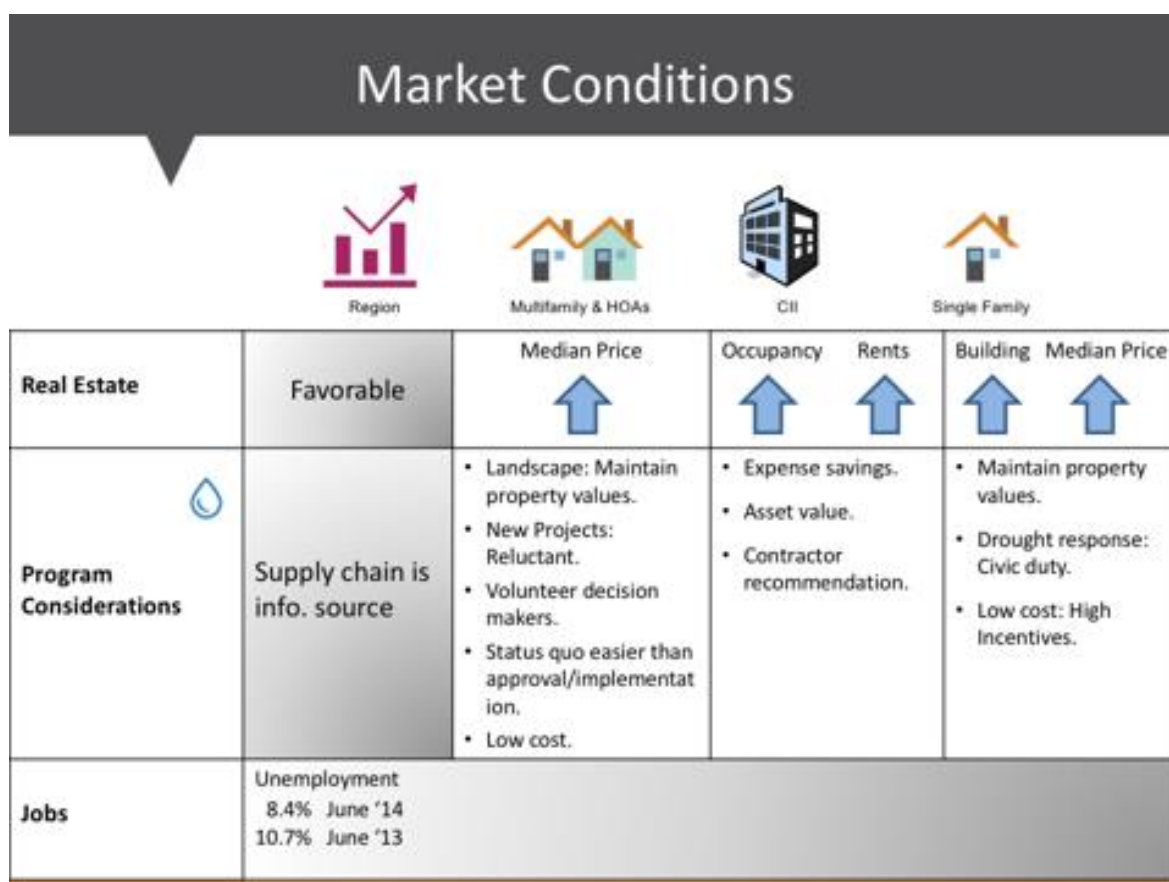


Figure 4: Market Conditions

The improving real estate market in the region gives new impetus for customers to make improvements to their properties. Since some landscape upgrades require fairly high up-front investments and longer term payback periods, customers need to believe that the real estate market will recognize the value of these investments.

The competitive multi-family and Homeowners Association (HOA) markets lead to customer's desire to have well-maintained and attractive landscapes to maintain property values. However, HOAs are typically governed by volunteer decision makers, and many are not willing to take risks or make investments in new technologies or alternative

landscape designs. As well, many HOAs lack the capital funds to make such improvements. They must plan years in advance to fund any large-scale project.

For commercial properties, business owners and managers have a known focus on the bottom line, requiring WUE measures to pay for themselves over a short time. Improving asset values is always a plus and contractors can have an inside edge in pushing new WUE technologies and practices due to years of developed business relationships.

The single family market sector is also characterized by customer demand for landscapes that maintains property values. However, single family customers take a more vested interest in maintaining their civic duty for drought response. Hence, messaging for support of community values such as drought response can have more traction. Increased new housing developments provides the opportunity to influence the highest efficiency fixtures, landscapes, and irrigation systems.

Significant economic incentives are motivating to all markets.

New Water Savings Approaches and Technologies

As new approaches and technologies become available in the market, or have proven savings, it is important to evaluate these opportunities. Two approaches being considered by the IEUA and its regional partners are Budget-Based Water Rates and Customer Engagement Technologies.

Budget-Based Water Rate Opportunities

Budget-based water pricing is a type of increasing block rate structure in which the block sizes vary according to household-specific characteristics (# of residents, irrigated area, local weather) and the use of indoor and outdoor efficiency standards (as a benchmark). Customers who manage their water consumption within their efficient allocation/water-budget pay a lower water rate; customers who exceed their efficient allocation/water-budget pay higher water rates.

The emphasis on account-by-account water use efficiency requires, with a budget-based design, that agency fixed costs be collected in large part on a fixed service charge and the remaining fixed costs are imbedded in the customers “efficiency” tiers. This helps protect the agency from losing necessary fixed revenues when customers save or use less water. Agencies with well-designed budget-based rates weather water demand changes associated with wet years, drought restrictions and economic downturns.

A recent UC Riverside study⁷ of the impact of implementing budget-based water rate structures found a pronounced effect that this type of rate reform can have, specifically in a nearby service area, Eastern MWD (EMWD).

Examining more than 12,000 residential customer’s consumption records from January 2003 through September 2012, the analysis arrived at the following findings:

- Average prices rose less than 4% under water budgeting, but would have had to rise 34% under flat rate pricing to achieve the same reduction in customer water use.
- EMWD’s budget-based rate structure resulted in at least a **15% reduction in residential water use**, controlling for the effects of inflation and the recent economic downturn.

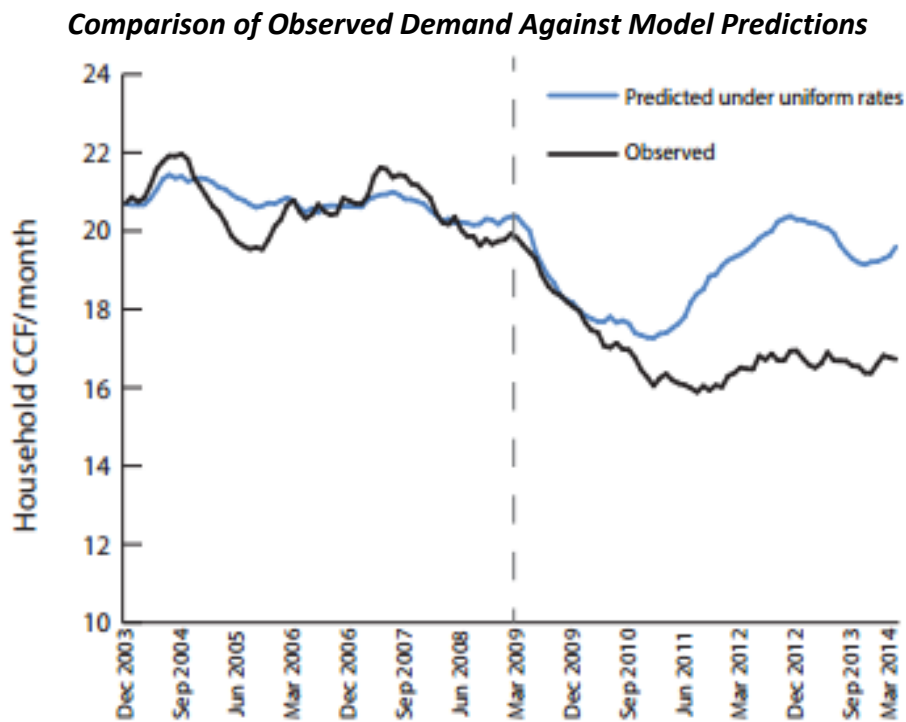


Figure 5: EMWD BBR Demand Against Model Predictions

There is also evidence that budget-based water rates are more desirable from a customer perspective especially when conservation targets must be achieved. Another UC Riverside Study² found that EMWD customers were better-off under budget-based water rates

⁷ Baerenklau, Kenneth A., Kurt A. Schwabe and Ariel Dinar. 2014a. “The Residential Water Demand Effect of Increasing Block Rate Water Budgets.” Forthcoming in *Land Economics* 90(4): 683-699. Baerenklau, Kenneth A., Kurt A. Schwabe, and Ariel Dinar. 2014b. “Allocation-Based Water Pricing Promotes Conservation While Keeping User Costs Low.” *Agricultural and Resource Economics Update* 17(6): 1-4.

rates than under either a uniform price increase or a uniform curtailment that would achieve the same levels of conservation and agency revenues. Of the three policies examined, budget-based rates were the only policy that improved average customer welfare relative to the old pricing policy, and the only policy that effectively rewarded water use efficiency.

Depicting Rate Change Savings

For the purposes of this plan and savings modeling, budget-based water rates were depicted as a WUE activity in the AWE Tool by contrasting different numbers of the IEUA’s member agencies rolling out the new rate over the 5-years of the implementation plan—either 2 or all of the member agencies. The agency-level savings assumption in Table 18 below is derived by translating the water use per account (AF/Account) into a weighted average water savings per account.

The econometric estimate of water savings includes the effect of the budget-based rates, increased customer outreach, and implemented water use efficiency measures. Another recent econometric study estimated customer engagement technology and associated increase in participation of water use efficiency programs to have resulted in a 4.6% reduction in a random sample controlled evaluation design.⁸ To avoid double counting, a water savings assumption of 11% was determined to be a reliable savings estimate solely attributable to budget-based rates and directly applied to single family accounts. Multi-family accounts are typically composed of mostly indoor uses and only 40% of the level of single family savings was assumed to apply. The 11% water savings was also applied to irrigation accounts. A volumetrically weighted savings per account across these three customer classes was then obtained and is presented in the last row of the table below.

Table 18: BBWR Water Savings Assumptions

Customer Type	AFY/ Account	Savings %	Savings AFY/Acct	Notes
Single Family	0.79	11%	0.09	Direct Effect of BBRS Implementation, Reliable Est.
Multi-Family	3.67	4.4%	0.16	MF mostly indoor, assume 40% of SF savings
Irrigation	7.19	11%	0.79	CIII - CII not affected, Irrigation affected
Weighted Use in AF/Account	1.09		0.11074	Weighted Average Savings (SF + MF + Irrig.) in AFY/ Acct
			Savings Gallons /Acct	(x325851 gallons/AF)

⁸ Mitchell, David and T.W. Chesnutt, *Evaluation of East Bay Municipal Utility District's Pilot of WaterSmart Home Water Reports*, Prepared for California Water Foundation & East Bay Municipal Utility District, December 2013.

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Customer Type	AFY/ Account	Savings %	Savings AFY/Acct	Notes
			36,085	Weighted Average Savings (SF + MF + Irrig.) in Gallons/ Acct

Two additional member agencies rolling out budget-based rate structures was translated into two-sevens of the 183,927 applicable accounts (SF+MF+Irrig.) or 52,551 accounts. An all agency rollout was also modeled using all 183,927 accounts.

