Drought Workshop for Tribal Drinking Water Systems

Spring RTOC Meeting

May 14, 2015

Welcome and Agenda Review

Workshop Overview

- Introduction to drought contingency planning
- Presentations by Tribes that have made successful institutional changes for effective short- and long-term drought mitigation
- Training in drought mitigation measures such as water auditing and water loss control, ordinances, effective public outreach for water use efficiency, and water reuse including graywater systems
- Discussion of technical and financial resources available to mitigate the current drought and prepare for future droughts

Drought Overview, Water Supply Planning, Kick-Off Planning Activity, and Water Loss Control Through Water Auditing

Eric Byous, USEPA Region 9

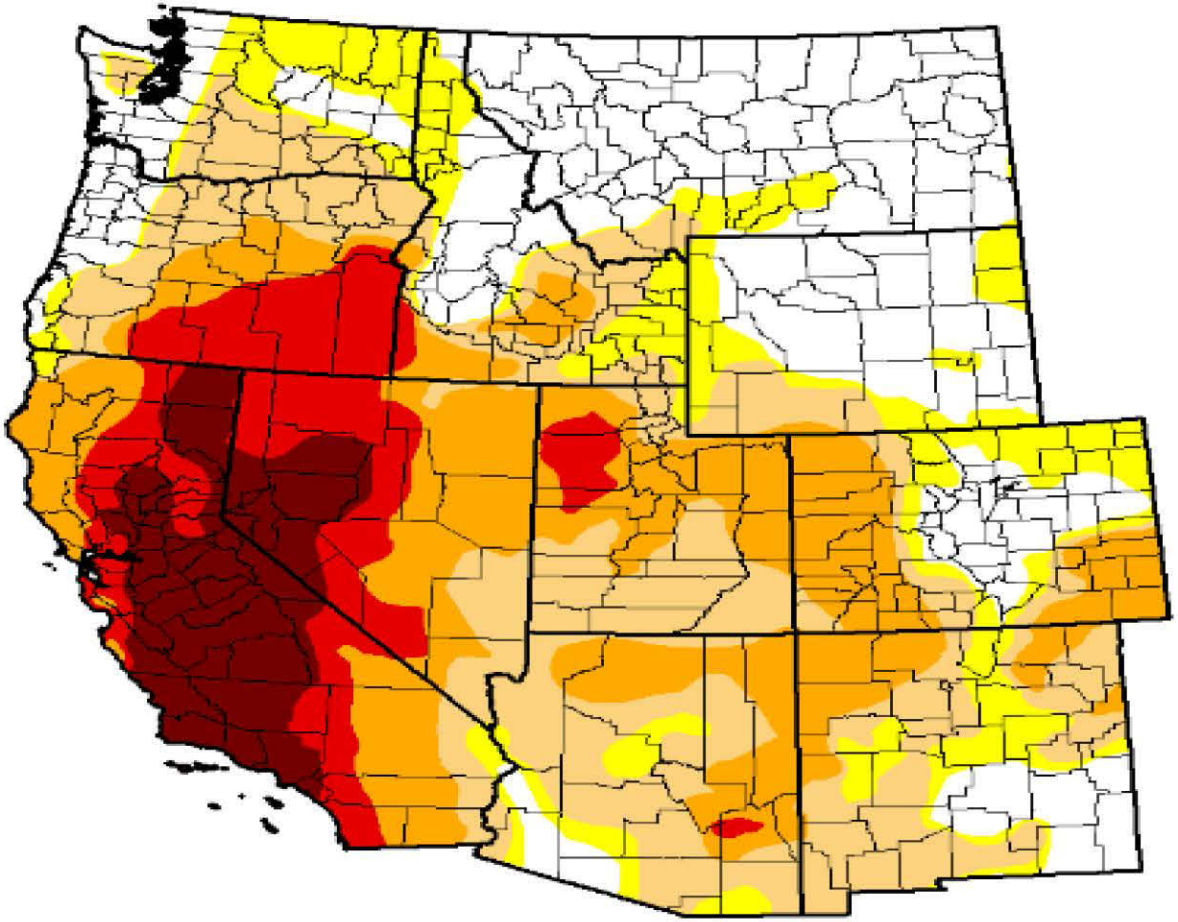
RTOC – Spring Meeting

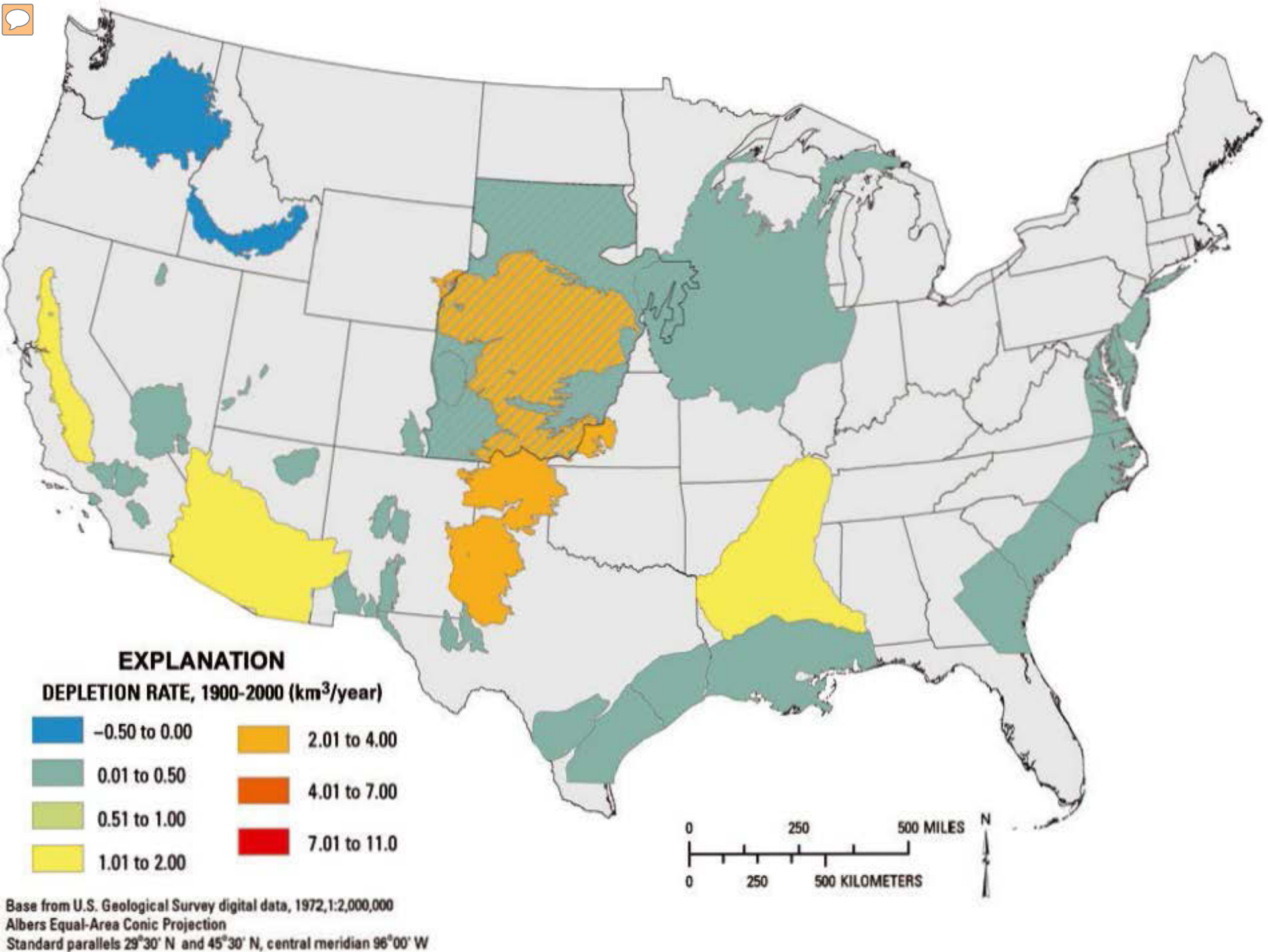
May 14, 2015

Drought Workshop for Tribal Drinking Water Systems

U.S. Drought Monitor

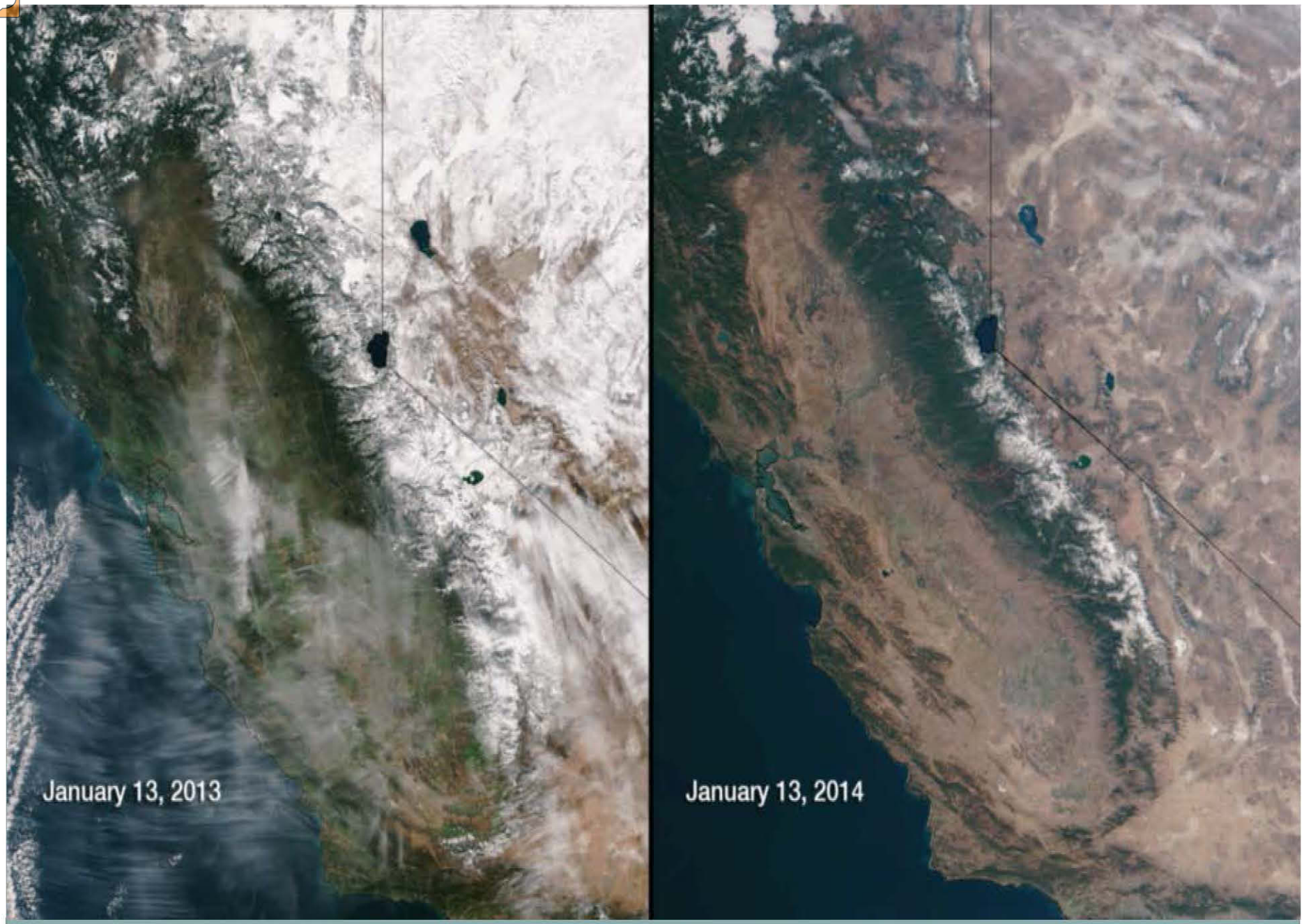
West





Base from U.S. Geological Survey digital data, 1972,1:2,000,000
Albers Equal-Area Conic Projection
Standard parallels 29°30' N and 45°30' N, central meridian 96°00' W

Subsidence and Lost Storage


January 13, 2013
January 13, 2014

“And it never failed that during the dry years the people forgot about the rich years, and during the wet years they lost all memory of the dry years. It was always that way.”

John Steinbeck

“Megadrought” ?

So….what now?

“You never want a serious crisis to go to waste… a crisis provides an opportunity to do things you couldn’t do before.”

Rahm Emanuel, Mayor of Chicago

We Need Effective Management

A Few Critical Questions

- What is your current cost of water production?
  - How much of that cost is subsidized by the overall Tribal budget?
  - If subsidization does occur, what other critical programs are not being funded?

- Do you know how long your supply will last?
  - Do you know the sustainable yield of your ground water sources?

    -At minimum, do you track ground water elevation over time?

A Few Critical Questions

- Do you know your water rights? Are they defendable if legal challenges arise?
- How much does the water from your next available supply (marginal supply) cost? Is it accessible?
- Have you maximized water efficiency opportunities?
- How much do water efficiency projects cost compared to your marginal supply?
- Is your utility or leadership considering supply-related ordinances?

Water Efficiency

- Drought can be a driver for long-term water efficiency improvements
- Water efficiency should be a key component of drought planning
- Nearly always the most cost effective way – by far – to expand water supplies
- Saves money by reducing
  - water system treatment and pumping costs
  - flows to wastewater systems

Water Loss Control

First, let's keep what you produce!

