Casitas Municipal Water District
WATER RESOURCES COMMITTEE
Baggerly/Spandrio

**February 19, 2019 – 10:00 A.M.**
at
Casitas Municipal Water District
1055 Ventura Ave.
Oak View, CA 93022

AGENDA

1. Roll Call
2. Public Comments
3. Board Comments.
4. Manager Comments.
5. Discussion of budget for State Implementation Policy proposal for quagga treatment.
6. Update on the California Department of Fish & Wildlife's Hatchery and Trout Plant Status.
7. Discussion of Primary Water Resources Proposal of January 15th, 2019.
8. Status of Teague Watershed Groundwater Assessment.
9. Discussion on the proposed Technical Advisory Committee for the Matilija Formation Deep Wells.
10. Proposal from MNS for design of Emily and Canada St. pipeline improvements in the amount of $55,510.
11. Director Request: Discussion of Draft Study Plan for the Development of an Integrated Groundwater-Surface Model of the Ventura River watershed.
12. Director Request: Discussion of Ventura River Watershed Instream Flow Enhancement and Water Resiliency Regional Framework.
13. Director Request: Discussion of CMWD-OBMGA Conjunctive Use Agreement.
14. Information item regarding the Localizing California Waters Regional Summit.
15. Discussion of coordination between the Rates & Regulations, Water Efficiency Allocation Program, Drought Contingency, Urban Water Management Plan and possible other District planning documents.

Right to be heard: Members of the public have a right to address the Board directly on any item of interest to the public which is within the subject matter jurisdiction of the Board. The request to be heard should be made immediately before the Board's consideration of the item. No action shall be taken on any item not appearing on the agenda unless the action is otherwise authorized by subdivision (b) of ¶54954.2 of the Government Code.
If you require special accommodations for attendance at or participation in this meeting, please notify our office in advance (805) 649-2251, ext. 113. (Govt. Code Sections 65954.1 and 54954.2(a). Please be advised that members of the Board of Directors of Casitas who are not members of this standing committee may attend the committee meeting referred to above only in the capacity of observers, and may not otherwise take part in the meeting. (Govt. Code Section 54952.2(c)(6)

CLEAN LAKES INC.

Aquatic Ecosystem Restoration & Maintenance

September 21, 2018

Ms. Susan McMahon
Water Quality Supervisor
Casitas Municipal Water District
1055 Ventura Avenue
Oak View, CA 93022

Subject: Evaluation of the Need for a State Implementation Plan (SIP) 5.3 Exception under the National Pollutant Discharge Elimination System (NPDES) Permit for Biological Pesticides and Residual Chemical Pesticide Applications from Aquatic Animal Invasive Species Control Applications at Lake Casitas.

Ms. McMahon,

Per our proposal of June 27, 2018, with regard to the above subject, provided below are Clean Lakes, Inc. (CLI) and Blankinship and Associates (BA) findings and recommendation based on information reviewed per our agreement for Task 1, State Implementation Plan Analysis.

We have reviewed United States Geological Survey (USGS) quadrangle maps from 1904, 1941, 1949, 1952,1955, 1959, 1966, 1975, 1982 and 1995 and Google Earth maps from 1994, 2002 – Present. In our judgement, Lake Casitas would be classified as Waters of the United States (WOTUS) based on pre-2015 (Rapanos) and post-2015 (United States Environmental Protection Agency /United States Corps of Engineers (EPA/COE)) definitions for 3 main reasons:

1. Numerous named blue line creeks lead to the Lake Casitas (e.g., Coyote, Santa Ana, Willow, Chismahoo and Ayers). In addition, several unnamed creeks also lead to the lake.

2. There is a significant nexus between the lake and its surrounding creeks in that the chemical, physical and biological integrity of one is related to the other. For example, water quality in creeks effects water quality in the lake. Another example is that lake level change likely effects the water elevation in creeks and the flora/fauna in surrounding riparian areas.

3. The lake itself is navigable by boat.

The more recent and broader definition of WOTUS by the EPA/COE is being contended nationally. Without getting into the details, California is currently among 26 states that the EPA/COE definition for WOTUS is in effect. It uses the Rapanos criteria provided above and adds far reaching inclusionary language. For example, land and water within a 100 year flood plain of a WOTUS is a WOTUS.

Based on the above information, it is our recommendation that Casitas Municipal Water District strongly consider a SIP exception for their NPDES permit for the application of copper for potential Dreissenid Mussel control. Whether it be treated water that spills into the Ventura River, or treated water that enters one of the adjoining creeks, in both cases these receiving waters have the potential, albeit small, of exceeding the hardness-adjusted receiving water limitations outside the treatment area during treatment and in the treatment area after treatment is complete.

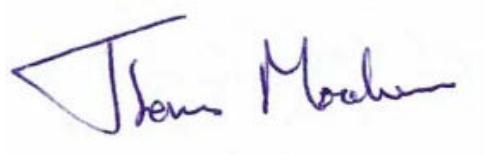
Although we did not initially speak about it, a SIP may also be useful in granting the District an exception from complying with receiving water limitations for copper per the California Ocean Plan should that be deemed necessary.

We will coordinate with you to schedule the Task 2, Client Meeting portion of our agreement. This will allow us to attend a meeting at your office to present a summary of Task 1 findings, discuss details of the analysis, and answer questions. At this time, the latter half of October, from the week of October 22, 2018 onward appears most suitable for us. Michael Blankinship is currently on leave until the end of the month, so it may more appropriate to schedule a meeting on his return on October 1, 2018.

Please feel free to contact me on my mobile phone at 818-201-5982 or via e-mail at tmoorhouse@cleanlake.com.

Sincerely,

**CLEAN LAKES, INC.**



Thomas G. Moorhouse
Manager

*31320 Via Colinas, Unit 114*
*Westlake Village, California 91362*
*Telephone: 1-818-889-8691*
*Fax: 1-818-889-8693*

# CASITAS MUNICIPAL WATER DISTRICT
# MEMORANDUM

**TO:** WATER RESOURCES COMMITTEE

**FROM:** CAROL BELSER, PARK SERVICES MANAGER

**SUBJECT:** UPDATE ON THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE'S HATCHERY AND TROUT PLANT STATUS

**DATE:** FEBRUARY 4, 2019

**RECOMMENDATION:**

It is recommended the Water Resources Committee receive this update report and direct staff to create policies and procedures for Casitas to perform hatchery inspections prior to fish planting/stocking into Lake Casitas.

**BACKGROUND:**

At the February 26, 2018 meeting of the Quagga Committee, the committee was informed the California Department of Fish and Wildlife (CDFW) stated that all trout planted into Lake Casitas are grown in, and are from the Fillmore Fish Hatchery. This is now changing for long term and short term. Since CDFW's Fillmore Fish Hatchery is now undergoing facility upgrades, short term alternatives of obtaining trout for Lake Casitas that CDFW is looking into are supplies of trout from one of several possible hatcheries. The identified possible hatcheries are namely Mojave River Hatchery in Victorville, Hot Creek Trout Hatchery in Mammoth Lakes, Black Rock Trout Hatchery in Independence, and Warm Springs in Geyserville located in Sonoma County.

Once Fillmore Hatchery upgrades are made, the long term plans are for CDFW to move most of its operation of raising trout for Casitas (and other stocking locations in the area) to their Mojave River Hatchery facility. Their plan is to use Mojave River Hatchery to rear the eggs supplied by the Fillmore Hatchery, and to then place the fish back in Fillmore prior to transport to their stocking location. The fish will spend about 2/3 of their life at the Mojave River Hatchery.

The CDFW have strict protocol for invasive species protection at their hatcheries, see attached document: Aquatic Invasive Species Monitoring at CDFW Hatcheries Department of Fish and Game, October 2015. In addition, over the past several years, Casitas has taken added due diligence procedure measures to inspect both CDFW and private hatcheries. Measures include review by third party consultant, Renata Claudi of RNT Consulting, Casitas' fisheries staff site visitation to hatcheries, and ensuring water samples were sent and processed by a third party namely Scripps Institution of Oceanography UC San Diego to verify the hatchery is quagga/zebra free prior to planting fish in Lake Casitas.

**ANALYSIS:**

The Lake Casitas Vulnerability Assessment for Invasive Mussels identified the risk of introduction of CDFW stocking pathway at low, Level 1, due to the fact that there are no

hatcheries in California that have a mussel infestation, and that their monitoring protocols are in place. The Vulnerability Assessment does suggest it may be prudent for Casitas to determine the trail of custody such as eggs and young fish purchase, samplings at the hatchery and other means to ensure that planting/stocking are free of quagga and zebra mussels. The practice has taken place as mentioned, and it recommended that protocol and procedure be established to ensure consistent diligence of an established policy will protect the lake while allowing for regular fish plantings to continue to maintain Casitas' fisheries.

# Aquatic Invasive Species Monitoring at CDFW Hatcheries
## California Department of Fish and Game
## October 2015

## Invasive Species

"Invasive species" are defined as plants or animals that cause environmental or economic harm, or harm to human health. Invasive species tend to be adaptable to new environments and multiply quickly. It is difficult to predict where an invasion will occur, which species may invade, or the consequences of their invasion; therefore, to protect facilities and the environment it is necessary to monitor for invasive species so that if an invasion does occur, efforts can be made quickly to prevent their spread within an area and to adjacent areas.

Invasive species threaten the diversity and abundance of native and desirable non-native species through competition for resources, predation, parasitism, hybridization, transmission of diseases, and/or causing physical or chemical changes to the environment. Invasive species also threaten man-made systems and structures, including water delivery and flood protection systems, agriculture, and developed lands.

Invasive species are commonly introduced into new areas as a result of human activities. Natural barriers, such as mountains, oceans, etc., historically confined species to their native range. Commerce and the advent of travel between remote locations has circumvented natural barriers, and trains, planes, ships, and vehicles are capable of transporting organisms great distances, often unknowingly and unintentionally. Hatchery activities have the potential to spread invasive species to new waterbodies, as well as between waterbodies, when stocking fish.

Invasive species in hatcheries pose a number of concerns. First, they may become established within a hatchery and impact operations, including clogging pipes, aeration devices, screens, and encrusting equipment, necessitating added maintenance. Second, they may be spread to other hatcheries and/or into the environment along with transferred or planted fish. Alternatively, invasive species may not directly impact operations at a hatchery, and thus go unnoticed, or pass through a hatchery in its source water. Both of these situations present the opportunity for hatchery activities to move invasive species to new environments in transport water, and therefore must also be addressed.

This protocol is limited to monitoring for aquatic invasive species (AIS); however, it is recommended that precautions to prevent the spread of terrestrial invasive species also be taken. This protocol does not address fish health issues or disease prevention. Monitoring for AIS is a component of a comprehensive Hazard Analysis-Critical Control Point (HACCP) Plan, which identifies pathways and preventatives for the introduction of AIS into a hatchery, the spread of AIS within a hatchery, and the release of AIS from a hatchery.

## Sources of Aquatic Invasive Species

Many hatcheries use surface water for operation. Surface waters are susceptible to AIS contamination, particularly if accessible for recreation (boating, fishing, etc.). Most of CDFW's anadromous mitigation hatcheries are located below dams and use water directly from an impounded reservoir that allows recreational access. Other hatcheries are located further down-river from reservoirs, or on rivers where recreation occurs, and are also at risk of AIS contamination. Well water pumped directly into a hatchery is at very low risk of being contaminated with AIS.