These per account savings translate into total annual savings for each model of:

- Two agency implementation of budget-based water rates: 5,820 AF
- Region-wide agency implementation of budget-based water rates: 20,368 AF

Customer Engagement Technology Opportunities

Customer Engagement Software is used to better inform customers of their real time water use and possibilities for improving water use efficiency. As discussed above, a recent study estimated customer engagement software and increased participation in water use efficiency programs to have resulted in a 4.6% reduction in water use.⁹

Table 19 below provides the savings assumption used for savings directly attributable to Customer Engagement Software (excluding the effect of increased participation in WUE programs.)

Table 19: Customer Engagement Software Water Savings Assumptions

Customer Class	AFY/ Account	Assumed Savings %	Savings AFY/Acct	Notes
Single Family	0.79	2%	0.0158	Direct Effect of Customer Engagement Software, Reliable Estimate
			Savings Gallons /Acct	(x325851 gallons/AF)
			5,148 Gallons per Year	Avg Savings (SF) in Gallons/ Acct

High Level Measure Potential Assessment

In order to select measures for further evaluation, it is necessary to understand the high level potential of specific measures within each market segment. Table 20 summarizes

⁹ Mitchell, David and T.W. Chesnutt, *Evaluation of East Bay Municipal Utility District's Pilot of WaterSmart Home Water Reports*, Prepared for California Water Foundation & East Bay Municipal Utility District, December 2013.

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sources of remaining water use efficiency potential by market sector. Within each sector the table lists sources of water use efficiency, the stage of programmatic development (early to late), and the qualitative range (low to high). This broad overview acts as a guide in selecting measures for further consideration.

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Table 20: High Level Market Potential by Measure

Sector, Measures, End Uses	Stage	Description of Potential	
Residential Indoor			
Toilets	Late	Small number 3.5gpf, ULF to HET less savings	Low
Faucets, Aerators, Flow Restrictors	Late	Small remaining potential	Low
Showerheads	Late	Very low flow rates existing fixtures	Low
Clothes Washers	Mid	Medium saturation - many freeriders	High
Pressure Regulating Valves	Pilot	Covers all end uses	High
Surveys, Education, Outreach	Ongoing	Gateway program	Low-Mid
Budget-Based Water Rates	Early	Covers all end uses	High
Landscape			
Controllers	Early	SF Residential large remaining potential	High
Nozzles	Early	Large remaining potential	High
Turf Replacement, Low Water Plants	Early	Large technical potential; small economic potential	High
Artificial Turf	Early	Large technical potential; small economic potential	High
Pressure Regulating Valves	Pilot	Covers all end uses	High
Landscape Management	Ongoing	Gateway program	High
Surveys, Education, Outreach	Ongoing	Gateway program	Low-Mid
Budget-Based Water Rates	Early	Covers all end uses	High
CII (Non-Landscape)			
Toilets	Mid	Small number 3.5gpf, valve type expensive replacement	Mid
Urinals	Mid	High traffic sites could be target	Mid
Faucets, Aerators, Flow Restrictors	Late	Small remaining potential	Low
Showerheads	Mid	Sports facilities, accommodation could be target	Mid
Food Service Equipment	Mid	Limited number of food steamers, offer upstream incentives	Mid
Laundry	Mid	Limited number in region	High
Industrial Processes and Manufacturing	Mid	Limited number in region	High
Cooling	Mid	Limited number in region	High
Pressure Regulating Valves	Pilot, Research	Covers all end uses	High
Surveys, Education, Outreach	Ongoing	Gateway program	Low-Mid
Budget-Based Water Rates	Early	Covers all end uses	High

Outdoor Water Savings Opportunities

Comprising an estimated 66% of the region's total demand, outdoor water use is clearly the prime opportunity for water savings.

Outdoor water efficiency is focused on reducing irrigation needs for landscapes by upgrading either the irrigation system or planted landscape to more water use efficient options. Examples of device upgrades for irrigation systems are high efficiency nozzles, micro and low precipitation irrigation, smart controllers, irrigation repairs, and pressure regulation. Turf removal and replacement with a more sustainable landscape is an example of an "upgrade" to a traditional landscape.

To determine the best water savings opportunities, the plan looks at two factors:

- 1) Sectors and customers with the highest outdoor water use and highest potential savings;
- 2) Available devices and programs with highest market potential.

Opportunities by Customer Type

The analysis of water usage by account type found that the account types with the highest total volume of water usage in the region, single family, multi-family and landscape accounts, also have the largest percentage of outdoor water use. These accounts use over an estimated 171,108 acre-feet of water per year and an estimated 110,584 acre-feet per year just for irrigation. A reduction of 10% could yield over 11,000 acre-feet in water annual water savings.

These account types should be targeted when pursuing outdoor water conservation programs.

Opportunities by Measure

There are several existing outdoor water efficient technologies that have a high potential for water savings.

High Efficiency Nozzles and Low Precipitation Systems

Most customers in the region, no matter their type, have some irrigated area within their property. These areas are typically irrigated by in-ground systems with inefficient nozzles (ex: pop-up spray heads). There are virtually millions of nozzles in the region. These irrigation systems can be easily retrofitted with high efficiency nozzles or micro or low precipitation systems. Market studies show that only around 20% of irrigation purchases are for high efficiency products. This low market saturation, coupled with the incredibly

high number of nozzles within the region, provides a high potential for increased efficiency.

Smart Controllers

The majority of customer sites also utilize standard timers to operate their irrigation system. There are tens of thousands of timers throughout the region. As with nozzles, less than 20% of controllers purchased are smart controllers. Smart controllers can be a great water saving measure for sites over irrigating as well as large landscape areas. When offering smart controller programs, IEUA and its regional partners needs to incorporate potential savings verification into the program design.

Turf Removal

The square feet of irrigated turf within the region is estimated at 434 million square feet for single family residential parcels (OmniEarth aerial imagery). GIS data calculating irrigated area will be made available to every IEUA member agency. It is clear that cutting across all sectors with landscape, turf replacement has enormous potential. Turf is the predominant landscape in Southern California and the potential for turf removal within the Inland Empire market is high.

Pressure Regulating Devices

Excessive water pressure in an irrigation system can cause increased and unnecessary water output from nozzles, and can also increase the chance of damage or leaks in the system. It is unknown how many customers suffer from excessive water pressure, however, it is known that most customers do not install outdoor pressure regulating devices. Regulating pressure is a potential area of high water savings worth further exploration through pilot studies.

Irrigation Repairs

Irrigation repairs are also an area that could assist customers with ongoing excessive water use. Using customer level water budget data can help identify sites with leaks. It is unknown how many customers have irrigation leaks, but the potential for savings is high.

Section 4 – Recommended Implementation Strategy

As discussed in the Executive Summary, there is a major difference between **water conservation** and **water use efficiency** and it is important to understand the dissimilarity.

The objective of this plan is **not** to focus on **water conservation** with its short-term focus on current emergency conditions. This approach will not provide prolonged savings. As drought restrictions are lifted, per capita water use will gradually rebound upwards as people breath a sigh of relief that the crisis is over and return to life as usual.

Instead the goal is to achieve **water use efficiency**, a sustainable reduction in water use, by creating a new resource value for water in the eyes of the end user.

The Regional WUE Business Plan proposes a five-year strategy to seek out inefficient water use customers, educating them about WUE goal attainment, and providing a “road map” to accomplish this.

It is important to understand that, while IEUA and its regional partners strive to offer an array of valuable programs and services, it is the retail water agency that ultimately determines the final design and level of participation for programs offered within their service area.

Proposed Strategy for Customer Interactions

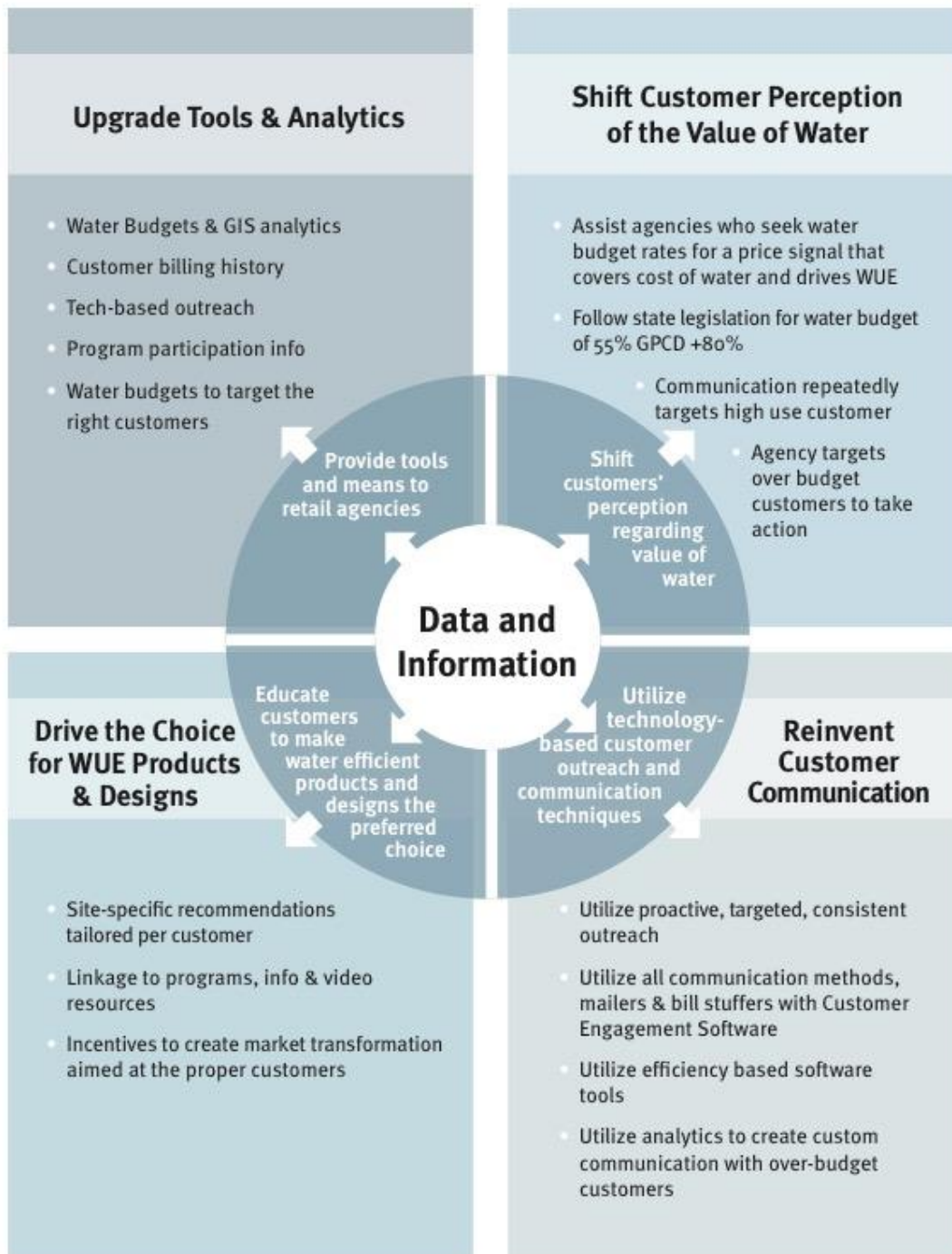
In order to achieve efficient water use, it is recommended IEUA and its regional partners conduct the in the following:

1. **Provide the tools and means** for retail water agencies to motivate the end use customers to meet reasonable and efficient water use targets. Personalized information, based on actual customer water use, measured against accepted State efficiency standards is necessary.
2. Accomplish this by **shifting customers’ perception regarding acceptable levels of usage.**
3. Assist customers to **make water-efficient products and landscape designs the preferred choice.**
4. **Utilize technology outreach and communication techniques** to provide refined and individualized communication with each customer.