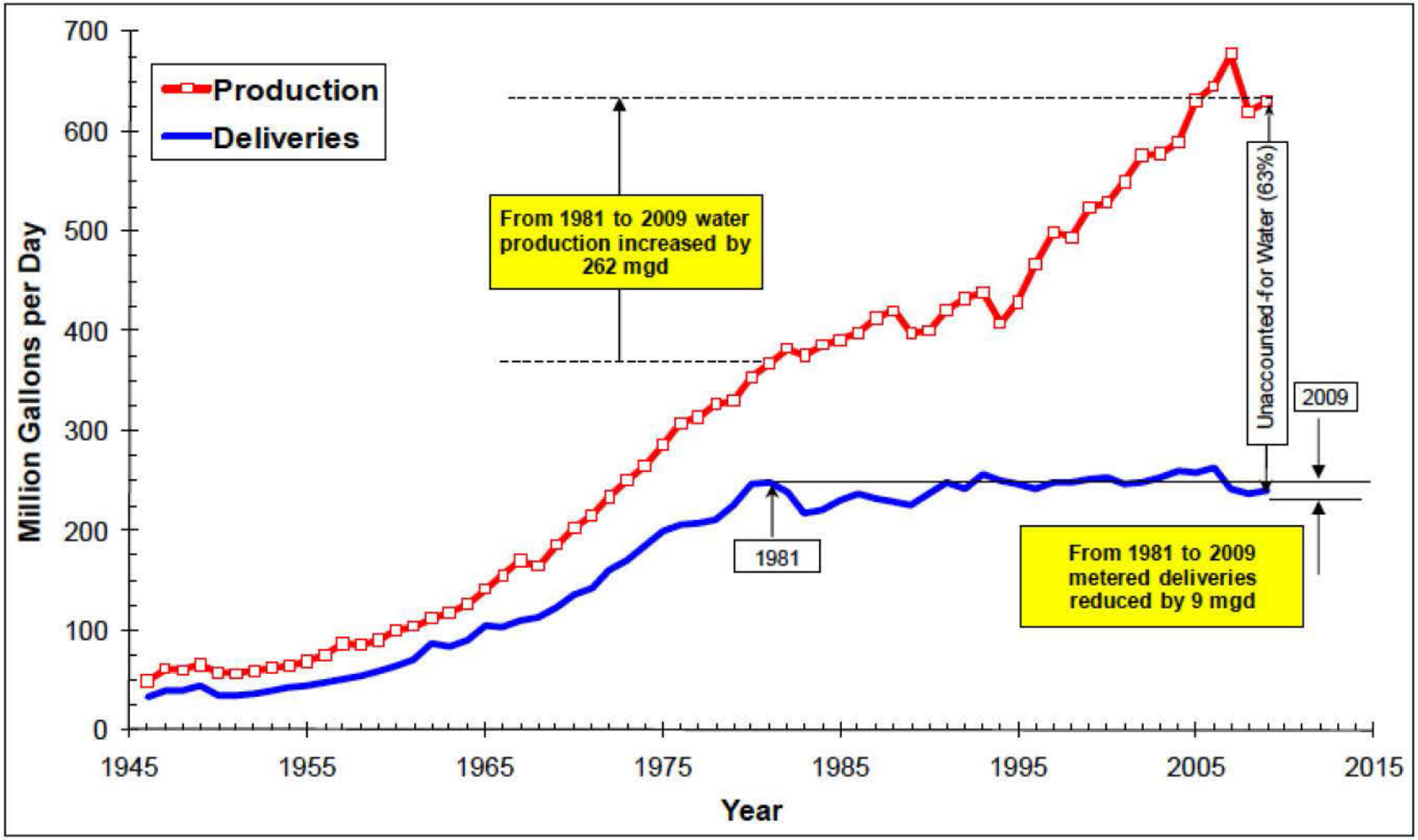
<u>More Questions</u>:

How much of the water that your system produces and/or purchases is delivered to an end user?

How much is it costing you to not know that information?


NEW SOURCES OF WATER
1. NEW DAMS
2. RIVER SHARING
3. RAIN-WATER HARVESTING
4. DESALINISATION
5. ICE-BERGS
JUST PLUG THE LEAKS!!

What Can Happen ???



Source: PRASA.

Water Loss Control Program

Determine Water Loss Volumes

- AWWA Water Audit
- Quantify Apparent & Real Loss Volumes

Distinguish Types of Leakage

- Breakdown Types of Leakage
- Sources of Apparent Loss

Evaluate Economics

- Costs of Losses
- Costs of Intervention Strategy

Implement Interventions

- Leak Detection/ DMAs
- Repair Time Improvement
- Pressure Management
- Metering
- Cost Effective!

Water Losses: Defined

APPARENT LOSSES

- Meter Under-registration
- Unauthorized Consumption
- Data Handling
- Reducing Apparent Losses increases revenue (but does not recover volume)

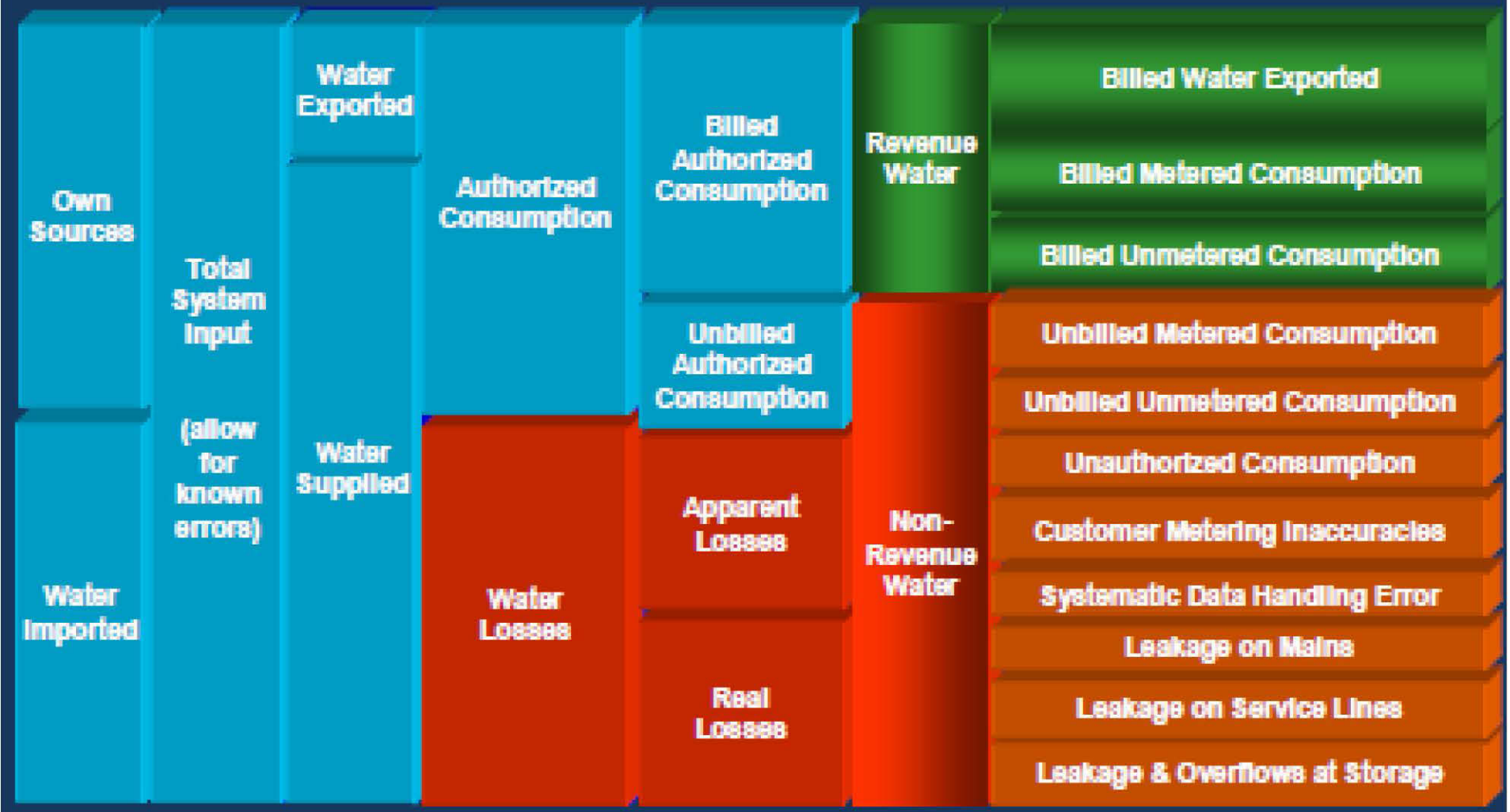
REAL LOSSES

- Physical Losses
- Range in flow rate & volume lost
- Reducing Real Losses recovers volume

NON-REVENUE WATER

* Also includes unbilled consumption

AWWA-Water Auditing & Loss Control Methodology



Water Loss Control – First Steps

- Complete AWWA Free Water Audit Software
  - Statewide training is slated to begin in June/July

- Metering! - You Can't Manage What You Don't Measure
  - Get confidence in your supply volumes

    -Is your source supply metered?

    -How often are your meters calibrated?

  - How do you measure how much water is delivered per connection?

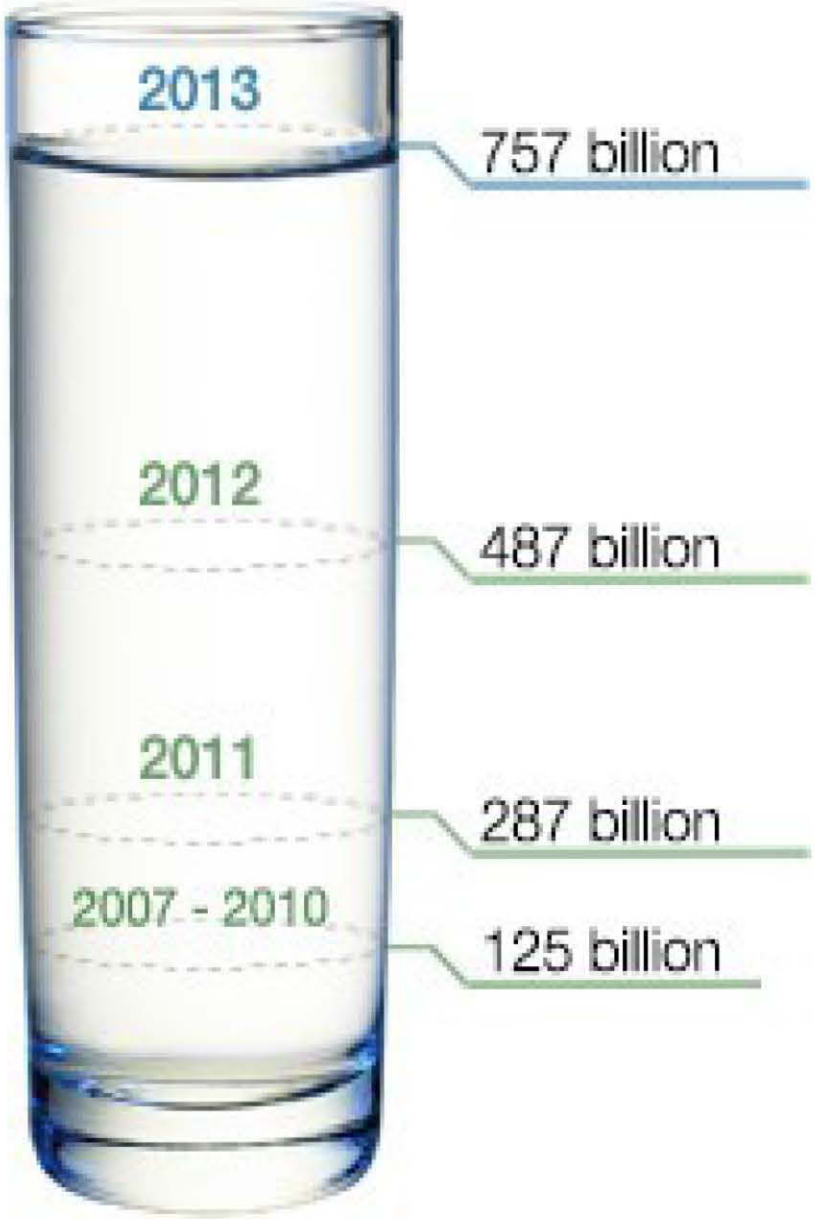
  - This information will help determine how much water is produced that is not delivered as intended

WaterSense®
HAS HELPED SAVE

757 BILLION

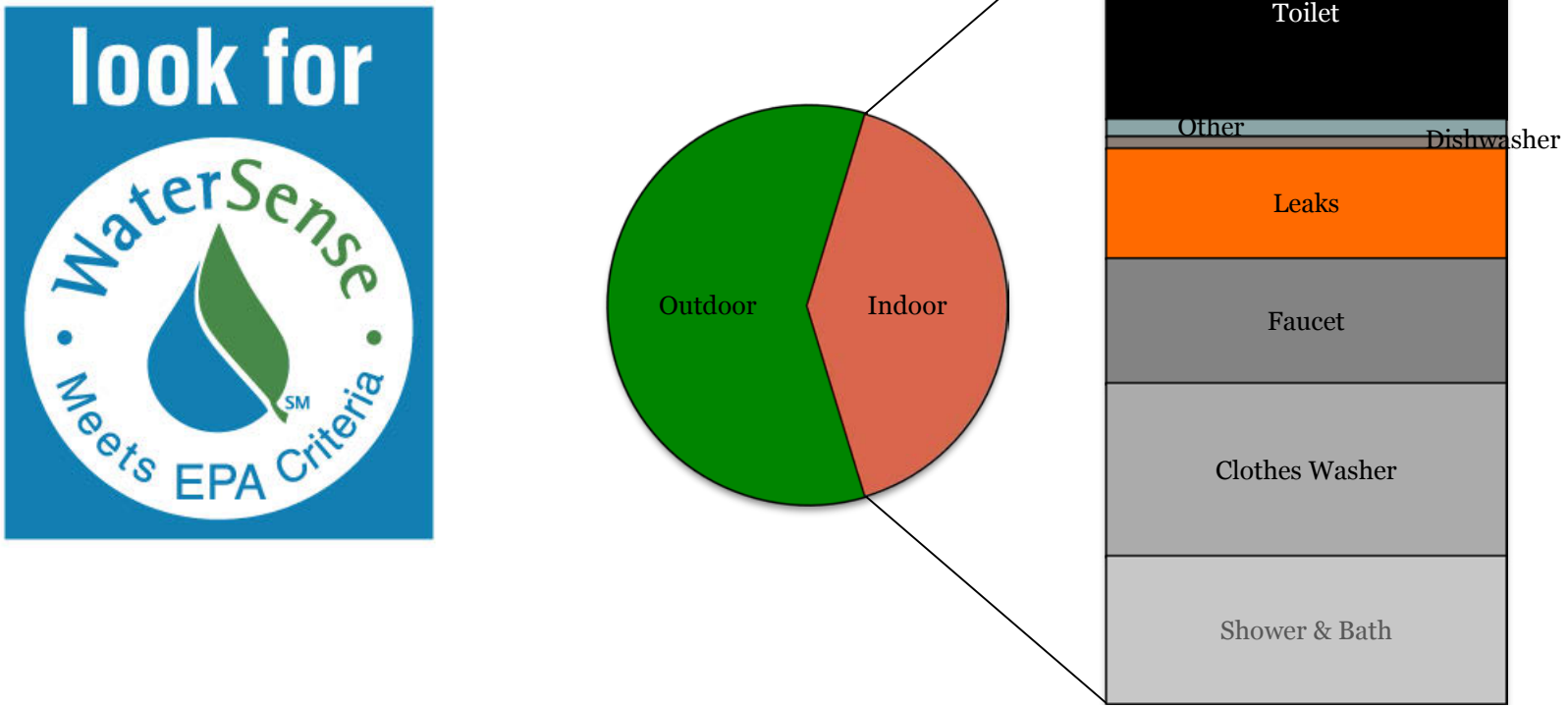
GALLONS OF WATER

$14.2 BILLION
ON UTILITY BILLS
SINCE 2006



WaterSense

- Replace low efficiency fixtures with WaterSense certified toilets, faucets, and showerheads
  - Also ENERGY STAR certified washing machines and dishwashers



WaterSense

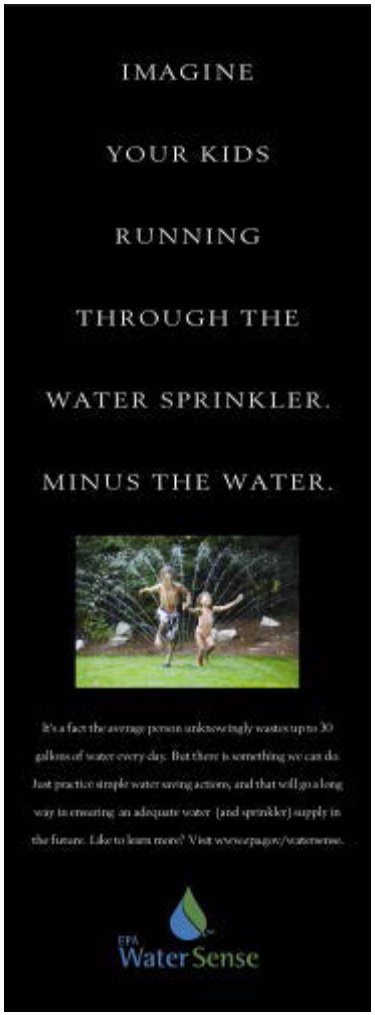
- Set Ordinances to Build WaterSense Labeled New Homes or Retrofit Existing Homes
  - Compared to a typical home, a WaterSense labeled new home can save a family of four 50,000 gallons of water a year or more. That's enough to wash 2,000 loads of laundry and could amount to utility bill savings of up to $600 each year.
  - Combine with outdoor restrictions/turf removal?

