



**TWSA BOARD MEETING PACKET  
for 12/1/2021**

**Refer to RED page numbers in the TOP left corner.**

<i>TOPIC</i>	<i>AGENDA ITEM</i>	<i>PAGES</i>
Cover Sheet / Agenda	D	1-3
Minutes	E	4-11
Staff Monthly Activity Report	F	12-18
Financials	F	19-24
Board Business (possible action)		
Associate Membership Requests	G	25-27
2016 TWSA Agreement (associate status not included)	G	28-32
2008 Agreement (w/associate status addendum)	G	33-41
TWSA Control Methods Test Comment Letter	G	42-46
WQTS Consultants Comment Letter	G	47-51
<i>Prioritizing Behavior Change Efforts for the Tahoe Care Tahoe Campaign Report (Conservation Science Partners) (TWSA Messaging a main focus)</i>	G	52-79



**NOTICE OF MEETING:**

**The next regular meeting of the Tahoe Water Suppliers Association (TWSA) is:  
TWSA Board Meeting Quarter 4  
Wed, Dec 1, 2021  
1:00 PM - 4:00 PM (PST)**

Please join my meeting from your computer, tablet or smartphone.

<https://global.gotomeeting.com/join/864329469>

You can also dial in using your phone.

United States (Toll Free): [1 877 568 4106](tel:18775684106)

United States: [+1 \(571\) 317-3129](tel:+15713173129)

Access Code: 864-329-469

New to GoToMeeting? Get the app now and be ready when your first meeting starts:

<https://global.gotomeeting.com/install/864329469>

**AGENDA**

- A. Introductions**
- B. Public Comment** Conducted in accordance with Nevada Revised Statute (NRS) Chapter 214.020 and limited to a maximum of 3 minutes in duration.
- C. Presentations:** none scheduled
- D. Approval of Agenda** for the December 1, 2021 TWSA Board Meeting
- E. Approval of Minutes** for the October 6, 2021 TWSA Board meeting
- F. Reports**
  - a. **Staff Reports** (2021 Events; Annual Report Process; Special Projects:Microplastics/Take Care)
  - b. **Budget** - see enclosed information for current expense details.  
Open Gov. link for current budget and expenses: <https://bit.ly/3wxURUA>

**TWSA Chair Report**
- G. General Business** (for possible action):
  - a. TKPOA Control Methods Test/Lahontan Water Board meeting Jan 2022.
  - b. Membership requests (per bylaws voting on this item to occur at December meeting):
    - 1. Discussion on STPUD request for change of status (non-voting Associate Status).
    - 2. Heavenly Water System request for admission (tabled – staff needs preparation time).
  - c. Establish new Vice-Chair
  - d. Adopt a Hydrant Take Care Campaign discussion (S. Thomsen)
- H. Purveyor Updates**
- I. Public Comment**
- J. Adjournment**

**Lahontan / TKPOA Control Methods Test** - January 2022 (TBD): Lahontan Board Decision.

Final project and environmental document review

[https://www.waterboards.ca.gov/lahontan/water\\_issues/programs/tahoe\\_keys\\_weed\\_control/](https://www.waterboards.ca.gov/lahontan/water_issues/programs/tahoe_keys_weed_control/)

<https://tahoekeysweeds.org>

<https://www.keysweedsmanagement.org>

TWSA Comment Letter: [https://www.yourtahoeplace.com/uploads/pdf-public-works/TWSA\\_FINAL\\_comments\\_on\\_Lahontan\\_Permit\\_\(submitted\\_10\\_28\\_2021\).pdf](https://www.yourtahoeplace.com/uploads/pdf-public-works/TWSA_FINAL_comments_on_Lahontan_Permit_(submitted_10_28_2021).pdf)

TWSA Project Staff summary:

[https://www.yourtahoeplace.com/uploads/pdf-public-works/TKPOA\\_CMT\\_TWSA\\_Staff\\_Summary\\_Antideg\\_10152021.pdf](https://www.yourtahoeplace.com/uploads/pdf-public-works/TKPOA_CMT_TWSA_Staff_Summary_Antideg_10152021.pdf)

### **2022 TWSA Board Meetings**

First Wednesdays, quarterly, held from 1 to 4 pm; virtual until further notice.