Other potential pathways for the introduction of AIS into a hatchery include the importation of eggs or fish, or by picking up an AIS on equipment or vehicles in the course of planting fish. These pathways, and all others, should be addressed in a comprehensive HACCP Plan.

## Aquatic Invasive Species of Concern, and Aids to Their Identification

AIS believed to pose the greatest threat to California's hatcheries and the environment are quagga mussel, zebra mussel, and New Zealand mudsnail, and the monitoring methods described herein are specific for these three species. Other AIS of concern, including channeled apple snail, Brazilian waterweed, Eurasian watermilfoil, *Hydrilla*, and the algae *Didymosphenia geminata* (also known as didymo or rock snot), are described in Attachment A and should be reported if found. Refer to Attachment A for species descriptions, suitable environmental conditions, known range, and photos to assist in their identification.

# QUAGGA MUSSEL AND ZEBRA MUSSEL

*Dreissena bugensis* and *Dreissena polymorpha*

Quagga and zebra mussels are separate species, but look very similar. The following description applies to both species. These freshwater mussels produce microscopic, free-floating larvae. The larvae eventually settle on surfaces and turn into the shelled adult form.

Species Description:

Body form – Juveniles and adults are 2-shelled (bivalve); may have dark colored "threads" on one edge. Larval life-stage is microscopic and cannot be seen by the unaided eye.

Size – Range in size from microscopic to up to 2" long; free-floating (planktonic) larvae are microscopic.

Color – Shells usually have alternating light and dark brown stripes, but can also be solid light brown to dark brown.

Suitable Environmental Conditions:

Temperature – Survives in water temperatures between 32° F and 88° F.

Moisture – Aquatic, but can survive out of water for weeks under suitable conditions (longest at low temperatures and high humidity).

Substrate – Usually attached to soft and hard surfaces, including aquatic plants, but also known to detach from surfaces and crawl or be carried by water. Small, newly settled mussels feel like gritty sandpaper when attached to a smooth surface. Larger mussels may feel coarser, like a small pebble or sunflower seed. Mussels often adhere to surfaces firmly and when lightly touched may rock back and forth.

Known occurrences in California – San Bernardino, Riverside, San Diego, Imperial, Orange, and San Benito Counties. For current known locations visit http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/maps/CaliforniaDreissenaMap.jpg.

Key Features for Identification:

Quagga and zebra mussels are not the only freshwater bivalve found in California, however they are the only freshwater bivalves that attach to surfaces. In the absence of attachment, a combination of characteristics including their alternating bands of color and evidence of "threads" can be used to identify.

Size and color variation in mussels


Quagga mussel showing 'threads'

# NEW ZEALAND MUDSNAIL

*Potamopyrgus antipodarum*

Small, fresh to brackish water aquatic snail that can be easily overlooked because it often blends in with its surroundings. New Zealand mudsnails are self-reproducing and give birth to live offspring, therefore a single snail can create a population.

Species Description:

Body form – Single shell that is elongated and spiraled, when fully grown having 5-7 spirals.

Size – From microscopic up to ¼" long.

Color – Variable; light to dark brown in color.

Suitable Environmental Conditions:

Temperature – Survives in waters between 32° F and 83° F.

Moisture – Aquatic, but can survive for weeks under suitable temperatures and humidity.

Substrate – Soft (mud, silt, plants, etc.) and hard substrates. Also capable of detaching and floating in the water.

Known occurrences in California – For current known locations visit http://nas.er.usgs.gov/queries/collectioninfo.aspx?SpeciesID=1008.

Key Features for Identification:

A key feature of live New Zealand mudsnails is the presence of an operculum (flap covering the shell opening). New Zealand mudsnails require expertise to accurately identify. Any snail ¼" or less should be forwarded for identification (see page 10).

Dead New Zealand mudsnail on metric ruler (5 millimeters = ~¼"). Operculum often absent in dead specimens.


Live New Zealand mudsnail showing operculum and spirals, numbered 1-5.

Dense colony of New Zealand mudsnails attached to the underside of a rock.

## Monitoring for Quagga and Zebra Mussels and New Zealand Mudsnail

### *General Guidelines*

Early detection monitoring concentrates efforts on areas where AIS are most likely to be found, rather than by randomly sampling. Attention should be directed to protected areas, such as crevasses, corners, and edges.

Hatchery personnel should always be on the look-out for unfamiliar plants and animals during daily operations. Current maintenace-intensive hatchery operations provide considerable opportunity to watch for AIS. Intensive maintenance could, however, inhibit the detection of AIS. Routine cleaning may prevent organisms from attaching to surfaces, becoming established, growing large enough to detect, or keep them at such low densities that they remain undetected.

In addition to watching for AIS during routine operations, hatcheries must inspect their facilities quarterly for AIS. Inspections provide only a snapshot in time, and do not guarantee that a facility is AIS-free. Increasing the frequency of inspections and using a variety of methods will improve the likelihood that an AIS is detected. In addition, monitoring may be useful in identifying the point of AIS introduction, should an infestation occur.

Because each AIS is different, no one method is effective for detecting all species. A combination of methods, including specialized sampling devices and examination of existing surfaces, is necessary. Monitoring methods and specific directions, as well as procedures for documenting and reporting monitoring, are provided below.

### *Monitoring Source Water and Outflow*

A means for continuous monitoring of non-well water entering the hatchery is necessary. Detecting AIS in water coming into a hatchery can exclude hatchery activities as the source of an AIS infestation. A portion of the inflow is routed into a flow-through system, referred to as a “biobox”, designed to provide a suitable environment for some AIS species, making their detection possible. In addition, hatchery staff should examine debris, including plants, entrained on intake screens and trash-racks for AIS. If it is not feasible to use a biobox at the inflow, then artificial substrates must be deployed near the water intake.

Because hatchery water is released into the environment untreated, AIS may be released as well. Monitoring hatchery outflow samples all the water passing through the hatchery, and is the final opportunity to detect AIS. Outflow monitoring can be achieved using either a biobox, artificial substrates and surface survey for depths three feet and greater, or surface survey for depths less than three feet.

*Bioboxes*

- ***This method is suitable for detection of quagga mussels, zebra mussels, and New Zealand Mudsnails.***

Bioboxes are flow-through aquaria, designed specifically to sample for the larval/settlement stage of quagga mussels, zebra mussels and New Zealand mudsnails. Microscopic larvae are suspended in the water, and upon reaching settlement stage, attach to surfaces. The biobox provides suitable conditions (surface and flow) for this to occur. Flow rates greater than 5 feet/sec inhibit mussel and mudsnail settlement, so a flow-through system must not exceed this velocity.

Location(s):
If using bioboxes, one will be installed where raw water enters the facility and, if feasible, at each (if more than one) hatchery outflow, prior to discharge. Bioboxes are not needed on water drawn directly from a well. Bioboxes should be placed on a stable surface adequate to support its weight. If the water temperature inside the biobox is more than 2° F above the hatchery water temperature then the biobox must be shaded. Bioboxes should be located in areas that will not be damaged by water if the box were to overflow. Individual hatcheries may need to modify the Biobox during installment to adequately meet all flow and temperature requirements. There may also be infrastructure modifications needed to connect the Biobox to individual hatcheries inflow and outflow water supply.

Monitoring frequency:
Bioboxes should be checked as needed to ensure they are operating correctly and maintaining the appropriate flow rate. A visual and tactile (touch) examination is conducted quarterly.

Requirements for biobox design:
- Minimum internal volume of 12 gallons
- Flow rate of 1.32 gallons/minute

The following design specifications meet the biobox requirements, above.

<u>Biobox Construction and Assembly (Figure 1)</u>
(Designed by Jody Rightmier, CDFW Yreka Screen Shop)

**BIO-BOX MATERIALS PARTS LISTING: material to cover single box**

1” PVC Ball Valve Female threaded ends, quarter turn design…..1 each

Nipple TBE SCH 80 1” x close PVC……..1 each

1” PVC 90 degree elbow slip x slip SCH 40…….1 each

1” pipe x MIPT PVC insert male adapter……2 each

1’ PVC Tank adapter SOCXFPT NPRN Gasket……...2 each

1’ x 2” (length) SCH 40 PVC pipe……1 each

22 x 17 x 12” Grey Bins and Divider box……1 each

Snap F/DC3000 Bins & Divider box cover…….1 each

Short Divider F/DC3080 (sold in 6 pk). Bins & Divider box…….3 each/box

ER308L 3/32 x 36” TIG welding rod……1 each

1/2 " bolt size medium flat washer 18-8 stainless/steel……6 each

The plates slide down into “channel guides” on either side of the interior walls of the box (Figure 2) and water flows over and under the plates as it passes through the box. Plates are kept submerged with stainless steel wire and washers that allow for removal when inspecting the plates. Flow into the box is regulated by a valve on the incoming water line. The outlet is an overflow pipe that ensures the water level in the box remains at a constant level. All interior surfaces and plates are roughed up with fine (150-180 grit) sandpaper to maximize suitability for settlement.

Figure 2. Interior view of biobox plates that provide suitable surfaces for mussel and mudsnail settlement.

Monitoring procedure:

To inspect biobox, begin by closing the inflow valve. One at a time, carefully remove each plate. Do not set the plates down as small or delicate organisms could be crushed. Hold the plate over a separate container to catch any dislodged organisms, and visually inspect it. Use a magnifying glass if necessary. Next, gently run fingers over the plates to feel for any organisms. Very small quagga or zebra mussels may be more easily felt than seen. Do not leave the plates out of the water so long that they dry; examine and return to the water immediately if no suspect organisms are found. When finished with the first plate, reinsert it and inspect the remaining plates the same way. Also examine the inner walls of the biobox. If walls are transparent, look in from the outside. If not, view from above. Next, gently run fingers over the walls as with the plates. When finished, open the valve to resume appropriate flow.

*Artificial Substrates*

- ***This method is suitable for detection of quagga and zebra mussels***

If it is not feasible to use a biobox at the inflow or outflow, then artificial substrates must be deployed.

**ARTIFICIAL SUBSTRATE MATERIALS PARTS LISTING: material to cover single substrate**

(4) 6” x 6” x 0.25” black/grey PVC with 1” hole through center

(5) 1.5” x 1.375” (35mm) exterior diameter PVC or ABS tube

(1) 8.5” x 0.8125” (21 mm) exterior diameter PVC or ABS tube

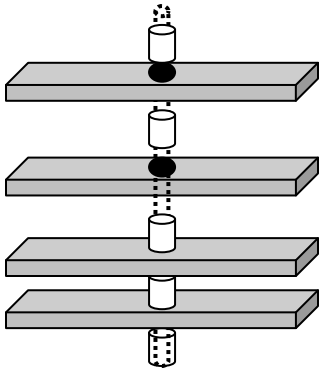
~25 ft plastic coated cable or rope

Some form of attachment to keep plates from floating up

Weight

Laminated label with your contact information

To assemble the substrate, run the cable or rope through the 8.5” tube and secure at one end. From the loose end of the rope string on the remaining pieces, alternating between the short segments of tube and the plates, beginning and ending with the short tubes (see figure). Secure the top tube to the rope to prevent the pieces from floating up. If necessary, attach a weight to the bottom of the assembly. Attach the label to the cable where the cable is secured to the structure.