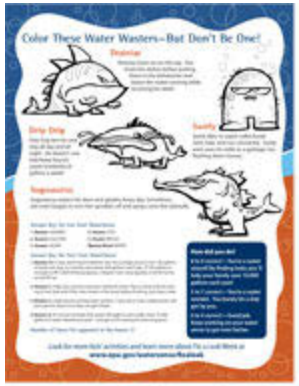
WaterSense

- Become a WaterSense Partner to gain access to Ready-to-Go Outreach materials, have membership in a national network, and be nationally recognized as a leader in water efficiency.

EPA WaterSense PARTNER

Sample Partner Resources





WaterSense

Joining WaterSense is easy!

Review the eligibility information:
www.epa.gov/watersense/partners/eligible.html#promotional

Review the *WaterSense Program Guidelines*:
www.epa.gov/watersense/docs/programguidelines.pdf

Complete and sign the online partnership agreement:
www.epa.gov/watersense/partners/join.html

Climate Ready Tools & Resources

What Can You Do In CREAT?

Build Awareness

- Explore local climate data
- View links to publications, models and other tools

Assess Risk

- Catalog data and assumptions
- Understand and assess climate impacts

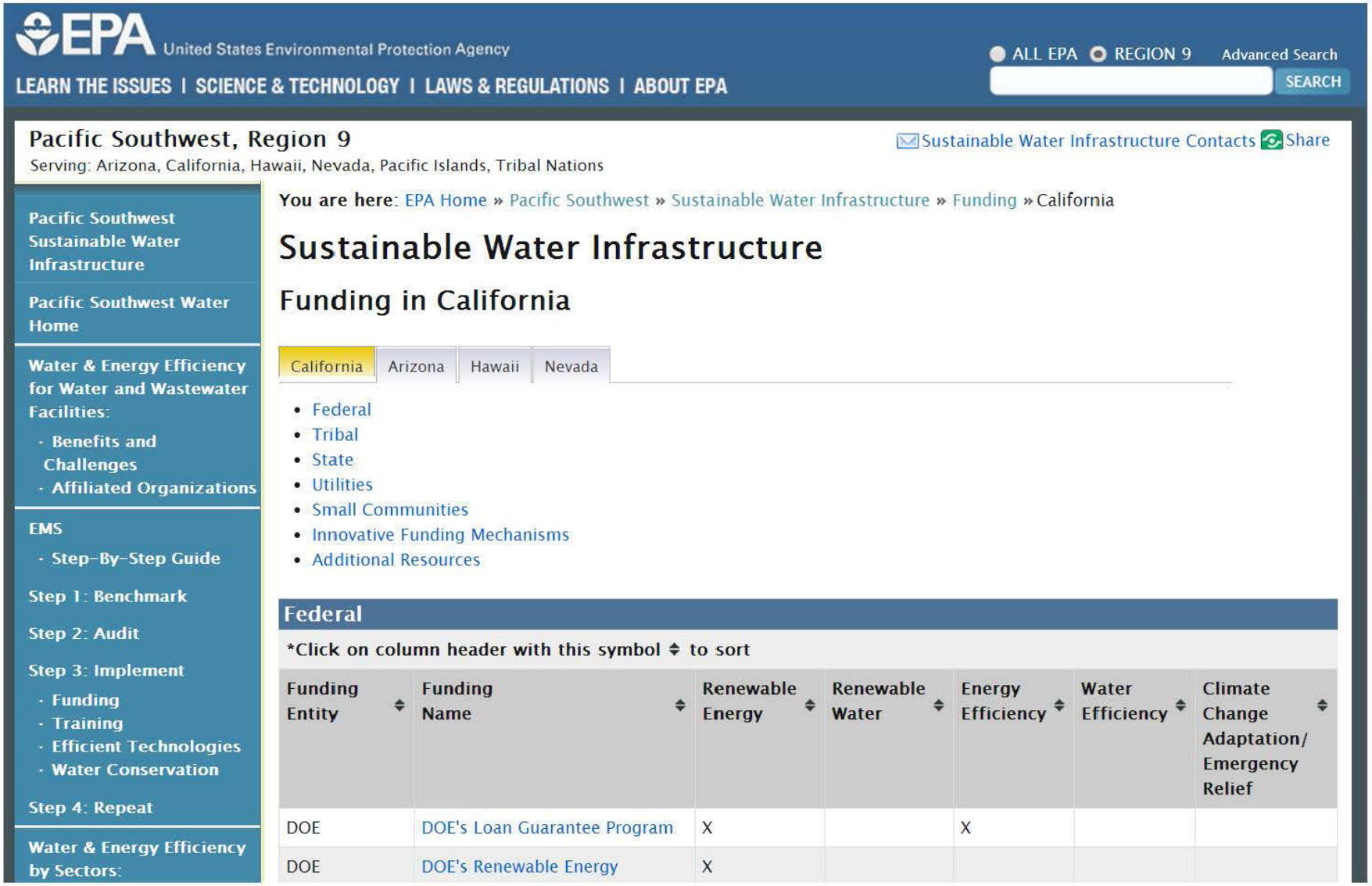
Plan Adaptation

- Compare adaptation options
- Generate reports to support decisions

Funding Resources

- The Sustainable Water Infrastructure funding page
  - http://www.epa.gov/region9/waterinfrastructure/funding.html
  - Lists federal, state, and utility grants and loans for the following project types:
    - Renewable energy, renewable water, energy efficiency, water efficiency and climate change adaptation/emergency response
- CA: State/Federal Funding Matrix (Updated 5/1/15)
  - Also Integrated Regional Water Mngmt Planning

www.epa.gov/region9/waterinfrastructure/funding.html



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Pacific Southwest, Region 9

Serving: Arizona, California, Hawaii, Nevada, Pacific Islands, Tribal Nations

Sustainable Water Infrastructure Contacts Share

- Pacific Southwest Sustainable Water Infrastructure
- Pacific Southwest Water Home
- Water & Energy Efficiency for Water and Wastewater Facilities:
  - Benefits and Challenges
  - Affiliated Organizations
- EMS
  - Step-By-Step Guide
- Step 1: Benchmark
- Step 2: Audit
- Step 3: Implement
  - Funding
  - Training
  - Efficient Technologies
  - Water Conservation
- Step 4: Repeat
- Water & Energy Efficiency by Sectors:

You are here: EPA Home » Pacific Southwest » Sustainable Water Infrastructure » Funding » California

Sustainable Water Infrastructure

Funding in California

California | Arizona | Hawaii | Nevada

- Federal
- Tribal
- State
- Utilities
- Small Communities
- Innovative Funding Mechanisms
- Additional Resources

Federal

*Click on column header with this symbol ⇕ to sort

Funding Entity	Funding Name	Renewable Energy	Renewable Water	Energy Efficiency	Water Efficiency	Climate Change Adaptation/ Emergency Relief
DOE	DOE's Loan Guarantee Program	X		X		
DOE	DOE's Renewable Energy	X				

Federal

*Click on column header with this symbol ⬍ to sort

Funding Entity	Funding Name	Renewable Energy	Renewable Water	Energy Efficiency	Water Efficiency	Climate Change Adaptation/ Emergency Relief
DOE	DOE's Loan Guarantee Program	X		X		
DOE	DOE's Renewable Energy Production Incentive	X				
DOE	DOE's Technical Assistance Program (TAP)	X		X		
DOE	DOE's Federal Funding for State and Local Clean Energy Programs	X		X		
EPA	Diesel Emissions Reduction Program	X				
FEMA	FEMA's Public Assistance (PA) Grant Program					X
FEMA	FEMA's Hazard Mitigation Assistance (HMA) Program					X
USBOR	USBOR's Bay-Delta Restoration Program: CALFED Grants				X	X
USBOR	USBOR's System Optimization Review Grants	X	X	X	X	
USBOR	USBOR's Water & Energy Efficiency Grants	X	X	X	X	
USBOR	USBOR's Water Reclamation and Reuse Program		X		X	

EPA Region 9 Funding Resources

- Tribal State Revolving Fund Set-Aside Programs
- Tribal General Assistance Programs
- Tribal Drought Information Packet:

http://www.epa.gov/region9/water/tribal/pdf/r9-drought-response-info-packet.pdf

Funding Opportunities

- Indian Health Service
  - Note: Assistance w/ Drought Contingency Plans
- USDA Rural Development
  - Emergency Community Water Assistance Grant
  - Water/Wastewater Program
  - Community Facilities Program
- US Bureau of Reclamation
  - WaterSMART Program
  - Emergency Drought Relief Act Reauthorization (in coordination with USDA NRCS)

Funding Opportunities

- US Department of Labor
  - National Emergency Grants
- US Housing and Urban Development
  - Community Development Block Grant Programs (Formula and Competitive)
    - Current webinar series
    - Tribal and State Opportunities

Funding Opportunities

- Center For Disease Control
  - Safe Water Funding Opportunity
- USDA Natural Resource Conservation Service
  - Emergency Watershed Protection Program

Additional Resources

- Western Drought Tribal PWS Guide:

http://www.epa.gov/region9/water/tribal/

- AWWA Free Water Audit Software:

http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx

-Upcoming CA workshops

Additional Resources

- CA Urban Water Conservation Council's Water Shortage Toolkit:

http://cuwcc.org/Resources/Drought-Resources/tool-kit

Includes Primers on:

-Model Water Shortage Contingency Plans
-Water Waste Ordinances and Enforcement
-Water Shortage Pricing
-Water Loss and Supply Alternatives
-Water Supply Fact Sheet (soon)
-Water Use Awareness
-Water School Curriculum
-Water Resources Funding

Questions and Discussion

Contact Information

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www.epa.gov/region09/waterinfrastructure

Big Pine Paiute Tribe's Planning Efforts for Water Efficiency Success

Alan Bacock, Big Pine Paiute Tribe

Big Pine Paiute Tribe's Water Story

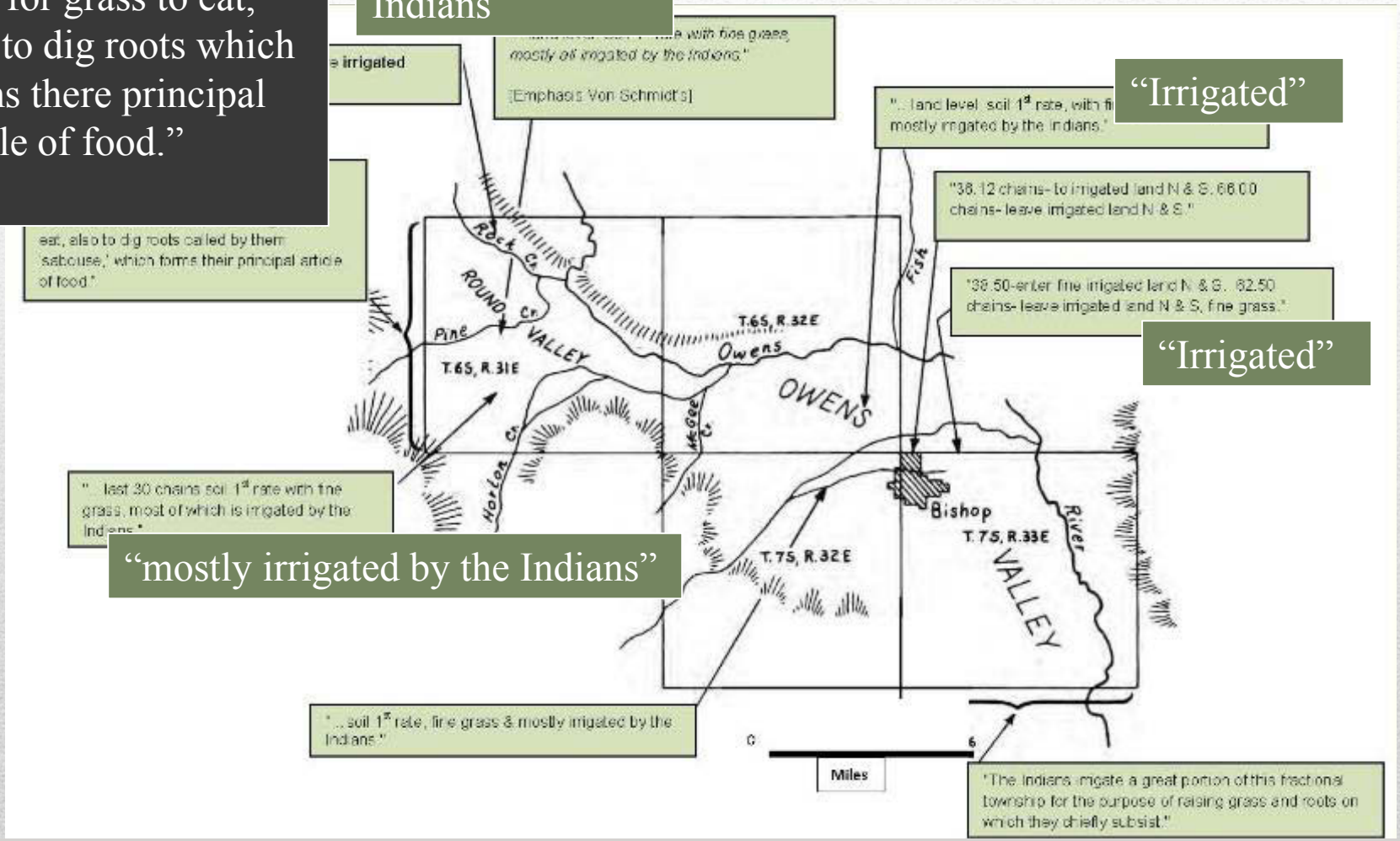
Drought Planning/Water Conservation Workshop

Alan Bacock
Water Program Coordinator
Big Pine Paiute Tribe of the Owens Valley

"I found many Indians…who live in the deep mountain ravines and come down here for grass to eat, also to dig roots which forms there principal article of food."

