



CALIFORNIA
WATER EFFICIENCY
PARTNERSHIP



Navigating New Tools to Explore Your Water Use Objective

***SWRCB Objective Exploration Tool and
AWE Tracking Tool v4.1 – CA Edition***

May 10, 2022

WHAT WE'LL COVER



Part
One

Overview and
Ground Rules

Part
Two

State Water Resources
Control Board
Objective Exploration Tool

Part
Three

AWE Tracking Tool v4.1
– California Edition

Part
Four

Q&A

CaIWEF's Mission

Maximize urban water efficiency and conservation by:

- *Advancing research, training, and public education*
- *Building collaborative approaches and partnerships*
- *Supporting and integrating innovative technologies and practices*
- *Encouraging effective public policies*

Contact us: hello@calwep.org

Ground Rules

Ground Rules



Navigating New Tools to Explore Your Water Use Objective

***SWRCB Objective Exploration Tool and
AWE Tracking Tool v4.1 – CA Edition***

May 10, 2022

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Q&A or Chat function.

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Audio Settings ^

Chat ^ Q&A

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CALIFORNIA
WATER EFFICIENCY
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Navigation
Explore Your
Options

SWRCB
AWE T



Alliance
for Water
Efficiency

Objectives to
Achieve

Control and
Mitigation

Q&A

Welcome to Q&A

Questions you ask the host and
panelists will show up here

Type your question here...

☐ Send anonymously

Cancel

Send



Who can see your questions?

Chat

Q&A

Adjust your
audio settings
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If you need to
leave the webinar,
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Audio Settings ^

Leave

Purpose: Consider future compliance status based on past usage and user inputs

Online tableau dashboard

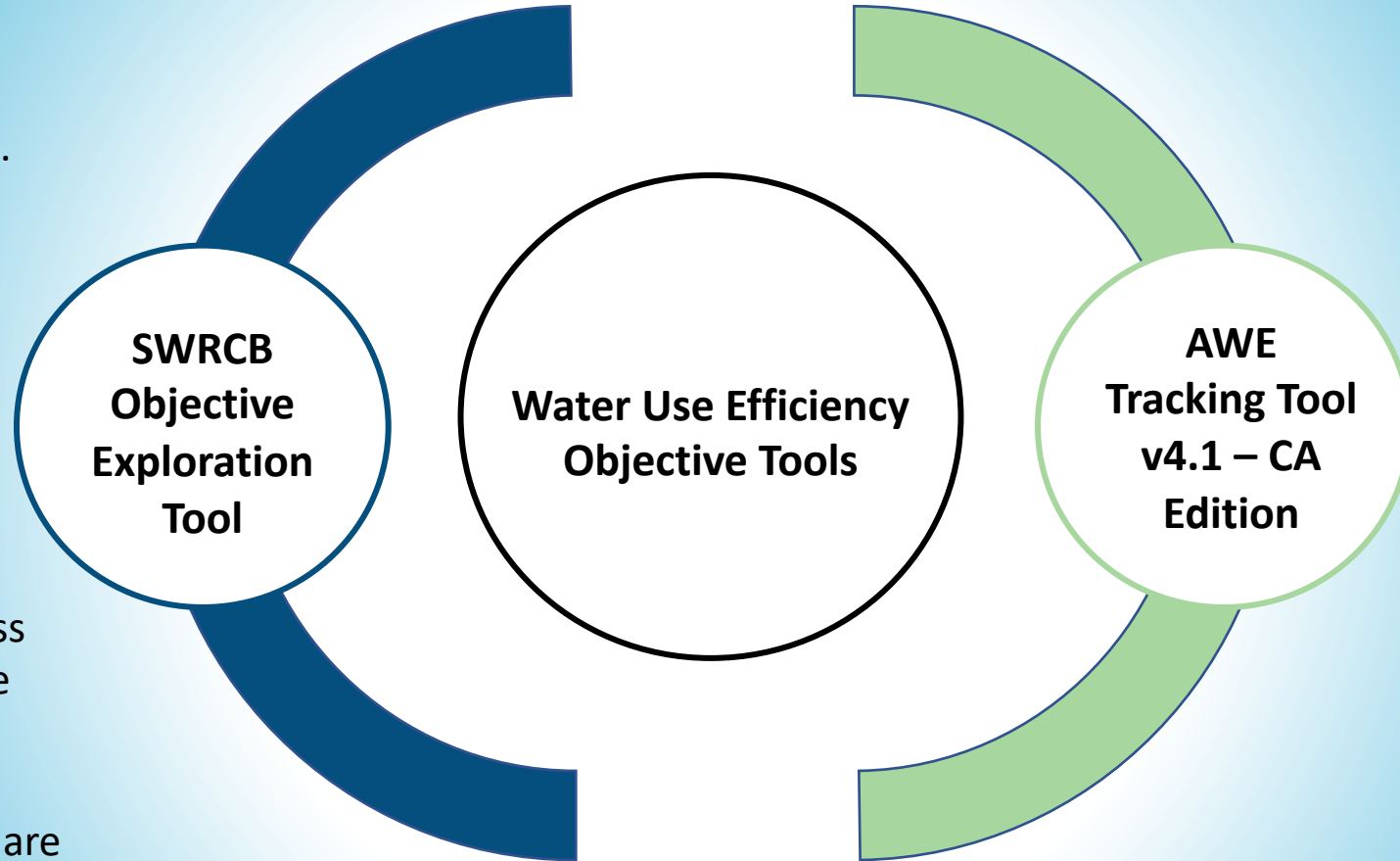
Simple to use and configure.
No training necessary

Not intended as a reporting tool

Does not define what the standards will be

The tool is a work in progress and will be updated as more data become available.

Feedback or corrected data are welcome and encouraged.
Please email the SWRCB's conservation team at ORPP-WaterConservation@Waterboards.ca.gov.