- March 2, 2022
- June 1, 2022 - TWSA's 20 year anniversary event at North Tahoe Event Center.
- September 7, 2022
- December 7, 2022

### **TWSA Board of Directors**

Suzi Gibbons (Chair)

Andrew Hickman

Richard Robilliard; Tom White (alt.)

Patrick McKay; Mike McKee (alt.)

Cameron McKay

Brad Underwood

Mitch Dion; Brandon Garden (alt.)

Nakia Foskett

Kim Boyd; Tony Laliotis (alt.)

Shelly Thomsen (Vice-chair)

North Tahoe Public Utility District

Round Hill General Improvement District

Douglas County Systems

Edgewood Water Company

Glenbrook Water Cooperative

Incline Village General Improvement District

Kingsbury General Improvement District

Lakeside Park Association

Tahoe City Public Utility District

South Tahoe Public Utility District

For more information, please contact: Madonna Dunbar, TWSA Executive Director

1220 Sweetwater Road, Incline Village, Nevada 89451

(775) 832-1212 office / (775) 354-5086 cell /email: mod@ivgid.org

Certification of posting of agenda = Physical Posting Suspended - Covid-19 restrictions. Online posting and email delivery of notice provided one week ahead of meeting. In compliance with State of Nevada Executive Department, Declaration of Emergency Directive 006, 016 and 018, this meeting is closed to the public and attendance is limited to members of the Board of Trustees and essential staff. Public comment is allowed and the public is welcome to make their public comment either via e-mail (please send your comments to mod@ivgid.org by 5 p.m. on Tuesday, Nov. 30 2021 or via telephone (775-354-5086) on the day of the meeting. By, Madonna Dunbar, Executive Director, TWSA

Notes: Items on the agenda may be taken out of order; combined with other items; removed from the agenda; moved to the agenda of another meeting; moved to or from the Consent Calendar section; or may be voted on in a block. Items with a specific time designation will not be heard prior to the stated time, but may be heard later. Members of the public who are disabled and require special accommodations or assistance at the meeting are requested to call IVGID at 832-1212 at least 24 hours prior to the meeting.

TWSA agenda packets are available at the TWSA website [www.TahoeH2O.org](http://www.TahoeH2O.org)  
or the TWSA office at 1220 Sweetwater Road, Incline Village, Nevada 89451.

**TWSA Board Meeting**  
**Wednesday, October 6, 2021 – 9:00 am to 12:00 pm**  
**Via GoToMeeting**

**Minutes / Results Agenda**

**A. Introductions**

Mitch Dion, General Manager, KGID  
 Tom White, Douglas County

**B. Public Comment**

No public comment was given.

- C. Presentations (TIME CERTAIN at 10:30 am.)** – Tahoe Keys Control Methods Test (Kim Carringer, Environmental Improvement Division Manager, Tahoe Regional Planning Agency; Rick Lind, Sierra Ecosystem Associates: Dr. Lars Anderson)

**Roll Call of Members in Attendance**

Suzi Gibbons (NTPUD), Shelly Thomsen (STPUD), Nakia Foskett (LPA), Patrick McKay (Edgewood), Kim Boyd (TCPUD), Andrew Hickman (RHGID), Brad B. Underwood (IVGID), Richard Robillard (Douglas County), Tom White (Douglas County), Cameron McKay (Glenbrook), Mitch Dion (KGID), Patrick McKay (Edgewood).

TWSA Staff in attendance: Madonna Dunbar and Sarah Vidra  
 Regulators: Reginald Lang (NDEP)

**D. Approval of Agenda** for the October 6, 2021, TWSA Board Meeting

Motion to approve agenda as submitted made by Cameron McKay, second by Nakia Foskett, all in favor; motion carried.

**E. Approval of Minutes** for the June 2, 2021, TWSA Board meeting

- F.** Motion to approve Minutes from June 2, 2021, as submitted made by Kim Boyd, second by Patrick McKay, 11 yes, 1 abstain, motion carried.