"The Indians irrigate a great portion of this township for the purpose of raising grass and roots on which they chiefly subsist"

"irrigated by the Indians"



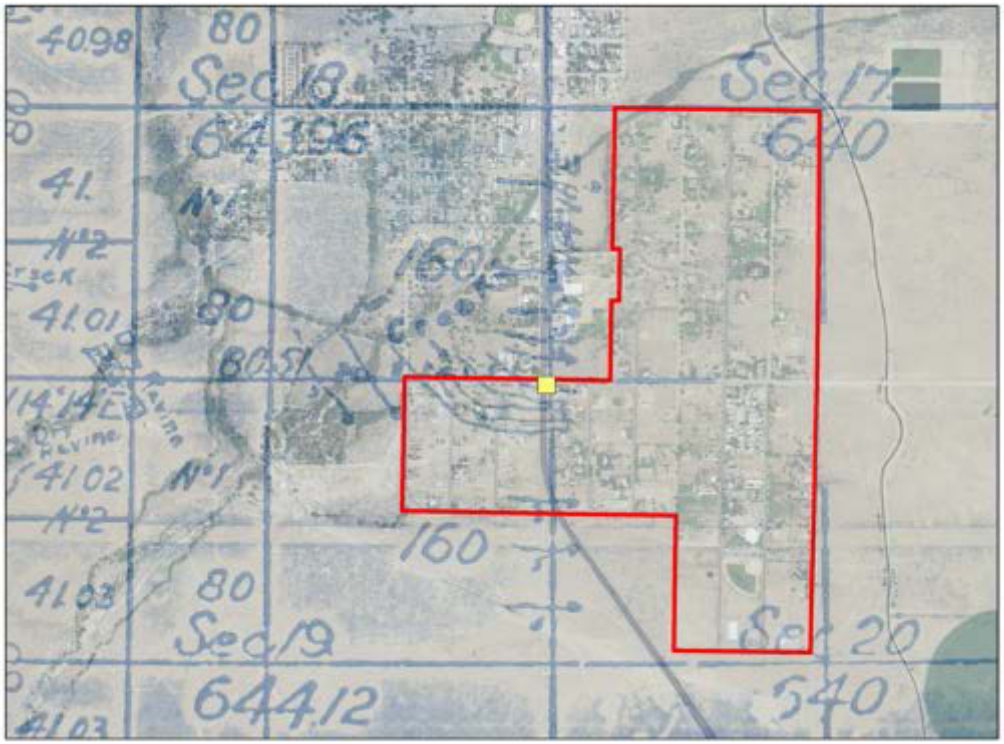
A.W. Von Schmidt 1856 – field observations during mapping and surveying contract with the U. S. Government. *(Lawton, et al., 1976)*

Owens Valley Paiute Irrigation

A.W. von Schmidt section lines

2009 aerial imagery and Reservation boundary

Below: Overlay the two images and zoom in. See the ancestral footprint.



Big Pine Indian Reservation

- Established through a land exchange agreement in 1939 between the federal government and the City of Los Angeles
- 299 acres
- 600 residents

Tribal Community Water System

- Originally installed in the 1960s by Bureau of Indian Affairs
- Currently serves 7 community facilities and 187 homes
- Consists of 1 operational well, 3 water treatment buildings, a 350,000 gallon water storage tank, 9,400 feet of distribution piping, 194 water meters and 63 fire hydrants

Tribal Wastewater System

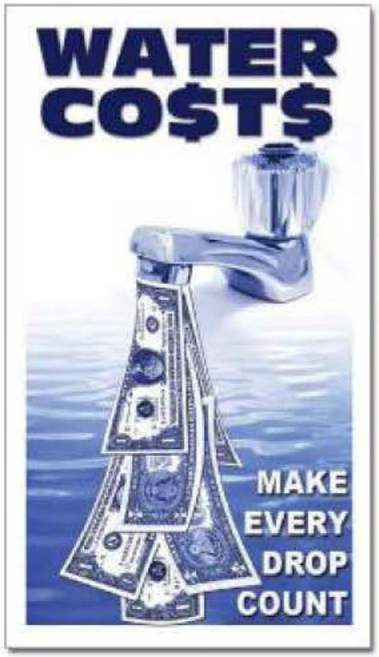
- Constructed in 1994 by Indian Health Service
- Consists of 1 lift station, 33,000 feet of main and a four cell lagoon

Water Conservation Program

- 2008: Began a water conservation program through outreach and installed water meters at community facilities
- 2009: Continued outreach and installed water meters at identified high water users
- 2010: Continued outreach and all water customers had water meters installed
- 2011: Tribal Council approved metered rate structure
- **2012: Water use dropped 68% from 2007 for the Community Water System**

One resident was monitored for water usage through a water meter for one month. It was determined that this individual used an extravagant amount of water.

In fact, in a 31 day period over the summer this individual used 805,000 gallons. An Olympic size swimming pool has a capacity of 660,000 gallons. Therefore, over the course of a month this individual used enough water to fill an Olympic size swimming pool AND seven residential swimming pools.



Last year it cost the Tribe $1.27 per 1,000 gallons produced. The cost associated to produce 1,000 gallons is including electricity, chemicals, sampling, wastewater system operation, personnel, maintenance and improvements. The water itself does not cost the Tribe any money, but there is a cost to deliver water to households.

The individual who used 805,000 gallons cost the Tribe $1,021.08 for a summer month. The individual paid the Tribe $34 a month in the summer. Who paid the rest of the $987.08 it cost to deliver water to their residence for a month?

Different Strategies for Using Irrigation Water at Your Residence

The Tribe has used various types of sprinklers to water the yard in front of the Tribal Office, Environmental Office and community area. The best sprinklers for use with the freezeless hydrants have a large passageway for the water to enter and escape. An example of this kind of sprinkler is directly below.

The Tribe has also used similar sprinklers to the ones found at the bottom of this box. These sprinklers need to be cleaned every other week to ensure that water can continue to flow through the sprinkler.

The Tribe has shown through its pool + pump + sprinkler combination that it is possible to create a high pressure system through the irrigation system. It takes a bit of work initially, but creates the ability to use the irrigation water in locations that are upgradient of the irrigation delivery device.

Using alfalfa valves continues to be a way to use irrigation water for flood irrigation. Valve covers which need a key to open are available through the Utility Operator for a nominal fee. When flood irrigating, please remember that it is your responsibility to open and close valves.

BREAK

Drought Contingency Planning, Ground Water Monitoring, Water Rights, and a Big Valley Rancheria Case Study

Lee Schegg,
Rural Community Assistance Corporation

San Pasqual Band of Mission Indians' Water Management and Drought Funding Approaches

John Flores,
San Pasqual Band of Mission Indians

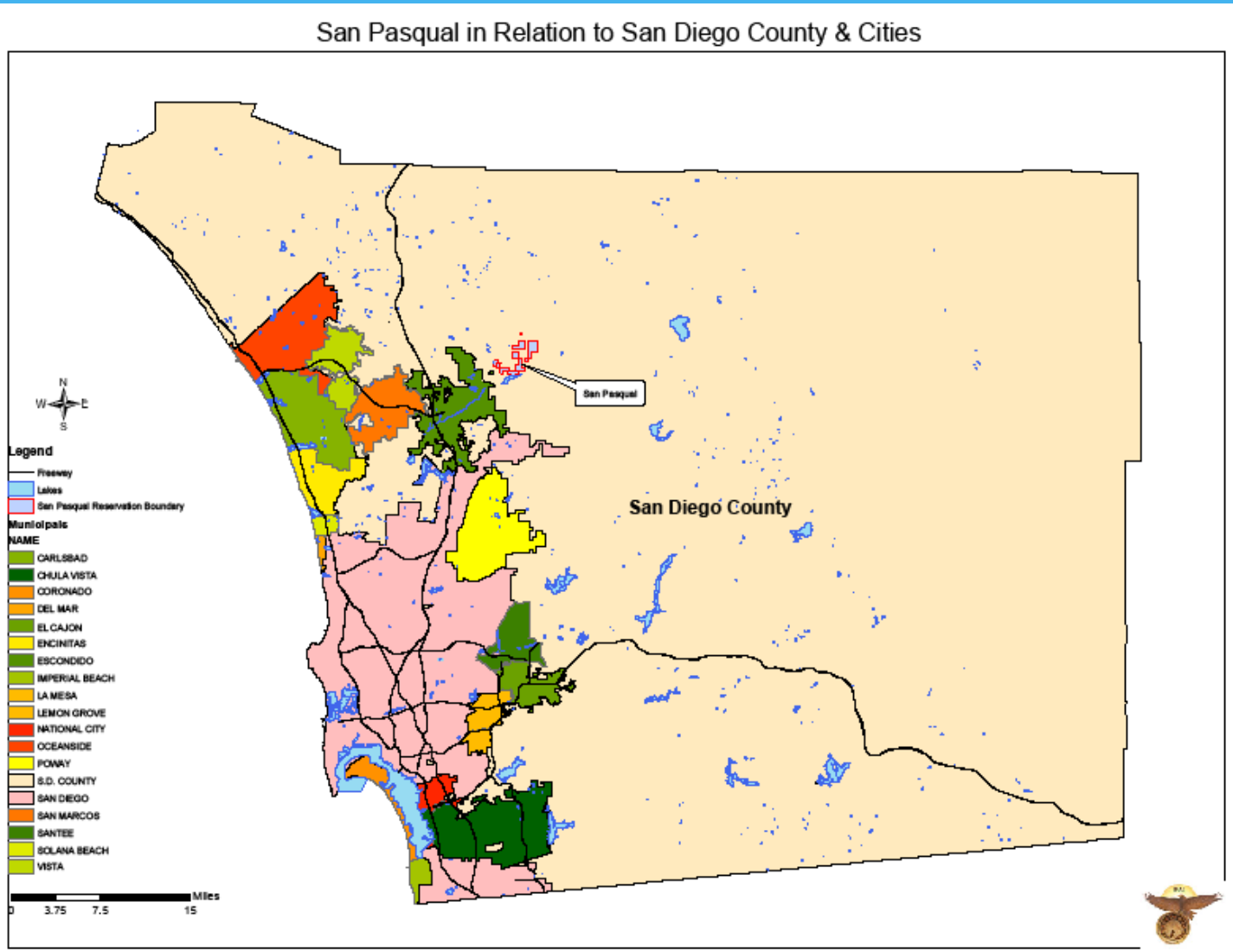
San Pasqual

RTOC May 14, 2014

San Pasqual General Information

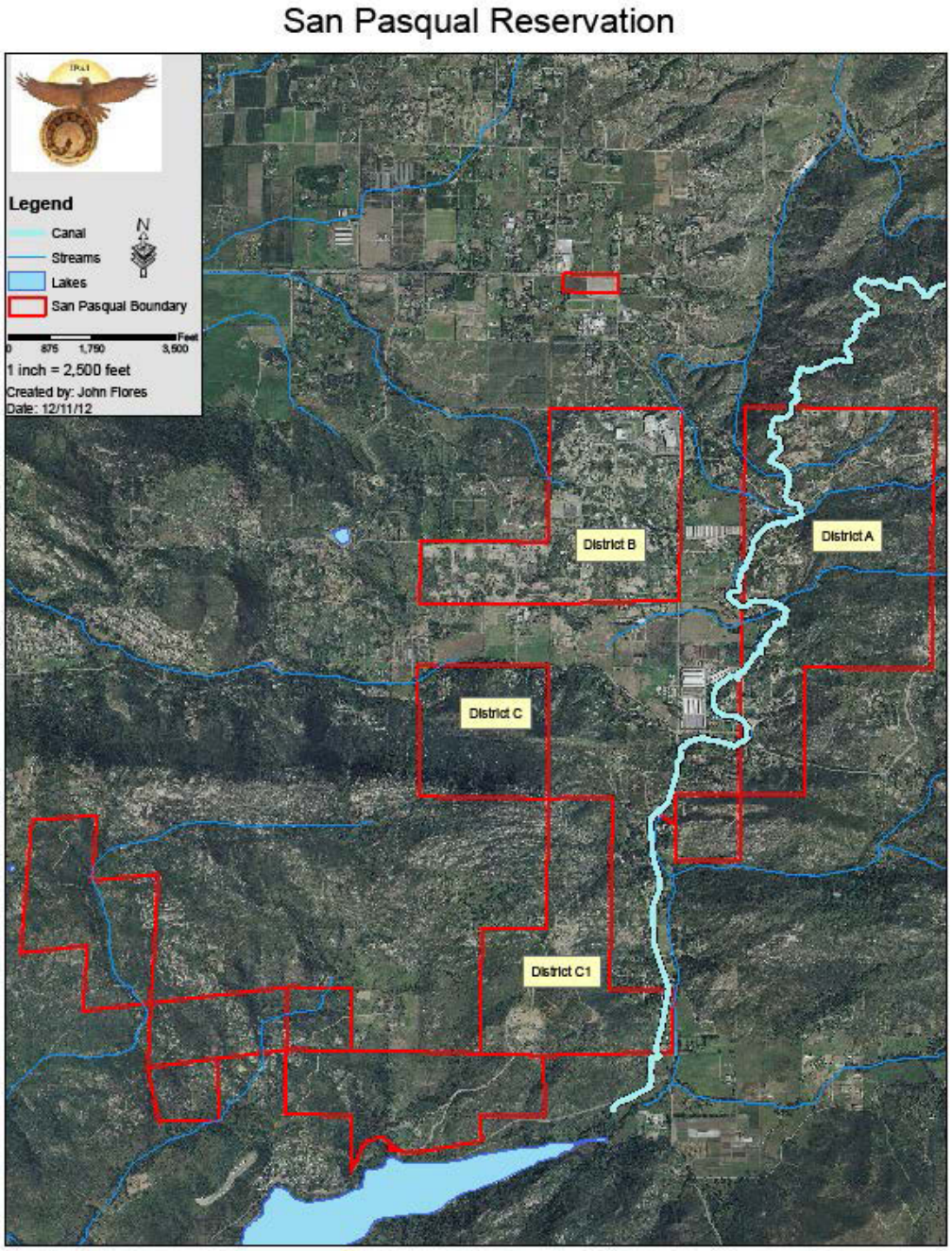
* San Pasqual Indian Reservation was established by Presidential decree in 1910.
* The San Pasqual Indian Reservation is located in northeastern San Diego County, California, near Valley Center.
* The San Pasqual Indian Reservation is two miles north of the Rincon Band of Mission Indians, and is nearby several other Indian Reservations including Pauma, Pala, La Jolla, Santa Ysabel, Mesa Grande, Los Coyotes, and Pechanga among others.