Purpose: Used for decision-making and planning

- *What must we do to be in compliance?*

Excel workbook

Training is needed for new users

Input of water agency data required

Compare water savings and cost-effectiveness across various program scenarios

Provides a customizable and dynamic analysis of conservation strategies

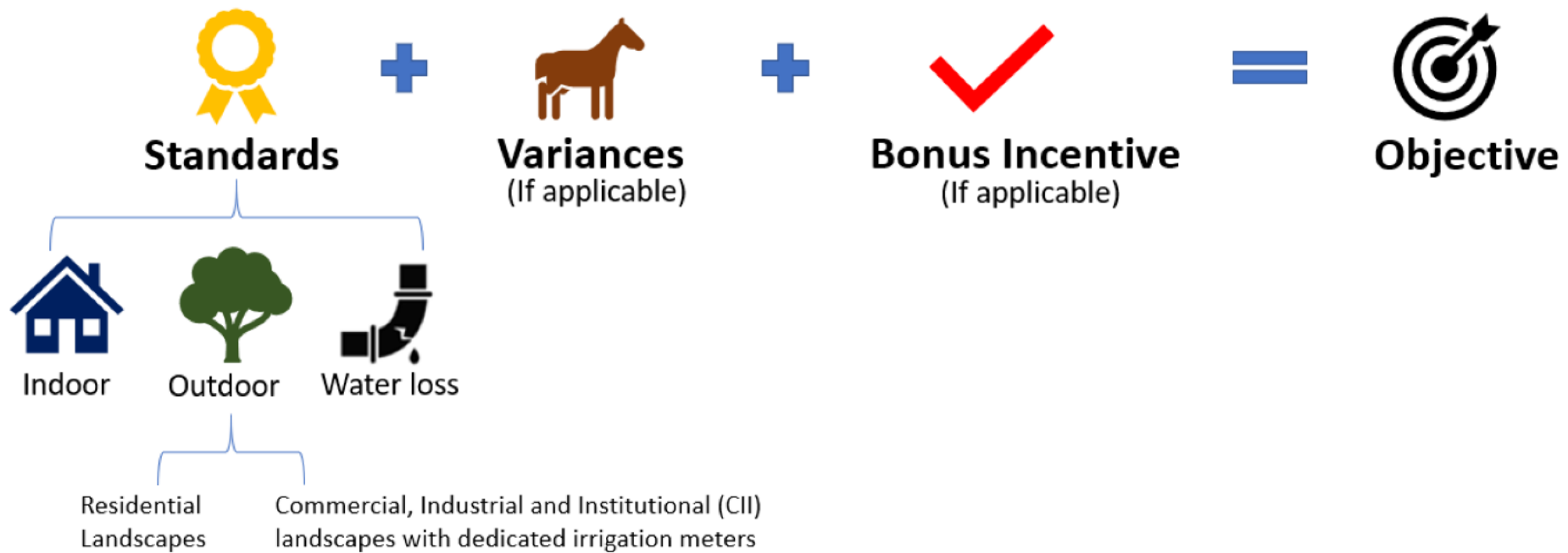
Making Conservation a Way of Life

The Objective Exploration Tool

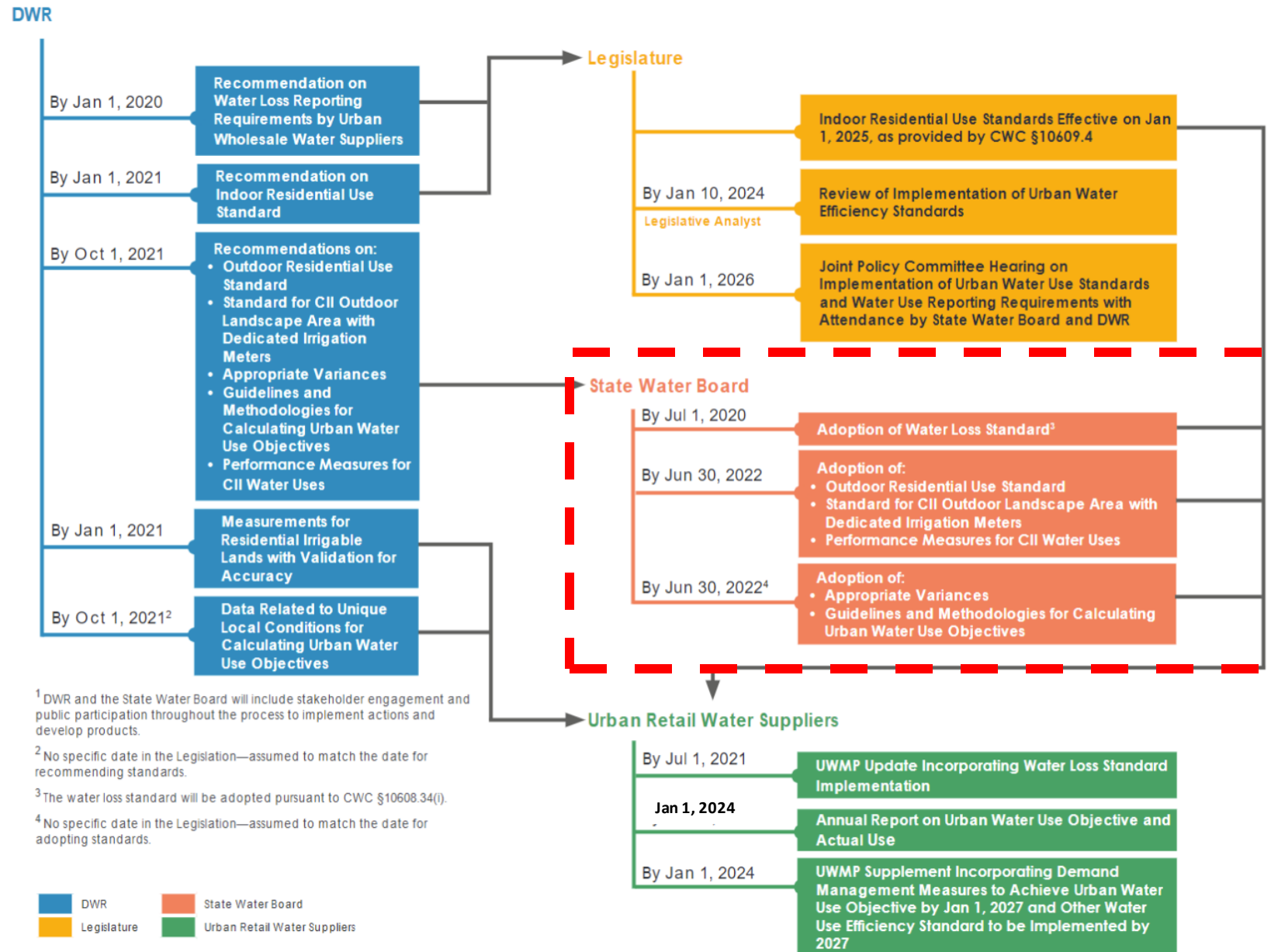


State Water Board

AB 1668/SB 606: Calculating Urban Water Use Objective



Where in the process are we?



Where in the process are we?

State Water Board

TBD

Adoption of water loss standards

By May 30, 2022

Identify impacts on local wastewater management, parklands, and urban tree health.

TBD

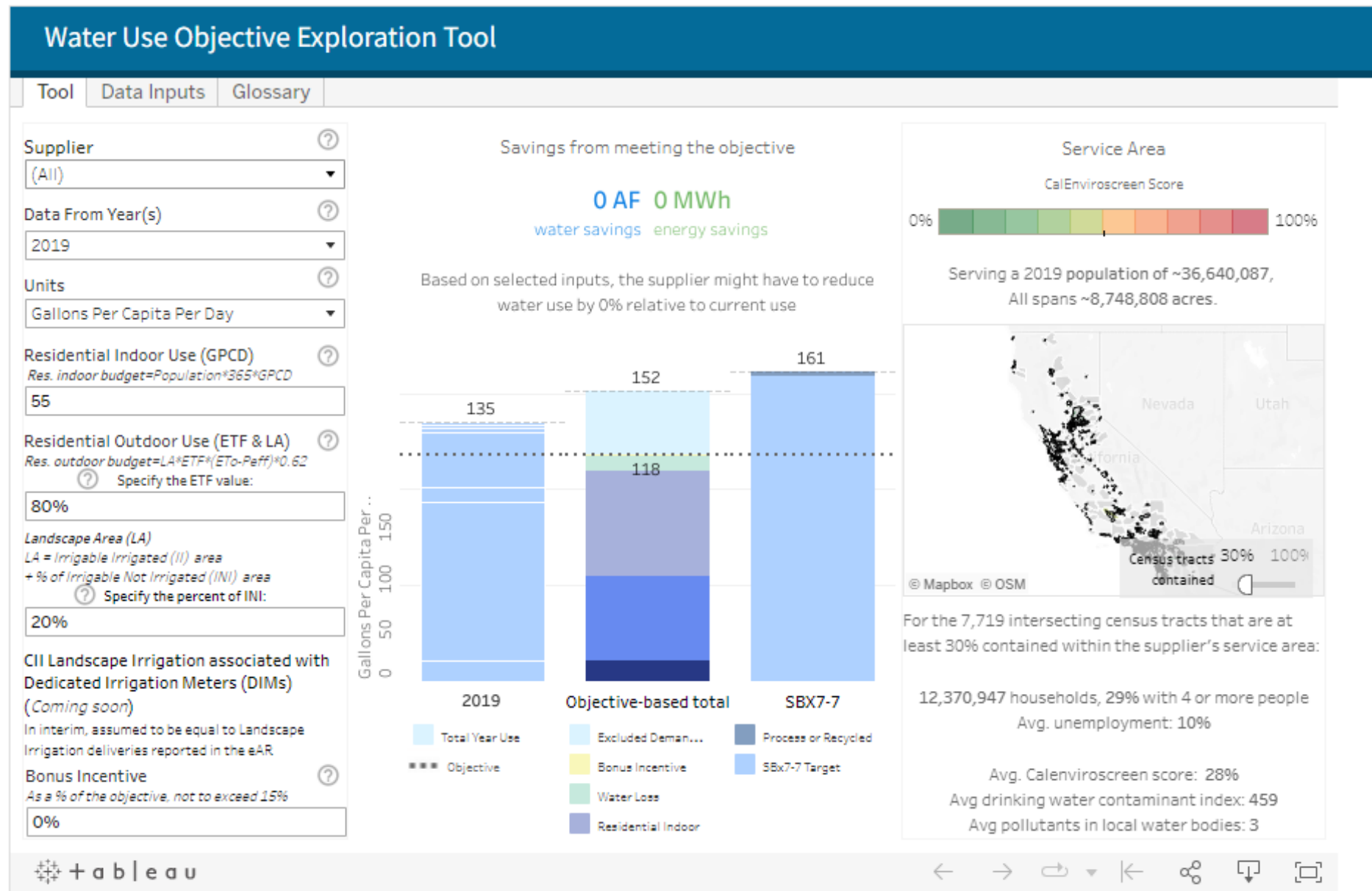
Adoption of efficiency standards

- Outdoor Residential Use Standard
- Standard for CII outdoor landscapes with dedicated irrigation meters
- Performance Measures for CII water uses
- Appropriate variances
- Guidelines and methodologies for calculating urban water use objectives