Figure 6 illustrates the four major changes, over traditional plans, which should be considered in order for the region to achieve reasonable and efficient water use.

Four Major Changes to Achieve Efficient Regional Water Use

Figure 6: Major Changes Required to Achieve Efficient Regional Water Use



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As illustrated in the chart above, there are a number of new, tech-based services and applications available to support WUE goals. These include:

Geographic information systems (GIS) designed to capture, store, analyze, manage, and present an array of geographical data.

Customer engagement software designed specifically for utilities to connect and communicate with their customers via web and mobile devices.

Water budgeting software that provides parameters for efficient water usage per billing period and compare customers' actual usage.

Adaptors of these technologies are seeing a number of positive outcomes. Utilities have more robust data for strategic WUE program targeting and greater ability to manage supplies and distribution. Additionally, the end use customer receives accurate and personalized information about water usage at their site as well as steps to eliminate excessive water use.

It is recommended that IEUA and its regional partners consider utilizing the new tech-based software. The benefits of enhanced customer engagement for an agency can be achieved through implementation of a plan composed of eight strategic elements. Each was selected, as shown in the chart on the following page, because they provide an important piece of the puzzle for a successful customer engagement process:

Eight Strategic Elements of the Regional Plan

Strategic Element:	➔	Reason Selected:
Provide satellite-based COMPUTER MAPPING DATA for each retail agency	•••••	Delivers valuable site-specific data on all customers that can be used to target inefficient water users.
Encourage retail agencies to utilize WATER EFFICIENCY PRICING SIGNALS	•••••	Proven to be equitable and effect change at least cost to the agencies. Helps agencies achieve revenue and conservation balance.
Focus on OUTDOOR water use	•••••	Outdoor use is 66% of total water demand.
Use TECHNOLOGY-BASED SOFTWARE designed to engage, educate, and motivate customers	•••••	Provides convenient, interactive connection with customer via mobile device or computer.
Implement WUE CODE requirements for new construction	•••••	Lowest cost opportunity for lifetime water use efficiency.
TARGET OVER-ALLOCATION CUSTOMERS and offer ACTIONABLE water saving solutions	•••••	Best opportunities for cost effective savings .
Provide INCENTIVE-BASED & Regional INFORMATION-BASED Programs for IRRIGATION & LANDSCAPE MEASURES	•••••	Drives customers to act on their own and pushes market transformation.
TRACK WUE RESULTS & MAKE ADJUSTMENTS when necessary	•••••	To meet changing regional demand reduction goals.

Figure 7: Strategic Elements of the Regional Plan

Section 5 - Potential Programs and Analysis

With opportunities and markets identified for specific technologies and a recommended strategy developed, the next step in the WUE planning process was to evaluate all programs—both new and existing. A list of programs and measures was created and compared with the region’s water demand and measure savings potential. At this stage of the process numerous possibilities were listed, with the understanding that many of these programs would not make the final cut.

The List of Potential Programs and the reasoning for consideration are shown in Table 21.

Table 21 Potential Programs and Reasons for Consideration

Program/Measure	Reasons for Consideration
SoCal WaterSmart Rebate Program	<ul style="list-style-type: none"> - Majority of funding from MWD. - Ease of operation.
High Efficiency Toilet Incentives and Direct Installation Programs	<ul style="list-style-type: none"> - Has provided long-term cost effective water savings in the past.
Turf Removal Incentives and Direct Installation	<ul style="list-style-type: none"> - Abundant opportunity that results in market transformation.
Smart Controller Direct Installation Programs	<ul style="list-style-type: none"> - Targets large use outdoor water and verifies savings will occur.
High Efficiency Nozzle Voucher and Direct Installation Programs	<ul style="list-style-type: none"> - Large number of pop-up heads to be retrofitted. - Program is easily scalable.
Landscape Evaluations	<ul style="list-style-type: none"> - Targets over-allocation landscape customers and motivates them to make water use efficiency improvements.
Submetering Incentive Program	<ul style="list-style-type: none"> - Saturation is low and potential water savings are high volume.
Graywater Incentive Program	<ul style="list-style-type: none"> - High water savings potential.
Pressure Regulation Incentives	<ul style="list-style-type: none"> - Known issue with homes and irrigation system.
Irrigation Repair Incentives and Direct Installation	<ul style="list-style-type: none"> - Addresses fundamental issues. Issues are exasperated with installation of efficiency measures.
Leak Detection and Flow Monitoring Incentives	<ul style="list-style-type: none"> - Could save huge amounts of water and reduce damage at properties.
Drip Irrigation Incentives	<ul style="list-style-type: none"> - Currently most efficient and viable method for irrigation.

Program/Measure	Reasons for Consideration
Budget-Based Water Rates	<ul style="list-style-type: none"> - Sends strong price signal, stable agency revenue recovery, and provides excess revenue for local agency programs - Drives over-allocation customers to consider changes, with little impact to low-income (UCR; Baerenklau) - Proven effective for long-term water demand reduction
Customer Engagement Software	<ul style="list-style-type: none"> - Customer-preferred communication method - Allows retailers to send messaging & program links to over-allocation customers - Proven effective elsewhere for reducing demand

As importantly, it is necessary to understand the issues and possible risks when considering a potential program and/or measure. Table 22 lists these other considerations.

Table 22: Potential Programs and Other Considerations

Program/Measure	Consideration
SoCal WaterSmart Rebate Program (multiple measures)	<ul style="list-style-type: none"> - MWD controls measures to be incentivized, incentive levels, and budgets. - Marketing is not consistent.
High Efficiency Toilet Incentives and Direct Installation Programs	<ul style="list-style-type: none"> - Saturation is high. - Code requires high efficiency fixtures. - Premium fixtures are not easily available and provide only incremental savings.
Turf Removal Incentives and Direct Installation	<ul style="list-style-type: none"> - Expensive and not cost effective. - Quality of installations vary. - Drip systems have maintenance issues. - Requires a significant amount of resources to manage a “best practices” program.
Smart Controller Voucher and Direct Installation Programs	<ul style="list-style-type: none"> - Cost is higher than traditional controllers. - Many contractors have not bought into technology. Customers are unfamiliar with technology. Can be complicated to install and program. - Many customer under-irrigate.

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Program/Measure	Consideration
High Efficiency Nozzle Voucher and Direct Installation Programs	<ul style="list-style-type: none"> - More expensive than traditional nozzles. - Many customers do not know what a nozzle is.
Landscape Evaluations	<ul style="list-style-type: none"> - Duration of behavioral savings are unknown. - Measure savings are usually associated with another program.
Submetering Incentive Program	<ul style="list-style-type: none"> - Extremely expensive. - Reading meters and billing is complicated.
Graywater Incentive Program	<ul style="list-style-type: none"> - As a retrofit option, graywater is not cost effective. Re-plumbing is costly.
Pressure Regulation Incentives	<ul style="list-style-type: none"> - Savings are not known. Hard to set average incentive. - Requires more extensive installation. All installations are different.
Irrigation Repair Incentives and Direct Installation	<ul style="list-style-type: none"> - Savings are not known. Hard to set average incentive. - Requires digging, additional equipment, etc. All installations are different. - Potential liability for water agency if repairs conducted by staff or contractor.
Leak Detection and Flow Monitoring Incentives	<ul style="list-style-type: none"> - Savings are not known. Breaks are different sizes therefore different savings. Hard to set average incentive. - Many solutions require extensive digging. Could create more liability for water agency.
Drip Irrigation Incentives	<ul style="list-style-type: none"> - Drip systems can have maintenance issues. - Savings are not known. Hard to set average incentive.
Budget-Based Water Rates	<ul style="list-style-type: none"> - Requires significant investment of time, resources and dollars - Must be clearly communicated to customers
Customer Engagement Software	<ul style="list-style-type: none"> - Duration of savings may be limited

For each program, a high level of costs and water savings were estimated. Additionally, each program was assessed for its ability to deliver desired outcomes.

Program selection was not a cut-and-dry process. Some of the water efficiency possibilities would not meet other regional criteria for selection such as customer

acceptability or market need. Others could meet regional goals to achieve market transformation, although they were not cost-effective. IEUA and its regional partners also needed to take advantage of MWD funding and grant opportunities.

After the first pass, several programs were removed or otherwise not selected and are listed below:

- **Toilet Replacement Programs.** As discussed in the previous chapter, efficient toilets have a saturation of 80% in single family and nearly 100% in multi-family sites. Based on this evidence as well as the current code, it is recommended that IEUA and its regional partner not implement direct installation programs or offer enhanced incentives.
- **Submetering Incentive Program.** Submetering individual apartment units or landscape use for residential and mixed-use meters has proven to reduce water use. However, installing, maintaining and reading those meters is complicated and costly from both a water agency and customer perspective. Therefore, submetering was deemed not feasible or cost effective.

In addition, several programs were tabled for later consideration because although they have potential for significant savings there is not sufficient information on savings and costs necessary to conduct a comprehensive evaluation. These programs are:

- Graywater Incentive Program
- Irrigation Repair Incentives and Direct Installation
- Leak Detection and Flow Monitoring Incentives

Cost-Effectiveness Analysis

The next action was to run each of the remaining program measures through the economic analysis model and compare against the region's overall strategy to better examine the pros and cons of each. The AWE Tracking Tool v3 was utilized to conduct the analysis.

In order to determine the cost-effectiveness threshold for a program, it is first necessary to determine the avoided costs of supply. The significance of the avoided costs is that for each acre-foot of water savings, IEUA and its regional partners can avoid the variable costs, which include power costs and purchasing MWD water.

The region's avoided cost ranges from \$1,122 in 2015 to \$1,285 in 2020 and \$2,231 in 2040.

The portfolio of programs being considered should fall below the current \$1,122 avoided cost.

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Cost-effectiveness analysis is the process of weighing the costs and benefits of a WUE program. For the regional plan, the relevant cost perspective for decision-making on WUE investments is the cost to IEUA and its member agencies alone. The benefits of the program are defined as the value of the water savings in dollar terms using the avoided costs estimates above. Finally, the dollar costs are compared to the dollar benefits. For sustainability purposes, the embedded energy savings and avoided greenhouse gas emissions calculated by the AWE Water Conservation Tracking Tool are also reported.

Table 23 shows the cost-effectiveness results for the potential program measures. A program such as SoCal WaterSmart has multiple measures and because each measure may have different savings and costs, it is represented on separate lines. Several measures are funded 100% by MWD or other grants and therefore have zero cost to the IEUA and its member agencies and are not listed in the table.

Table 23: Potential Program Cost per Acre-foot

Activity Name	Regional Cost to IEUA (\$/AF)
Budget-based Water Rates*	\$0
Residential Landscape Retrofit Program*	\$0
Cooling Tower Controllers SCWS Rebate	\$124
Technology Customer Engagement Software	\$127
Smart Controllers SCWS Rebate (Commercial) \$50 per Station	\$130
Ultra-Low Volume Urinals SCWS Rebate	\$148
FreeSprinklerNozzles.com Voucher (All Classes)	\$185
High Efficiency Sprinkler Nozzles SCWS Rebate (CII)	\$202
Smart Controllers SCWS Rebate (SF)	\$221
High Efficiency Clothes Washers SCWS Rebate (SF)	\$303
Air-Cooled Ice Machine SCWS Rebate	\$744
Turf Removal \$1.00	\$879
HE Sprinkler Nozzle Direct Installation Program (All classes)	\$931
Landscape Evaluation Program	\$1,286
Turf Removal \$2.00	\$1,783
Residential Smart Controller Upgrade Program	\$2,215

* Program has outside funding.