San Pasqual Reservation in San Diego



San Pasqual Land and Acreage

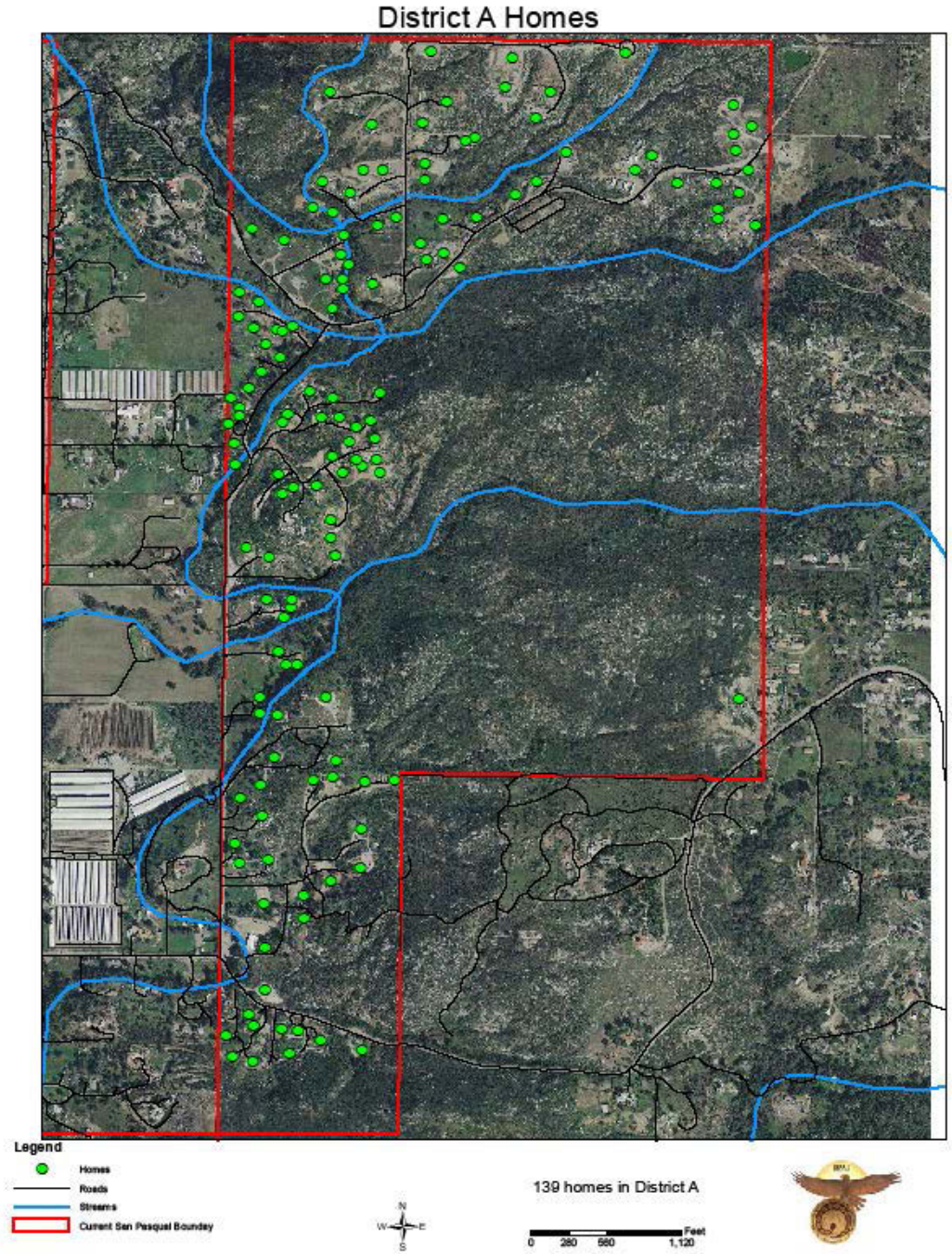
* The Reservation encompasses approximately 2,656 acres
* Approximately 2,100 acres of trust land and 556 of fee land
* San Pasqual is considered a “checkerboard” Reservation, as it does not occupy one contiguous land mass.
* The San Pasqual Reservation is divided into three non-continuous districts: A, B, and District C.



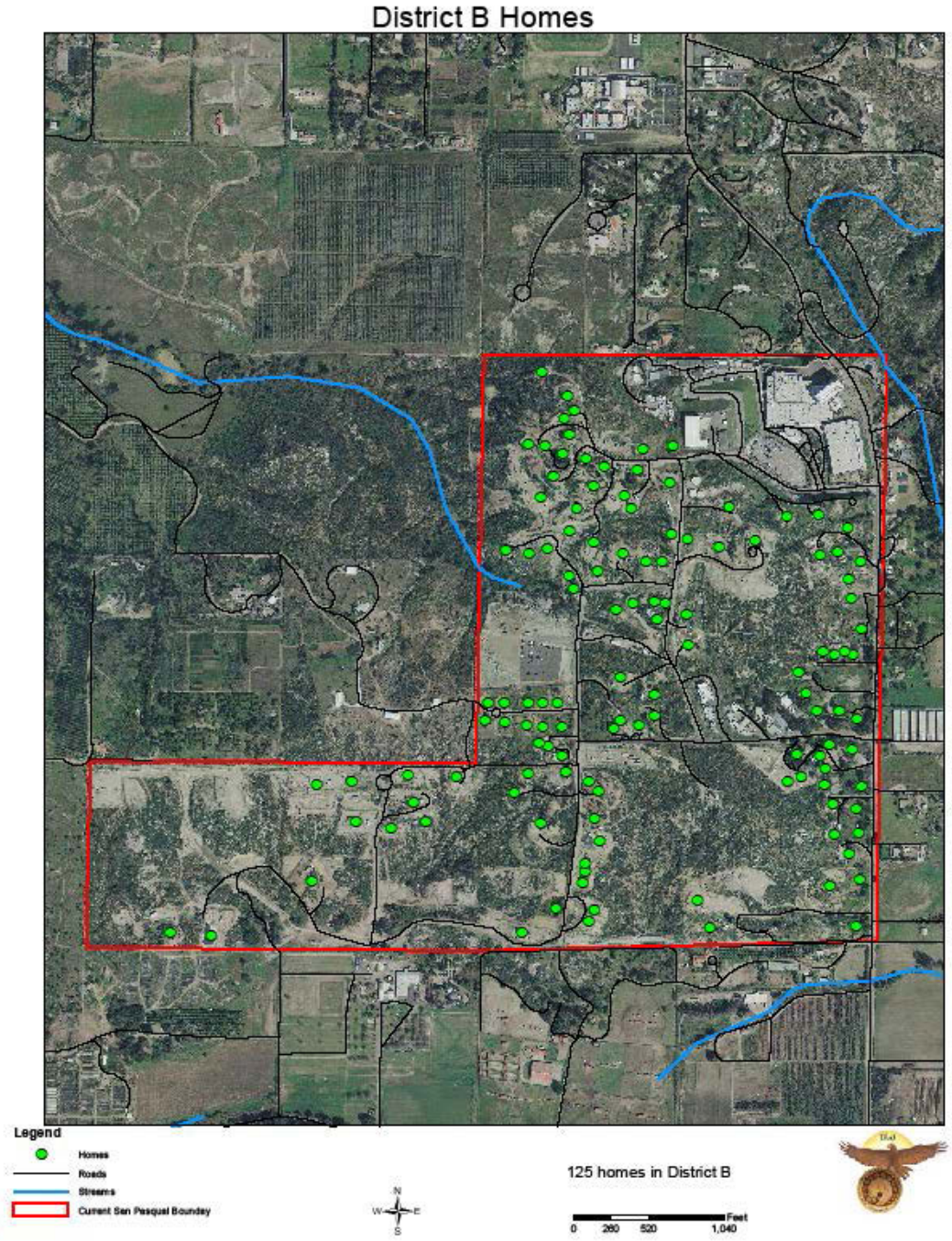
Current Reservation (Trust Only)

Tribal Demographics

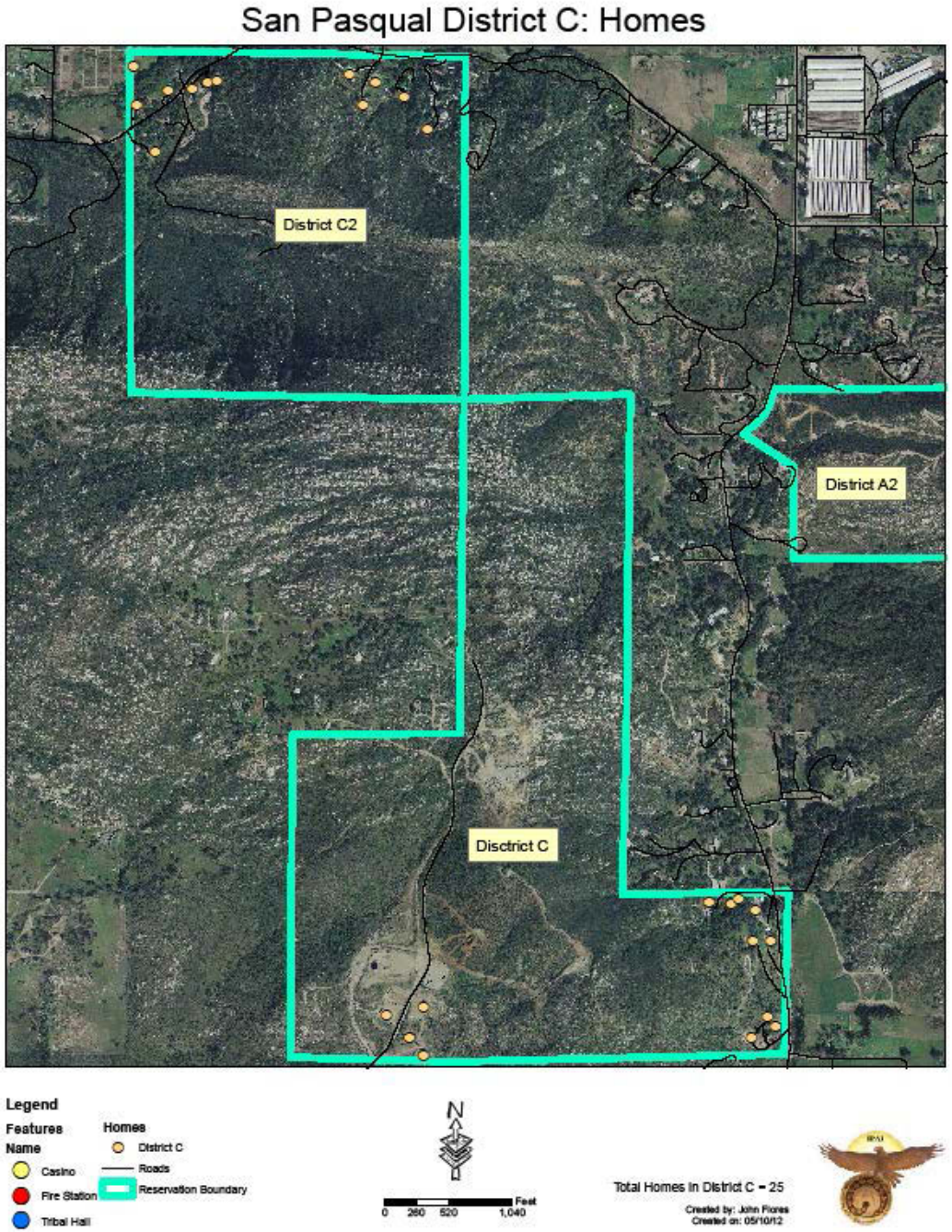
* Current enrolled Tribal Membership consists of approximately 200 Tribal members and over 1,200 lineal descendants.
* The Reservation population is between 1200 - 1400 total residents, occupying about 330 homes.
* The majority of homes and residents on the Reservation currently reside in Districts A and B, with a small population and clusters of homes on District C.



San Pasqual - District A



San Pasqual - District B



San Pasqual – District C

Domestic Water System

* The Tribe operates a Public Water System serving the Tribal communities in Districts A and B.
* District C is a mix of a private well and municipal water supplies
* All homes have water usage metered, meters are read monthly and are billed each month
* If bills are not paid we send off “Shut-Off Notices”

Water System District A

* 200,000 gallon water tank
* 2 domestic drinking water wells are operated by the Tribe
* Well #3 was off-line from 2003 – 2014and can sustain 25 GPM. Well brought back online in October 2014
* Well #4 brought on line in 2006 and can sustain 65 GPM
* Also have an emergency connection to VCMWD

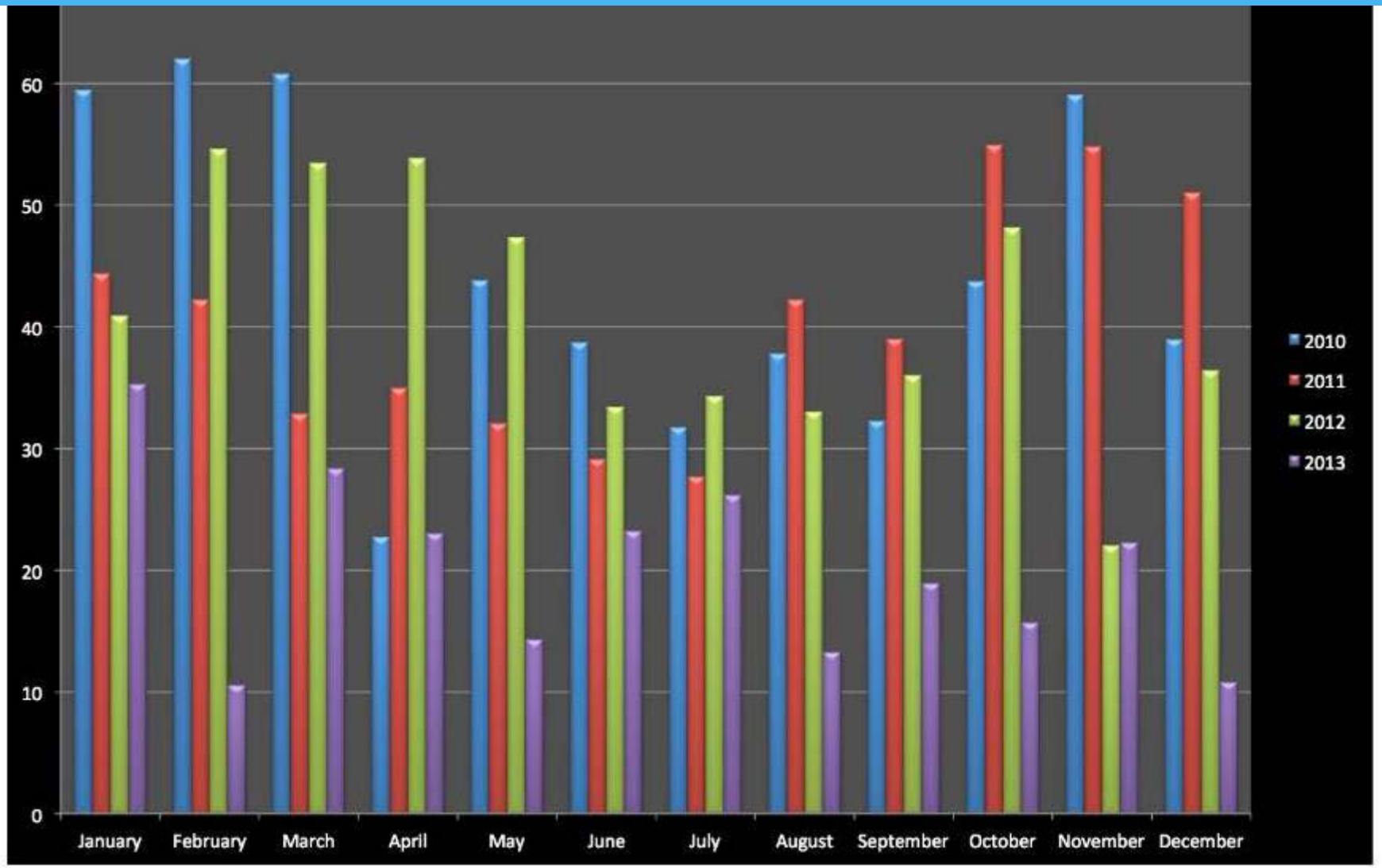
Water System District B

* 100,000 gallon water tank
* Currently building a new 250,000 gallon water tank
* No domestic drinking water wells in operation
* All of District B domestic drinking water is supplied by VCMWD water connection
* A well was drilled in early 2000 to offset the need to be totally dependent on Valley Center water
* Unfortunately, this well could not meet drinking water standards