**G. Reports**

- a. Staff Reports (2021 Events, Special Projects, Annual Report)
- Staff highlighted several activities from the quarter; a full activity report is available in the Board Packet.
    - *NDEP 319 (h) Pilot Project to Reduce Source Water Plastic Pollution at Lake Tahoe* is moving forward. The new interpretative display is available for public view at the UC Davis Tahoe Environmental Research Center at Sierra Nevada University. The display includes a large Drink Tahoe Tap installation at the water station. NV state parks would like to extend the outreach project to Lake Tahoe NV State Park, Sand Harbor. There are Bottles regionally, in 116 Raley's stores, in NW NV and Northern California, Monterey to Crescent City and Central Valley.



Raley's has committed water refill stations in the Tahoe Basin stores and Mt. Rose. The two year pilot will be ending in December 2021.

- The Executive Director attended the 2021 Lake Tahoe Summit and handed out the 'Fill' bottles with TRPA staff.
- The water stations have had limited use throughout the summer. They were deployed including pre-measured bleach spray bottle with instructions and Safety Data Sheet.
- Staff is working on the 2021 Watershed Control Program Annual Report. Preliminary graphs are provided for annual maximum turbidity and total coliform results. All filtration exempt purveyors are within requirements.

b. Current Budget

New TWSA account summary provided in the board packet.

Update link to OpenGov: <https://tinyurl.com/29z7bb65>

- i FY 20-21 current operating balance \$90K.
- ii The current reserve budget is \$175K.

c. TWSA Chair Report

The Chair welcomed Mitch Dion the new General Manager, KGID.

On behalf of the TWSA the Chair sends condolences to IVGID on the loss of their Utilities Superintendent, Bob Lochridge. Bob was the alternate for IVGID for TWSA and attended a few meetings. Bob worked in water and wastewater here in the basin for 37 years, and was set to retire in February. The Chair extends condolences to the Lochridge family, who has strong ties to NTPUD including Bob's father, Jim who retired from NTPUD, and his nephew Jesse who is currently a member of the NTPUD team.

Additional TWSA staff comments: Bob Lochridge was a legacy employee, coach, friend, and leader of the IVGID Public Works team, he will be greatly missed.

**H. General Business** (for possible action):

a. TKPOA Control Methods Test update – 10:30 TIME CERTAIN

TKPOA and TRPA Staff gave a presentation the TKPOA Control Methods Test, their current status with Lahontan, and the mitigation and monitoring portion of the test. The final statement from the presentation:

“There are no other solution that we know of that might represent opportunities to bring the plants under control, and you know, to be blunt, we’re hopeful for your support.” - Rick Lind, TKPOA & SEA.

Support is referring the Lahontan RWQCB Resolution (under consideration) granting an Exemption to the Aquatic Pesticide Discharge Prohibition in the Water Quality Control Plan for the Lahontan Region (Application for the Control Methods Test of Herbicides and Other Techniques to Reduce Aquatic Invasive plants in the Tahoe Keys Lagoons).

Discussion Highlights:

- LPAs Board has no change in their position on herbicide. OPPOSED.
- RHGID had voted in opposition of chemical opposition in the past, further discussions the Board is leaning toward only as a last resort, at the smallest use available.
- The current TWSA Board approved statement is still the right position to have: June 8, 2017: “The TWSA cannot support the application of herbicide, until all non-chemical methods have been fully vetted.”

Staff will circulate the final comment letter for electronic vote for submittal by the November 1, 2021 deadline. (note: letter drafted, vote conducted, passed 8/3/1 (yes/no/abstain) on 10/28/21 letter was submitted.

- b. Membership requests (per bylaws voting on this item to occur at December meeting):
  1. Discussion on Heavenly Water System request for admission.
  2. Discussion on STPUD request for change of status.

The current TWSA agreement does not include language to admit new Associate Members. The membership addendum will be updated and voted on at the December 2021 meeting. STPUD is lobbying regionally for fire suppression infrastructure, and would like to focus their district funding on these efforts. As an Associate Member (previously) STPUD championed obtaining U.S. Forest Service funding for water infrastructure that all members have gotten benefit from.