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Most measures, except the programs/measures below, fall below the region’s current avoided cost of \$1,122 per acre-foot.

- Landscape Evaluations
- Residential Smart Controller Upgrade (direct installation)
- Turf Removal Rebates of \$2.00 per square foot

These programs offer other benefits and assist in moving the landscape and irrigation efficiency (L&I) markets forward.

- Landscape evaluations provide customers with education as well as direction in implementing measures.
- The direct installation of smart controllers introduce customers to the new technology, educates them on their specific site water needs and ensures correct installation and programming.
- Enhanced turf removal incentives overcome the initial cash outlay barrier and drive market transformation.

Additionally, a scorecard was created and the programs rated by its ability to deliver desired outcomes.

Table 24: Potential Program Qualitative Scoring

	Scalability	Impact on L&I Market Transformation	Speed of Implementation
Budget-Based Water Rates	High	High	Medium
Cooling Tower Controller SCWS Rebates	Low	Low	Immediate
Customer Engagement Software	High	High	Medium
FreeSprinklerNozzles.com Vouchers	High	Medium	Immediate
HE Clothes Washers SCWS Rebates (SF)	Low	Low	Immediate
HE Nozzle Direct Installations	High	Medium	Short
HE Sprinkler Nozzles SCWS Rebates (CII)	Medium	Medium	Immediate
Landscape Evaluations	Low	Medium	Immediate
Residential Landscape Retrofits	Low	Medium	Immediate
Residential Smart Controller Upgrades	Medium	Medium	Short
Smart Controllers SCWS Rebates (CII)	Low	Medium	Immediate
Smart Controllers SCWS Rebates (SF)	Low	Medium	Immediate
Turf Removal Rebates (\$2.00)	High	High	Short
Ultra-Low Volume Urinals SCWS Rebates	Low	Low	Immediate

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The above programs offer varying levels of scalability; ability to transform the WUE market, and feasibility of implementation. Despite the range of ratings, each program contributes a worthwhile volume of cost-effective water savings. This high level scoring can be used as a guide in the future as conditions change such a needing to scale program activity.

Section 6 - Selected Programs

With the analysis completed, it was clear that most of the current programs proved to be cost-effective and each provided significant benefits. Each program was next assessed for potential refinement.

The programs below are shown to deliver effective levels of water efficiency and are available whether or not an agency chooses to implement Budget-Based Water Rates or the Customer Engagement Software. Table 25 provides the final list of programs, along with the reasoning for selection and potential support actions to improve results.

Table 25: Selected Programs and Reasoning

Program	Reasoning	Support Actions
Budget-Based Water Rates	<ul style="list-style-type: none"> - Sends strong price signal - Drives over-allocation customers to consider changes - Proven effective at reducing water demand 	<ul style="list-style-type: none"> - Member agency education - Rate evaluation and implementation support through SAWPA grant
Customer Engagement Software	<ul style="list-style-type: none"> - Customer-preferred communication method - Allows retailers to send messaging & program links to over-allocation users - Proven effective elsewhere for reducing demand 	<ul style="list-style-type: none"> - Link new media and WUE programs with targeted customers.
Landscape Evaluations	<ul style="list-style-type: none"> - Links customer with programs - Provides one-on-one customer education - Starts relationship with customer 	<ul style="list-style-type: none"> - Use water budget data to identify customers - Provide more visual report - Implement automated and consistent follow up - Provide more cost/benefit information - Modernize data collection and reporting
Residential Landscape Retrofit Program	<ul style="list-style-type: none"> - Target large water use - Site visit verifies there will be savings - Professional installation and programming of controller 	<ul style="list-style-type: none"> - Provide electronic follow up with customer to ensure sustained savings.

Program	Reasoning	Support Actions
Residential Smart Controller Upgrade Program	<ul style="list-style-type: none"> - Offering to smaller customer provides bigger pool of potential customers - Site visits verifies there will be savings - Education workshop ensures customer can program and maintain controller and therefore sustain savings 	<ul style="list-style-type: none"> - Use water budget and potential savings to show return on investment - Consider customer co-pay option to lower costs.
FreeSprinklerNozzles.com Program	<ul style="list-style-type: none"> - Cost effective - Targets large water use - Hugely scalable - Gateway measure 	<ul style="list-style-type: none"> - Target largest users and over-allocation users to maximize savings and MWD funding - Market more aggressively
SoCal WaterSmart Regional Rebate Program	<ul style="list-style-type: none"> - MWD funding - MWD administration - Ease of implementation 	<ul style="list-style-type: none"> - Continue to add dollars to priority measures - Market locally
High Efficiency Nozzle Direct Installation Program	<ul style="list-style-type: none"> - Removes financial barrier of entry - Ensures quality installation - High potential and scalability 	<ul style="list-style-type: none"> - Implement aggressive marketing campaign - Hire additional contractors - Offer multiple nozzle manufacturerers

In addition to the nine selected active programs, IEUA and its regional partners will continue to provide regional educational and outreach programs. Current regional education and outreach programs include the following:

National Theatre for Children Program National Theatre for Children (NTC) delivers a package of live theatre, student curriculum and teacher guides to elementary schools throughout the region.

Shows That Teach Shows That Teach (STT) provides educational and motivational school assembly programs that focus on water education.

Regional Landscape Training Workshops In this series of regional sponsored courses; residential landscapers learn the latest ways to reduce water usage through workshops. The courses cover information on the basics of efficient irrigation systems, the benefits of properly watering and fertilizing landscaping, landscape design techniques and plant identification.

Garden in Every School® Program Grants are awarded to elementary schools within IEUA’s service area for the establishment of a water-wise gardens. In addition, a blog is available for educators, parents, and community members to follow the development of the gardens, acquire gardening tips, curriculum tips and water savings tips at ieuagies.blogspot.com.

Water Discovery Field Trip Program Free educational field trips are provided at the Chino Creek Wetlands and Educational Park to promote the public understanding of the value of natural treatment wetlands, the creation of habitat for endangered/sensitive species and environmental stewardship. A busing mini-grant is offered to schools within the state of California to take part in the field trip program, partially funded by the California Department of Parks and Recreation.

IEUA Water Softener Rebate Program The IEUA Water Softener Rebate Program is part of the third phase of the IEUA’s Salinity Reduction Program that is addressing the impacts of automatic water softeners on IEUA’s recycled water. The goal of this project is to demonstrate the transferability of a financial incentive “rebate” for the removal of residential self-regenerating water softeners within the service area of IEUA.

Water Saving Garden Friendly The Water Saving Garden Friendly program was founded in 2011 to provide local communities with conservation-based educational opportunities, as well as information and access to climate-appropriate plants. Through partnerships with sponsors like Home Depot, Scotts Miracle Grow and others, the program hosts events, workshops, and other educational and “do-it-yourself” opportunities for local residents to learn about and enjoy sustainable landscaping. The Garden Friendly program is a public-private partnership that welcomes the participation of all members of the public as well as interested landscape retailers.

Recommended Program Summary Pages

Implementation details for each recommended program including: program descriptions, measure(s) offered, target customer segments, delivery mechanisms, annual activity, program costs and economic evaluation results are included on the following pages.

Budget-based Water Rates	
Target Customer Customers exceeding their water budget	<p>A budget-based water rate design identifies efficient and inefficient water users. The rate, as designed, then sends an economic message to over-allocation water users. Customers are provided a context for efficient water use and driven to make efficiency improvement. Budget-Based Water Rates provide the retail agency with the most cost-effective means to reduce demand.</p> <p>As depicted by university studies, the pace and longevity of achieving water use efficiency is significantly enhanced with budget-based rate implementation.</p> <p>At least two IEUA member agencies are expected to utilize the SAWPA grant and IEUA assistance for Budget-Based Water Rate implementation.</p> <p>Typical costs for agencies the size of those in the region range from \$250,000 - \$350,000. The SAWPA grant provides all single family residential landscape square footage and ET data for use by the local agency. Ongoing costs are similar to any tiered rate structure design. Agency costs for implementation are expected to be recovered within 3 months for every \$1,000,000 dollars of agency revenue loss being incurred.</p> <p>In addition, IEUA provides support for rate design, staff training, public outreach and Prop 218 assistance.</p> <p><i>Benefits</i></p> <ul style="list-style-type: none"> - Customer educated on their specific water efficiency - Sends strong price signal - Drives over-allocation customers to consider changes and implement water use efficiency measures - Proven effective at reducing demand and stabilizing agency revenue - Water budgets, based on State efficiency standards, gives the local agency a defensible rate design and efficiency benchmark
Potential for the Region High	
Estimated Activity 52,551 residential accounts	
Water Savings 11-15% average savings across the agency <i>Program: 5,819 AF over 5-year Lifetime</i>	
Costs Implementation: Average of \$300,000 per agency \$5.7 per account Paid for by grants or local agencies Zero regional costs to IEUA	
Funding Source SAWPA GRANT	
Other Benefits Customer engagement and education	

FreeSprinklerNozzles.com Voucher Program	
Target Customer All customers with pop-up spray irrigation systems.	<p>There are millions of pop-up spray nozzles being used in IEUA’s service area in all types of landscapes. These nozzles are installed as part of an in-ground irrigation systems and can be easily upgraded with high efficiency (HE) nozzles or rotating nozzles. When correctly installed, high efficiency fixed spray and rotating nozzles can have an immediate and drastic impact on outdoor water efficiency. All customers, even those with average or below average water usage, can see a reduction by upgrading to HE nozzles.</p> <p>However, many customers without knowledge of their irrigation systems are intimidated by HE nozzle retrofits because the product is relatively unknown and more expensive than standard nozzles. The FreeSprinklerNozzle.com program is designed to assist customers in gaining knowledge about HE nozzles and overcoming the initial cash outlay barrier.</p>
Potential for the Region High Millions of pop-up spray nozzles with all customer types.	
Estimated Activity 60,000 nozzles/year	
Water Savings <i>Device:</i> 757 gpy per nozzle <i>Program:</i> 5,689 AF over Lifetime	<p><i>Program Delivery</i></p> <p>The FreeSprinklerNozzle.com program is a web-administered program that provides vouchers for free high efficiency nozzles to all eligible customers. Customers must first view online videos explaining how the nozzles work with their irrigation system, how to survey their landscape to determine which nozzles are needed, and how to install and adjust the nozzles. Customers are then given a voucher for free nozzles.</p>
Costs <i>Device:</i> \$2.75 <i>Per AF savings:</i> \$185	<p>These vouchers can be redeemed at participating irrigation stores. Residential customers can receive up to 25 free nozzles. Commercial customers can receive as many nozzles as needed for their site.</p>
Funding Source <ul style="list-style-type: none"> • IEUA and its regional partners • MWD 	<p><i>Benefits</i></p> <p>The most common barriers to purchase and installation of HE nozzles are: 1) lack of knowledge on how to choose, purchase, and install the appropriate nozzles; and 2) cost of nozzles. FreeSprinklerNozzle.com addresses both of these barriers with a voucher and required educational component.</p>
Other Benefits <ul style="list-style-type: none"> • Reduced runoff • Customer education • Market transformation 	<p>FreeSprinklerNozzle.com is a multi-agency program, administered by Western MWD. IEUA and its regional partners benefits from the economies of scale and ease of implementation.</p>