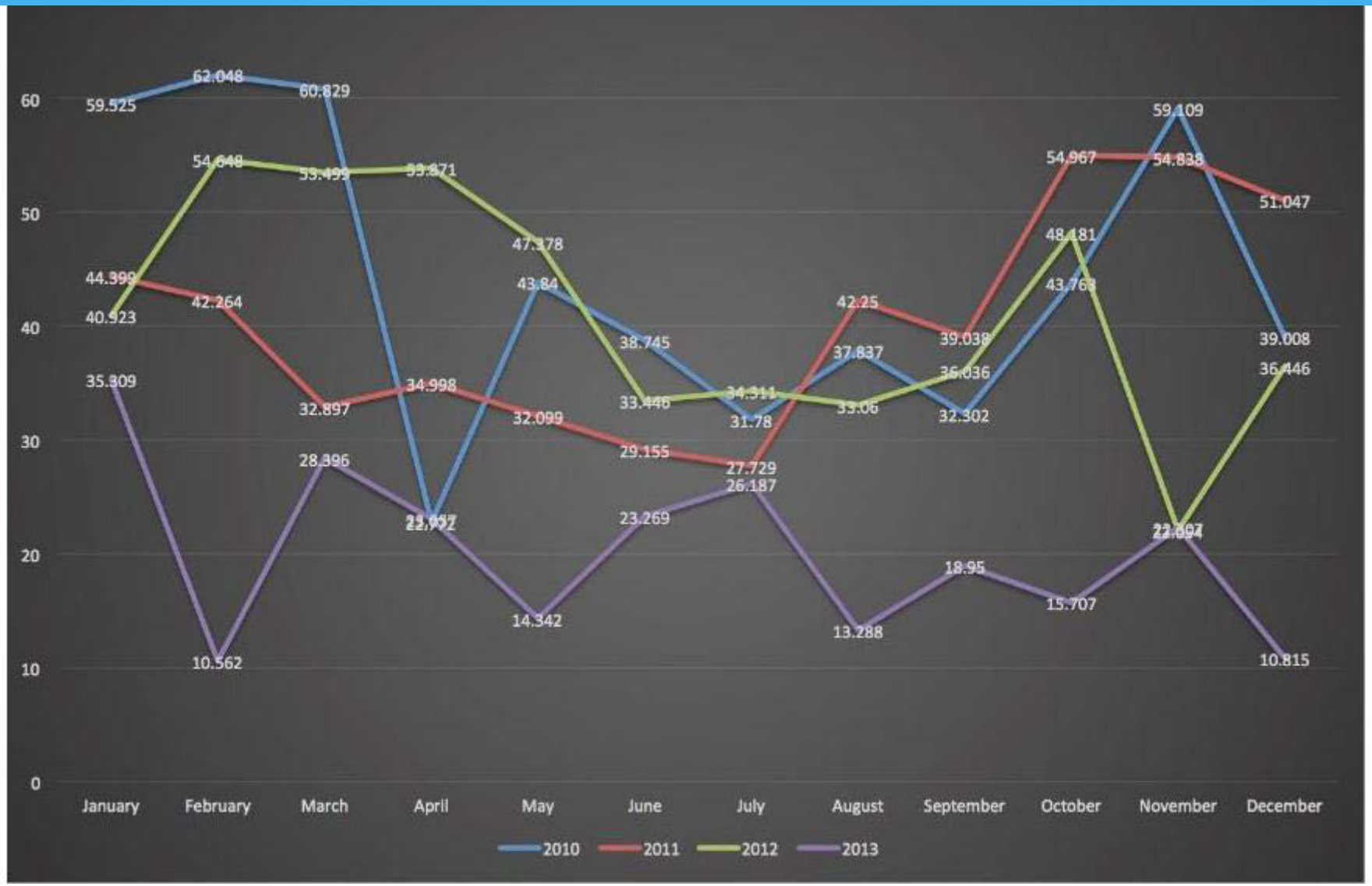
District C

* The majority homes have direct water connections to VCMWD
* One small well provides water to 5 homes
* Looking for more water sources in District C

Water Loss in District B



Water Loss in District B



San Pasqual: Water Insecure

* San Pasqual is water insecure
* Relies too much on VCMWD
* The water supply is at further risk due to:
  * Climate change
  * Drought
  * Population growth
  * Invasive plants
  * Water waste
  * Water leaks

What is the solution!?!?

* Dig more wells!!
  * May not hit water or usable water
* Rain water harvesting
  * Little to no rain in the summer months or during drought
* Reclaimed water from the casino for irrigation
* Promote native and drought resistant plants
* Water Efficiency Efforts

Water Efficiency Efforts

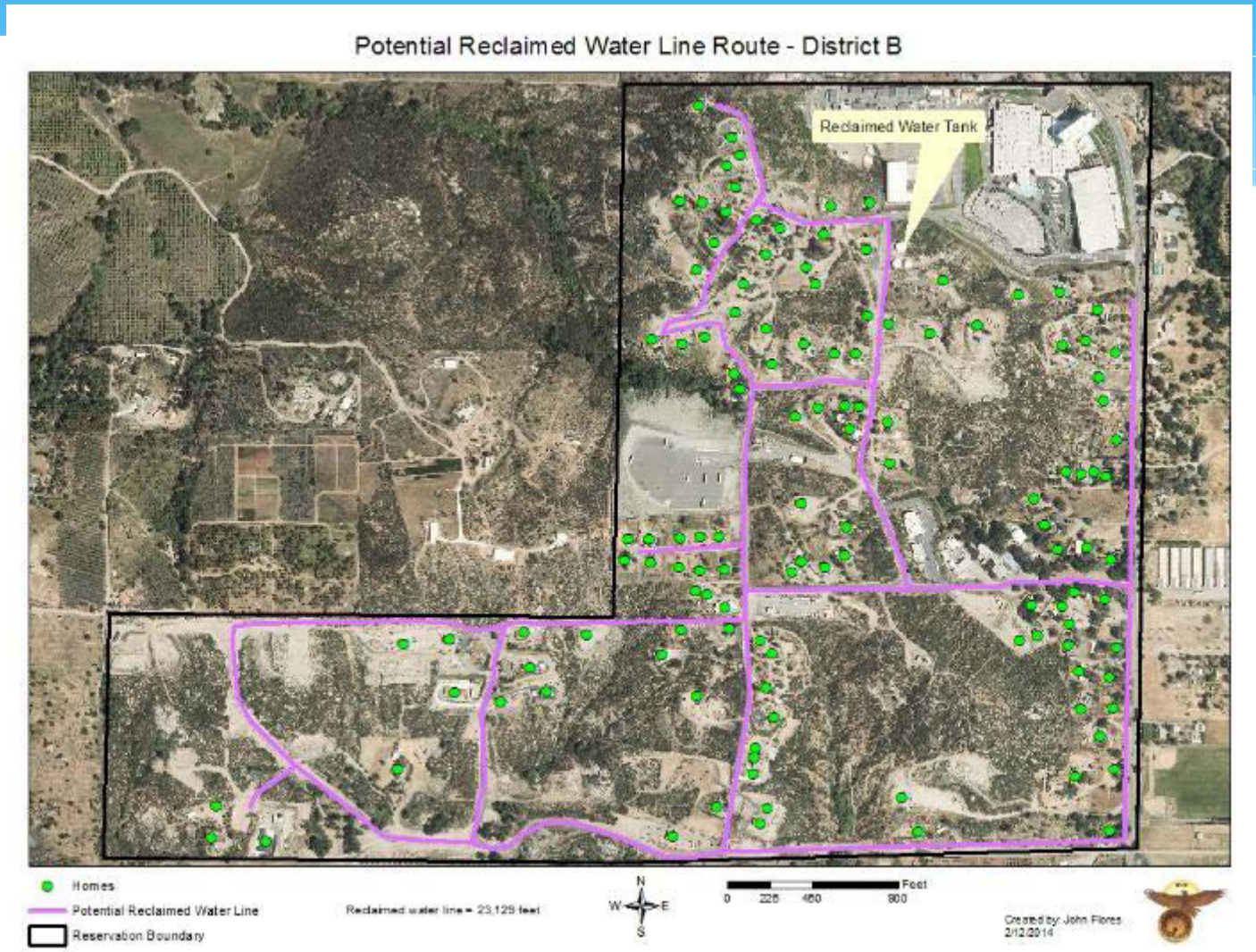
* Promoting and offering high efficiency shower heads at no cost to home owners
* Reading meters – helps identify leaks
  * Transition to smart meters
* Aggressively finding and fixing leaks

SDGE
A Sempra Energy utility®

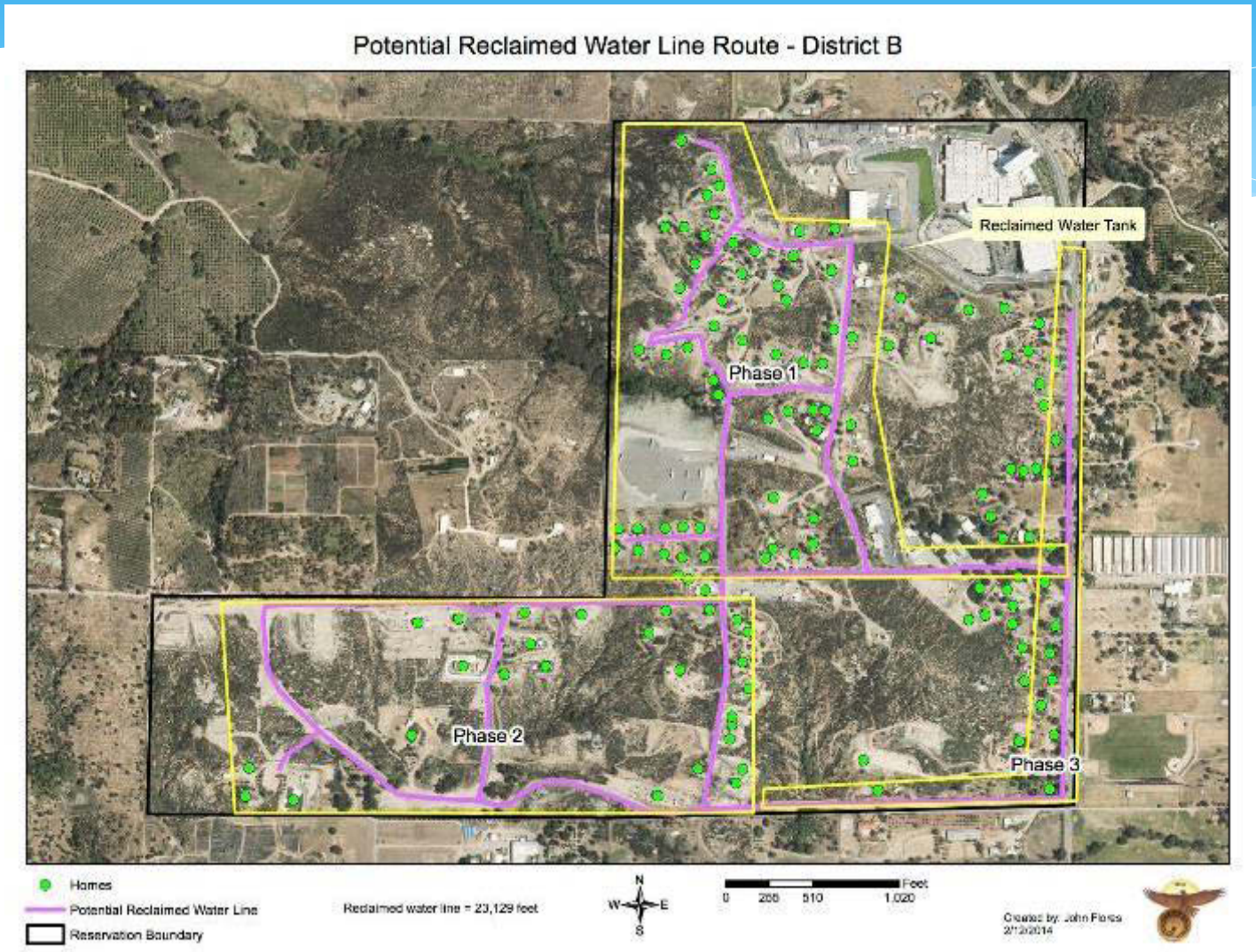
Maximizing Resources

* San Pasqual is a gaming Tribe with a 108 room hotel. Valley View Casino treats all of its waste water and uses it for landscaping and irrigation around the casino grounds
* The Tribe wanted to use the excess reclaimed water from the Valley View for irrigation on the Reservation
* San Pasqual, in partnership with RCAC applied for IRWMP and received funding for the creation of a reclaimed water system to be used for irrigation
* Funds will pass through RCAC to the Tribe

Proposed Reclaimed Water Project



Proposed Reclaimed Water Phased



A Group Effort

* Multi-partner and multi-funding approach: San Pasqual, RCAC, BIA, DWR, and Valley View Casino

Rural Community Assistance Corporation

IRWM
INTEGRATED REGIONAL WATER MANAGEMENT
GRANT PROGRAM

VALLEY VIEW CASINO & HOTEL
San Diego's Favorite™

U.S. DEPARTMENT OF THE INTERIOR
1824
BUREAU OF INDIAN AFFAIRS

Partner Contributions and Roles

* BIA
  * Tribal Water Resources Grant: Funded the engineering and survey work of the project
  * $50,000 in funds for engineering of the system
  * Lead agency and provided CatEx
* RCAC
  * Partnered with San Pasqual to assist with the IRWMP application and submittal process
* Valley View Casino
  * Providing the reclaimed water
* IRWMP
  * Provided the funds

Reclaimed Water Line Details

* Funded $350,000 from Prop 84 for Phase 1 of the San Pasqual Reclaimed Water Line
* Will be receiving on average 30,000 gallons of reclaimed water from VVC each day
* Phase 1 consist of the installation of 9,000 linear feet of 6 inch reclaimed water line
* Will have 100,000 gallon reclaimed water reservoir for storage capacity and pressure

Benefits

* Conserve potable water from being wasted on landscapes and yards
* Financial benefit for homeowners
* Water source for construction projects
* Fire suppression water source

Challenges of Working with DWR

* CEQA vs NEPA
* Federal lead agency of BIA, IHS, etc has helped
* 35 day Notice of Exemption of BIA CatEx (CEQA requirement) – Expires May 14, 2015, **TODAY!**
* Labor Compliance: Comply with Labor Compliance Program in place to monitor prevailing wage rates
* Prevailing wages vs Tribal Wages and child support
* San Pasqual Finance Department is responsible for all Labor Compliance and financial reporting
* Reimbursement grant for work completed

IRWM Requirements, Round 4 Application

Item	Required of IRWM Applicant	Required of Tribe as subagreement with RCAC
Application Components		
• Submit extensive application on-line	X	
• Project greater than $500,000	X	
• Project Interview	X	
• Project Selection	X	
Contract/Grant Components		
• Signed Contract	X	X
• 10-yr Monitoring of Project Components	X	X
• Adoption of SD IRWM Regional Plan	X	
• Proof of Insurance	X	
• Submit Wage Rates for Contract Admin. Staff	X	
• Annual Budget Forecast	X	
• Quarterly Reporting throughout contract	X	
• Quarterly invoicing throughout contract	X	X (monthly invoicing to RCAC during construction only)
• Periodic trainings, informational meetings	X	
• Share groundwater data through CASEGEM database (required for groundwater projects only)	X	X
Construction requirements		
• Construction sign	X	X
• Prevailing Wage paid to contractors	X	X
• NEPA compliance, CEQA concurrence	X	X*
• Monitoring plan submitted	X	X*
• PE-signed plans, specs submitted	X	X

* RCAC assistance available.