Objective Exploration Tool

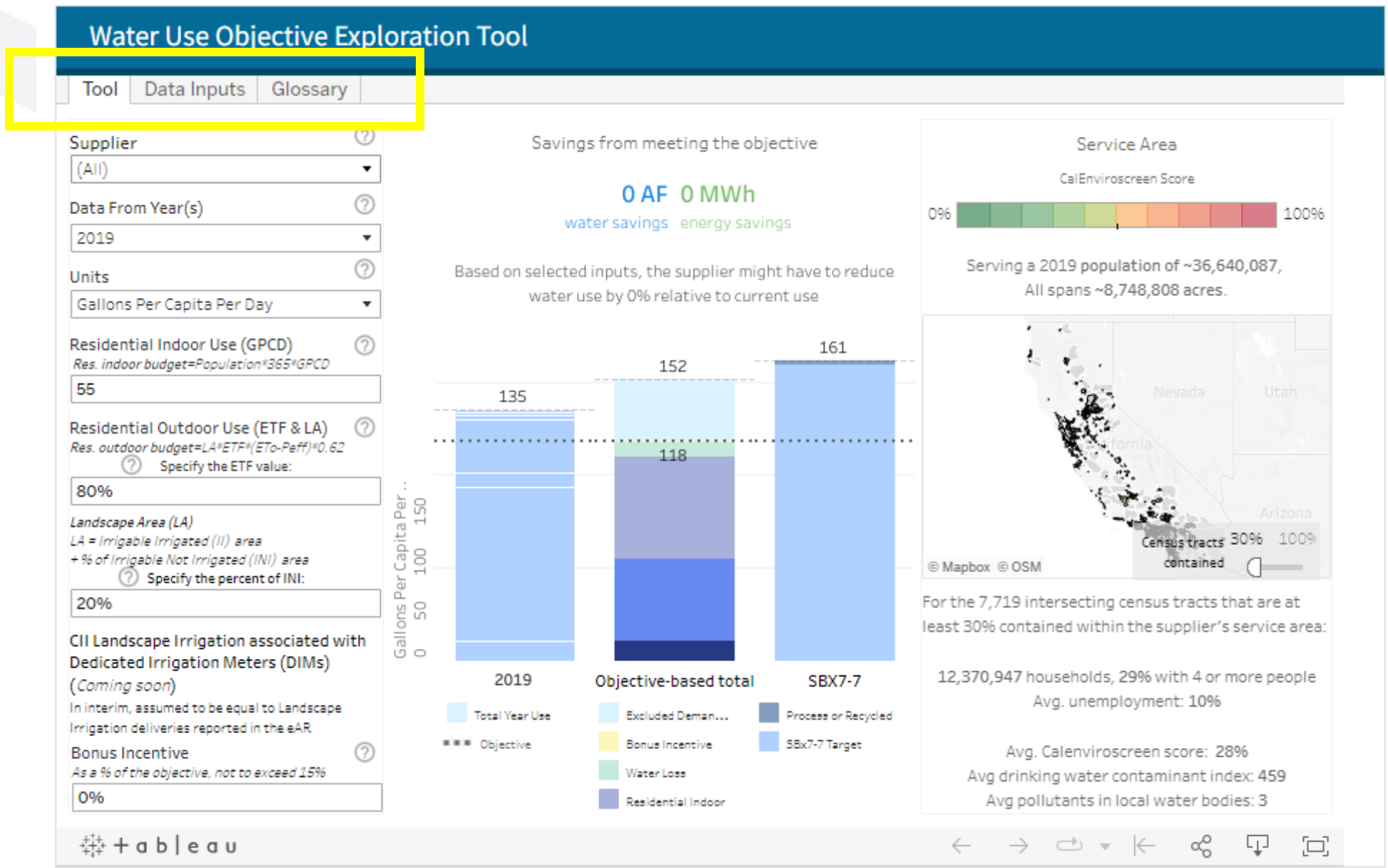
- Can be accessed from the SWB site: [Objective Exploration Tool | California State Water Resources Control Board](#)
- Currently has data from 2017-2019
- The tool is a work in progress and will be updated as more data become available. Feedback or corrected data are welcome and encouraged.
- Please e-mail the State Water Board's conservation team at ORPP-WaterConservation@Waterboards.ca.gov

Dashboard's landing page.



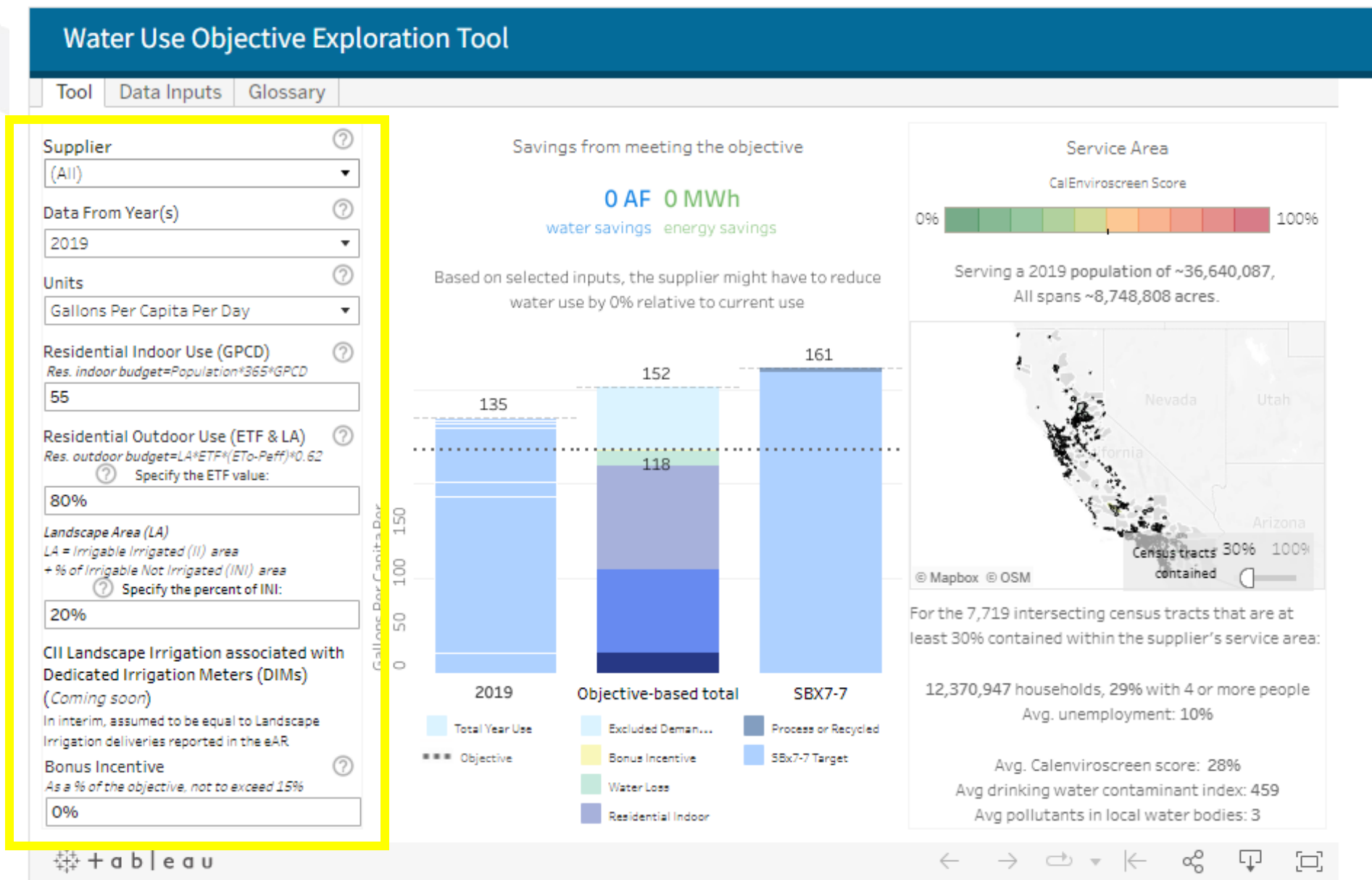
Dashboard has 3 tabs:

- Tool
- Data Inputs
- Glossary



Where the user adjusts the different parameters that affect the resulting objective.

User can hover to the ? for additional information on that parameter.



Where the results are shown.

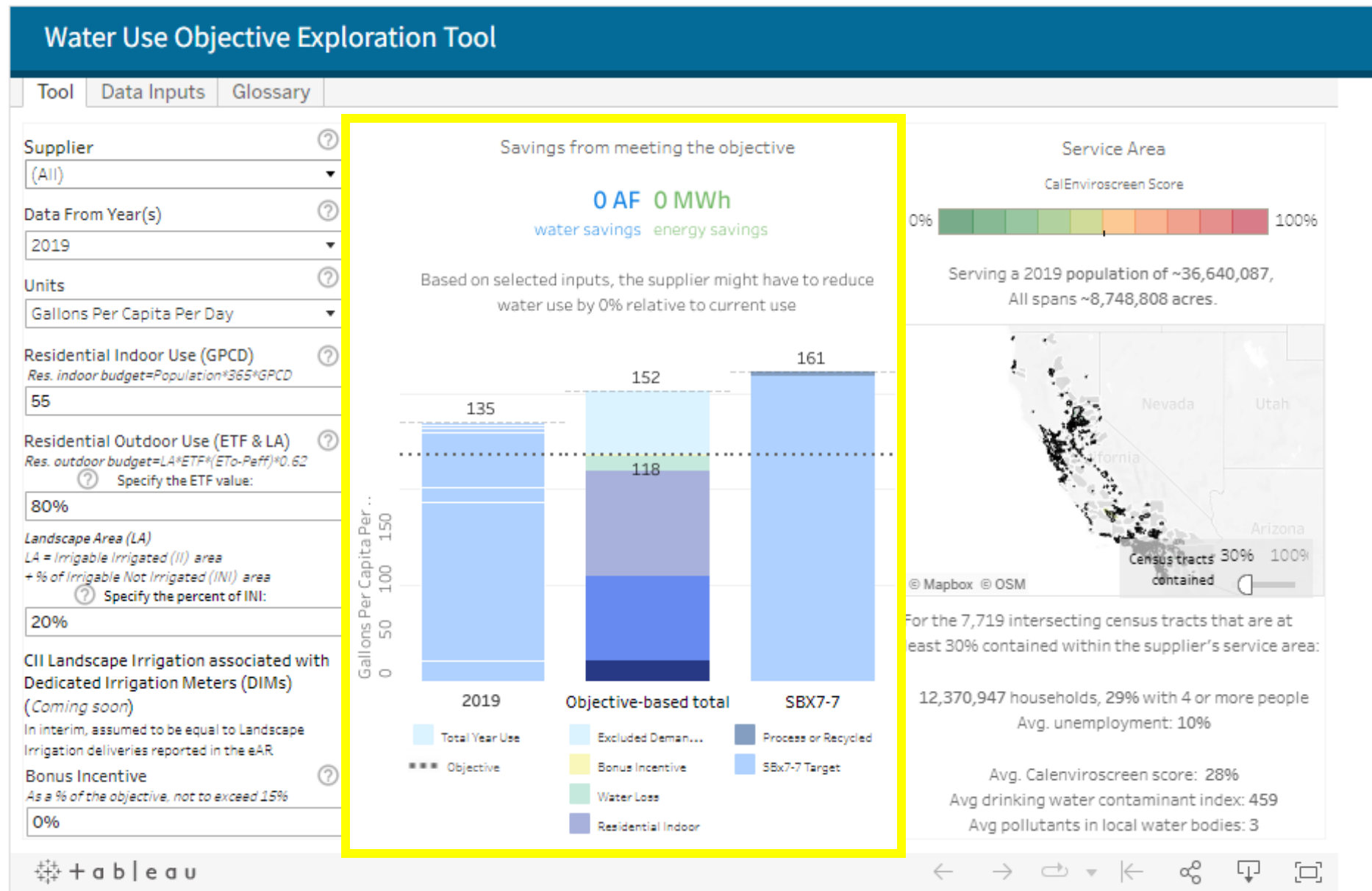
Additional information on how water savings and energy savings are calculated can be found in the "Glossary"

Left bar represents current use.