SoCal Water\$mart Rebate Program	
Target Customer All customers classes	SoCal Water\$mart (SCWS) is MWD’s regional rebate program offering incentives for a menu of indoor and outdoor water saving measures for both residential (RES) and commercial/industrial/institutional (CII) customers. Current incentives include:
Potential for the Region High Multiple measures available for all customers.	<ul style="list-style-type: none"> • High Efficiency Sprinkler Nozzles (CII, RES) • High Efficiency Clothes Washers (RES) • Premium High Efficiency Toilets (MF 1.0 gpf/less) • Smart Controllers (RES, CII) • Cooling Tower Conductivity & pH Controllers (CII) • Rain Barrels (RES) • Air-Cooled Ice Machine (CII) • Soil Moisture Sensors (RES, CII) • Drip Irrigation (RES, CII) –<i>Available in 2016</i>
Estimated Activity See Estimated Activity in Table	
Water Savings 3,254 AF over Lifetime	Member and retail agencies have the option of adding additional incentives onto MWD’s base incentive. The region will add additional incentive dollars to several devices including:
Costs FY16: \$1 Million for Turf Year 1 + \$400,000 for devices FY17-20: \$100,000	<ul style="list-style-type: none"> • Residential high efficiency clothes washers • Residential and commercial smart controllers • High efficiency sprinkler nozzles • Air-cooled ice machines <p><i>Benefits</i></p>
Funding Source <ul style="list-style-type: none"> • IEUA and its regional partners • MWD 	SoCal Water\$mart provides regional rebates to all Regional customers reducing customer confusion regarding availability in their specific area. The Region benefits from MWD paying for the majority of the incentive dollars as well as administration.
Other Benefits <ul style="list-style-type: none"> • Runoff reduction • Waste water savings • Market transformation 	<p><i>Estimated Annual Activity</i></p> <ul style="list-style-type: none"> • High Efficiency Sprinkler Nozzles - 10,750 across all markets per year • High Efficiency Clothes Washers – 500 per year • Smart Controllers (commercial sites) – 100 year 1, 50 years 2 - 5 • Smart Controllers (single family sites) – 50 per year • Cooling Tower Controllers – 10 per year <p>All other measures have negligible participation and no additional funding from the Region.</p>

Customer Engagement Technology and Data Analytics Program	
Target Customer Customers exceeding their water budget	OmniEarth is a new technology that combines physical characteristics of parcels collected through aerial/satellite imagery (ex: size, land cover type) with customer information (ex: current and historical water usage) to create water budgets for each customer. The program compares water budgets with actual usage to identify customers who are exceeding their water budget and have the most room for efficiency. This information is then consolidated and presented in layered maps and easy to understand graphs.
Potential for the Region High	
Estimated Activity 131,376 residential accounts	DropCountr is a complementary program that can share OmniEarth’s information directly with customers. DropCountr utilizes OmniEarth’s customer water budget information to show customers how their usage compares to households with similar geographic and household qualities. Customers can also track their usage and budget information through web-based and mobile interfaces. To maximize this information, DropCountr also provides personalized conservation tips.
Water Savings <i>Device:</i> 4.6% per account <i>Program:</i> 3,093 AF over Lifetime	
Costs <i>Device:</i> \$3.05 per account. <i>Per AF:</i> \$190 <i>Estimate include \$.75 per GIS mapping SF account for all agencies for 2 years plus \$2 per SF account for 2 agencies for 5 years for DropCountr.</i>	
Funding Source SAWPA GRANT IEUA and its regional partners	<p><i>Program Delivery</i></p> <p>If a retail agency opts in, the Program utilizes OmniEarth to target high yield customers, identify geographic areas of highest water use for targeted marketing, and match customers with best-suited WUE programs.</p> <p><i>Benefits</i></p> <p>OmniEarth provides vital information for both targeting customers and executing efficient programs such as:</p> <ul style="list-style-type: none"> - logical and defensible water budgets for each customer - Identification of over-allocation customers with high savings potential - Geographical location of over-allocation customers for identifying trends <p>DropCountr takes this information to the next step by interacting directly with the customer.</p>
Other Benefits Customer engagement and education	

High Efficiency Nozzle Direct Installation Program	
Target Customer High water use customers across all classes with pop-up spray head irrigation systems.	<p>The largest water consumption in the region is outdoor landscape usage. Retrofitting existing systems with high efficiency (HE) nozzles is an easy way to increase efficiency of irrigation systems and reduce water usage. HE nozzles can be used to replace any inefficient standard pop-up sprinkler head creating instant water savings. However, the majority of customers are not aware of HE nozzles, where to purchase them, or how to install and maintain them.</p> <p><i>Program Delivery</i></p> <p>The goal of the HE Nozzle Direct Installation Program is to target high water use customers and assist them in overcoming any barriers to HE nozzle installation at their site. This program would be free to customers and executed by a contractor who would:</p> <ul style="list-style-type: none"> - Work with retail agencies to identify the highest water use customers. - Market the program directly to high water use customers. - Perform on-site visits to ensure customers have functional irrigation systems and meet other eligibility requirements. - Schedule and perform retrofit of pop-up sprinkler heads with HE nozzles. - Educate the customer while on-site about how to identify, install, adjust, and maintain the HE nozzles. - Provide educational materials on HE nozzles and other water saving resources <p><i>Benefits</i></p> <p>There are many benefits from a direct installation program including:</p> <ul style="list-style-type: none"> - Ability to target specific customers or sectors - Assurance that HE nozzles were installed and not just purchased - Guarantee that nozzles are installed correctly - Opportunities for on-site customer education.
Potential for the Region Medium- For high water use customers only	
Estimated Activity 10,000 nozzles/year	
Water Savings <i>Device:</i> 757 gpy per nozzle <i>Program:</i> 1,101 AF over Lifetime	
Costs Device: \$6 Per AF savings: \$931	
Funding Source IEUA and its regional partners MWD	
Other Benefits Reduced runoff	

Residential Smart Controller Upgrade Program	
Target Customer Residential customers with 500 sq ft – ¼ Acre of irrigated area	Smart controllers adjust irrigation based on weather, plant type, and other factors. These controllers save water by automatically adjusting irrigation to meet plant needs with minimal customer intervention.
Potential for the Region Medium	<i>Program Delivery</i> The Residential Smart Controller Upgrade Program will be offered to residential customers with 500 square feet to ¼ acre of irrigated area. The program will be implemented by a vendor and contains several steps.
Estimated Activity 500 per year	<ul style="list-style-type: none"> - First, a site survey of the customer’s property would be performed by a contractor to confirm that they have an eligible irrigation system and will in fact see water savings.
Water Savings <i>Device: 13,490</i> <i>Program: 828 AF over Lifetime</i>	<ul style="list-style-type: none"> - Second, customers would attend a workshop to learn about the maintenance and use of their controller. - Third, a contractor would install a smart controller at the customer’s home and program it to meet the property’s needs. Controllers and installation would be provided free of charge to the customer.
Costs <i>Device: \$800</i> <i>Per AF: \$2,215</i>	<i>Benefits</i> There are several barriers stopping many residential customers from installing smart controllers including:
Funding Source IEUA and its regional partners	<ul style="list-style-type: none"> - complex installation process - need for initial set-up/programming to meet site specific zones - lack of knowledge on adjusting the automated controller
Other Benefits <ul style="list-style-type: none"> • Runoff reduction • Customer education • Market transformation 	This direct installation program is designed to address all of these barriers. It ensures correct installation of the product and an opportunity for property-specific training by the installing contractor on the maintenance of the product.

Residential Landscape Retrofit Program	
Target Customer Residential customers over ¼ Acre of irrigated area	<p>The largest water consumption sector in the region is single family residential landscape and irrigation. Single-family site with large landscape provide a significant opportunity to reduce water use. The goals of the Residential Landscape Retrofit Program is to reduce use through the installation of smart controllers and high efficiency (HE) sprinkler nozzles.</p> <p>Smart controllers adjust irrigation based on weather, plant type, and other factors. These controllers save water by automatically adjusting irrigation to meet plant needs with minimal customer intervention.</p> <p>High efficiency nozzles reduce use through reduced water flow.</p> <p><i>Program Delivery</i></p> <p>The Residential Landscape Retrofit Program is offered to residential customers with ¼ acre or more of irrigated area. The program is implemented by an outside contractor. The contractor conducts a site visit to verify eligibility. The contractor then installs the smart controller and nozzles at no cost to the customer.</p> <p><i>Benefits</i></p> <p>There are several barriers stopping many residential customers from installing smart controllers including:</p> <ul style="list-style-type: none"> - complex installation process - need for initial set-up/programming to meet site specific zones - lack of knowledge on adjusting the automated controller <p>This direct installation program is designed to address all of these barriers. It ensures correct installation of the product. The program is funded by MWD and a grant from USBR requiring no funding from IEUA and its regional partners.</p>
Potential for the Region Low	
Estimated Activity 150 per year	
Water Savings <i>Device:</i> 13,490 gpy <i>Program:</i> 447 AF over Lifetime	
Costs <i>Device:</i> \$800 <i>Per AF:</i> \$0	
Funding Source <ul style="list-style-type: none"> • MWD • USBR Grant 	
Other Benefits <ul style="list-style-type: none"> • Runoff reduction • Customer education • Market transformation 	

Landscape Evaluations	
Target Customer Large landscape customers, residential and commercial	Customers with large landscapes require proportionally larger amounts of water to maintain the health of the landscapes. In addition, many large landscape sites are hard to irrigate such as turf located in street medians. Major areas of opportunities include: repairs to existing system, micro-zone planting, removal of non-functional turf, improvements to the distribution uniformity and finally hardware upgrades. Site surveys or customer audits are an effective tool for determining the best opportunities at a specific site and assisting the customer in evaluating the opportunity and moving forward with the measures.
Potential for the Region Low	
Estimated Activity 200 Year 1 150 Years 2 - 5	<i>Program Delivery</i> The Landscape Evaluation Program offers customers a comprehensive outdoor water use evaluation. Note that there are large landscape surveys offered by Metropolitan Water District. These are abbreviated versions of the evaluations conducted by the IEUA and its regional partners.
Water Savings <i>Device:</i> 25,742 GPY <i>Program:</i> 126 AF	The Landscape Evaluations are free to customers and provide an assessment of a site’s irrigation system, including the controllers, valves, heads, layout, and performance including:
Costs <i>Device:</i> \$200 <i>Per AF:</i> \$1,286 over Lifetime	<ul style="list-style-type: none"> • Pressure testing • Valve operation per controller • Distribution uniformity tests
Funding Source IEUA and its regional partners MWD	The auditor also evaluates landscape design, vegetation types and local conditions for potential reductions in water use. The customer receives a written report that outlines recommended water efficiency measures and available programs and incentives.
Other Benefits <ul style="list-style-type: none"> • Runoff reduction • Customer education • Market transformation 	<i>Benefits and Recommendations</i> Landscape evaluations are an important tool in customer outreach and education. Recently, many energy and water audits have taken advantage of automation to reduce the time needed to survey the site or produce an customer report. A contractor utilizing an automated audit system could provide customers with immediate results and feedback while on-site. They would also have the opportunity to walk the customer through their options and answer any questions face-to-face. In addition, the customized reports should contain customer-friendly visuals, graphs, and aids that help customers understand their water usage and opportunities for efficiency.
	Utilizing an automated audit system coupled with more comprehensive follow-up could significantly improve implementation of recommended water saving measures.