Board discussion on TWSA Associate Membership and Associate Administrative Fees for membership includes the following highlights:

- There are lots of benefits to an Associate Membership, you can be a part of the messaging without being a full-time voting member.

- There is value in enhanced regional messaging with associate members, including Vail resorts and other organization throughout the Tahoe-Truckee region.
- Including Heavenly as an Associate Member, is a great opportunity to a share information messaging specifically on micro-plastics, which are created in quantity at ski resorts.
- How many other water systems could request Associate Membership? The Executive Director believes there are no other immediate request for Associate Membership. There are several possible members within and outside of the Tahoe Basin.
- Associate Members should pay a fee.
- Associate Members will help get more people involved in watershed issue around the basin.
- New members must be in regulatory compliance with local, state, and federal regulations.

#### Fee Structure Discussion Included:

- What are the current membership fees are biased on production volume over three years. Current fee range is \$5-30K. What is the value that we provide for that fee outside of regulatory reporting?
- What is the value of Drink Tahoe Tap messaging?
- An administrative cost for information distribution and board support, needs to be accounted for in the fee.
- A tiered schedule of flat rates. Apply at one quarterly meeting, vote in on the next meeting, and pro-rate based on when the join within the fiscal year.
  - STPUD should be pro-rated for half the year, effective January 1, 2021. Heavenly would pay half the annual fee for the second part of the year.

#### Next steps for December Meeting:

- i Approve amendment for associate membership, with a tiered schedule of flat rates and process of application including application and discussion at board meeting, vote on membership at the following meeting, with fee to be pro-rated based on time of membership.
- ii Approval of STPUD change of status to associate membership.
- iii Approval of Heavenly associate membership.

STPUD currently houses the Vice-Chair, a new Vice-Chair will need to be selected.

c. TWSA 2022 meeting dates-the following dates were selected for 2022:

- March 2, 2022
- June 1, 2022
- September 7, 2022
- December 7, 2022

Motion to approve the 2022 TWSA board meeting dates as presented made by Mitch Dion, second Cameron McKay, all in favor motion carries.

d. TWSA's 20 year anniversary in 2022 – set a date for luncheon with speakers? NTPUD will host in 2022 the 20<sup>th</sup> anniversary of the TWSA celebration, on or around the June 1, 2022 board meeting.

e. Caldor Fire Emergency Operations discussion

South Lake Tahoe purveyors provided a summary of operational and personnel impacts from the Caldor Fire. STPUD provided a through description of their management of the Caldor Fire. They will be participating in a utility lessons learned session with their partners in South Lake Tahoe, all TWSA members will be invited to participate.

STPUD – Mandatory evacuation of their service area, including the majority of the 115 staff members, many of whom evacuated their families and then reported back to work.

- STPUD set up the Emergency Operation Center at the Wastewater Treatment Plant, centrally located within district.
- Prior to the evacuation the district shared GIS data with the fire districts including where and the priority of the water and wastewater facilities. The local fire districts are familiar with the location and priority of the water infrastructure, but in a large wildfire situation the local districts are not the leaders of the operation. Communication needs to be open to support utility operation prioritization.
- Emergency preparations included moving all spare parts from pump stations and district buildings. Removal of two of four pumps at Luther Pass, as a precaution if the pump station burned, the two pumps that were removed would be put back into service to support the community effluent removal needs, without waiting the current lead-time of 6-months to a year for new pump procurement.
- STPUD staffed the Luther Pass Pump station, which moves recycled water out of the Lake Tahoe basin, 24/7 for protection from embers/fire with STPUD and Fire district staff. The same staffing for protection was done at other facilities in the Myers area as the fire moved.
- The district provided fire resistant clothing for staff working with in the evacuation area, and had couplings for fire hoses at district facilities.