California Department of Fish and Game

Biological Research

PLEASE DO NOT DISTURB

Deployment of the Artificial Substrates:

Depending on water clarity and depth, the artificial substrate should be set below the euphotic zone (below the depth of light penetration) or 6 feet, whichever is deeper, and at least two few feet above the bottom. One to two substrates are deployed per site. If the site is shallower than 2 m, then raise the substrate about 0.5 m (2 ft) off of the bottom. Record the actual sampling depth. At sites that are deep and have little vertical mixing, a second substrate is installed at a depth of approximately 15 meters (50 feet) below the surface (or 1 meter off the bottom if the depth is less than 15 meters).

Monitoring procedure:

To check an artificial substrate, first carefully lift it out of the water and place it in a large plastic tub (the tub will capture any mussels that fall off). Avoid knocking the substrate as you pull it out of the water because you may dislodge or crush any attached mussels. First visually inspect each plate (top, bottom, and sides), the spacers, the cable and the weight. Use a magnifying glass if necessary. Next, gently run fingers over the plates to feel for any organisms. Very small quagga or zebra mussels may be more easily felt than seen. After looking closely, attempt to gently push any attached organism that might be a mussel. Freshwater limpets and snails easily move or slide across the plate. Zebra and quagga mussels stick in place or are more securely attached. In all cases, if in doubt, bag it.

If no mussels are detected, lower the substrate back into the water. Zebra and quagga mussels are more likely to attach to a substrate that has some algal growth, however if the substrate becomes too heavily coated it may be unsuitable for mussel settlement. As necessary, gently remove heavy accumulations of algae to maintain suitable conditions for settlement.

### *Monitoring In-Hatchery and Outflow*

In addition to monitoring at the inflow and outflows, surface surveys must be conducted within the hatchery facilities and outflows if a biobox is not used.

*Surface Surveys*

- ***This method is suitable for detection of quagga and zebra mussels and New Zealand mudsnail***

When areas are dewatered during hatchery operations, surfaces must be inspected for AIS. Many AIS blend in with their surroundings and prefer sheltered areas, so close inspection is necessary and most easily conducted when dewatered. In addition, surfaces and structures within the hatchery must be inspected quarterly. Specific instruction on how to inspect surfaces is provided below.

Locations and frequency:
Inspect 5% of dewatered surfaces as dewatering occurs. In addition, inspect 5% of surfaces throughout the facility each quarter. For example, if there are ten raceways, inspect the safely accessible surfaces equivalent to one-half of a raceway (10 raceways x 0.05 = 0.5 raceways), divided among the ten raceways. Spreading the 5% over all of the raceways increases the chance of finding an AIS if it is in the facility.

The 5% applies to surfaces, outflow settling ponds (if applicable) as well as equipment such as screens, tubing, lines, etc. As with all forms of early detection monitoring, the more you look, the more likely you are to find something if it is there. Always err on exceeding the minimum sampling requirement, rather than just meeting it.

If monitoring is conducted outside of secured areas of the hatchery there is greater potential that they are infested with invasive species. Do not allow gear that will be returned to the hatchery (including, but not limited to boots, waders, nets, etc.) to contact the settling ponds. In these cases gear dedicated to this purpose should be used and prominently labeled, and stored separately from other gear. If dedicated gear is not feasible, then gear must be decontaminated after monitoring outside of the hatchery according to the following protocols:

http://www.dfg.ca.gov/invasives/quaggamussel/

Monitoring procedure:

Carefully examine surfaces both visually and tactilely by running fingers over them, with particular attention given to protected areas such as crevasses, corners, and edges, and areas where fish are excluded from. If needed, use a magnifying glass, flashlight, or other aides to thoroughly examine.

## Summary of Monitoring Methods and Minimum Monitoring Frequencies

| | Biobox | Surface Survey | Artificial Substrates |
|---|---|---|---|
| Inflow | Quarterly (January, April, July, October) | N/A | N/A |
| In hatchery | N/A | Dewatering and 5% Quarterly (January, April, July, October) | N/A |
| Outflow | Quarterly (January, April, July, October) | 5% Quarterly (January, April, July, October) | Quarterly (January, April, July, October) |

## Specimen Identification and Collection

If a suspect AIS is detected either during daily operations or monitoring, immediately contact your CDFW Regional AIS Scientist (page 12). To aid their identification, first take a close-up digital photograph of the organism next to a ruler so that there is a size reference. Next, collect the specimen(s) and place in a container where it will not be crushed and add enough 70% ethanol to cover it. Label the sample with hatchery name, location within the hatchery, date, suspected species, and the name of who collected it. If the entire substrate needs to be retained, place the entire unit in a plastic bag. E-mail the photos to the CDFW Regional AIS Scientist and they will try to identify the specimens from the photographs. If they are unable to identify the species from photographs, they may request the specimen(s) or substrate.

## Data Recording and Reporting

Quarterly monitoring is to be conducted during the months of January, April, July, and October. Quarterly monitoring datasheets must be completed to document monitoring, and are to be submitted by the end of the month of monitoring. Absence data is as important to document as presence, so complete and submit a datasheet (electronic form provided) even if no AIS are found. Hatcheries are to send an electronic copy of the datasheet to their respective regional Senior Hatchery Supervisor, Regional AIS Scientist, to the Fisheries Branch Fish Production Program Manager, Headquarters AIS Program (invasives@wildlife.ca.gov), and Hatchery Coordinator via email, and retain the originals on-site. All data will be entered into a centralized monitoring database maintained by the Habitat Conservation Planning Branch AIS Program.

## CDFW Regional Office Contacts for AIS Monitoring

Contact information subject to change. For the most up to date information refer to: http://www.nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=4955.

Region 1 – Northern Region

Counties: Del Norte, Humboldt, Lassen, Mendocino, Modoc, Shasta, Siskiyou, Tehama, and Trinity
601 Locust Street, Redding, CA 96001
L. Breck McAlexander
Louis.McAlexander@wildlife.ca.gov
Office: (530) 225-2317
Fax: (530) 225-2381

Region 2 – North Central Region

Counties: Alpine, Amador, Butte, Calaveras, Colusa, El Dorado, Glenn, Lake, Nevada, Placer, Plumas, Sacramento, San Joaquin, Sierra, Sutter, Yolo and Yuba
1701 Nimbus Road, Rancho Cordova, CA 95670
Angie Montalvo
Angie.Montalvo@wildlife.ca.gov
Mobile: (530) 333-7749
Fax: (916) 358-2912

Region 3 – Bay Delta Region

Counties: Alameda, Contra Costa, Marin, Napa, Sacramento, San Mateo, Santa Clara, Santa Cruz, San Francisco, San Joaquin, Solano, Sonoma, and Yolo
7329 Silverado Trail, Napa, CA 94558
Catherine Mandella
Catherine.Mandella@wildlife.ca.gov
Mobile: (831) 588-1463
Fax: (707) 944-5563

Region 4 – Central Region

Counties: Fresno, Kern, Kings, Madera, Mariposa, Merced, Monterey, San Benito, San Luis Obispo, Stanislaus, Tulare and Tuolumne
1234 E. Shaw Avenue, Fresno, CA 93710
Kelley Aubushon
Kelley.Aubushon@wildlife.ca.gov
Office: (559) 243-4017 X-285
Fax: (559) 243-4004

Region 5 – South Coast Region

Counties: Los Angeles, Orange, San Diego, Santa Barbara and Ventura
4665 Lampson Avenue, Los Alamitos, CA 90720
Eloise Tavares
Eloise.Tavares@wildlife.ca.gov
Office: (562) 342-7155

Fax: (562) 342-7153

Region 6 – Inland Deserts Region
Counties: Imperial, Inyo, Mono, Riverside and San Bernardino
P.O. Box 2160, Blythe, CA 92226
David Vigil
David.Vigil@wildlife.ca.gov
Mobile: (760) 668-9029
Fax: (760) 922-5638

**Other Aquatic Invasive Species of Concern**

The following species are known to occur in California and should be reported if found. Additional species accounts may be added as warranted.

Animals
- Channeled apple snail

Plants and Algae
- Eurasian watermilfoil
- Brazilian waterweed or Brazilian elodea
- Hydrilla
- Rock snot or didymo

# CHANNELED APPLE SNAIL

*Pomacea canaliculata*

Freshwater aquatic snail. Channeled apple snails leave the water to lay eggs and eat terrestrial vegetation. Eggs hatch and juvenile snails return to the water. Reproduction is dependant on food availability and water temperature, but usually occurs in the early spring and early fall.

Species Description:

Body form – Single shell with compact spirals that are deeply indented, hence the common name “channeled”. Eggs are reddish in color, and loosely attached to each other in masses of 200-600.

Size – Adult shells can reach up to 3” long, individual eggs are 0.09-0.14” in diameter.

Color – Shell color is yellowish to brown.

Suitable Environmental Conditions:

Temperature – Survives in water between 65° F and 90° F.

Moisture – Aquatic, but commonly leaves water to lay eggs and eat. Can survive out of water for several months by closing the opening of its shell and bedding in the soil.

Substrate – Soft (mud, silt, plants, etc.) and hard surfaces.

Known occurrences in California – Lake Miramar, San Diego County, Norton Simon Museum pond, Los Angeles County, and Riverside County near the Salton Sea.

Key Features for Identification:

The large size of adult channeled apple snails and their egg masses is unique. Smaller specimens may be identifiable by their round, deeply indented shell.

Adult channeled apple snail shells

Egg masses


Newly hatched (5 day) channeled apple snail.

# EURASIAN WATERMILFOIL

*Myriophyllum spicatum*

Species Description:

Plant – Reddish-brown or whitish-pink

Stems – Branched and 20-30” long, reddish-brown or whitish-pink.

Leaves – Olive green and occasionally reddish tinted and arranged circularly around the stem in groups of 3-6 (usually 4). Each leaf is less than 2” long, soft, and feather-like. Each leaf has a rib and 14-24 or so slender segments on each side of the rib.

Flowers – Individual flowers are reddish, very small, and many together form spikes several inches long that are held above the water.

Roots – Fibrous, often developed on small pieces broken off larger plant.

Suitable Environmental Conditions:

Temperature – Able to overwinter in frozen lakes and ponds in northern states and Canada; also able to grow in shallow, over-heated bays.

Moisture – Underwater; often found in water 1½” to 12’ deep, and up to 30’ in very clear water. Prefer lakes, ponds and slow-moving rivers and streams but can also grow in fast-moving water. Tolerates a wide range of water conditions, including spring water and even brackish water of tidal creeks and bays with salinity of up to 10 parts per thousand.

Substrate – Root in all types of substrates, and broken pieces float freely.

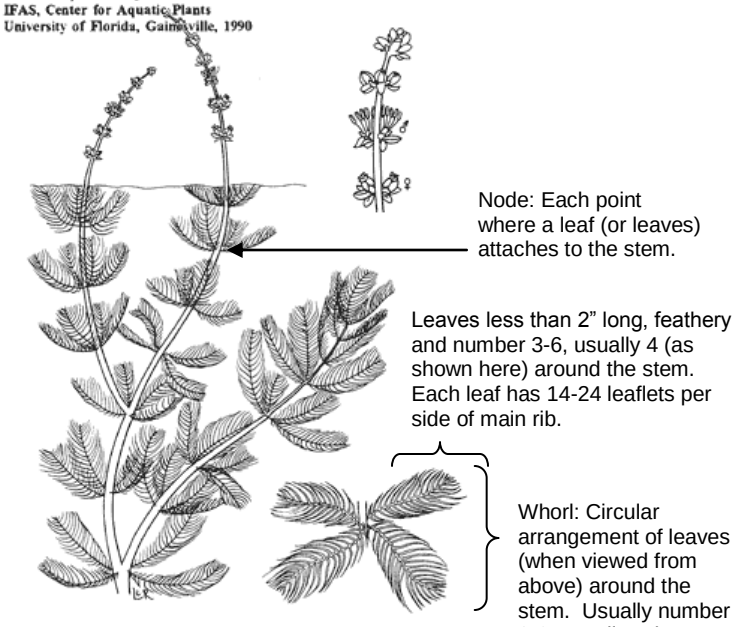
Known occurrences in California – Sacramento-San Joaquin Delta, San Francisco Bay Area and Central Valley ditches and lakes; margins of Southern California’s south-east border.