New Programs and Pilots Summary Pages

IEUA and its regional partners will continue to test new technologies and program delivery mechanisms. A pilot scheduled for implementation in 2016 is the Home Pressure Regulator Pilot described below.

Residential Pressure Regulator Rebate Pilot Program	
Target Customer Residential customers with high water pressure	<p>Pressure regulators are compact valves installed on water pipes to reduce the speed, or pressure, of water as it flows into a home or irrigation system. Water pressure in the distribution system can vary widely. Ten water districts in Southern California were surveyed in 2013 and found water pressure to range from 63 pounds per square inch (psi) to 113 psi. The ideal pressure for fixtures and irrigation systems at a residential home is 45 to 60 psi. A properly installed regulating valve at the main line into a residential property can reduce water flowing into irrigation systems and indoor fixtures to 60 psi or below. Regulating water pressure saves water by:</p> <ul style="list-style-type: none"> - Reducing the “push” of water coming out of fixtures and irrigation systems, and thus the amount of water per second. Even low-flow fixtures will have increased water use at higher pressures. Reducing water pressure ensures that every fixture lives up to its water conserving potential. - Preventing slow leaks caused by increased wear and tear on fixtures, pipes, and irrigation systems. - Reducing pipe breakages caused by elevated pressure. <p><i>Program Delivery</i></p> <p>The pressure regulator rebate pilot program will provide a rebate for customers who install qualifying pressure regulating systems on their main line that will reduce pressure to both outdoor irrigation systems and indoor fixtures. IEUA would contract with a vendor to market the program, review rebate applications, verify eligibility, and issue incentives to qualifying customers. Site inspections of a set number of customers may take place.</p> <p><i>Benefits</i></p> <p>Not many customers know their water pressure or the importance of maintaining a proper pressure. This Pilot Program will create customer awareness of pressure regulators and proper pressure. It will also provide more information to the IEUA and its regional partners on the importance and effectiveness of pressure regulation within their service area.</p>
Potential for the Region TBD	
Estimated Activity 110 pressure regulating valves/year over	
Water Savings Device: 57,050 gallons per year. Program: 962 AF over Lifetime	
Costs \$30 - \$140 per regulator	
Funding Source	
Other Benefits	

Section 7 – Five Year Plan

At the inception of the Regional WUE Business Plan development the exact water savings goal and budgets had not yet been determined. Due to this uncertainty and as part of the initial Integrated Resource Planning (IRP) process, five levels of WUE budgets and productivity were modeled. These were conducted as a preliminary test to explore the impact varying amounts of water savings would have on water resources programs. Below are the modeled tiers estimated savings and costs. Details on the different models are described in Technical Memo, *IEUA Preliminary Test of WUE Tiers for IRP*, provided as an appendix.

IEUA Preliminary Test of WUE Tiers for IRP Process		
Tier Name	Estimated Peak Annual Savings (AF/Year)	Estimated Annual Cost (IEUA+Outside)
Tier 1: Current Path	3,700 AF by 2020	\$1.5M
Tier 2: New Programs	6,000 AF by 2020	\$3.5M
Tier 3: High WUE Implementation	10,000 AF by 2029	\$6.5M
Tier 4: 20% reduction (WUE Active Programs Alone)	48,000 AF 2035	\$30M
Tier 5: 40% reduction (WUE Active Programs Alone)	98,700 AF by 2035	\$79M

It is important to note that WUE projects included in the IRP were structured differently than in the WUE Business Plan. Project categories in the IRP which included WUE devices, turf removal, budget-based rates, recycled water demand management, and advanced metering technologies will be refined and updated in the portfolio building and modeling tools per the project specifications during the IRP Phase 2.

In addition, as part of the WUE Business Plan planning process and detailed in Section 3, Budget-Based Water Rates were depicted as a WUE activity by contrasting different levels of IEUA’s member agencies rolling out the new rate structure—either 2 member agencies or region-wide implementation.

IEUA Regional Water Use Efficiency Business Plan

This plan is estimated to produce peak annual water savings of 11,000 acre-feet (active and passive savings) in fiscal year 2019/20. The annual peak savings are estimated at half the cost projected through the IRP process. This is because the majority of estimated savings, 5,820 acre-feet per year, are derived from Budget-Based Water Rates at zero cost to IEUA. The plan assumes the costs associated with implementing the new rates would be covered under the SAWPA grant. Table 26 presents an overview of the plan if 2 agencies implement Budget-based Water Rates.

Table 26: Plan Overview with Budget-Based Water Rates

Plan Overview With Budget-Based Water Rates	
Regional IEUA Cost per Acre-foot	\$52 per acre-foot
Five-Year Water Savings (active programs)	33,554 acre-feet
Lifetime Water Savings (active programs)	147,836 acre-feet
Avoided Costs (NVP)	\$152.7 Million
Five-Year Total Budget*	\$7.5 Million

*Budget includes IEUA regional program costs exclusive of outside funding.

*Budget includes \$300,000 per year for education and outreach programs.

Table 27 presents an overview if none of IEUA's member agencies elect to implement Budget-based Water Rates.

Table 27: Plan Overview without Budget-based Water Rates

Plan Overview Without Budget-Based Water Rates	
Regional IEUA Cost per Acre-foot	\$208 per acre-foot
Five-Year Water Savings (active programs)	16,095 acre-feet
Lifetime Water Savings (active programs)	31,446 acre-feet
Avoided Costs (NVP)	\$28.9 Million
Five-Year Total Budget*	\$7.5 Million

Implementation Schedule and Activities per Year

Table 28 displays the projected annual activity for each measure. Toilets are being phased out in FY2015/16. As of October 2015, MWD only provides rebates for premium efficiency fixtures at a much discounted incentive. The model includes toilet activity prior to the change. Turf removal was not modeled after FY2015/16. It is likely that MWD will lower the current turf removal incentive and impose caps. If the regional partners chose

IEUA Regional Water Use Efficiency Business Plan

to offer turf removal incentives more than likely they would have to fund the program themselves.

Table 28: Annual Activities by Measure

Activity Name	Measure Metric	FY16	FY17	FY18	FY19	FY20
	Sites Evaluated	200	150	150	150	150
Cooling Tower Controller Rebates	Cooling Tower Controllers	10	10	10	10	10
FreeSprinklerNozzles.com	HE Nozzles	50,000	50,000	50,000	50,000	50,000
High Efficiency Clothes Washer Rebate	HE Clothes Washers	500	500	500	500	500
HE Nozzle Direct Install	HE Nozzles	--	30,000	30,000	30,000	30,000
High Efficiency Nozzle Rebate (all markets)	HE Nozzles	10,750	11,000	11,000	11,000	11,000
High Efficiency Toilet Rebates (all markets)	HE Toilets	2,600	0	0	0	0
Premium Efficiency Toilet Rebate (MF)	HE Toilets	750	0	0	0	0
Rain Barrels	Rain Barrels	50	50	50	50	50
Residential Landscape Retrofit	Turf Removed (sites)	200	250	250	250	250
Residential Smart Controller Upgrade	Smart Controllers	0	500	500	500	500
Smart Controller Rebate (SF)	Smart Controllers	50	50	50	50	50
Smart Controller Rebate (CII)	Smart Controllers	100	50	50	50	50
Technology Customer Engagement Software	Customer Accounts	0	131,376	131,376	131,376	131,376
Turf Removal Rebate (CII)	Turf Removed (SF)	11.5 M	--	--	--	--
Turf Removal Rebate (SF)	Turf Removed (SF)	1.5 M	--	--	--	--
Ultra Low Volume Urinals	ULV Urinals	5	--	--	--	--
Budget-Based Water Rates (2 Agencies)	Customer Accounts	--	--	52,551	--	--

Water Savings

The following chart depicts the annual savings from active water use efficiency activities for the five-year implementation FY2015/16 – FY2019/20.

Table 29: Annual Water Savings

Annual Water Savings	
Fiscal Year	Annual Water Savings (AF)
2015/16	1,975
2016/17	3,083
2017/18	9,206
2018/19	9,502
2019/20	9,788

Water Savings by Sector

Table 30 below depicts the water savings by sector. Eighty-four percent of the projected savings will be procured from the single family sector predominately through landscape measures. When you add the savings from the program targeted at dedicated irrigation customers, nearly 99% of the savings are derived from landscape measures.

Table 30: Water Savings by Sector

Sector	Lifetime Water Savings (Acre-feet)	% of Total Water Savings
Single Family	124,389	84%
Multi-family	103	0.07%
Commercial	835	0.55%
Irrigation	22,717	14.8%
Total	147,836	

Savings by Activity

Table 31 below presents the acre-feet savings by activity for the five-year period and the respective percent of total savings. Budget-Based Water Rates at 116,390 acre-feet or 79% is clearly the highest water savings.

Table 31: Water Savings by Activity

Activity Name	Lifetime Water Savings (AF)	% of Total Savings
Budget-Based Water Rates	116,390	79%
Turf Removal (CII)	14,950	10%
FreeSprinklerNozzles.com Voucher (All Classes)	5,689	4%
Technology Customer Engagement Software	3,093	2%
Turf Removal (SF)	1,950	13%
HE Sprinkler Nozzle Direct Installation Program (All classes)	1,101	0.6%
High Efficiency Toilet SCWS Rebate (All markets)	892	0.6%
High Efficiency Sprinkler Nozzles SCWS Rebate (All markets)	890	0.6%
High Efficiency Clothes Washers SCWS Rebate (SF)	863	0.6%
Residential Smart Controller Upgrade Program	828	0.5%
Premium Efficiency Toilet Rebate (CII)	561	0.4%
Residential Landscape Retrofit Program	447	0.3%
Cooling Tower Controllers SCWS Rebate	161	0.11%
Landscape Evaluation Program	126	0.09%
Smart Controllers SCWS Rebate (SF)	104	0.07%
Smart Controllers SCWS Rebate (Commercial)	39	0.03%
Ultra Low Volume Urinals SCWS Rebate	12	0.01%
Air-Cooled Ice Machines	2	0.00%
Rain Barrels	2	0.00%

Passive vs Active Savings Assumptions

Some of the most significant and cost-effective water savings in California have come from state or national updates to plumbing and building codes. These changes are referred to as “passive”, simply because they require no active program efforts for local water agencies. The AWE Tracking Tool calculate the passive savings from activities including:

- Residential and commercial high efficiency toilets
- Single family and multi-family high efficiency clothes washers

Below is the estimated passive and active water savings to be achieved through the five-year plan.

Table 32: Estimated Passive and Active Water Savings

Water Savings Category	Five-Year Savings (AF)	Total Lifetime Savings (AF)
Passive Water Savings	3,150	146,933
Active Water Savings	33,554	147,836
Total	36,704	294,769

Budget by Year

IEUA prepares annual regional program budgets with line items dedicated to water use efficiency activities. The projected annual budget for each year of the five-year planning period is below. The budget amounts reflect the financial commitment only of IEUA and are exclusive of MWD or other financial contributions. The budgets presented below will not exactly line up with actual costs because they are based upon activity estimates which vary depending upon program participation rates.

Table 33: Annual Budgets

Program Year	Annual Budget (\$/Yr)
FY 2015/16	\$1,928,800
FY 2016/17	\$1,394,335
FY 2017/18	\$1,394,335
FY 2018/19	\$1,394,335
FY 2019/20	\$1,394,335
Total	\$7,506,140

*Budget includes IEUA regional program costs exclusive of outside funding.

*Budget includes \$300,000 per year for education and outreach programs.