Middle bar is calculated using the parameter inputs.

Right bar is the SBx7-7 target.

Dashed line is the objective.



Where the service area, CalEnviroscreen scores, and summary demographics are shown

Water Use Objective Exploration Tool

Tool

Data Inputs

Glossary

Supplier

(All)

Data From Year(s)

2019

Units

Gallons Per Capita Per Day

Residential Indoor Use (GPCD)

Res. indoor budget=Population*365*GPCD

55

Residential Outdoor Use (ETF & LA)

Res. outdoor budget=LA*ETF*(ETo-Peff)*0.62

Specify the ETF value:

80%

Landscape Area (LA)

LA = Irrigable Irrigated (II) area

+ % of Irrigable Not Irrigated (INI) area

Specify the percent of INI:

20%

CII Landscape Irrigation associated with Dedicated Irrigation Meters (DIMs)

(Coming soon)

In interim, assumed to be equal to Landscape Irrigation deliveries reported in the eAR

Bonus Incentive

As a % of the objective, not to exceed 15%

0%

Savings from meeting the objective

0 AF 0 MWh

water savings energy savings

Based on selected inputs, the supplier might have to reduce water use by 0% relative to current use

Gallons Per Capita Per Day

135

152

161

2019

Objective-based total

SBX7-7

Total Year Use

Excluded Demand...

Process or Recycled

Objective

Bonus Incentive

Water Loss

Residential Indoor

SBX7-7 Target

Service Area

CalEnviroscreen Score

0% 100%

Serving a 2019 population of ~36,640,087, All spans ~8,748,808 acres.

California

Nevada

Utah

Arizona

Census tracts 30% 100% contained

© Mapbox © OSM

For the 7,719 intersecting census tracts that are at least 30% contained within the supplier's service area:

12,370,947 households, 29% with 4 or more people

Avg. unemployment: 10%

Avg. Calenviroscreen score: 28%

Avg drinking water contaminant index: 459

Avg pollutants in local water bodies: 3

+ a b | e a u

Gives a summary of all the data used by the Tool.

User can download one or more tabs as a PDF.

If you have corrected data, you can email the State Water Board's conservation team at ORPP-WaterConservation@Waterboards.ca.gov.

Water Use Objective Exploration Tool

Tools

Data Inputs

Glossary

Data Input Summary

Last Data Refresh:
2/17/2022 11:46:41 PM

San Jose Water Company

DWR ID 2175

Water System

CITY OF CUPERTINO

SAN JOSE WATER

PWSID

CA4310018

CA4310011

Display in Acre-Feet

	2017	2018	2019
Population	991,790	991,790	991,790
Reference Evapotranspiration (in)	44.72	44.04	43.71
Effective Precipitation (in)	5.80	3.19	6.26
Current Total Connections	229,682	230,268	226,533
Water Loss Standard (gal/connections/day)	25	24	25
Water Loss Budget	6,317	6,317	6,317
Landscape Irrigation	0	0	0
Bonus Incentive	0	0	0
Residential Indoor (Multi- & Single-Family Homes)	57,232	60,742	60,209
Other	5,572	5,936	5,681
Commercial, Institutional, & Industrial	38,494	39,627	38,990
Total Water Deliveries	103,311	108,319	106,893
Average Real Water Losses (2016-2019)	6,317	6,317	6,317
Apparent Water Loss	1,730	1,730	1,730
Authorized Unbilled Water	284	284	284
Notes on data sources	UWMP as Population source.	UWMP as Population source. SWB as Residential source. SWB as CII source. SWB as Other source.	UWMP as Population source. SWB as Residential source. SWB as CII source. SWB as Other source.

Download Summary (PDF)

Electronic Annual Reporting (eAR) System Portal

+ a b l e a u

←

→

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↻

⌂

📄

🖨

Defines tool terms and provides data sources.

Broken up into four sections: User Selections, Bar Chart, Other, Map

Water Use Objective Exploration Tool			
Tool Data Input Glossary			
Category	Term	Definition	Data Sources
User Selections	Bonus Incentive	The bonus incentive will be based on the volume of potable reuse water delivered to residential water users and to landscape areas with dedicated irrigation meters in connection with CII water use. In the tool, users can adjust what percentage of the "objective-based total" the bonus incentive may represent. A hypothetical bonus incentive quantity is calculated by multiplying the "objective based total" by a user-entered percentage, ranging from 0 to 15%.	
	Evapotranspiration Factor (ETF)	A factor that when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency. This is the one input in the tool that adjusts the Residential Outdoor budget. User can enter value from 0 to 100%.	
	Irrigable Irrigated (II)	Area of healthy vegetation where the vegetation appears to be in growth, not senesced, and is foliated. The area is presumed to be maintained and managed through active irrigation, comprising an irrigated hydro-zone. Other non-vegetative features may be included in the irrigated hydro-zone. The tool includes all Irrigable Irrigated area in the Landscape Area, which is used to calculate the Residential Outdoor Use budget.	revised DWR classification with appendix A_112320.pdf; Landscape Area from Department of Water Resources' Landscape Area Management Project (Nov 2021)

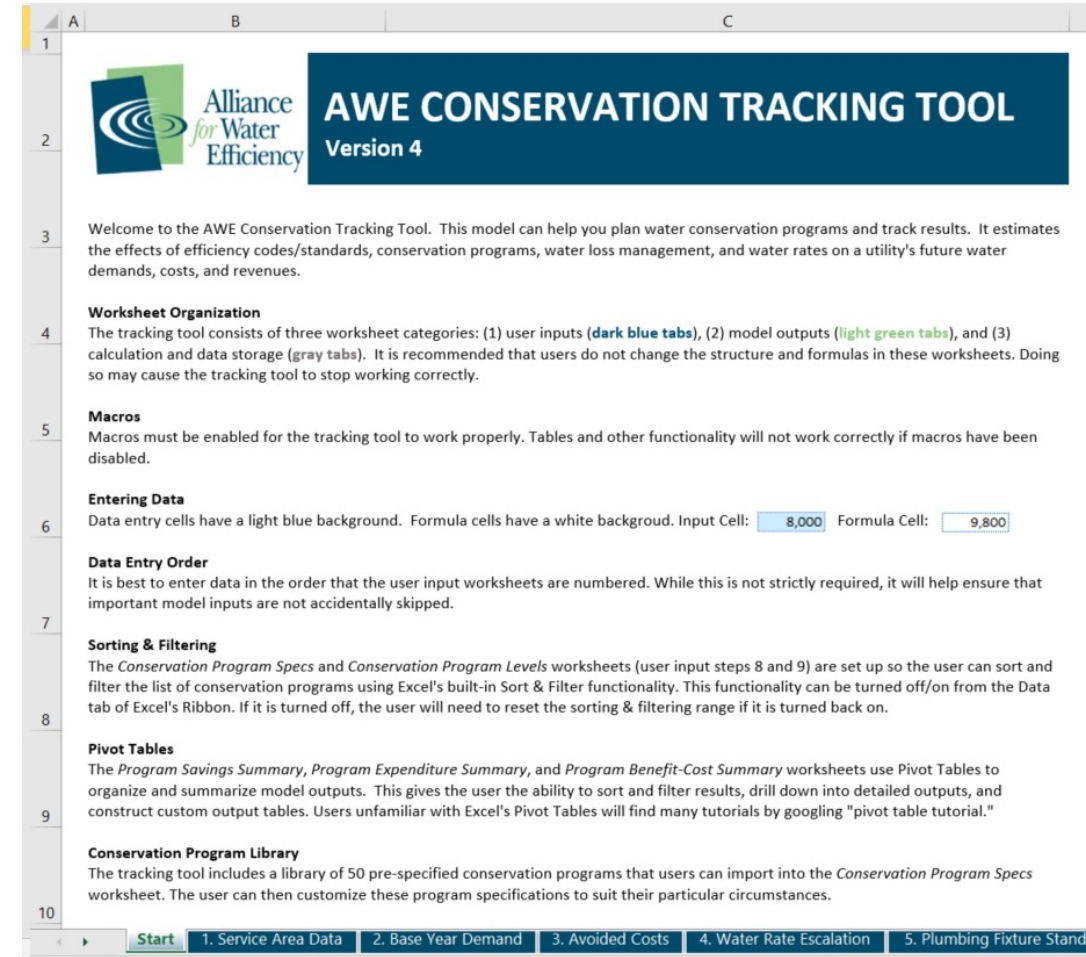
AWE: A Voice for Water Efficiency

- Our mission is to promote an efficient and sustainable water future
- 530+ member organizations in 200 watersheds delivering water to over 50 million water users
- A unique network of water efficiency experts and practitioners.
- A forum for collaboration around policy, information sharing, education, and stakeholder engagement
- AWE provides training, research, and other resources for water efficiency professionals
- Visit allianceforwaterefficiency.org/membership to learn more