Key Features for Identification:

Finely divided, feather-like leaves ½ to 2" long.

Color variation of Eurasian watermilfoil

*illustration provided by:*
**IFAS, Center for Aquatic Plants**
**University of Florida, Gainesville, 1990**



# BRAZILIAN WATERWEED OR BRAZILIAN ELODEA

*Egeria densa*

Species Description:

Plant – Green

Stems – Highly branched and can reach 25' or more in length.

Leaf attachment to stem (nodes) – Densely spaced at growing tip and indistinguishable. Points of attachment are more widely spaced near the main stem and stems deeper in the water. Double nodes bear branches and flowers.

Leaves – Thin, ¾ – 1½" in length and 1/16 – 1/8" wide, arranged circularly around the stems when viewed from above (whorls) of 3-6 leaves. Spear-shaped leaves have tiny teeth that may require a magnifying glass to see. The number of leaves doubles or triples (up to 12 leaves per whorl) every 8-12 whorls.

Flowers – Three white petals and are about ¾" across on 1" stems above the surface of the water.

Roots – Thin

Suitable Environmental Conditions:

Temperature – Survives in water between 40°F and 90°F.

Moisture – Underwater, in both flowing and shallow and standing water.

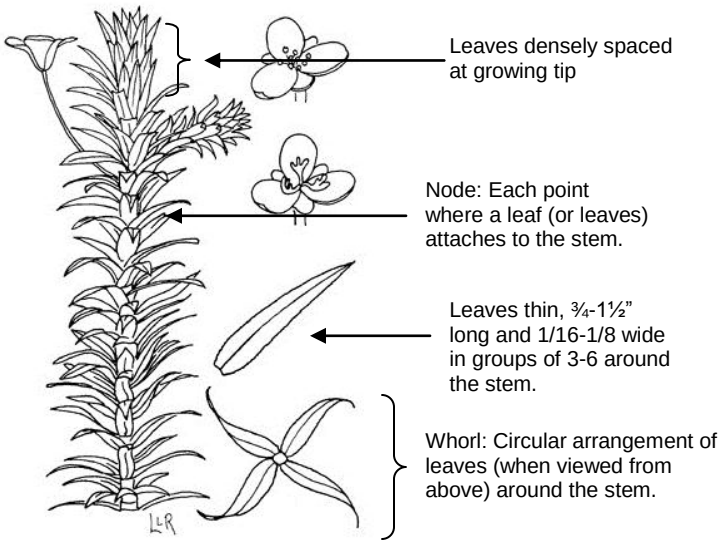
Substrate – Roots in all types of substrates; broken pieces float freely

.

Known occurrences in California – Throughout the Sacramento-San Joaquin Bay-Delta.

Key Features for Identification:

Robust 1-inch leaves closely spaced in whorls of 3-6 around the stem. Also refer to page 7 for a comparison with similar species.

# HYDRILLA

*Hydrilla verticillata*

Species Description:

Plant – Green, up to 25' long.
Stems – Slender, branched.
Leaves – Spear-shaped, ½ - ¾" long and 1/16" wide arranged in groups of 4-8 leaves around the stem. Leaf margins distinctly saw-toothed. Often 1-2 sharp teeth along the underside of the leaf rib.
Flowers – Tiny, white flowers born on long stalks at the surface of the water.
Roots – Roots are white and may have yellowish, potato-like structures ½" long and ½" wide at the tips of the roots.

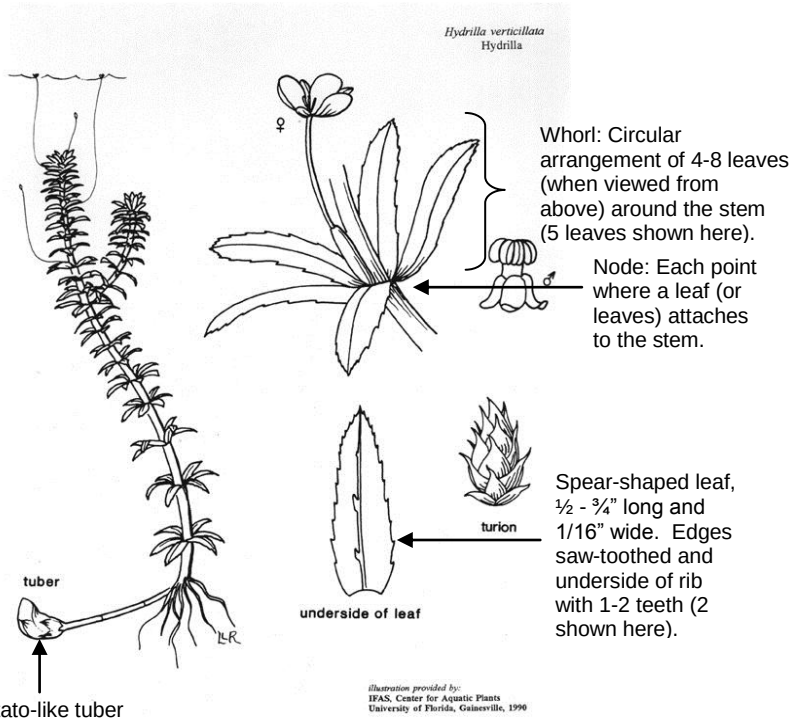
Suitable Environmental Conditions:

Temperature – Somewhat winter-hardy; its optimum water temperature is 68° F - 81° F; its maximum temperature is 86° F.
Moisture – Underwater, from a few inches deep to more than 20'.
Substrate – May be found in all types of water bodies including springs, lakes, ponds, marshes, ditches, canals, rivers, tidal zones. Broken pieces float freely.

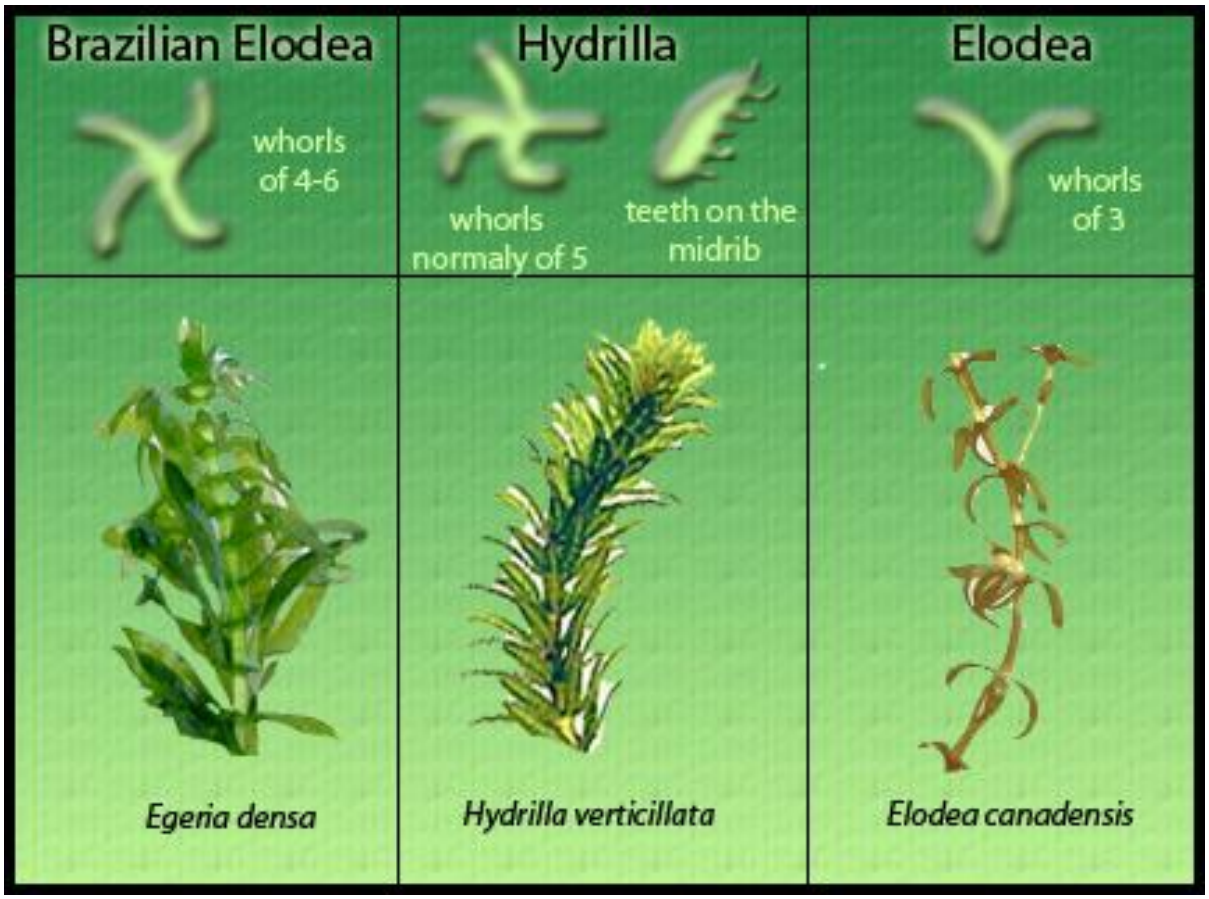
Known occurrences in California – As of 2012, hydrilla is currently being eradicated from 9 locations in Calaveras, Imperial, Lake, Nevada, Shasta, Tulare, and Yuba counties.

Key Features for Identification:

Hydrilla has distinctly saw-toothed leaf edges and teeth on the leaf underside. In addition, potato-like tubers on roots are diagnostic. Also refer to page 7 for a comparison with similar species

Side-by-side comparison of two invasive aquatic plants, *Egeria densa* and *Hydrilla verticullata*, to that of the common native *Elodea canadensis*.




| INVASIVE | INVASIVE | NOT INVASIVE |
|---|---|---|

# ROCK SNOT OR DIDYMO

*Didymosphenia geminata*

Rock out of water, colonized with rock snot.

Species Description:

- Growth form – Single-celled algae that forms thick mats.
- Size – Starts as small clumps and can spread to cover entire wetted areas.
- Color – Pale yellowish-brown to white.