Regional Costs and Benefits

The plan is estimated to save over 147,836 acre-feet of water at a cost to IEUA and its regional partners of \$52 per acre-foot. This falls well below the region’s avoided cost to purchase water from MWD of \$1,122 per acre-foot. The avoided purchases equate to a net present value (NPV) of over \$152 Million. The overall benefit to cost ratio is 27.9.

Figure 8 and Table 34 show the cost per acre-foot per activity. The amounts reflect the financial commitment only of IEUA and are exclusive of MWD or other financial contributions.

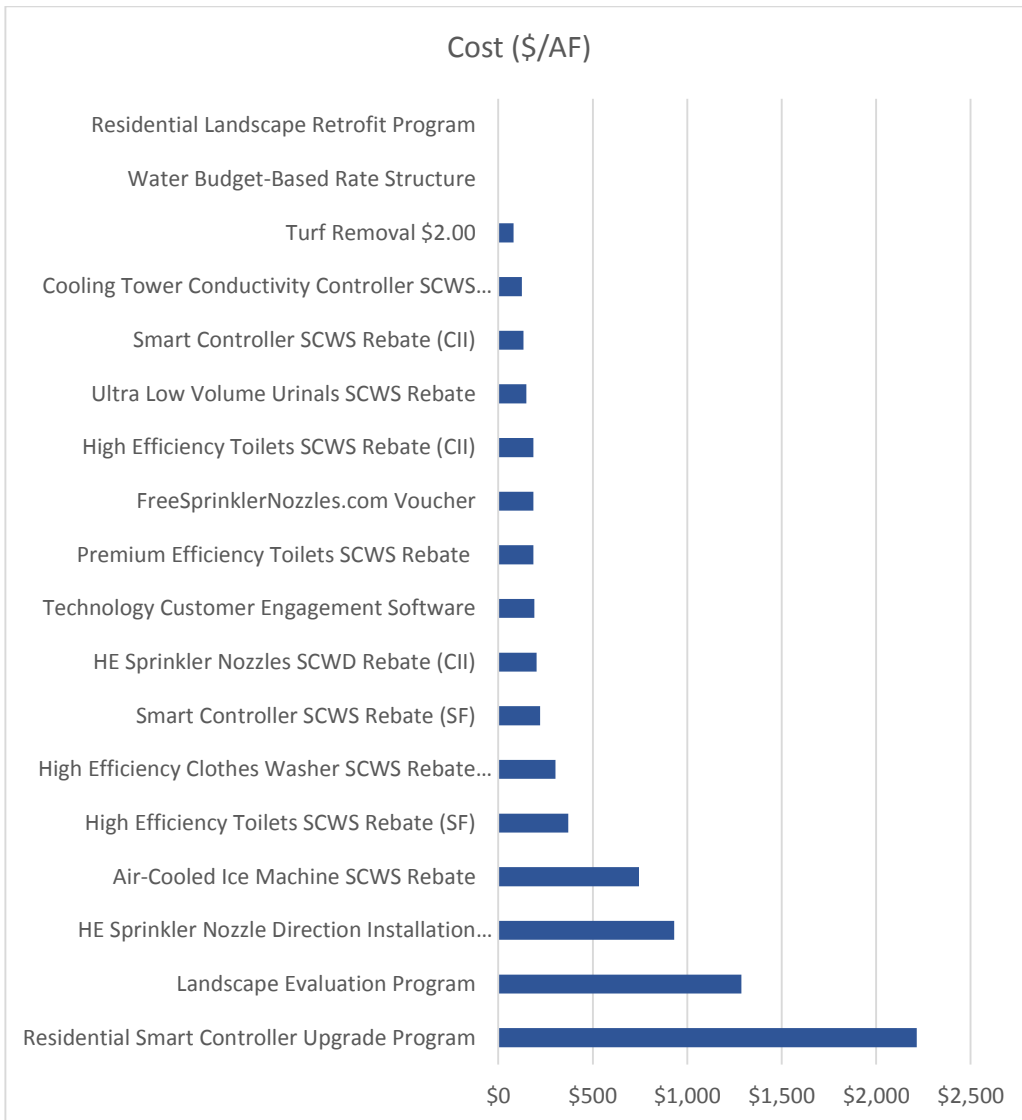


Figure 8: Cost per Acre Foot

IEUA Regional Water Use Efficiency Business Plan

Table 34 shows the cost-effectiveness for the selected program measures. A program such as SoCal WaterSmart has multiple measures and because each measure may have different savings and costs, it is represented on separate lines. Several measures are funded 100% by MWD or other grants and therefore have zero cost to the IEUA and its member agencies and are not listed in the table.

Table 34: Selected Programs - IEUA Cost per Acre-foot

Measure	IEUA Only Cost (\$/AF)
Budget-Based Water Rates	\$0
Residential Landscape Retrofit Program	\$0
Turf Removal \$2.00	\$81
Cooling Tower Controller SCWS Rebate	\$124
Smart Controller SCWS Rebate (CII)	\$133
Ultra Low Volume Urinals SCWS Rebate	\$148
FreeSprinklerNozzles.com Voucher	\$185
High Efficiency Toilets SCWS Rebate (CII)	\$185
Premium Efficiency Toilets SCWS Rebate	\$186
Customer Engagement Software	\$190
HE Sprinkler Nozzles SCWD Rebate (CII)	\$202
Smart Controller SCWS Rebate (SF)	\$221
High Efficiency Clothes Washer SCWS Rebate (SF)	\$303
High Efficiency Toilets SCWS Rebate (SF)	\$370
Air-Cooled Ice Machine SCWS Rebate	\$744
HE Sprinkler Nozzle Direction Installation Program	\$931
Landscape Evaluation Program	\$1,286
Residential Smart Controller Upgrade Program	\$2,215

The Net Present Value (NPV) is the sum of the benefits of the water use efficiency program for all units implemented minus the sum of the costs - “net benefits” or also known as Net Present Value. NPV is, perhaps, the most useful of the cost-effectiveness criteria in that it shows the absolute size of the program benefits not just the value of one acre-foot of savings. The Benefit/Cost (B/C) column contains the ratio of benefits to costs. For B/C ratios greater than one the program is cost effective. The higher the ratio the most cost effective.

IEUA Regional Water Use Efficiency Business Plan

The avoided purchases equate to a NPV of over \$152 Million. The overall benefit to cost ratio is 27.9. Table 35 on the following page details the NPV and B/C for each program/measure.

Table 35: Benefits by Activity

Activity Name	NPV (\$)	B/C Ratio
Budget-Based Water Rates	\$123,792,926	NA
Turf Removal \$2.00 (CII)	\$15,475,316	15.7
FreeSprinklerNozzles.com Voucher (All Classes)	\$5,373,192	7
Technology Customer Engagement Software	\$2,863,880	6.3
Turf Removal \$2.00 (SF)	\$2,156,070	NA
High Efficiency Sprinkler Nozzles SCWS Rebate (CII)	\$755,762	6.4
Premium High Efficiency Toilets SCWS Rebate (MF)	\$502,097	7.4
High Efficiency Toilets SCWS Rebate (SF)	\$530,605	3.7
Residential Landscape Retrofit Program	\$491,254	NA
High Efficiency Clothes Washers SCWS Rebate (SF)	\$493,107	4.2
HE Sprinkler Nozzle Direct Installation Program	\$328,316	1.4
Cooling Tower Controllers SCWS Rebate	\$156,512	9.9
High Efficiency Toilets SCWS Rebate (CII)	\$94,591	7.3
Smart Controllers SCWS Rebate (SF)	\$94,725	6
High Efficiency Sprinkler Nozzles SCWS Rebate (SF)	\$85,163	NA
High Efficiency Toilets SCWS Rebate (MF)	\$79,591	3.7
Smart Controllers SCWS Rebate \$50 per Station	\$38,231	9.9
Ultra Low Volume Urinals SCWS Rebate	\$8,110	9.1
Rain Barrels SCWS Rebate (SF)	\$2,637	NA
Air-Cooled Ice Machine SCWS Rebate	\$886	1.8
Landscape Evaluation Program	-\$10,117	0.9
Residential Smart Controller Upgrade Program	-\$574,331	0.6
Total	\$152,738,523	27.9

Energy and Greenhouse Emissions

The collection, distribution, and treatment of drinking water as well as wastewater treatment consume tremendous amounts of energy and release significant amounts of carbon dioxide (greenhouse emissions). Saving water reduces energy usage through out the water cycle and thereby greenhouse emissions. The following calculations as based on the energy embedded in delivering potable water through 2050, the region’s five-year plan is expected to cumulatively save 182,555 MWh of electricity, 3,747 thousand therms of natural gas, and to avoid 505,983 tons of greenhouse emissions. Figures 9 -12 visually depict the annual savings and benefits. The embedded energy and avoided greenhouse gas emissions reflect all "upstream" embedded energy--source, conveyance, treatment, distribution pumping and pressurization. Wastewater flows and treatment that involve additional "downstream" embedded energy was not quantified.