Thank you

Questions or Comments

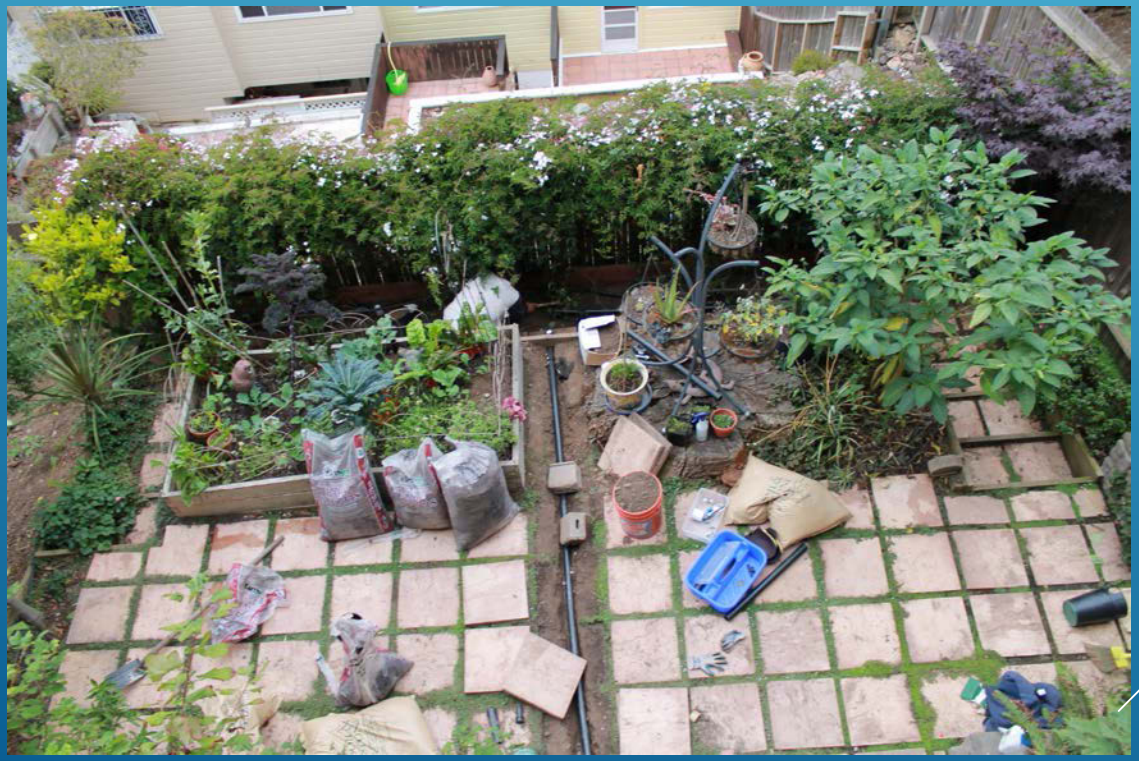
Overview of Graywater Systems for Drought Resiliency

Erica Yelensky, USEPA Region 9

Overview of Graywater Systems for Drought Resiliency

Erica Yelensky, US EPA Water Division

May 2015 RTOC



TODAY'S DISCUSSION

- What is graywater?
- Reasons to install a graywater system
- Potential water savings
- System costs
- Graywater system planning checklist
- Types of graywater systems: laundry to landscape & branched drain
- Guidelines
- Graywater system examples: Pinoleville, Hoopa, and Winnemem Wintu
- Resources

WHAT IS GRAYWATER?

Graywater comes from:

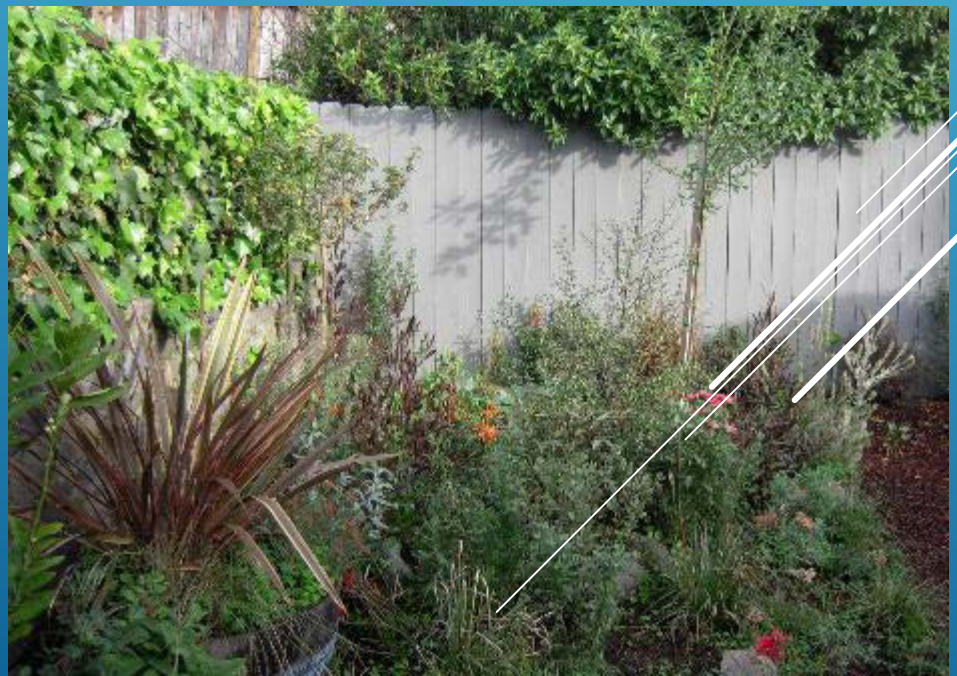
- Showers/baths
- Washing machines
- Sinks (lavatory or bathroom sinks)

Not from:

- Toilets or diaper wash water
- Dishwashers

WHY CONSIDER INSTALLING A GRAYWATER SYSTEM

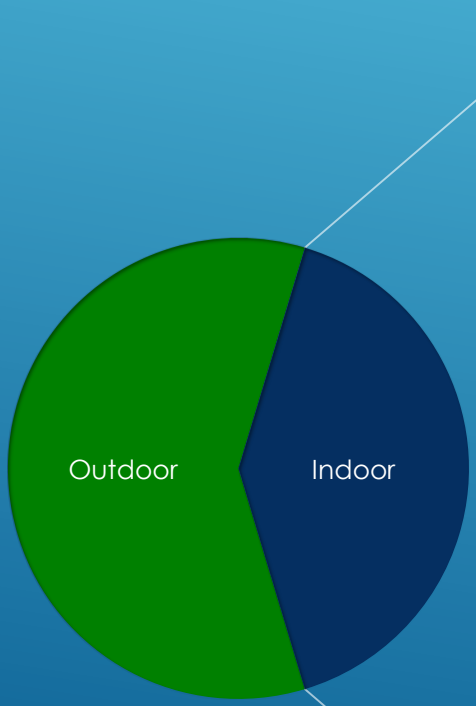
- Saves water
- Reduces strain on septic systems
- Lessons need for fertilizer
- Irrigate fruit and shade trees, non-root crops, willow, and other Building materials for e.g. basket weaving

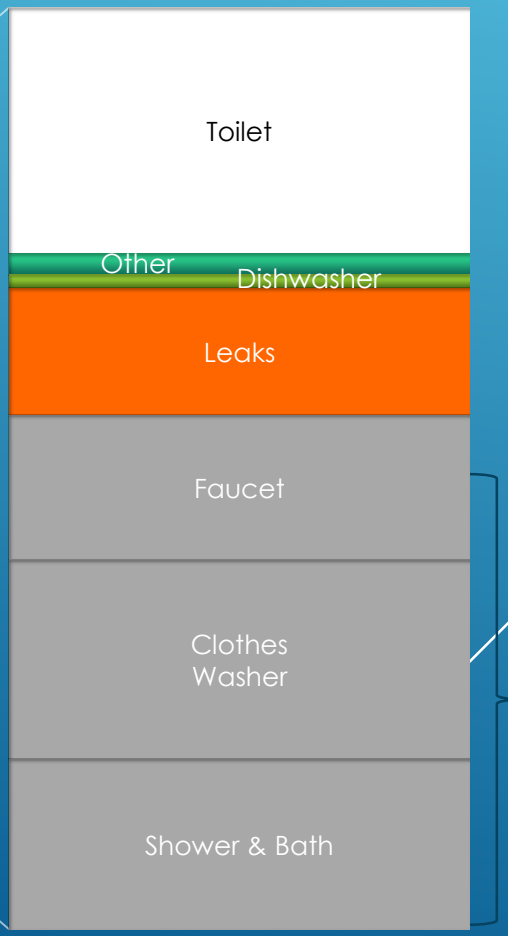


Graywater Quantity & Quality

- Average indoor residential water use: 69 Gallons Per Capita Per Day (GPCD)
- Average outdoor residential water use: 101 GPCD

Assuming 50% of used indoor water is greywater, 34.5 GPD available to irrigate a garden (cutting outdoor potable water use by ~ 1/3). Of all





Including a portion of faucet flows (i.e. bathroom faucet flows), greywater comprises more than one-half of the water used indoors

A note on greywater quality

Knowledge is lacking on the long term effects of greywater irrigation on landscape plants, soil microflora, and human health. Existing studies suggest immediate benefits to plants and soil microflora. While well-established that greywater exceeds allowable levels of fecal coliform for wastewater discharge, there are no documented cases of illness transmitted from a greywater system in the US. While greywater reuse poses minimal health risks so too do the risks associated with water shortages, sewer overflows and leaky septic tanks—the likelihood of which can be lessened with the use of greywater.

SCALING THE SAVINGS

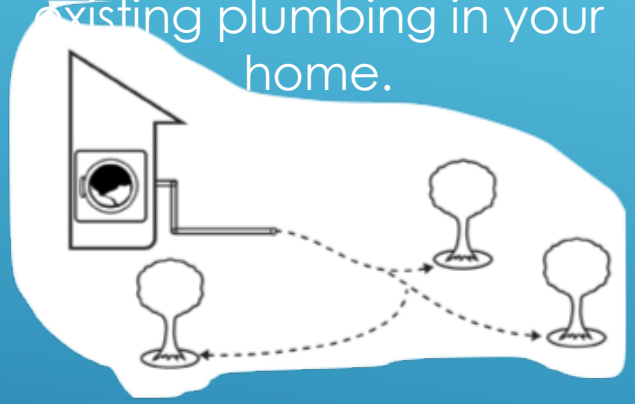
Recent Greywater Reuse Study

- Analyzed 83 systems in the San Francisco Bay area, Monterey Bay area, and the Santa Rosa area.
  - Per capita water consumption decreased by **17 GPD**
  - Average household savings decreased **14,565 gallons/year**
    - By replacing inefficient toilets with WaterSense labeled models, the average family can reduce water use by nearly 13,000 gallons of water/year

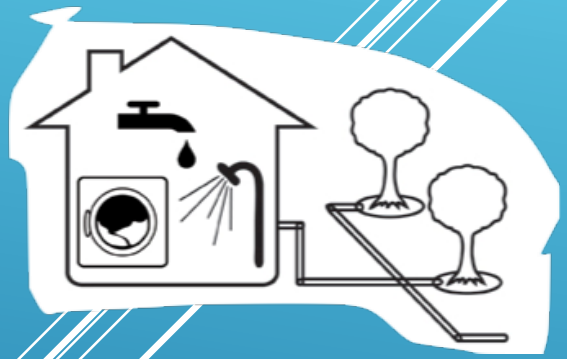
Source: Greywater Action

GREYWATER BASICS COSTS & SYSTEM DESIGN

A "laundry-to-landscape" graywater system captures graywater from the discharge hose of your washing machine, enabling you to reuse the water without altering the existing plumbing in your home.



A "branched-drain" system is driven by gravity flow; no pressure is provided by a washing machine pump. "Branched-drain" systems usually distribute graywater from showers and/or sinks.



Professionally-Installed

Materials/Labor/Permit $	**Laundry to Landscape**	**Branched-Drain**
Low	$350.00	$500.00
Average	$750.00	$1,740.00
High	2,000.00	$4,250.00

Homeowner-Installed

Materials/Labor/Permit $	**Laundry to Landscape**	**Branched-Drain**
Low	$100.00	$250.00
Average	**$250.00**	**$715.00**
High	$500	$1,750.00

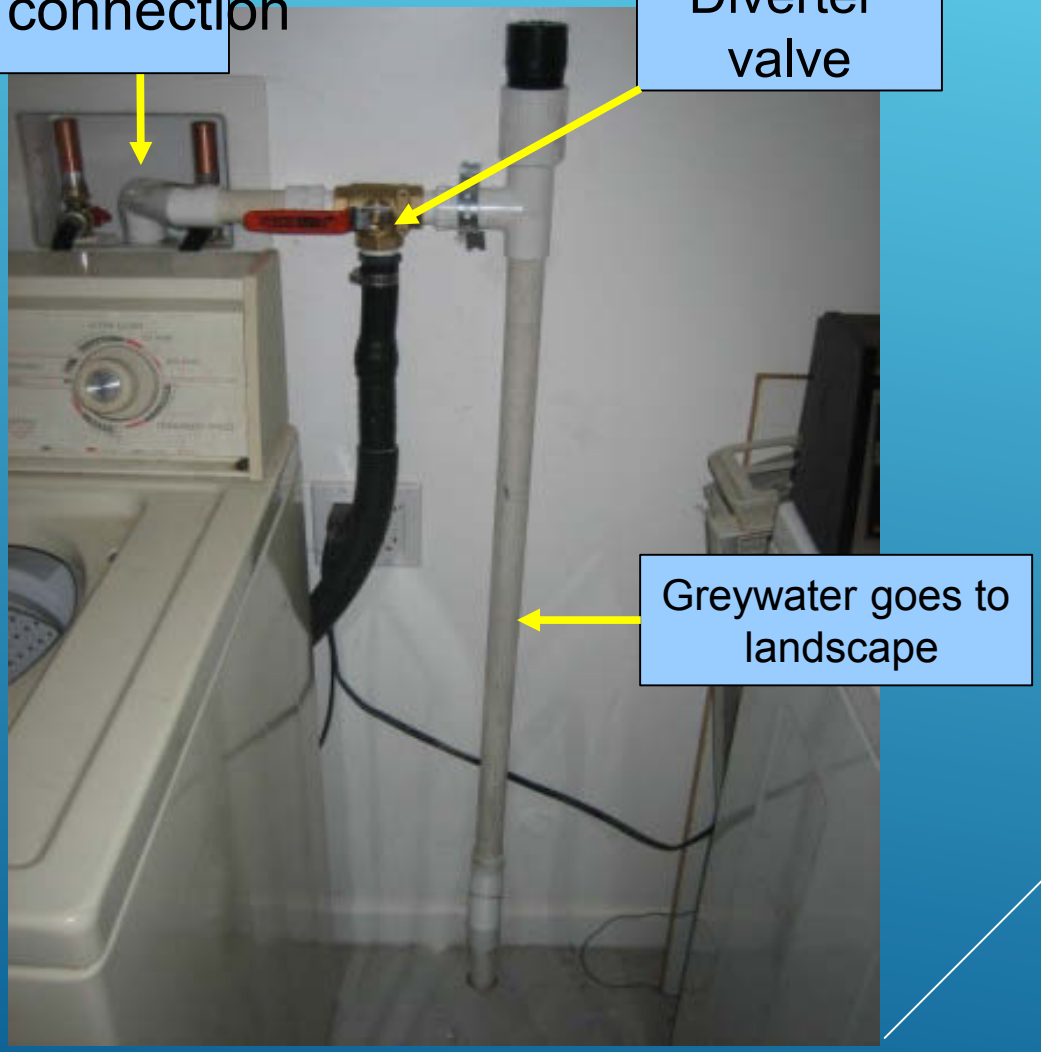
Note: Individual system costs would likely be much lower buying in bulk with contractor rates and relying on equipment and workers already on

GRAYWATER SYSTEM PLANNING & INSTALLATION CHECKLIST

1) Assess the Site: how accessible is the plumbing?
2) Develop landscape plan- what plants and where will they go
3) Conduct percolation test(may/may notbe necessary)
4) Purchase 3-way valve and piping for system
5) Purchase graywater friendly detergent/soap
6) Prepare the landscaping
7) Install graywater system(DIY or hire professional)
8) "Tune" the system in
9) Test the system
10) Label the system.