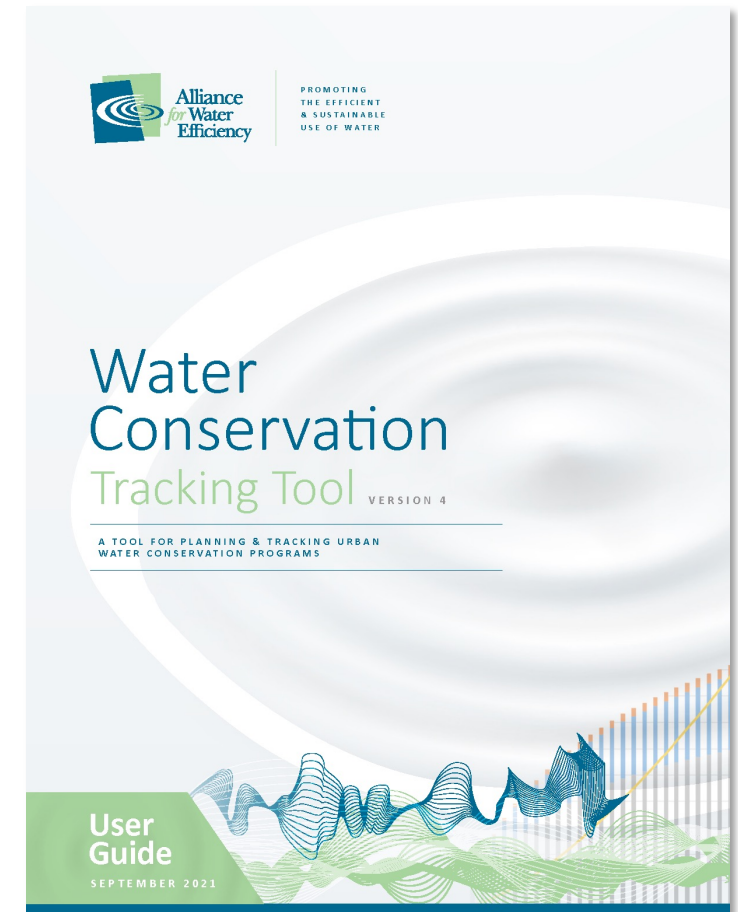
WHAT IS THE WATER CONSERVATION TRACKING TOOL?

- An Excel-based model that can be used to evaluate the costs and benefits of water conservation programs
- Includes detailed User Guide
- Graphic model outputs which are usable for manager and board presentations
- A free resource for AWE and CalWEP members



WHAT'S NEW IN VERSION 4.1

- Redesigned User Interface
- Ability to specify up to 200 programs
- Expanded program library with 50 pre-defined programs
- Updated plumbing fixture efficiency module
- New landscape standards module
- New price response module
- New water loss management module
- New California AB 1668/SB 606 Module





WUE OBJECTIVE ANALYSIS WITH THE AWE WATER CONSERVATION TRACKING TOOL

May 10, 2022

Alliance for Water Efficiency

TRACKING TOOL USE CASES

1

Projecting future demands

2

Developing conservation plans

3

Evaluating costs and benefits

4

Comparing program alternatives

5

Developing WUE objective compliance strategies

Today's
Focus

WUE OBJECTIVE COMPLIANCE ANALYSIS STEPS



Prepare baseline demand projection

- Population
- Services
- Use/Service
- System losses

Adjust baseline projection for:

- Plumbing codes/building standards
- Marginal water costs
- Already planned conservation/water loss programs

Compare water use objective to adjusted baseline projection

- Calculate objective
- Adjust for bonus incentives and variances
- Compare to projected demand

Rinse and repeat

SETTING UP THE BASELINE PROJECTION #1

Population Served												
	Required						Required					Required
	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045
Service Area Population												
Total Population in Service Area	56,741						57,630					63,394
Population Shares (%)												
Single-Family	79%						80%					80%
Multi-Family	21%						20%					20%
Group Quarters	0%						0%					0%
Total	100%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%
Population by Living Quarters												
Single-Family	45,000						46,104					50,715
Multi-Family	11,741						11,526					12,679
Group Quarters	0						0					0
Total	56,741						57,630					63,394

Enter Service Area Data

1. Population
2. Service Connections
3. Housing Units

Service Connections												
	Required						Required					Required
	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045
Number of Service Connections												
Single-Family	15,000						15,300					16,830
Multi-Family	190						210					231
CII Irrigation Meter	200						250					275
CII Mixed Meter	1,000						1,100					1,210
Other/Temporary/Misc Meter	25						40					44
Total	16,415	0	0	0	0	0	16,900	0	0	0	0	18,590

Housing Units												
	Required						Required					Required
	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045
Average Number of Housing Units/Connection												
Single-Family	1.0						1.0					1.0
Multi-Family	27.0						25.0					25.0

SETTING UP THE BASELINE PROJECTION #2

Residential Demand

	Single-Family		Multi-Family		Residential
Sales (AF)	8,500	+	1,800	=	10,300
Connections	15,300		210		15,510
GPD/Connection	496		7,652		593
Housing Units	15,300		5,250		20,550
GPD/Housing Unit	496		306		447
Population	46,104		11,526		57,630
GPD/Person	165		139		160

Enter Base Year Demand

1. Residential
2. Non-Residential
3. Non-Revenue



Non-Residential Demand

	CII Irrig.		CII Mixed		Other		Total
Sales (AF)	1,000	+	1,500	+	20	=	2,520
Connections	250		1,100		40		1,390
GPD/Connection	3,571		1,217		446		1,618



Non-Revenue Water

	Unbilled Authorized		Apparent Losses		Real Losses		Total NRW
Volume (AF)	91	+	254	+	761	=	1,106
Total Connections	16,900		16,900		16,900		16,900
GPD/Connection	5		13		40		58

TRACKING TOOL COMBINES THESE DATA TO PROJECT FUTURE DEMANDS

Baseline Demand Projection (AF)

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Water Sales												
Single-Family	<input type="checkbox"/> Edit forecast	8,500	8,534	8,568	8,602	8,636	8,670	8,704	8,738	8,772	8,806	8,840
Multi-Family	<input type="checkbox"/> Edit forecast	1,800	1,807	1,814	1,822	1,829	1,836	1,843	1,850	1,858	1,865	1,872
CII Irrigation Meter	<input type="checkbox"/> Edit forecast	1,000	1,004	1,008	1,012	1,016	1,020	1,024	1,028	1,032	1,036	1,040
CII Common Meter	<input type="checkbox"/> Edit forecast	1,500	1,506	1,512	1,518	1,524	1,530	1,536	1,542	1,548	1,554	1,560
Other Meter	<input type="checkbox"/> Edit forecast	20	20	20	20	20	20	20	21	21	21	21
Subtotal		12,820	12,871	12,923	12,974	13,025	13,076	13,128	13,179	13,230	13,282	13,333
Non-Revenue Water												
Unbilled Authorized	<input type="checkbox"/> Edit forecast	91	91	92	92	92	93	93	94	94	94	95
Apparent Losses	<input type="checkbox"/> Edit forecast	254	255	256	257	258	259	260	261	262	263	264
Real Losses	<input type="checkbox"/> Edit forecast	761	767	785	802	820	837	855	873	891	909	928
Subtotal		1,106	1,114	1,132	1,151	1,170	1,189	1,208	1,228	1,247	1,267	1,286
Total Production		13,926	13,985	14,055	14,125	14,195	14,266	14,336	14,407	14,477	14,548	14,619

NEXT STEP: ADJUST BASELINE DEMAND PROJECTION

- Plumbing Codes & Building Standards
- Marginal Water Cost
- Already Planned
 - Conservation
 - Water Loss Management

PLUMBING & BUILDING CODES

Enter Plumbing Fixture Standards

Enter plumbing fixture efficiency standards for your state/region on this worksheet. The model uses this information to calculate expected changes in plumbing fixture water use over time. By default, the model will use the U.S. National Standards unless different standards are entered for your state/region. To the right of the input table are standards for various states for reference.