Figure 9: Annual Electric Savings

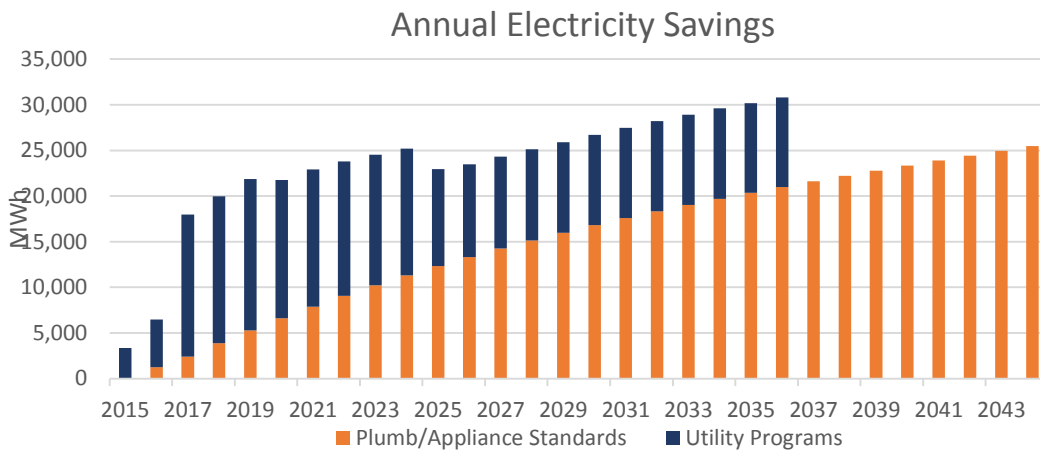


Figure 10: Annual Gas Savings

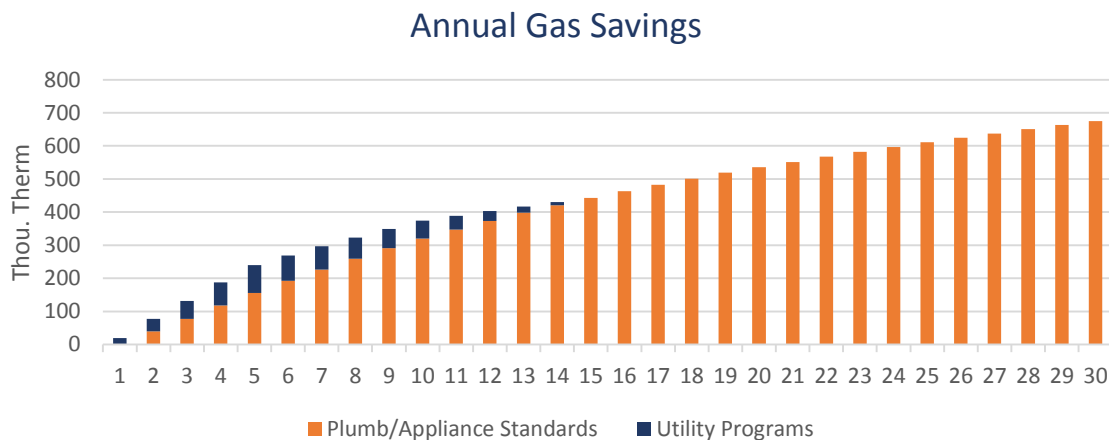


Figure 11: Annual CO2-Equivalent Emission Reductions

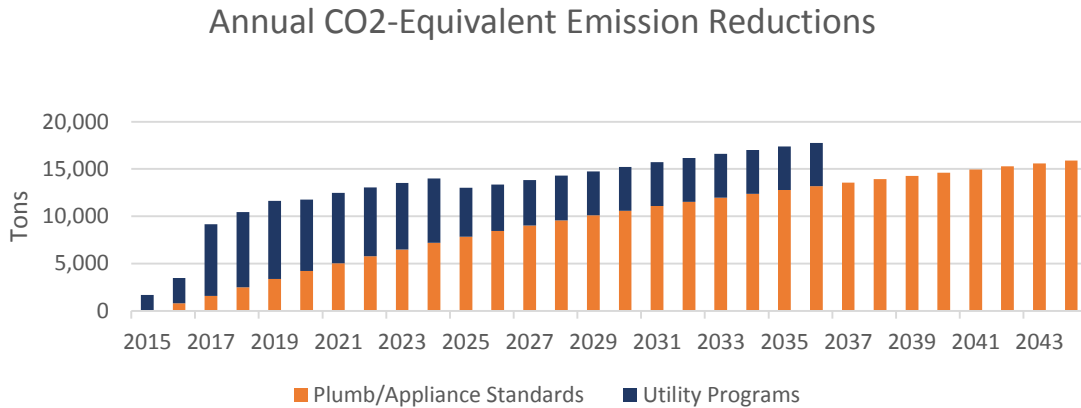
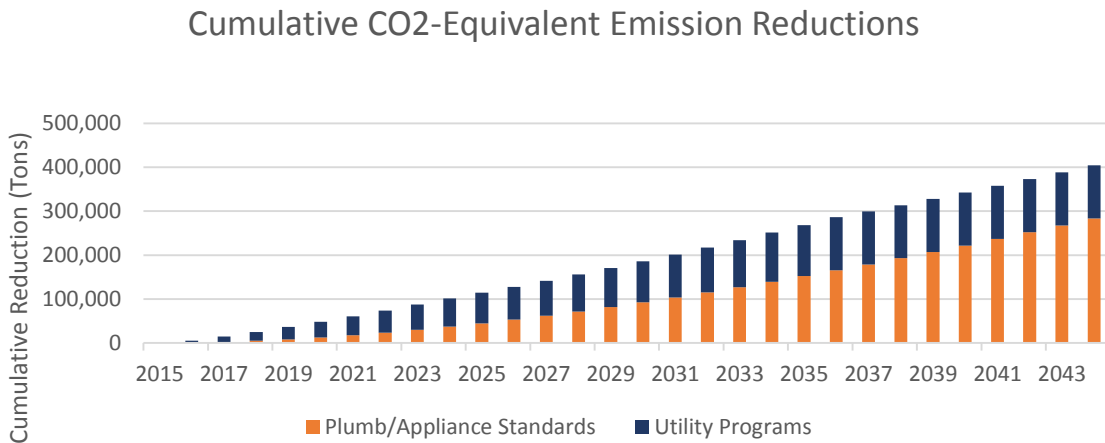


Figure 12: Cumulative CO2-Equivalent Emission Reductions



Sustainable Communities Strategy

Drawing from IEUA’s 2015 Integrated Resources Plan, the water demand analysis underlying the WUE Business Plan incorporated alternative low impact development/smart growth scenarios from the Sustainable Communities Strategy outlined in the 2012 Regional Transportation Plan of Southern California Association of Governments (RTP-SCAG).

RTP-SCAG’s Sustainable Communities Strategy provides the regional planning assumptions for Southern California that integrates land-use, transportation and housing policies to achieve the greenhouse gas emissions targets for the region (consistent with the requirements of SB 375, the Sustainable Communities and Climate Protection Act of 2008). SCG’s strategies for sustainable communities embed higher-density housing,

IEUA Regional Water Use Efficiency Business Plan

sustainable landscaping, living soils, and stormwater capture into an integrated watershed approach for future development.

Three demand scenarios were considered using IEUA's IRP Scenario Manager from the Water Demand Forecasting Model (CDR data based on 2012 RTP-SCAG):

1. "Sustainable" Strategy: 40% of new growth is anticipated to be Multi-Family housing in Baseline along with 60% of new growth captured in smaller single family lot sized homes;
2. "More Sustainable" Strategy: 71% of new growth is anticipated to be Multi-Family housing, with 29% of new single family housing development weighted toward much smaller lot sizes as compared to more traditional older developments;
3. "Maximum Sustainable" Strategy: 96% of new growth is anticipated to be Multi-Family housing.

New mandatory landscaping requirements also occurred when Governor Brown issued an Executive Drought Order in April 2015 to update the State's Model Water Efficient Landscape Ordinance (MWELO) through an expedited regulation. The directive outlined five specific areas to address:

1. More efficient irrigation systems
2. Limiting the percentage of turf planted in landscapes
3. Onsite stormwater capture
4. Graywater Usage
5. Required reporting on the implementation and enforcement of the ordinance by local agencies

All revisions to the MWELO became effective December 1, 2015 with affected agencies provided with a February 1, 2016 deadline to adopt the new requirements.

The WUE Business Plan is the product of collaboration across jurisdictions involving multiple agencies and stakeholders in the development of regional programs. The WUE Business Plan reflects a suite of innovative water management approaches that includes but goes beyond traditional water efficiency rebates. The new program emphases in the WUE Business Plan approach, consistent with the 2015 IRP include:

- Multi-beneficial projects and programs that are linked together for improved synergy
- Integration of water use efficiency, water-energy nexus (with quantifiable avoided Greenhouse Gas Emissions attributable to water use efficiency), low impact development, run-off prevention, stormwater management, including onsite capture/recharge and low impact development, and water quality, among others;

IEUA Regional Water Use Efficiency Business Plan

- Proactive, innovative, and sustainable solutions;
- Sustainable landscaping in which every garden is viewed as a mini-watershed, holding on to or cleaning all the water that falls on it and supporting a diverse habitat of plants and insects.
- Integrated regional solutions supporting local water reliability and local priorities for water management, and
- Watershed approaches based project and programs that effectively leverage limited resources and maximize the greatest potential benefits.

A snapshot of the proposed programs and their integration with Sustainable Communities are highlighted in the chart below.

Table 36: Sustainable Communities - Program Integration

WUE Active Program	Multiple Benefits	Energy-Water Nexus	Run-off Prevention	Stormwater Mgmt	Sustainable Landscapes
Budget-Based Water Rates	√	√	√		√
Turf Removal	√	√	√	√	√
FreeSprinklerNozzles.com Program	√	√	√		√
SoCal Water\$mart Regional Rebate Program	√	√	√	√	√
Customer Engagement Software	√	√	√		√
High Efficiency Nozzle Direct Installation Program	√	√	√		√
Residential Smart Controller Upgrade Program	√	√	√		√
Residential Landscape Retrofit Program	√	√	√		√
Landscape Evaluations	√	√	√	√	√
Regional Landscape Training Workshops	√	√	√	√	√
Water Saving Garden Friendly Program	√	√	√	√	√

INFORMATION
ITEM
2H

3rd Quarter Planning & Environmental Compliance Update



Regulatory Compliance Update

- **RWQCB**
 - All Facilities – 100% compliance

- **AQMD**
 - RP-5 SHF Flare – Excess emissions
 - RP-2 Engine – Excess emissions
 - RP-2 – Notice to Comply

- **SWRCB-DDW**
 - CDA1 – 100% compliance
 - GWR - Total Nitrogen at RP3 Basin



RP-5 Solids Handling Facility

- **Lease agreement (3/17/10 – 9/30/21)**
 - Monthly payment \$50,000/month
 - Electricity sale 95% of SCE Rate
- **Facility Operation**
 - Food waste delivery: 140 tons/day (60% processed solid waste, 40% industry)
 - Biogas production: up to 600,000 cft/day
 - Electricity generation output: 800 kW (single engine operation)
- **Compliance (2016)**
 - Flare excess emissions – AQMD granted variance (3/9/16 through 5/15/16)
 - Digester gas venting incidents – 1/20, 1/21, 1/30, 2/10, 2/17, 2/25

Pretreatment & Source Control

- **Regional System**
 - Dental Amalgam Rule
 - Local Limits Dioxin Evaluation

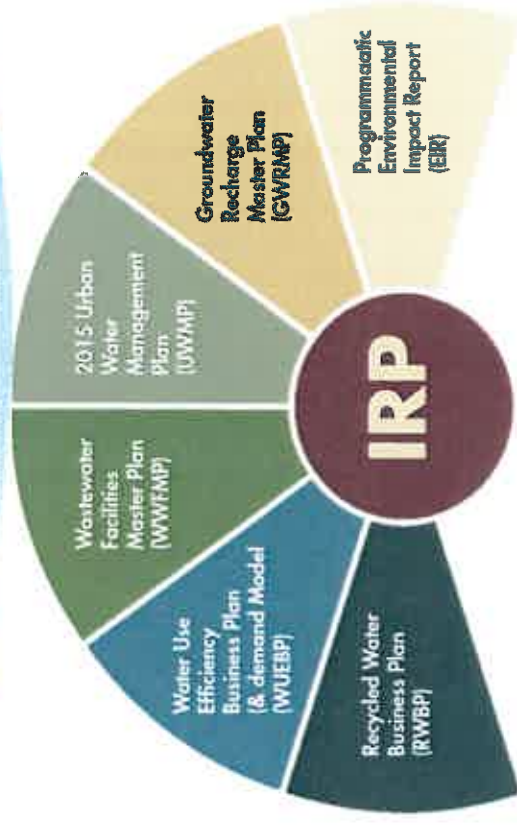
- **North NRWS**
 - Solids Discrepancy Formula Evaluation
 - Industry Rate Workshop

- **South Brine Line**
 - SAWPA Ordinance No. 8
 - OCSD Local Limits Revision
 - TSS Solids Imbalance



Planning

- **Integrated Resources Plan**
 - IRP Phase 1 circulated March 2016
 - Adopt IRP Phase 1: May 2016
 - Complete Programmatic EIR: summer 2016
 - Commence Phase 2: summer 2016
- **Water Use Efficient Business Plan**
 - Draft Plan circulated February 2016
 - Proposed IEUA Board adoption: 2016 April
- **Santa Ana River Habitat Conservation Plan (Jan 2017)**
 - Included existing GWR basins and diversion structures
 - Hydraulic modeling to begin in April 2016



Water Resources Activities

- **Water Supply Allocation Plan (WSAP)**
 - 30% (17,867 of 61,269 AF) of Allocation as of February 2016

- **2015 Urban Water Management Plan (UWMP) Update**
 - Land Use Based Model was completed
 - Draft UWMP Draft released for internal review

- **SAWPA Proposition 84 DWR Grant –Turf Removal**
 - IEUA invoiced SAWPA for full grant of \$807,564
 - IEUA will pursue any available unspent funds