LAUNDRY TO LANDSCAPE

LAUNDRY TO LANDSCAPE



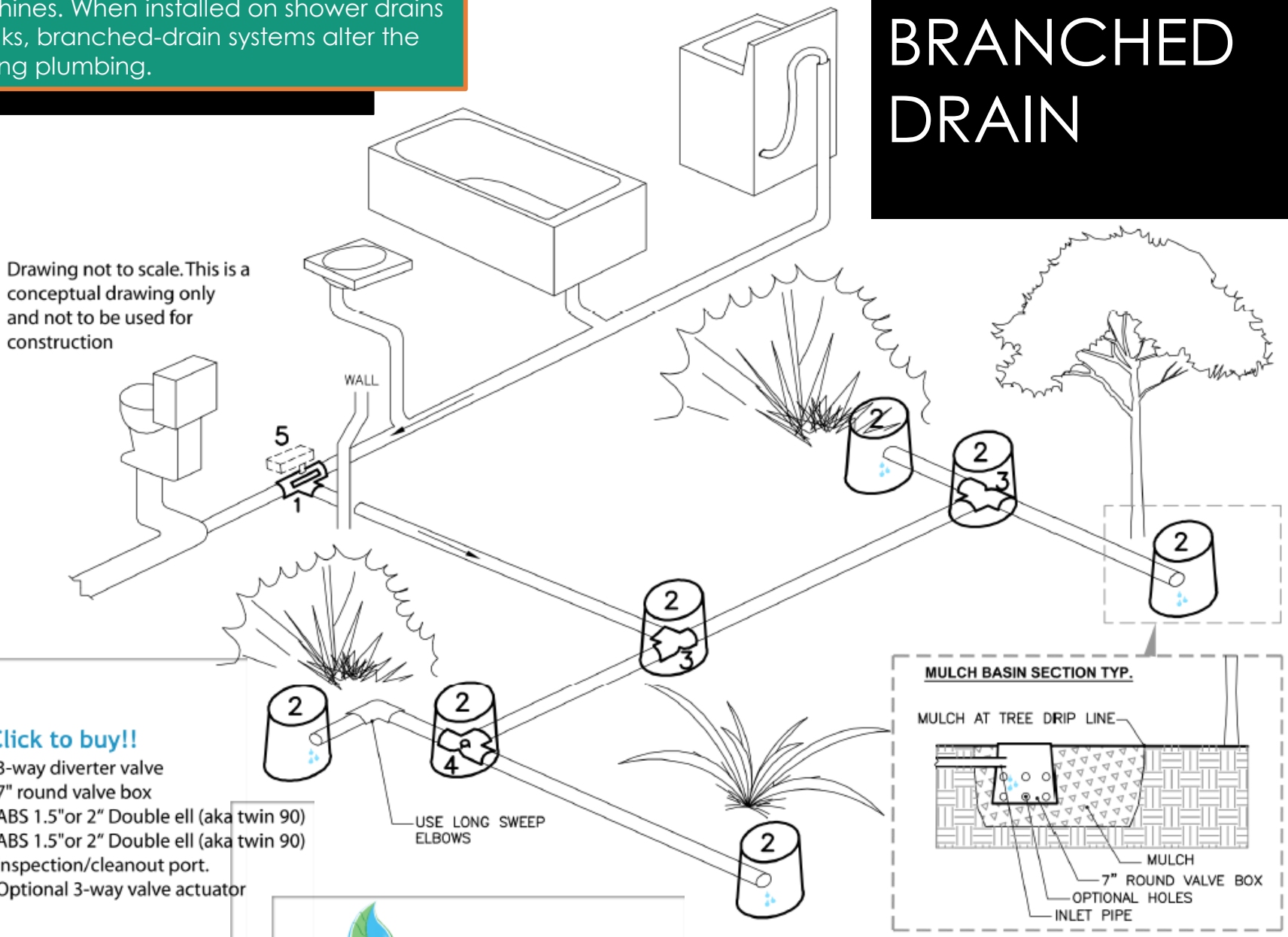
LAUNDRY TO LANDSCAPE

TRENCHES

MULCH BASINS

Description:
Typically installed on shower drains and/or sinks, but can also be installed for washing machines. When installed on shower drains or sinks, branched-drain systems alter the existing plumbing.

BRANCHED DRAIN

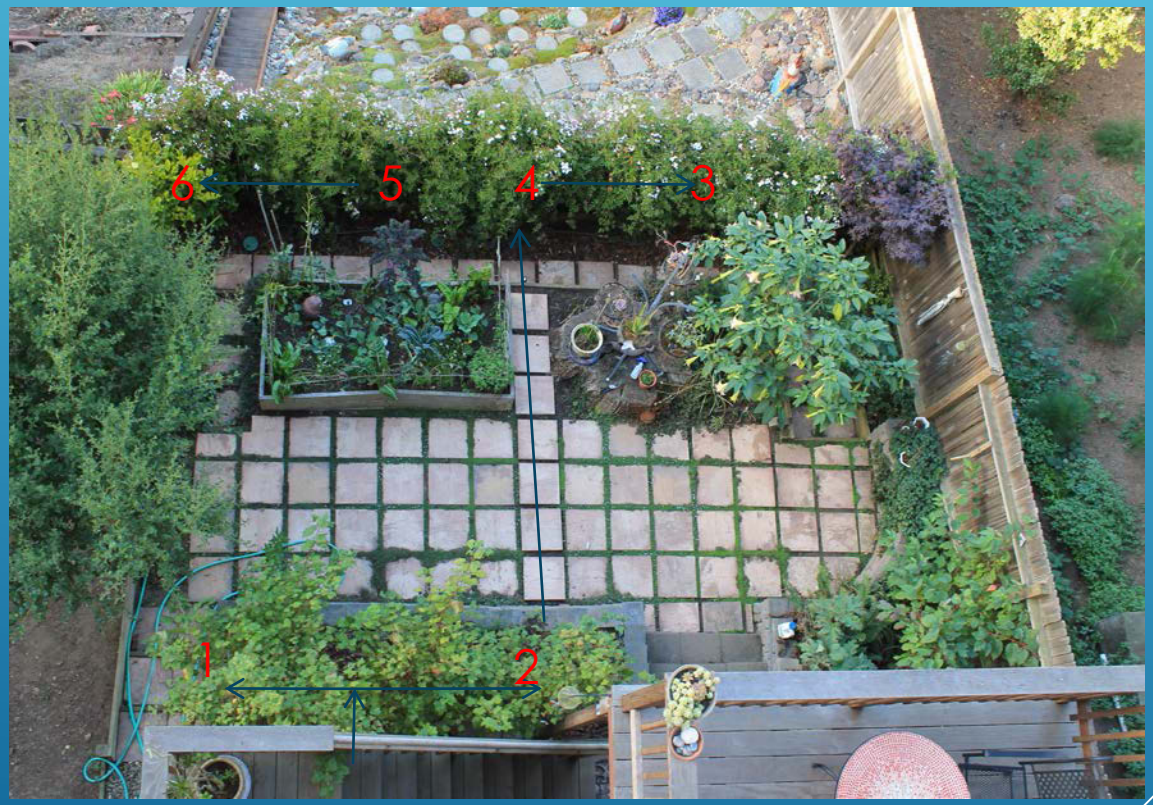


Click to buy!!

(1) 3-way diverter valve
(2) 7" round valve box
(3) ABS 1.5"or 2" Double ell (aka twin 90)
(4) ABS 1.5"or 2" Double ell (aka twin 90) w/ inspection/cleanout port.
(5) Optional 3-way valve actuator

clean water components

FINISHED BRANCHED DRAIN SYSTEM



6 outlets

BASIC GRAYWATER GUIDELINES

Graywater is different from fresh water and requires different guidelines for it to be reused.

- **Don't store graywater** (more than 24 hours). If you store graywater the nutrients in it will start to break down, creating bad odors.
- **Minimize contact with graywater.** Graywater could potentially contain a pathogen if an infected person's feces got into the water, so your system should be designed for the water to soak into the ground and not be available for people or animals to drink.
- **Infiltrate graywater into the ground, don't allow it to pool up or run off** (knowing how well water drains into your soil (or the soil percolation rate of your soil) will help with proper design. Pooling graywater can provide mosquito breeding grounds, as well as a place for human contact with graywater.
- **Keep your system as simple as possible, avoid pumps, avoid filters that need upkeep**. Simple systems last longer, require less maintenance, require less energy and cost less money.
- **Install a 3-way valve** for easy switching between the graywater system and the sewer/septic.
- **Match the amount of graywater your plants will receive with their irrigation needs.**

Source: http://greywateraction.org/contentabout-greywater-reuse/

GREYWATER: WHAT TO LOOK FOR IN LAUNDRY DETERGENTS

For happy plants, avoid products containing:

- **Salt (sodium compounds)**
- **Boron (borate)**
- **Chlorine bleach (hydrogen peroxide bleach okay)**

Recommended products: Salt/boron free

- **Liquid laundry detergent**
  - **e.g. Oasis, ECOS, Biopac, Vaska, and more**

EXAMPLES

- Pinoleville Pomo Nation
- Hoopa Valley Tribe
- Winnemem Wintu Tribe
- Santa Ynes Band of Chumash Indians

PINOLEVILLE POMO NATION GRAYWATER SYSTEMS

- **System type**: Laundry to landscape and branched drain
- **Environmental outcome:** Reduce risk to Ackerman Creek from potential failed septic system
- **Funding:** Tribal CWA 319, tribal match

HOOPA VALLEY TRIBE

- **System type:** Install graywater systems for 2 + homes as part of a wastewater project that also connects the homes to the sewer collection system
- **Environmental outcomes:** Reduce stress on sewer collection system and demonstrate that a small project can make a significant difference in a tribal community.
- **Funding**: Clean Water Act Indian Set-Aside
- **Status:** sites will be selected this summer, and most likely built this year

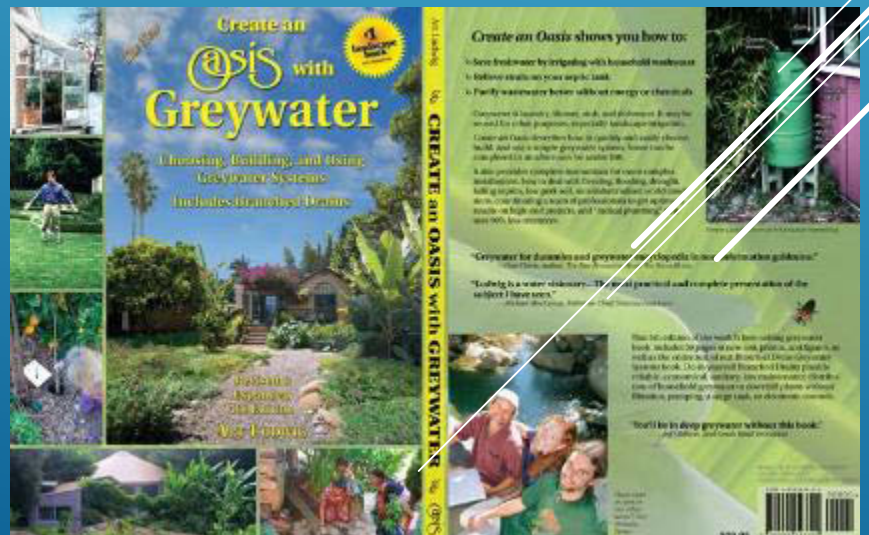
WINNEMEM WINTU TRIBE

- Installed laundry to landscape and branched drain systems for several trailers and a house
- All members took a 2-day graywater installation class on-site

SANTA YNEZ BAND OF CHUMASH INDIANS

GREYWATER EDUCATIONAL RESOURCES

- Upcoming 3-part webinar series June 16, 24,July 1 https://www.eventbrite.com/e/greywater-education-webinar-series-of-3-webinars-617-624-71-tickets-16864635579
- Greywater Action: www.greywateraction.org
- Oasis designs: http://oasisdesign.net/
- "This Old House" video:
  - www.thisoldhouse.com/toh/tv/ask-toh/video/0,,20565323,00.html



FINDING GRAYWATER SYSTEM PARTS

- Work with local hardware store to order parts
- Urban farmer store (Richmond and SF)
- http://www.gray-2-green.com/
- http://www.dripworks.com/

POSSIBLE* EPA FUNDING SOURCES

- Clean Water Act Indian Set-Aside
- Tribal CWA 319
- GAP: training, develop water use ordinance, graywater demonstration project

*check with your project officer

QUESTIONS

Thank you!

Contact info:

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GREYWATER: WHAT'S IN IT?

Source	Possible content
Automatic clothes washer	Suspended solids (dirt, lint), organic material, oil and grease, sodium, nitrates and phosphates (from detergent), increased salinity and pH, bleach
Bathtub and shower	Bacteria, hair, organic material and suspended solids (skin, particles, lint), oil and grease, soap and detergent residue

BREAK

Drought-Related Funding and Resources

Drought-Related Funding and Resources

- USEPA Region 9's Tribal Drinking Water Program
- USEPA's WaterSense and Climate Ready Water Utilities Programs
- Federal and State Tribal Drought Funding
- CA Urban Water Conservation Council's Drought Primers

Final Discussion and Q&A