Sheet ID: Sheet37

U.S. National Standards				Your State/Region			Used by Model		
Year took Effect	Toilets (gpf)	Urinals (gpf)	Shower Heads (gpm)	Toilets (gpf)	Urinals (gpf)	Shower Heads (gpm)	Toilets (gpf)	Urinals (gpf)	Shower Heads (gpm)
1990	>1.60	>1.00	>2.50				>1.60	>1.00	>2.50
1991	>1.60	>1.00	>2.50				>1.60	>1.00	>2.50
1992	>1.60	>1.00	>2.50	1.600	1.000	2.500	1.600	1.000	2.500
1993	>1.60	>1.00	>2.50				1.600	1.000	2.500
1994	1.60	1.00	2.50				1.600	1.000	2.500
1995							1.600	1.000	2.500
1996							1.600	1.000	2.500
1997							1.600	1.000	2.500
1998							1.600	1.000	2.500
1999							1.600	1.000	2.500
2000							1.600	1.000	2.500
2001							1.600	1.000	2.500
2002							1.600	1.000	2.500
2003							1.600	1.000	2.500
2004							1.600	1.000	2.500
2005							1.600	1.000	2.500
2006							1.600	1.000	2.500
2007							1.600	1.000	2.500
2008							1.600	1.000	2.500
2009							1.600	1.000	2.500
2010							1.600	1.000	2.500
2011							1.600	1.000	2.500
2012							1.600	1.000	2.500
2013							1.600	1.000	2.500
2014				1.280	0.500		1.280	0.500	2.500
2015							1.280	0.500	2.500
2016					0.125	2.000	1.280	0.125	2.000
2017							1.280	0.125	2.000
2018						1.800	1.280	0.125	1.800
2019							1.280	0.125	1.800
2020							1.280	0.125	1.800

Plumbing Codes

New Development Landscape Standards

Adjustments for federal clotheswasher and dishwasher standards also calculated

Adjusts demands for new & existing development

Enter Water Savings from Standards for New Landscape

Some regions have adopted or are considering adopting water use efficiency standards for landscape in new development. These standards are expected to reduce landscape water use in new development relative to baseline landscape water use. Use this worksheet to incorporate these effects into the demand projection. This worksheet assumes the user has separately estimated expected savings from the standards.

Sheet ID: Sheet41

Single-Family

Avg Occupancy (persons/household)	3.0			
Baseline Indoor Use Share (% of total)	35%			
Baseline Water Use (GPD)	Total	Indoor	Outdoor	
	Household	436	174	322
	Person	165	58	107
Reduction in New Landscape Use Relative to Baseline Outdoor Use				
Year Standard Starts				
Reduction as % of Baseline Outdoor Use				
Reduction GPD/New Housing Unit				

Multi-Family

Avg Occupancy (persons/household)	2.2			
Baseline Indoor Use Share (% of total)	39%			
Baseline Water Use (GPD)	Total	Indoor	Outdoor	
	Household	306	119	187
	Person	139	54	85
Reduction in New Landscape Use Relative to Baseline Outdoor Use				
	Year Standard Starts	2025		
Reduction as % of Baseline Outdoor Use	15%			
Reduction GPD/New Housing Unit	28			

CII Irrigation Meters

Baseline Water Use (GPD)	Total	Indoor	Outdoor
Meter	3,571	0	3,571
Reduction in New Landscape Use Relative to Baseline Outdoor Use			
	Year Standard Starts	2025	
Reduction as % of Baseline Outdoor Use		15%	
Reduction GPD/Meter		536	

Adjusts demands for new development only

MARGINAL WATER COST

Enter Retail Water Rate Escalation

Utility customers adjust their water use in response to changes in the marginal cost of water. In many regions, water rates have been increasing faster than inflation so that inflation-adjusted water costs have been increasing. This trend is expected to continue. The demand forecast can be adjusted to account for the effect higher (or lower) marginal water cost is likely to have on future water demand. To adjust the demand forecast for price effects, enter the expected annual water rate escalation for the years indicated. Accept or modify the default price elasticities used by the model to adjust future water demand for water rate effects.

Worksheet ID: Sheet35

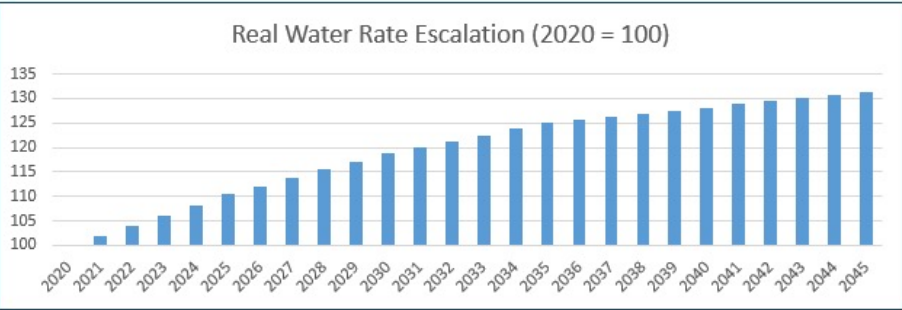
1. Water Rate Escalation

Enter the average annual rate of change for the periods shown	2021 to 2025	2026 to 2030	2031 to 2035	2036 to 2040	2041 to 2045
Nominal Water Rate Escalation*	4.0%	3.5%	3.0%	2.5%	2.5%
General Price Inflation	2.0%	2.0%	2.0%	2.0%	2.0%
Real Water Rate Escalation	2.0%	1.5%	1.0%	0.5%	0.5%

* i.e., including general price inflation

2. Price Elasticity Parameters

	Default Parameter	User-Entered Parameter	Used by Model
Single-Family	-0.15		-0.15
Multi-Family	-0.075		-0.075
CII Irrigation Meter	-0.25		-0.25
CII Common Meter	-0.15		-0.15
Temporary/Misc Meter	0.00		0



Note on demand adjustment:

The model adjusts water demand for a real change (i.e. after accounting for inflation) in the price of water from P0 to P1 using the formula:

Adjustment Factor = $(P1/P0)^{elasticity}$

For example, if P1 is 110 and P0 is 100 and elasticity is -0.25, then the Adjustment Factor is 0.976. Thus, a real price increase of 10% is expected to cause demand to decrease 2.4% in this example.

Must enter base year water rates on Avoided Cost Worksheet to use this adjustment

ALREADY PLANNED CONSERVATION PROGRAMS

Specify Conservation Programs

Conservation programs are specified on this worksheet. A user can specify a conservation program from scratch (i.e. roll your own) or by importing one from the Program Library. If a program is imported from the library, the user can modify its parameters to align them better with their circumstances. Library programs do not include values for all the cost parameters. The user must specify these based on their expected program costs. Consult the User Guide for more information on specifying the program cost and water savings parameters. Up to 200 programs can be specified. The program specification table can be sorted and filtered like any other Excel table. Table rows should never be deleted. The tracking tool will stop working correctly if this occurs. Programs can be cleared from the table by clicking the Clear Program button and following the prompts. To activate a program in the tracking tool, set the Program Active field to TRUE. To deactivate a program in the tracking tool, set the Program Active field to FALSE.

Worksheet ID: Sheet1

Import Program from Library Clear Program Clear Data Filters Manage Scenarios



DO NOT DELETE OR CHANGE THE PROGRAM IDS! TRACKING TOOL WILL STOP FUNCTIONING CORRECTLY. SORTING AND FILTERING ROWS IS OKAY.

Program Name & Category					
Program ID	Program Active	Program Name	Program Category	Program Class	Units
1	TRUE	SFR Home Water Report	Audits & Rpts	Single-Family	Household
2	TRUE	SFR AMI Leak Alert	Audits & Rpts	Single-Family	AMI Meter
3	TRUE	MFR Bathroom Direct Install	HET	Multi-Family	Toilet
4	TRUE	MFR Large Landscape Irrigation System Flow Sensor Rebate	Irrigation Systems & Devices	Multi-Family	Controller
5	TRUE	CII Large Landscape Irrigation Controller	Irrigation Systems & Devices	CII Irrigation Meter	Controller
6	TRUE	CII Urinal (1/8 gpf) Replacement	Urinal (0.125 gpf)	CII Common Meter	Urinal
7	TRUE	SFR HET Replacement	HET	Single-Family	Toilet
8	TRUE	CII HET Replacement	HET	CII Common Meter	Toilet
9	TRUE	MFR Water Use Audit	Audits & Rpts	Multi-Family	Household

Program Cost Parameters		
Utility (\$/unit)	Program Partner (\$/unit)	Program Participant (\$/unit)
7		
1		
350		
190		
1400		
150		
150		
150		
75		

Program Water Savings				
Utility Program Expected Savings (gpd/unit)	Expected Life of Savings (Years)	Savings Decay Rate (%/Yr)	Outdoor (% savings)	Indoor (% savings)
10.3	1	0%	60%	
0.7	1	0%	50%	
52.6	25	0%	0%	
27.0	10	0%	100%	
727.0	10	0%	100%	
21.0	25	0%	0%	
27.8	25	0%	0%	
38.7	25	0%	0%	
11.0	5	20%	0%	

- Users can specify their own programs or import programs from the tracking tool library.
- Up to 200 programs can be specified.

ALREADY PLANNED WATER LOSS PROGRAMS

3. Leak Detection and Repair Inputs

Enter leak detection and repair inputs: survey rate, cost of leak detection and repair, and average flow rates of main and lateral leaks. If you do not intend to operation a leak detection program, leave these fields empty or set them to zero.

Survey rate (miles/month)

4

Cost of leak detection per mile (\$/mile)

\$750

Estimated Proportion of Service Leaks (%)

40%

Average flow rate of unreported main leak (gpm)

15

Average flow rate of unreported service leak (gpm)

5

Average Repair Cost of Unreported Main Leak (\$/Repair)

\$75,000

Average Repair Cost of Unreported Service Leak (\$/Repair)

\$10,000

4. Pressure Reduction Inputs

Enter pressure reduction inputs: amount and cost of pressure reduction. If you do not intend to implement pressure reduction, leave these fields empty or set them to zero.