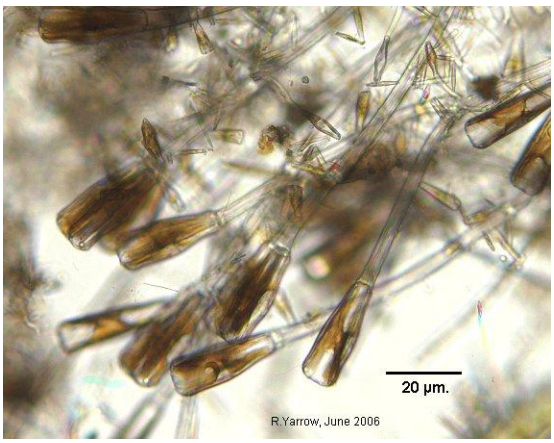
Suitable Environmental Conditions:

- Temperature – 32° F - 72° F
- Moisture – Under water.
- Substrate – Attaches to hard and soft substrates at depths of 4" to 6½'. Fragments float freely

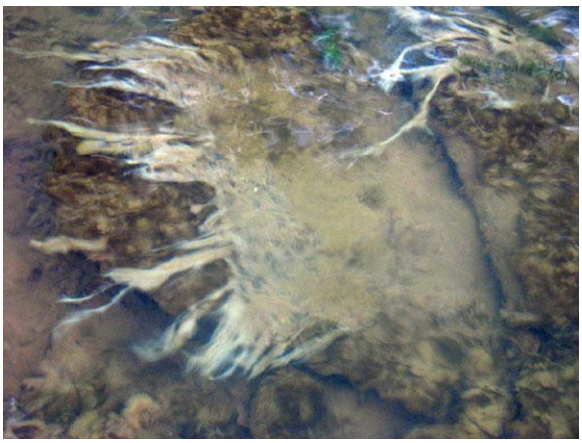
Known occurrences in California – South Fork of the American River, Sierra Nevada.

Key Features for Identification:

Looks like slimy blobs attached to rocks or wet toilet paper trailing from rocks and aquatic plants in streams, and as mats in slow moving water. Appears slimy but feels coarse, like damp wool.




Rock snot structure, as seen under a microscope



Rock snot in flowing water

# MEMORANDUM

TO: Water Resources Committee

From: Michael L. Flood, General Manager

RE: **Discussion of Primary Water Resources Proposal of January 15, 2019**

Date: February 15, 2019

RECOMMENDATION:

The Water Resources Committee provide direction to the General Manager.

BACKGROUND:

Ted Moore of Primary Water Resources (PWR) presented a proposal entitled “Primary Water Resources Proposal to the Casitas Municipal Water District” at the January 15, 2019 Water Resources Committee meeting.

The proposal included two overall concepts:

1. Teague watershed well information sharing.
2. Sale of groundwater to Casitas from a groundwater well at Grand Ave & Gorham Rd.

Committee Member Baggerly asked that the proposal be reviewed by District Counsel and that comments be returned to the Water Resources Committee.

The proposal was transmitted to District Counsel and Pueblo Water Resources for review and comment.

DISCUSSSION:

District Counsel will produce a confidential memo to the Committee members in regard to the proposal. That memo is expected to be presented to the Committee during the Water Resources Committee meeting of February 19, 2019.

Pueblo Water Resources indicates that understanding the location of the well might prove useful to the feasibility study being conducted for the Teague Watershed Test Bore project.

# Primary Water Resources Proposal to Casitas Municipal Water District

**DATE: January 15th, 2019**

*Ted Moore, President & CEO*
*Andrea Neal, PhD, Chief Scientific Officer*
*Primary Water Resources*

A. Test Well Program for Teague Watershed:
   a. The Board is currently considering a proposal from Pueblo Water Resources, Inc. to locate test well sites in the area just North of Lake Casitas near Santa Ana Creek and the Diversion Canal.
      i. We're assuming that the Pueblo proposal will be approved by the Board, and we're proposing that the Board further approve that PWR work with Pueblo as a Sub or Co-Consultant.
      ii. PWR has spent considerable time and money investigating and mapping the groundwater resources in the Ojai Valley, including the Teague Watershed Area. We believe this knowledge should be considered when locating test well sites in this area.
      iii. Recently, we located a well site on private property (that was drilled) within this area, which has a flow of 400 gallons per minute (gpm).
      iv. Furthermore, we've mapped a large water-bearing fault system that runs through this area that does not flow subsurface into the Ventura River, but goes away from it over to Carpinteria and eventually out through Goleta.
      v. We think the groundwater potential of this fault system is significant, and can support 3 - 5 wells that will each generate 400 to 600 gpm.
      vi. Santa Ana & Coyote Creek Aquifers: We've located both of these groundwater aquifers, which cross the fault system and run under Lake Casitas (and below the clay cap on the lake's bottom).
      vii. We believe the test wells should be located at the junction of these aquifers and/or on the fault system. The depth of the fault system and the aquifers is estimated to 600' to 800'.
   b. Compensation to PWR:
      i. We are not trying to take any of the fee proposed by Pueblo. We are proposing to the Board that PWR is paid an additional fee of $10,000. In return, we'll share all of our knowledge and work with Pueblo to help develop a test well program for the Teague Watershed.

B. Sale of Water to Casitas (from an existing well at Grand and Gorham):
    a. PWR is a private water company that was created two years ago with the intention to develop new groundwater resources for the Ojai Valley. Most of us live here and are very concerned about maintaining the economic viability and quality of life in the valley.
    b. Our studies indicate that significant volumes of water are flowing underground out of the valley (and being lost to the ocean) far in excess of current safe yield estimates.
    c. Our business plan is to front the cost of drilling wells (and infrastructure) on different aquifers (typically on private properties) that we've located and sell water to farmers, property owners and local water districts at a price that is equal to or lower than current rates of water districts in the valley.
    d. Legal Consideration:
        i. We work closely with Amy Steinfeld, our water attorney, at Brownstein Hyatt, Santa Barbara. She has assured us that it is legal to implement our business plan to sell water from our wells within the boundaries of the two GSA's (OBGMA and the Upper Ventura River). Having said that, she cautions that the different GSA Boards may need to approve, and that the current lawsuit filed by the City of Ventura may put our venture at risk.

C. Proposal to Sell Water to Casitas:
    a. Existing well at Grand and Gorham:
        i. We have an agreement with a private property owner near the intersection of Grand Avenue and Gorham Road. There is an existing well located on the property that is currently not active. Importantly, this well is located on one of the groundwater aquifers that we've located and confirmed with our lithology mapping system. The property owner wants to put it back into service and has been paying extraction fees to the OBGMA since she purchased the property about four years ago. A recent pump test indicates a flow of 500 gpm, which equals 807 AFY. Initial water tests indicate that the water is potable and meets California safety standards. Casitas has an existing distribution line in Grand Avenue very close to the well location.
    b. PWR Proposal:
        i. PWR proposes to sell this water to Casitas at a price of $650 AFY with an annual increase equal to the greater of 4% per year or the amount that Casitas increases their pricing.
        ii. Term of Agreement: 5 year rolling term, ie, the term gets extended for an additional year as each year passes.
        iii. Acre Feet to be Purchased: we're obligated to provide water to the property owner who owns about 10 acres, so the balance would be sold to Casitas.

iv. PWR will pay the cost to put the well back into service and work with Casitas to put in appropriate infrastructure and connect it into the Casitas line on Grand Ave.
v. PWR will pay the cost of power to pump the water from the well.
vi. Casitas will pay the cost of the engineered plans for the line from the well, needed infrastructure apart from the well, and for the tie-in to their pipeline on Grand.
vii. Construction will be managed by Casitas at their cost.
viii. Casitas will maintain the well and infrastructure, including the cost of any further treatment of the water, such as a chloramine station.
ix. Legal costs:
    1. Each party will pay their respective legal fees. We suggest that the District's legal counsel first confer with our legal counsel before proceeding with an Agreement.
x. Conditions to the Agreement:
    1. Any legal clearances or assurances required by Casitas, as well as approval of costs involved.
    2. Easements will be granted to Casitas as needed for the pipeline connecting the well to the Casitas line and for well access and maintenance.

D. Going Forward:
    a. PWR currently has Agreements in place with 4 other private property owners where we've located additional wells sites in the Valley that we'd like to drill to create additional water sources. It is our desire to make this Grand/Gorham project the beginning of an overall plan for the valley.

**CASITAS MUNICIPAL WATER DISTRICT**
**INTEROFFICE MEMORANDUM**

**TO:** MIKE FLOOD, GENERAL MANAGER

**FROM:** JULIA ARANDA, ENGINEERING MANAGER

**SUBJECT:** TEAGUE WATERSHED GROUNDWATER ASSESSMENT

**DATE:** 02/19/19

**RECOMMENDATION:**

It is recommended the Water Resources Committee receive a status update on the Teague Groundwater Watershed Assessment.

**DISCUSSION:**

Pueblo Water Resources was retained to assess the feasibility of groundwater resource development in the Teague property, located northerly of Lake Casitas. Pueblo will provide an update of their research to date.

Attachment: Presentation

**CASITAS MUNICIPAL WATER DISTRICT**
**INTEROFFICE MEMORANDUM**

**TO:** MIKE FLOOD, GENERAL MANAGER

**FROM:** JULIA ARANDA, ENGINEERING MANAGER

**SUBJECT:** TECHNICAL ADVISORY COMMITTEE FOR MATILIJA FORMATION DEEP WELLS

**DATE:** 02/19/19

**RECOMMENDATION:**

It is recommended the Water Resources Committee receive an update regarding the formation of a Technical Advisory Committee (TAC) for the Matilija Formation Deep Wells and provide direction on the composition and scope for the TAC.

**DISCUSSION:**

The Board requested a 'second opinion' regarding the feasibility of the Matilija Formation Deep Wells project, including the Horizontal Bore (HOBO) and Vertical Bore (VERBO) components. In discussion with Pueblo Water Resources (Pueblo), the concept of a TAC was discussed. The proposed TAC would include staff from Pueblo to serve in a coordination role, and be comprised of professional hydrogeologists familiar with region and with extensive experience in similar projects.

Pueblo will attend the committee meeting to discuss and hear feedback from the Water Resources Committee. It is expected a proposal for the TAC's work will be presented at the Water Resources Committee meeting of March 19, 2019, followed by approval of such at the Board meeting of March 27, 2019.