- With the evacuation order staff in the service area didn't have a place to stay. STPUD paid for hotels in State Line, NV that were closed to the public but available for utility staff. In addition to housing, STPUD provided employees with food and supplies as grocery stores and restaurants were closed.
- A backup EOC was established at Harris, near other utilities at Harris and Hard Rock (Fire, Police, and Utilities)
- Staff needed identification to cross the four National Guard barricades between SLT and the Carson Valley/North Shore.
- When the fire entered the Tahoe Basin Christmas Tree Valley was First. STPUD has hydrants both water and recycled water in that area all of which were used, the fire moved behind neighborhoods in the Pioneer Trail area. Water was continuously moved to optimize supply and pressure for firefighting, and the district overfilled tanks when fire got close.
- One STPUD facility burned, a control building next to a tank. The next day crews were able to restore communication with that tank.
- STPUD has backup power at most but not all facilities. Ahead of the fire the district purchased additional generators and staged them.
- The water hammer from hydrant opening and closing caused huge leaks all over the district, crews were continuously responding.
- STPUD had trouble keeping water in tanks due to customer irrigation systems that remained on. Using the AMI system, district and fire crews turn off 250 connections, which were using 2.8 million gallons of water per day for sprinkler systems.
- The North Lake Tahoe Fire Protection District did a press release for residents to turn off irrigation systems. The message is perceived better from the fire district, when saying leave your sprinklers systems off to help the firefight.
- Communication issues became apparent when the fire moved through and cell coverage would be lost. Additional radios were used by STPUD crews.
- Lessons Learned:
  - With staff working 24/7 it was difficult to track who was working where and when.
  - Messaging ahead of evacuation on turning off irrigation systems.
  - Have a representative at every meeting, to know what's going to happen before it happens so you can prepare as much as possible.
  - When populations are removed from the wastewater system, biological organisms will die, and need to be resorted when repopulation happens. STPUD was able to procure "bugs" from IVGID to restart their wastewater treatment plant.
- Next Steps:

- Debrief meetings
- Utility forum for water and sewer partners to discuss what worked and what will be done differently next time.
- Legislative outreach to continue to lobby for funding in the wildland urban interface for funding on for fire suppression infrastructure.

Lakeside Park- no direct fire impacts, the service area was evacuated. STPUD and TWSA Staff assisted in point of contact with incident command, and procurement of diesel fuel for generators.

RHGID- customers were confused on evacuation requirements. The district prepared generators and secured backup fuel if needed.

KGID- The fire had no operational impacts, the largest issue was the evacuation order in South Lake Tahoe causing road congestion, and residents trying to waiting-out the evacuation in State Line, until the evacuation order was made for the KGID service area. KGID was securing housing or operators to be ready to work behind the fire. The new General Manager reminded everyone to have their reimbursement documentation ready including all paperwork and staff time tracking.

Chair- Reminds members of the mutual aid agreement, and to reach out to partners with requests.

Executive Director – Nevada Department of Environmental Protection reached out to us for GIS information on member agency infrastructure assets. Purveyors should have their information available for emergency planning.

**I. Purveyor Updates**

The chair requested tabling purveyor updates to the December 2021, due to time restraints after the TKPOA presentation and discussion.

Andrew Hickman motions to table purveyor updates from this meeting to the next quarterly meeting on the Tahoe Water Suppliers Association, second by Shelly Thomsen, all in favor; motion carried.

**J. Public Comment**

No public comment was given.