Pressure reduction from baseline (psi)

0

Cost of pressure reduction per psi (\$/psi)

\$0

5. Accelerated Reported Leak Repair

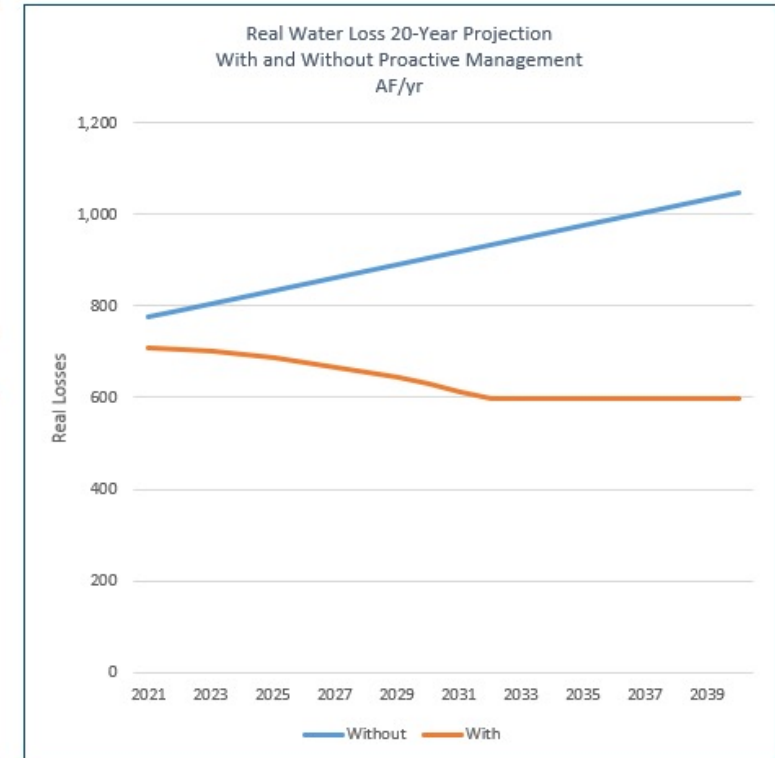
Enter the inputs for accelerating the repair of reported leaks: percent reduction in response time and annual cost of responding more quickly. If you do not intend to accelerate the repair of reported leaks, leave these fields empty or set them to zero.

Percent reduction in reported leakage duration (%)

0%

Cost of responding to reported leaks more quickly

\$0



Must enter distribution system information first. Tracking tool uses the same information as the Water Board's Water Loss Economic Model.

TRACKING TOOL PROVIDES SUMMARY OF ADJUSTMENTS

Adjustments (AF)

Plumbing Fixture Standards

Single-Family	<input checked="" type="checkbox"/> On
Multi-Family	<input checked="" type="checkbox"/> On
CII Irrigation Meter	<input checked="" type="checkbox"/> On
CII Common Meter	<input checked="" type="checkbox"/> On
Other Meter	<input checked="" type="checkbox"/> On
Subtotal	

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Single-Family	0	-35	-69	-100	-129	-157	-183	-207	-230	-252	-272
Multi-Family	0	-3	-6	-8	-9	-10	-11	-12	-12	-12	-17
CII Irrigation Meter											
CII Common Meter	0	-7	-14	-21	-28	-34	-40	-47	-52	-58	-64
Other Meter											
Subtotal	0	-45	-88	-128	-166	-201	-235	-265	-294	-322	-353

New Landscape Standards

Single-Family	<input checked="" type="checkbox"/> On
Multi-Family	<input checked="" type="checkbox"/> On
CII Irrigation Meter	<input checked="" type="checkbox"/> On
CII Common Meter	<input checked="" type="checkbox"/> On
Other Meter	<input checked="" type="checkbox"/> On
Subtotal	

Single-Family	0	0	0	0	0	0	-3	-7	-10	-13	-17
Multi-Family	0	0	0	0	0	0	-1	-1	-2	-3	-3
CII Irrigation Meter	0	0	0	0	0	0	-1	-1	-2	-2	-3
CII Common Meter											
Other Meter											
Subtotal	0	0	0	0	0	0	-5	-9	-14	-18	-23

Conservation Programs

Single-Family	<input checked="" type="checkbox"/> On
Multi-Family	<input checked="" type="checkbox"/> On
CII Irrigation Meter	<input checked="" type="checkbox"/> On
CII Common Meter	<input checked="" type="checkbox"/> On
Temporary/Misc Meter	<input checked="" type="checkbox"/> On
Subtotal	

Single-Family	0	-125	-126	-126	-126	-126	-126	-126	-126	-126	-126
Multi-Family	0	-10	-19	-27	-35	-43	-51	-58	-66	-73	-72
CII Irrigation Meter	0	-8	-16	-24	-33	-41	-41	-41	-41	-41	-41
CII Common Meter	0	-3	-5	-6	-6	-7	-7	-6	-6	-6	-6
Temporary/Misc Meter	0	0	0	0	0	0	0	0	0	0	0
Subtotal	0	-145	-167	-183	-200	-217	-224	-231	-239	-246	-244

Price Response

Single-Family	<input checked="" type="checkbox"/> On
Multi-Family	<input checked="" type="checkbox"/> On
CII Irrigation Meter	<input checked="" type="checkbox"/> On
CII Common Meter	<input checked="" type="checkbox"/> On
Temporary/Misc Meter	<input checked="" type="checkbox"/> On
Subtotal	

Single-Family	0	-25	-50	-74	-99	-124	-142	-161	-179	-198	-216
Multi-Family	0	-3	-5	-8	-11	-13	-15	-17	-19	-21	-23
CII Irrigation Meter	0	-5	-10	-15	-19	-24	-28	-31	-35	-39	-42
CII Common Meter	0	-4	-9	-13	-18	-22	-25	-28	-32	-35	-38
Temporary/Misc Meter	0	0	0	0	0	0	0	0	0	0	0
Subtotal	0	-37	-74	-110	-146	-183	-210	-238	-265	-292	-320

Non-Revenue Water

Unbilled Authorized	<input checked="" type="checkbox"/> On
Apparent Losses	<input checked="" type="checkbox"/> On
Real Losses	<input checked="" type="checkbox"/> On
Subtotal	

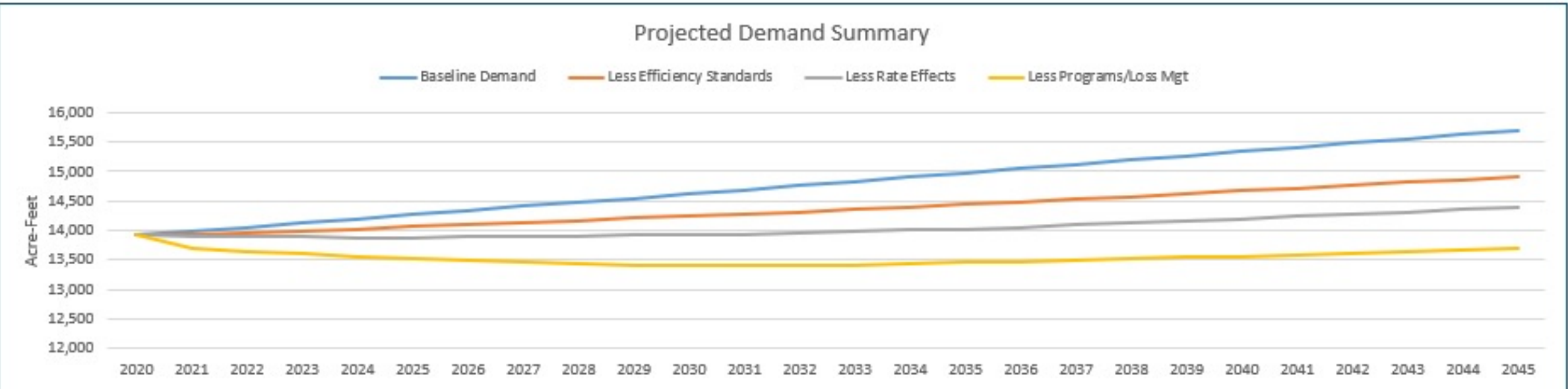
Unbilled Authorized											
Apparent Losses											
Real Losses	0	-66	-84	-104	-125	-147	-170	-195	-221	-248	-276
Subtotal	0	-66	-84	-104	-125	-147	-170	-195	-221	-248	-276

AND ADJUSTED DEMAND PROJECTION

Demand Projection

This worksheet holds the baseline and adjusted demand projection. The baseline projection equals the baseline demand per service entered on the "Enter Base Year Demand" worksheet multiplied by the projected number of services from the "Enter Service Area Data" worksheet. The adjusted projection is the baseline projection less savings from plumbing codes, ordinances, conservation programs, water rates, and water loss management. The adjustments are summarized in the tables below the charts. The user can choose which adjustments to apply by checking/unchecking the "On" checkboxes. The user also can edit the baseline projection by checking the "Edit forecast" checkboxes. The model's default projection is restored by unchecking these boxes. Use the drop-down list embedded in the top left chart to select which demand projection to view. Use the up/down spinner button embedded in the bottom left chart to show the distribution of sales and non-revenue water for a particular forecast year.