**CASITAS MUNICIPAL WATER DISTRICT**
**INTEROFFICE MEMORANDUM**

**TO:** MIKE FLOOD, GENERAL MANAGER

**FROM:** JULIA ARANDA, ENGINEERING MANAGER

**SUBJECT:** EMILY STREET / CANADA STREET PIPELINE IMPROVEMENTS

**DATE:** 02/19/19

**RECOMMENDATION:**

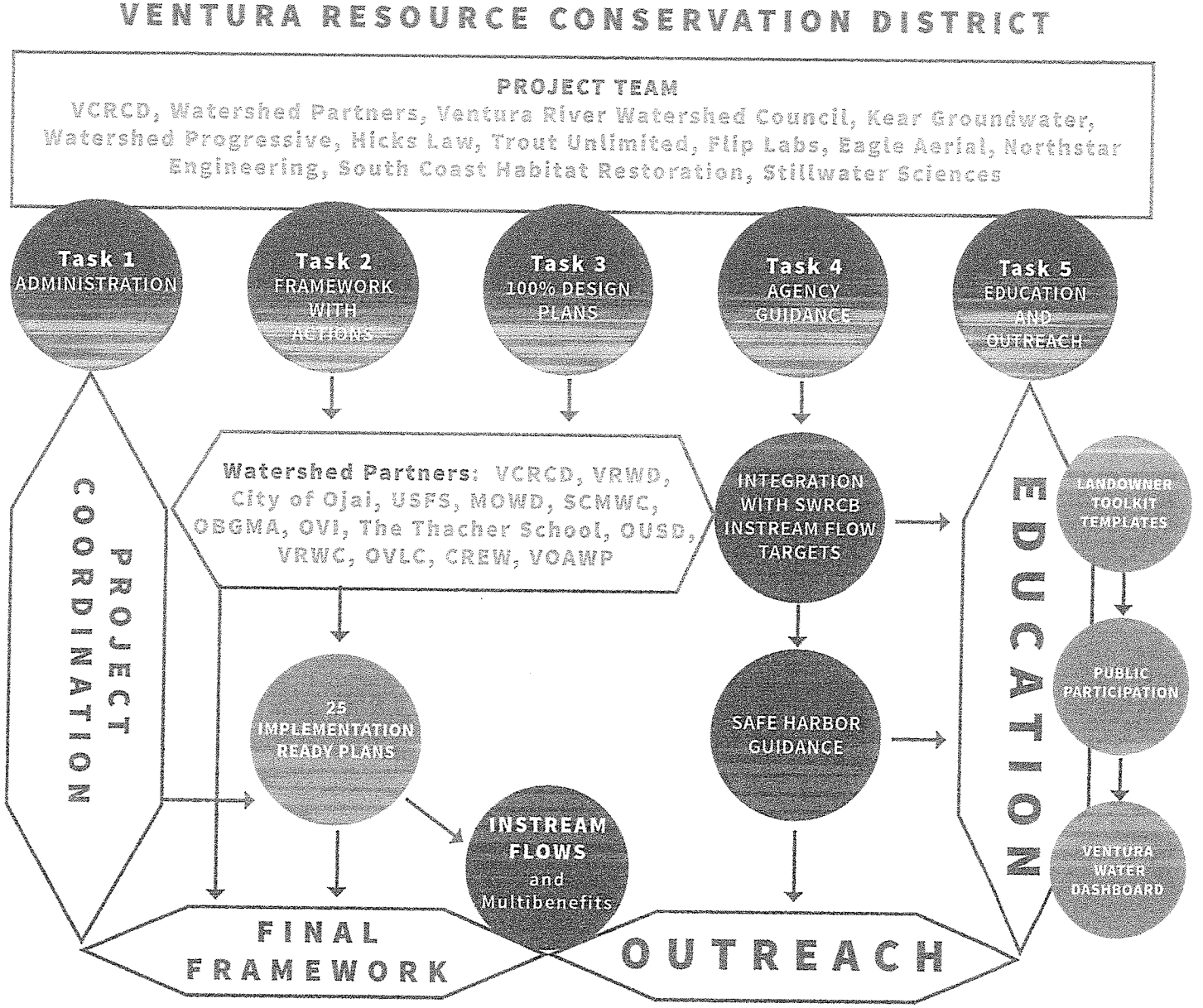
It is recommended the Water Resources Committee review the proposal from MNS Engineers for the Emily Street/Canada Street Pipeline Improvements project and recommend such to the Board of Directors.

**DISCUSSION:**

Engineering staff requested a proposal from MNS Engineers (MNS) for design engineering services for the Emily Street / Canada Street Pipeline Improvements project in the Ojai Water System. MNS is one of the District's on-call engineering firms. This is a budgeted project for Fiscal Year 18-19 in the amount of $150,000.

Attachment: Proposal from MNS

# VENTURA WATERSHED INSTREAM FLOW ENHANCEMENT AND WATER RESILIENCY REGIONAL FRAMEWORK



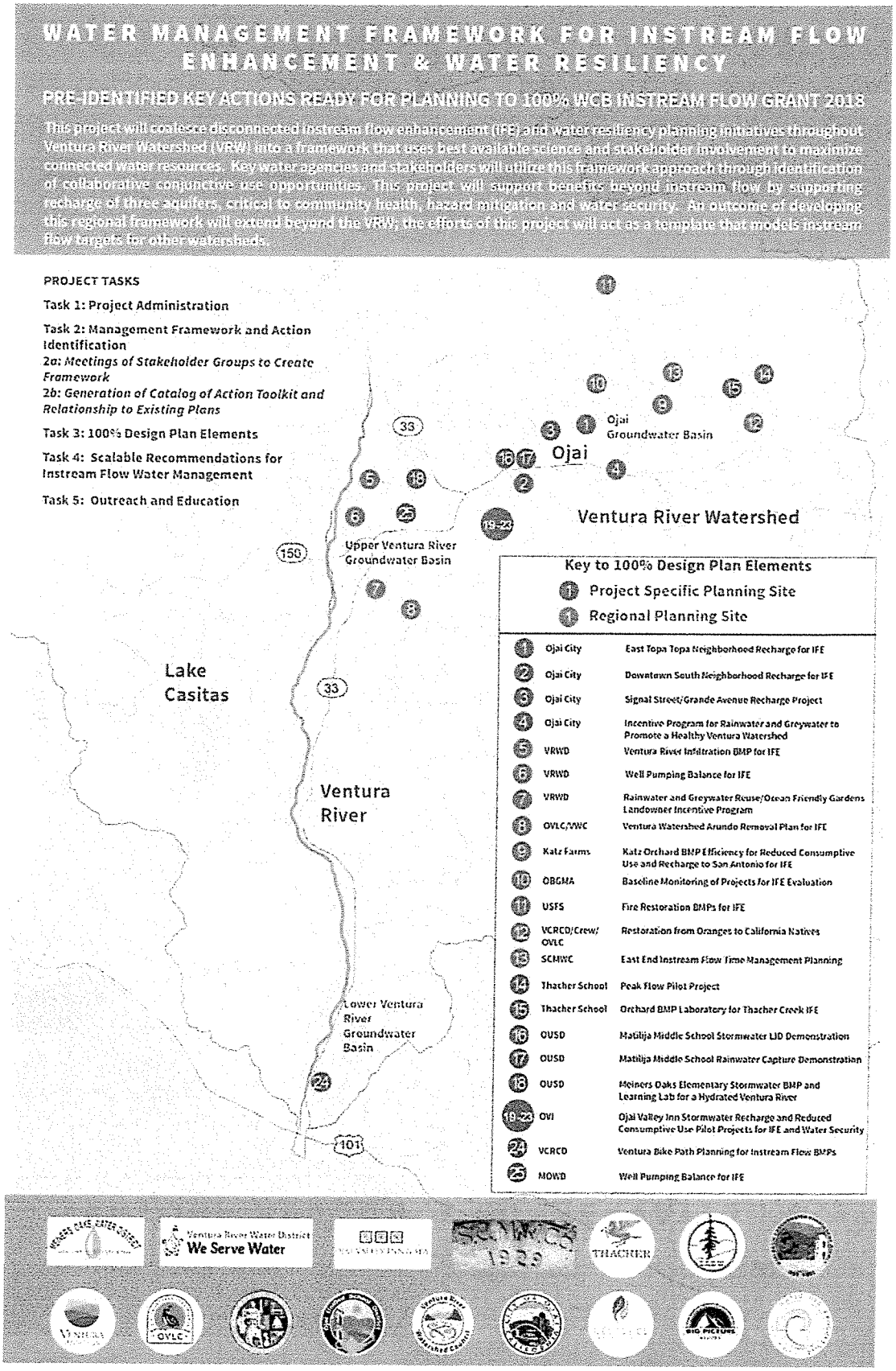



**Figure 1:** Project concept map.

RESOURCE
CONSERVATION DISTRICT
Ventura County



John P. Donnelly
Wildlife Conservation Board
Streamflow Enhancement Program
1416 9th Street, Room 1266
Sacramento, Ca. 95814

September 3, 2018

**Re: WCB California Stream Flow Enhancement Program Proposal Cover Letter**

Dear Mr. Donnelly,

The State of California has long recognized the perilous water supply scenario in Western Ventura County. When a highly-promoted 2016 El Niño did not transpire, both water providers and the community recognized the precarious, and even dangerous water supply shortage that was in play. Since then, a series of water education events have occurred, starting in the Ojai Valley. This proposal is a culmination of these long-term collaborative outreach and planning efforts.

This region of our County has one source of water: rainfall. Being "off the water grid" from other water sources and lacking strong water user and provider relations, it has taken nearly two years of meeting with and educating this community as to the mounting problem. This problem is big in scale and complex. Sometimes big problems require big solutions, or perhaps many small, targeted endeavors that add-up to a scalable solution.

That is what this grant application titled *Ventura Watershed Instream Flow Enhancement and Water Resiliency Regional Framework* intends to provide - small, scientifically-targeted projects that, when implemented, will produce measurable increases in stream flow. The projects run the gamut of rainwater capture, water reuse, and aquifer recharge, among others, to maintain appropriate instream flows support fish habitat and provide other benefits. Local water use efficiency, agricultural demonstrations, and water reuse projects are also included to improve water availability and the integrity of our regional waterways. This comprehensive approach is designed to provide a level of water security to a region at risk as drought and climate change impacts continue.

The approach described in this application is dynamic. We have identified small water cycle-related projects and bound them together into a regional watershed-wide solution that can be monitored, measured, and replicated.

By grant completion, this collection of projects will demonstrate the innovative, collaborative efforts of partners who have worked to streamline efforts and improve relations between local water users and providers. It is critical to note the depth of collaboration and innovation behind the consolidation structure of this grant application. If individual organizations from each of the 25 projects featured in this application were to independently apply for planning grant funding, the time and resources spent per organization would be immense. Additionally, by combining similar instream flow planning projects into a single application, efforts are streamlined and expedited, not only for the organizations involved in application development, but also for technical reviewers, who can more holistically understand and evaluate each project at the watershed or regional level.

We sincerely appreciate your time and effort in evaluating this proposal. As the project proponent, the Ventura County Resource Conservation District felt it important to provide this cover letter to express our appreciation of and provide the reviewing committee a glimpse of the proactive efforts expended by project partners to develop the proposed Framework planning grant. Thank you in advance for your deliberations on this proposal.

Best regards,

Debra Gillis
Executive Director

**BY FIRST CLASS MAIL & EMAIL**

February 10, 2019

John Donnelly
Executive Director
Wildlife Conservation Board
1807 13th Street, Suite 103
Sacramento, CA. 95811
John.Donnelly@wildlife.ca.gov

**Re: WCB California Stream Flow Enhancement Program**
**Letter of Support**
***Ventura Watershed Instream Flow Enhancement and Water Resiliency Regional Framework* (submitted September 4, 2018)**

Dear Mr. Donnelly,

The Casitas Municipal Water District (Casitas) submits this letter in support of the Ventura County Resource Conservation District's (VCRCD) September 4, 2018 *Ventura Watershed Instream Flow Enhancement and Water Resiliency Regional Framework* grant proposal.

Casitas operates the Casitas Dam and Reservoir in Ventura County, which has a 238,000 Acre-Foot capacity when full. In addition, Casitas is the owner of the former Golden State Water Company and the City of Ojai water system.

Casitas supports this proposed project because it will generate 100% design plans and permitting to deliver 25 local implementation-ready projects that will contribute an additional 4,517 AFY or 6.24 cfs to enhance stream flow and multi-beneficial uses such as municipal and agricultural uses. This project is unusual in its depth of community support and participation, much of it facilitated by the Ventura RCD and Regina Hirsch of Sierra Watershed Progressive. Casitas believes that the integrated projects as envisioned are an important, if not integral, component of a long-term, durable, water supply and drought resiliency strategy.

Specifically, the Ventura RCD proposal will develop an integrated voluntary strategy to address multiple converging factors such as:

- Ongoing multi-year drought;
- 2017 Thomas Fire;
- 2014 Sustainable Groundwater Management Act (SGMA);
- Local groundwater agency plans and regulations;
- State Water Resources Control Board's *DRAFT Study Plan for the Development of an Integrated Groundwater-Surface Water Model of the Ventura River Watershed;* and
- Others.