Sheet ID: Sheet23



NEXT STEP: CALCULATE WATER USE OBJECTIVE

- Residential Indoor Standard
- Residential Outdoor Standard
 - Landscape Area
 - ETF Factor
 - Irrigated, not irrigated buffer %
- Dedicated Irrigation Meter (DIM) Standard
 - Regular & Special Landscape Area
 - Regular & Special Landscape ETF Factors
- Real Water Loss Standard
- Bonus Incentive & Variances

RESIDENTIAL INDOOR STANDARD

Select Compliance Year

Compliance Year

2030

Standard depends on compliance year selected

Select a year for the comparison of projected water use with the water use objective. It can be any year in the forecast period.

Residential Indoor Objective

Per Capita Standard	42.0	gallons/person/day
x		
Residential Population	59,936	
x		
Days/Year	365	
/		
Gallons/AF	325,851	
=		
Residential Indoor Standard	2,820	AF

Enter the residential indoor water use standard in gallons/person/day (gpcd) [or liters/person/day if using metric units].

The state has adopted the following standards: 55 gpcd until 2025; 52.5 gpcd from 2025-2029; 50 gpcd from 2030 onward. Currently (May 2021), there are proposals to revise these standards. Friedman has introduced legislation (AB 1434) that would reduce the standards to: 55 gpcd until 2023; 48 gpcd from 2023 to 2025; 44 gpcd from 2025-2029; 40 gpcd from 2030 onward. A draft recommendation by the Department of Water Resources (DWR) and State Water Board (SWB) proposes: 55 gpcd until 2025; 47 gpcd from 2025-2029; and 42 gpcd from 2030 onward.

RESIDENTIAL OUTDOOR STANDARD

Residential Outdoor Objective

	Irrigable, Not		
	Irrigated	Irrigated	Total
Regular Landscape Area	3,000 acres	1,000 acres	4,000 acres
x			
% Area Subject to Standard	100%	20%	80%
=			
Subject to Standard	3,200 acres		
<hr/>			
ETo - [Rainfall x % Effective]	ETo	Rainfall	Effective
	39.0 in/yr	15.0 in/yr	25%
=			
Net ETo	35.3 in/yr		
<hr/>			
Landscape Area Subject to Standard	Regular	Special	Recycled
	3,200 acres	0 acres	0 acres
x			
Net ETo	35.3 in/yr	35.3 in/yr	35.3 in/yr
x			
Outdoor Standard (Net ET Factor)	65%	100%	100%
x			
Unit Conversion	0.083333	0.083333	0.083333
=			
Residential Outdoor Budget	6,110 AF	0 AF	0 AF

The residential outdoor standard is currently (summer 2021) underdevelopment. The calculator is based on an approach being considered by DWR. Under this approach, the standard would be based on 100% of irrigated residential landscape area plus a percentage of irrigable but not irrigated landscape area, as classified by DWR's Landscape Area Measurement (LAM) study. The exact percentage has not been determined, but DWR has recommended 20%. The user can vary the percentage of landscape area subject to the standard to determine what effect this would have on the outdoor objective.

The landscape area subject to the standard is multiplied by net ETo. This is the amount of irrigation water needed by cool season turf grass after accounting for effective precipitation. The user can vary the percentage of annual rainfall assumed to be effective. The state's Model Efficient Water Landscape Ordinance (MWELO) assumes 25% of precipitation is effective. For purposes of the standard, DWR is recommending setting effective precipitation to an amount determined by a DWR model for the supplier's service area or 25% of total precipitation, whichever is less.

The amount of irrigation water needed for cool season turf grass is multiplied by the outdoor standard, which is expressed as a percentage of net ETo. The standard for regular landscape area has not been set yet (summer 2021), but it is likely to fall within the range of 50 - 80%. The user can vary the standard to determine what effect this would have on the outdoor objective. DWR is recommending setting the standard for special

DIM STANDARD

Irrigation Meter Objective

	Irrigable, Not		
	Irrigated	Irrigated	Total
Regular Landscape Area	400 acres	0 acres	400 acres
x			
% Area Subject to Standard	100%	0%	100%
=			
Area Subject to Standard	400 acres		
<hr/>			
	Irrigable, Not		
	Irrigated	Irrigated	Total
Special Landscape Area	50 acres	0 acres	50 acres
x			
% Area Subject to Standard	100%	0%	100%
=			
Area Subject to Standard	50 acres		
<hr/>			
	Regular	Special	Recycled
Landscape Area Subject to Standard	400 acres	50 acres	0 acres
x			
Net ETo	35.3 in/yr	35.3 in/yr	35.3 in/yr
x			
Landscape Standard (Net ET Factor)	65%	100%	100%
x			
Unit Conversion	0.083333	0.083333	0.083333
=			
Dedicated Irrigation Meter Budget	764 AF	147 AF	0 AF

The efficiency standard for dedicated irrigation meters is currently (May 2021) underdevelopment. The calculator is based on an approach being considered by DWR. Under this approach, the standard would be based on 100% of irrigated residential landscape area plus a percentage of irrigable but not irrigated landscape area. The exact percentage has not been determined, but DWR has suggested 20%. The user can vary the percentage of landscape area subject to the standard to determine what effect this would have on the outdoor objective.

The landscape area subject to the standard is multiplied by net ETo. This is the amount of irrigation water needed by cool season turf grass after accounting for effective precipitation. The user can vary the percentage of annual rainfall assumed to be effective. The state's Model Efficient Water Landscape Ordinance (MWELo) assumes 25% of precipitation is effective. For purposes of the standard, DWR is considering setting the maximum effective precipitation to 25%.

The amount of irrigation water needed for cool season turf grass is multiplied by the outdoor standard, which is expressed as a percentage of net ETo. MWELo divides landscape served by dedicated meters between regular landscape and special landscape, which includes landscape dedicated solely to edible plants, recreation areas, areas irrigated with recycled water, or water features using recycled water. The calculator separates landscape area irrigated with recycled water from other special landscape area so that the user can enter separate standards for these two water uses if desired.

The landscape standard has not yet been set (summer 2021). For regular

REAL WATER LOSS STANDARD

Real Water Loss Objective

Water Loss Standard	25	gallons/connection/day	
x			
Total Connections	17,576		Active connections from baseline projection
x			
Ratio of Total to Active Connections	1.05		Scaled to include inactive connections
x			
Days/Year	365		
/			
Gallons/AF	325,851		
=			
Real Water Loss Budget	517	AF	

SWB has released draft real water loss standards for retail urban water suppliers subject to SB 555. The standard is expressed in gallons/connection/day [or liters/connection/day if using metric units]. The standard applies to the total of active and inactive service connections. The calculator uses projected connections from the demand projection. These are assumed to be active connections. The user can enter the ratio of total (active + inactive) to active connections to calculate their real water loss objective.

VARIANCES & BONUS INCENTIVES

Variances

Approved or Expected AF

Potable Reuse Credits

	Existing Projects	New Projects	
Prior Year Potable Reuse	<input type="text" value="200"/> AF	<input type="text" value="0"/> AF	
Maximum Possible Credit	<input type="text" value="1,554"/> AF	<input type="text" value="1,036"/> AF	
% Use Subject to Efficiency Standards	<input type="text" value="86%"/>	<input type="text" value="86%"/>	Maximum of Existing and New
Credit for Potable Reuse	<input type="text" value="173"/> AF	<input type="text" value="0"/> AF	<input type="text" value="173"/> AF

Bonus incentive only gets applied to water uses subject to the standards

OVER/UNDER OBJECTIVE SUMMARY

Projected vs Objective Water Use

<u>Water Use in 2030</u>	<u>Projected</u>	<u>Objective</u>	<u>Difference</u>
Residential	9,966 AF	8,930 AF	1,036 AF
+			
Irrigation Meters	954 AF	911 AF	43 AF
+			
Real Water Losses	651 AF	517 AF	134 AF
+			
Variances		0 AF	0 AF
+			
Credits		173 AF	-173 AF
=			
Total	11,571 AF	10,530 AF	1,041 AF
Over/Under Objective			OVER OBJECTIVE
% Over/Under Objective			10%

This panel compares projected residential, irrigation meter, and distribution real losses water use to objective water use plus variances and credits. Projected water use volumes come from the demand projection and incorporate the adjustments to future demands the user has included for plumbing fixture standards, new landscape standards, conservation programs, price response, and real water loss management.

Over/Under Objective = volume by which projected water use is over or under objective water use plus variances and credits.

% Over/Under Objective = % by which projected water use is over or under objective water use plus variances and credits.

Regulatory compliance depends on meeting the total objective, not the individual components. An exception is Real Water Losses, which are separately governed by SB 555. The State Water Board has indicated that it would be unlikely to take enforcement action against suppliers not meeting their Real Water Losses standard provided they were meeting their overall objective.

RINSE AND REPEAT

- If under objective, user can:
 - Put feet up
 - Crack open a beer
 - Laugh diabolically
- If over objective, user can:
 - Adjust implementation levels of planned conservation/water loss programs
 - Add new programs
- Tracking tool will re-calculate:
 - Expected savings
 - Costs & benefits
 - Over/Under summary

Questions?

Peer to Peer 2022

Peer to Peer 2022 will be held June 1-2, 2022, in Sacramento, CA. This event will bring together water conservation professionals from across the state to connect, collaborate, and grow.



Member Pricing

In-person attendance: \$250

Limited remote participation: \$50

Non-Member Pricing

In-person attendance: \$450

Limited remote participation: \$100



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