# WATER MANAGEMENT FRAMEWORK FOR INSTREAM FLOW ENHANCEMENT & WATER RESILIENCY

## PRE-IDENTIFIED KEY ACTIONS READY FOR PLANNING TO 100% WCB INSTREAM FLOW GRANT 2018

This project will coalesce disconnected instream flow enhancement (IFE) and water resiliency planning initiatives throughout Ventura River Watershed (VRW) into a framework that uses best available science and stakeholder involvement to maximize connected water resources. Key water agencies and stakeholders will utilize this framework approach through identification of collaborative conjunctive use opportunities. This project will support benefits beyond instream flow by supporting recharge of three aquifers, critical to community health, hazard mitigation and water security. An outcome of developing this regional framework will extend beyond the VRW; the efforts of this project will act as a template that models instream flow targets for other watersheds.

**PROJECT TASKS**

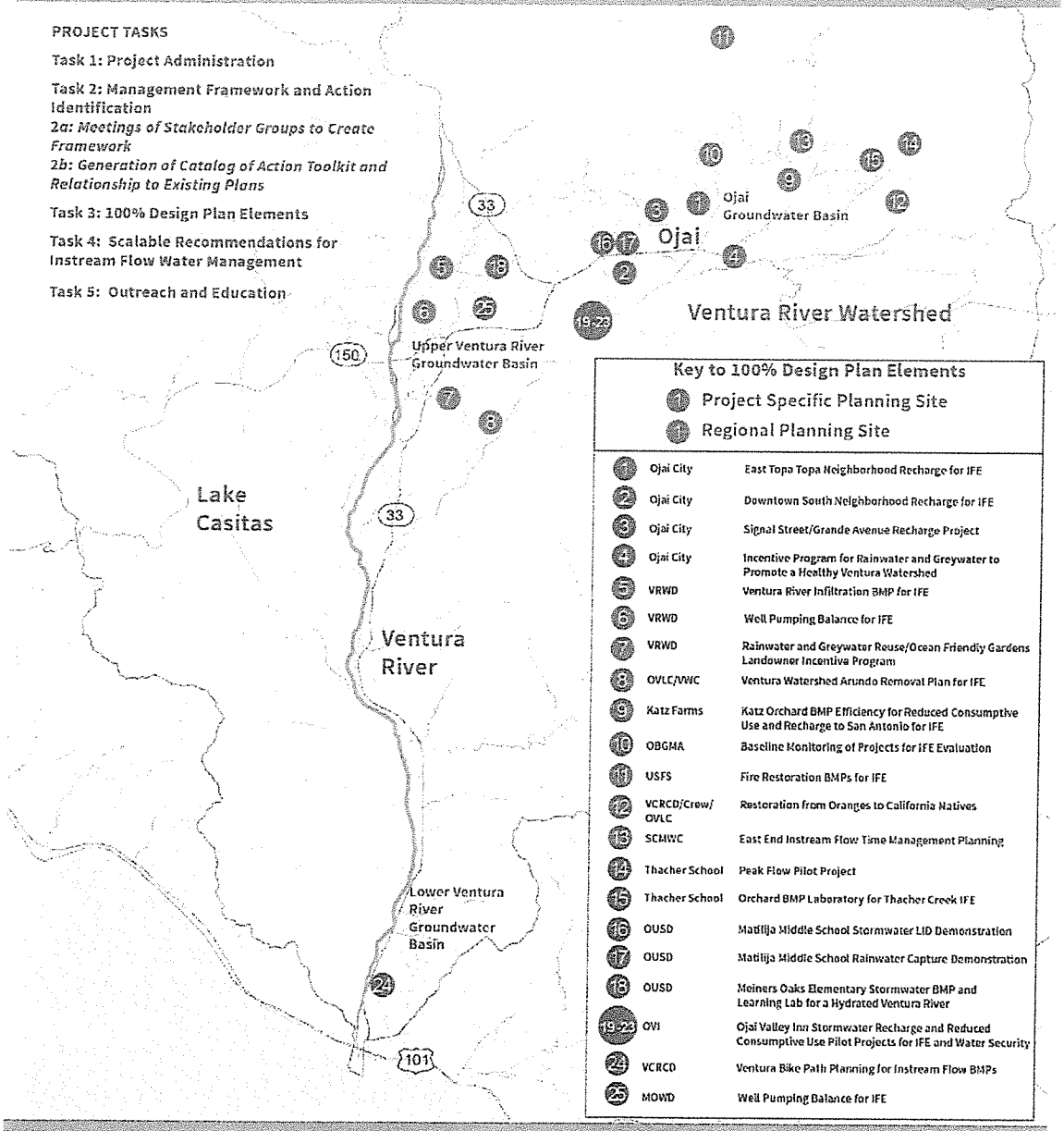
**Task 1: Project Administration**

**Task 2: Management Framework and Action Identification**
*2a: Meetings of Stakeholder Groups to Create Framework*
*2b: Generation of Catalog of Action Toolkit and Relationship to Existing Plans*

**Task 3: 100% Design Plan Elements**

**Task 4: Scalable Recommendations for Instream Flow Water Management**

**Task 5: Outreach and Education**




**Key to 100% Design Plan Elements**

1 Project Specific Planning Site
2 Regional Planning Site

| | | |
|---|---|---|
| 1 | Ojai City | East Topa Topa Neighborhood Recharge for IFE |
| 2 | Ojai City | Downtown South Neighborhood Recharge for IFE |
| 3 | Ojai City | Signal Street/Grande Avenue Recharge Project |
| 4 | Ojai City | Incentive Program for Rainwater and Greywater to Promote a Healthy Ventura Watershed |
| 5 | VRWD | Ventura River Infiltration BMP for IFE |
| 6 | VRWD | Well Pumping Balance for IFE |
| 7 | VRWD | Rainwater and Greywater Reuse/Ocean Friendly Gardens Landowner Incentive Program |
| 8 | OVLC/VWC | Ventura Watershed Arundo Removal Plan for IFE |
| 9 | Katz Farms | Katz Orchard BMP Efficiency for Reduced Consumptive Use and Recharge to San Antonio for IFE |
| 10 | OBGMA | Baseline Monitoring of Projects for IFE Evaluation |
| 11 | USFS | Fire Restoration BMPs for IFE |
| 12 | VCRCD/Crew/ OVLC | Restoration from Oranges to California Natives |
| 13 | SCMWC | East End Instream Flow Time Management Planning |
| 14 | Thacher School | Peak Flow Pilot Project |
| 15 | Thacher School | Orchard BMP Laboratory for Thacher Creek IFE |
| 16 | OUSD | Matilija Middle School Stormwater LID Demonstration |
| 17 | OUSD | Matilija Middle School Rainwater Capture Demonstration |
| 18 | OUSD | Meiners Oaks Elementary Stormwater BMP and Learning Lab for a Hydrated Ventura River |
| 19-22 | OVI | Ojai Valley Inn Stormwater Recharge and Reduced Consumptive Use Pilot Projects for IFE and Water Security |
| 24 | VCRCD | Ventura Bike Path Planning for Instream Flow BMPs |
| 25 | MOWD | Well Pumping Balance for IFE |

In particular, Casitas and its multiple constituents and community members can identify with the WCB proposal's voluntary v. regulatory approach to stream flow. In part, the grant will consider and anticipate the interests and concerns of private landowners or other public interest landowners to ensure the: (1) protection of the full and existing legal rights to divert and consume surface and/or groundwater; (2) protection of the real property interest in conserved and non-diverted or non-consumed water; and (3) enhancement of stream flow for steelhead and other wildlife in and along the identified rivers and creeks. We support voluntary conservation.

The WCB grant proposal presents a unique and timely opportunity for the Ventura River watershed to address long-term water supply reliability, climate resiliency, and flow-related issues. At the same time, Ventura County can use State of California assistance. With the WCB as a potential partner, Casitas is prepared to more fully engage and lend its support to the ultimate implementation of the proposed projects and the successful enhancement of stream flow in the Ventura River watershed.

Thank you for your consideration.

Sincerely,

Angelo Spandrio
Casitas Municipal Water District
Board

iii. Any export permits would contain conditions and criteria that will otherwise protect the in-basin users and beneficial uses to the fullest extent allowable under the law.

No entity has applied for a surplus extraction permit in the history of the agency.

## Conjunctive Water Use Management.

Conjunctive water management involves the coordinated use of ground and surface water supplies to use the overall water supply more efficiently for improved use and protection. The purposes of conjunctive management are to coordinate water resource use in ways that reduce exposure to drought, to maximize water availability, to protect water quality, and to sustain ecological needs and aesthetic and recreational values. Other potential benefits are improved security of water supplies, reduced reliance on costly and environmentally disruptive surface water impoundment and distribution systems, and enhanced protection of aquatic life and habitat.

The CMWD is the primary water supplier in the Ventura River Watershed, providing water to both water resale agencies and retail customers. The City of Ventura is Casitas' largest customer, and Lake Casitas water serves as one of the main sources of water for the City of Ventura. One of CMWD's important functions is to serve as the "backup" water supply for a number of customers, including water suppliers and farmers, when groundwater supplies become depleted. The high-quality lake water is blended with poorer quality groundwater by some water purveyors to improve water quality and extend supplies. The annual variability of rainfall in the Ventura River Watershed affects both the total amount of water used each year as well as the relative amounts of surface water versus groundwater used. In very wet years, groundwater use goes up and demand on Lake Casitas goes down; in very dry years the reverse happens. Water demand in the watershed also varies seasonally. Demand is greater in the drier months of summer and fall, and lesser in the wetter months of winter and spring.

Lake Casitas was constructed in 1959 by the United States Bureau of Reclamation and designed to hold 254,000 acre-feet of water (but has reduced to 237,761 based on a 2017 study)The long-term average annual demand on Lake Casitas is about 17,500 acre-feet, of which about 3680 acre-feet (or 21%) is typically imported to the Ojai Basin. Water from the Ventura River comprises a little less than half of the inflow into Lake Casitas; drainage from the reservoir's surrounding watersheds comprises the rest. A significant amount of water is lost to evaporation from the surface area of Lake Casitas. CMWD takes daily evaporation pan measurements. Between 1959 and 2010, an average of nearly 8000 acre-feet per year evaporated from the lake.

*Develop Conjunctive Use Policy for coordination with CMWD*

The OBGMA will establish a conjunctive use policy with CMWD for surface water use and groundwater extraction largely in keeping with target volumes and established thresholds and triggers.

## Establishment of Thresholds and Triggers.

Groundwater within the Ojai Basin is considered largely in balance, despite groundwater levels and storage volumes that can fluctuate dramatically from one year to the next. Water levels in the

basin fluctuate considerably in response to groundwater extraction and recharge from seasonal rainfall. Review of precipitation, accumulative departure curves, and water level responses over time indicate that the basin has the hydrologic characteristics of quick discharge and quick recharge, when precipitation occurs. Typically, conditions in the watershed cycle between very wet years, which bring more water than drainage networks can hold, and multi-year dry periods, which strain available water supplies. This variability in supply poses significant challenges to long-term water supply management.

There is a great variation in location and depth of the wells in the basin, and their relative access to groundwater at low points in the hydrologic cycle. There is also variation in water quality in different parts of the basin. Based on aquifer testing, there is a significant amount of overlap of cones of depression created in the potentiometric surface by pumping wells. These features must be considered when establishing action levels of groundwater elevations or stream flow.

The OBGMA will establish multi-tiered basin storage thresholds that trigger special action by the Agency to assure protection of groundwater supplies in the basin as outlined in Table 1. Storage thresholds will take into account the needs of the water users, overlying landowners and well operators in the basin, as well as the existing conjunctive relationship between groundwater from within the basin and Lake Casitas water imported into the basin. When groundwater levels or quality are low, the Agency will notify users to rely more heavily upon Lake Casitas water. This creates a somewhat self-regulating effect on the Ojai Basin, as the charges for purveyor water encourage conservation and good stewardship of the groundwater resource.

| Table 1 - Storage and Action Table | | | |
|---|---|---|---|
| Stage | Casitas condition (WEAP elevation Stages) | Ojai Basin Condition | Actions |
| 1 | >50% capacity<br>>117,881 AF | >90% Capacity<br>>80,000 AF<br>Key Well WL spring High shallower than 50 ft | Groundwater first Excess of Basin Safe yield okay |
| 2 | 40-50% capacity 118,881 AF - 95,104 AF | 81% to 90% capacity: At or above long-term average in storage<br>72k to 80kAF in storage<br>Key Well between 50 and 100 feet to water | Groundwater remains primary, target extraction of safe yield, prepare for reductions |
| 3 | 30-40% capacity<br>95,104-71,328 AF | 64000AF to 72k AF in basin, 70 to 80 % capacity.<br>Key Well depth to water at Spring high: 120 to 180 | 20% reduction in pumping, targeting 4,000 acre feet annual extraction |
| 4 | 25-30% capacity<br>71,328 AF - 59,440 AF | 50000 AF to 64000 AF in basin, Spring high depth to key well water 180 to 250 ft | 20% additional stage reduction in pumping targeted, 3,000 AF extraction annually |
| 5 | <25% capacity<br>59,440 AF - 957 AF | Less than 50,000 AF storage spring time high; DTW in key well >250 ft | 20% additional stage reduction, 2,000 AF extraction target equal to recharge sans rain |

Implementation of the actions in the above table are currently on a voluntary basis. However, they may be implemented in a compulsory fashion by Ordinance at the discretion of the OBGMA Board under authority granted by SGMA and the OBGMA Act. Following the annual high point in water level storage, established at its June meetings, the board will issue letters to pumpers informing them of the state of the basin and recommended – or compulsory – extraction volumes relative to past years' reported extractions. The highest use constituents (estimated top 25) will be given target volumes specific to their wells.

Special actions will also include mandatory conservation measures that must be implemented at those points. The Agency will develop the procedures and pass the ordinances needed to put the conservation measures into effect. This will be done with full communication with, and the involvement and understanding of, the basin well operators. Additional special actions may be triggered on a well-by-well basis in response to high extraction rates. To do so, the Agency will

establish a database that contains the typical use for each registered well. Principal monitoring thresholds will include:

*Water levels at key wells during springtime-high (proxy for basin wide storage)*

*Discharge points of groundwater to surface water in San Antonio Creek and its relation to perched and deeper groundwater elevations*

*Water quality (elevated chloride, sulfate, and odor issues).*

*New Well Location and potential interference*

OBGMA, as responsible agency for well location, establishes setbacks from contaminant sources per Water Well standards and uses knowledge of basin properties to recommend separations from existing wells.

When OBGMA new well permit applications are received, staff and consultants will review for potential interference issues and ensure that unreasonable overlapping cones of depression of the water table will not be created by adjacent wells pumping.
Well performance (sanding, scaling, aeration, cavitation, and dry issues) Thresholds for groundwater levels with respect to certain wells or areas pumping sand, increased scale production, aeration of pumped water, cavitations of pumps, and wells "going dry" will be established by ordinance.

*Subsidence*

State Well #04N/22W-05L08S is a key well monitored for water levels by Ventura County, with data available beginning in 1949. The historic low in basin storage (about 50% of maximum capacity) was in 1951 during a significant drought and before the current practice of conjunctive use, including CMWD water imports, was commonplace. This nadir is a significant threshold because the confined aquifer skeleton would have been maximally compacted at that time. Static water levels below that depth would increase compaction and potentially cause inelastic land subsidence and irrecoverable storage capacity in the Ojai Basin. To date, no surface or subsurface evidence of land subsidence has been observed in the Ojai Basin.

*Peak water level known and reported by June meeting each year: ensuing actions*

The OBGMA will measure the springtime-high water level (typically between March and June) at the key well annually. A percentage of groundwater storage in the basin will be estimated based on this water level. Based on the estimated volume of storage in the basin, the OBGMA will calculate a recommended extraction at each well from the typical usage records. This recommendation will be delivered to water users on June 30 each year. As shown on the SAT, for example, if the basin is estimated to be at 80% of its maximum storage capacity, the OBGMA will limit users to the typical average extraction. For every 20% reduction in estimated storage, the pumpers will be requested (or mandated by ordinance) to cumulatively reduce extractions by 1,000 acre feet annually.

April 29-30, 2019

Localizing California Waters Regional Summit

LCW: TriCounty Central Coast *(working name)*

*Building Community Resiliency through Collaboration*

PREAMBLE:

Ojai Valley Inn

225 people classroom style

400 max theatre style

AUDIENCE: Water, Landuse, Natural Resource Managers (influencers-policy/designers/regulatory/equity/funding/service)

**POTENTIAL LISTED PARTNER CONVENERS:** (not confirmed)

Ojai City, Ventura River Water District, Santa Barbara Land Trust, Ventura Land Trust, SLO Land Trust, Ojai Valley Land Trust, Ojai Chautauqua, Ventura City, Project WET, USFS, Ventura River Watershed Council, South Coast Habitat Restoration, Santa Barbara County, VCRCD, SLORCD, Cachuma RCD, TriCounty Fish Team, Creeklands, Ca Gov Office OPR, City of San Luis Obispo, Telele Foundation, NOAA, Tribal, Central Coast Water Conservancy, Ojai Valley Green Coalition, Ventura County Watershed Coalition, Morro Bay National Estuary Program, Ojai Ventura Water Agency Partnership, UC Santa Barbara, Cal Poly SLO, Friends of the River, Upper Ventura River Groundwater Assoc.

**(POTENTIAL) FUNDING SPONSORS:**

1. Ojai Valley Inn (facility, discount on rooms/food)
2. Project WET (coordination funds, topics, proceedings)
3. The Thacher School (A/V)
4. Patagonia (facilitator-pending ask)
5. Casitas Municipal Water District (lunch-pending ask)
6. Wildlife Conservation Board (facilitator-pending approval)
7. Santa Barbara Foundation (need to request, informal yes)
8. Rosewood Foundation (DAC participant travel assistance)
9. California Onsite Water Association (breakfast)
10. Ojai Valley Brewery?/Topa Topa Brewery/Winery (for mixer-poster session)
11. more to brainstorm HERE still need (15 speaker rooms $3750)

**Need Statement:** The coastal San Luis Obispo, Santa Barbara and Ventura Counties have many geographical similarities while sharing vulnerabilities, such as water security, diminishing instream summer base flows, heightened fire and flooding risks. Many organizations in these counties have worked on streamlining efforts to reach a shared water vision, such as the Central Coast Water Conservancy and local IRWMs. However successful these efforts, silos still remain a barrier and competition for funding resources and lack of multiple benefit based projects can be enhanced. The LCW meeting aims at giving space to exchanging ideas of successful strategies that benefit Water Security, Fire/Flood, and Instream Flows, and opportunity to create a larger framework for voluntary agreements and collaborative approaches.

**Outcomes:** The LCW outcomes will focus on a shared water vision in 2019 for TriCounty Ca Coast Region, building off intersections of existing excellent visions from local efforts such as Ventura River Watershed Management Plan and other Water Management collaborative in the region.

- **Day 1 Ventura-San Luis Obispo Focus:** Collaboration, and literacy of latest case studies and tools from experts throughout California on balancing healthy economies, water security and watershed balance. A poster session/reception will integrate relevant current case studies, strategic planning efforts, and implementation streamlining.
- **Day 2 Ventura Watershed Focus:** Facilitated workshop, panels, seminars resulting in a shared vision and next steps for collaborative frameworks for Ventura River Watershed. If other watersheds participants are present, they will be allowed to breakout to create next steps for their watersheds as well.

**Featured Speakers/Presenters:**

**Power of the Shared Water Vision**: *Felicia Marcus, SWRCB and Eric Ekdahl Deputy over Division of Water Rights*

**Water Availability and Climate in Tight Places:** Drought/Fire (setting the stage statewide-describing overall trends) *Jay Famiglietti (confirmed): James S. Famiglietti is the director of the Global Institute for Water Security at the University of Saskatchewan in Saskatoon, Canada*.

Other notable speakers: *(others are pending)*

- Brock Dolman, The Water Institute
- Nicole Kuenzi, Ann Marie Orr Division of Water Rights, SWRCB
- Dan Worth, Kevin Delano Instream Flow Unit, SWRCB
- Mary Larson, Erin Wilson, CDFW
- Adam Ballard, WCB (funding)
- Staci Smith, and other (pending) NOAA/NMFS
- Carmela Brown, DWR (funding)
- Martha Davies (Inland Empire WD, Mono Lake Committee)
- Debbie Franco, Ca Governors Office of Planning and Research, Drought and Rural Affairs
- Bob Wilkinson, UC Santa Barbara Bren School

**CMWD Ask:**

1) Sponsor for Lunch for Monday and Tuesday, $13,200 total
   - $44/per participant
   - Expected no more than 200 on Monday $8,800
   - Expected no more than 100 on Tuesday $4,400
2) Participate in program with staff, and two board members
3) If sponsor, give input on agenda prior to March 22

**Benefits to CMWD:**

4) Leader in Collaborative Solutions for Ventura Watershed
5) No risk for taking a position on Channel Keeper v Ventura, only gain by creating space for solution based forum
6) Been seen as engaged by SWRCB, WCB, CDFW, NOAA/NMFS, DWR (who will be present)
7) Will be able to give input on agenda prior to March 22
8) Signage (if desired) at sponsored lunch
9) Speaker choice (if desired) at sponsored lunch

# Planning Document Coordination

Water Resources Committee

February 19~~November 27~~, 201~~8~~9

1. Documents Currently Under Review/Development

    - Rates and Regulations – document overhaul underway (appendices)
    - Urban Water Management Plan Update – under production through Milner-Villa Consulting (completion expected in Spring 2019).
    - Water Efficiency Allocation Program (WEAP) – Latest update in May 2018. Needs error correction and addition of allocation appeals procedure.
    - Water Shortage Contingency Planning - part of 2016 UWMP Update; under review through current Urban Water Management Plan Update
    - Comprehensive Water Resources Plan – ~~Qualifications/Proposals due on December 7, 2018; expect to a~~Awarded at Board meeting of January 23, 2019

2. Current Coordination Needs

    - Rates and Regulations – ~~current document includes an outdated version of the WEAP~~Initial draft will be distributed soon.
    - Urban Water Management Plan Update – 2020 UWMP expected to begin development in late 2020 with due date of July 1, 2021.
    - Water Efficiency Allocation Program (WEAP) – should become an appendix of the Rates and Regulations document and reflect aspects of the UWMP/Allocation penalty procedure to be brought forward for Board approval soon.
    - Water Shortage Contingency Planning – should include coordination with upcoming Comprehensive Water Resources Plan.
    - Comprehensive Water Resources Plan – coordination with all other planning documents with a particular focus on safe yield analysis. Expect draft late summer 2019.