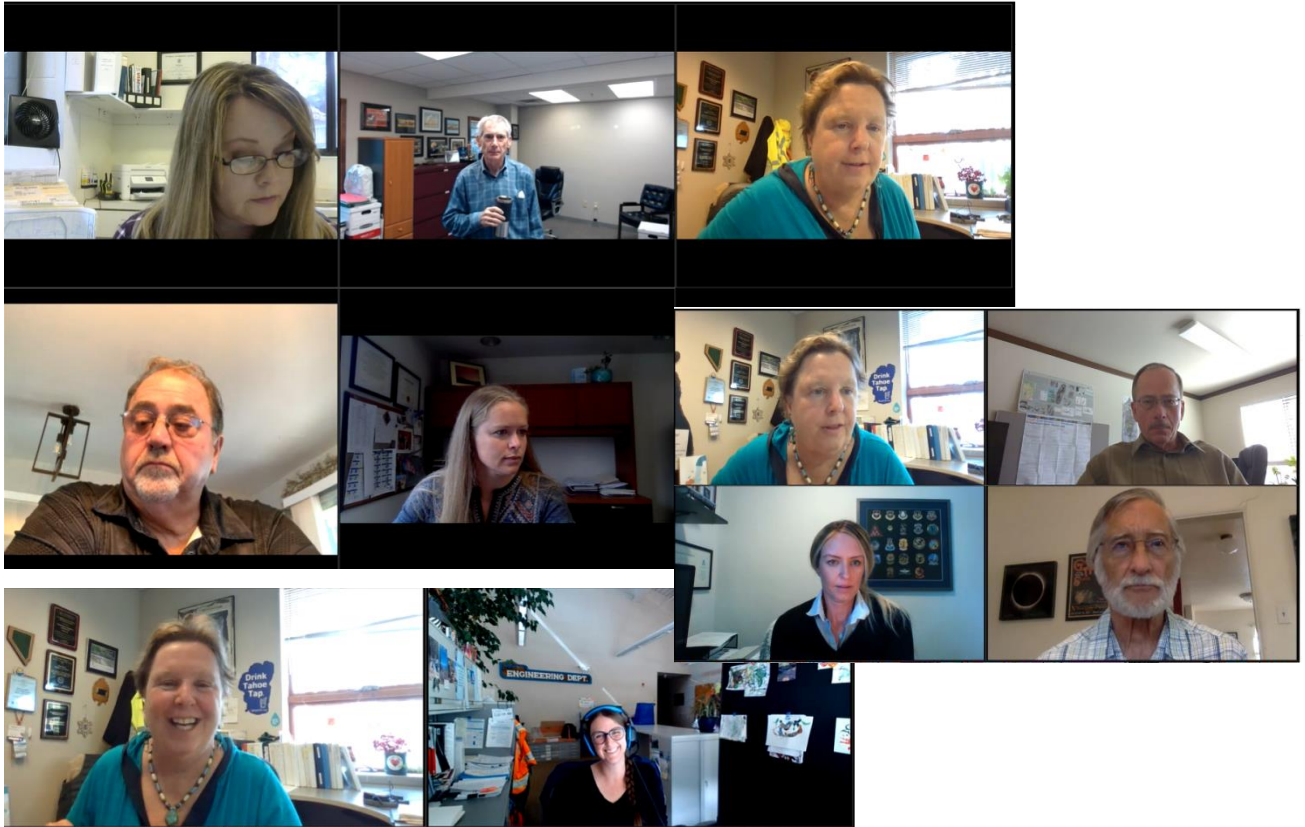
**K. Adjournment**

Meeting adjourned at 11:54 am.

Motion to adjourn made by Kim Boyd, second Nakia Foskett, all in favor; motion carried.

**2021 TWSA Board Meetings** – First Wednesdays, quarterly, held from 1 to 4 pm; virtual until further notice.

- December 1





**TWSA Staff Report Q 4 2021 (11/15/2021)****TWSA / Water Quality / Water Efficiency**Aquatic Invasive Species (AIS):

Staff continues to attend the multi-agency Stakeholder Circle planning meetings on the Tahoe Keys Property Owners Association (TKPOA) Control Methods Test project. This test (seeking approval for the potential use of herbicides) has been a major focus for staff, and is projected for decision making by Lahontan Water Board in January 2022.

Staff spent many hours in review of the following Lahontan released documents and preparation of draft comments. Comments closed Nov. 1, 2021. Comments were prepared for Board review; voting to approve sending correspondence was conducted electronically. Action to send comment letter to Lahontan Water Board was approved by an email vote of 8/3/1 (Yes/No/Abstain) on 10/28/21.

Staff coordinated with Water Quality Treatment and Solutions Inc. on the consultant comments which were also submitted.

TWSA Comment Letter: [https://www.yourtahoeplace.com/uploads/pdf-public-works/TWSA\\_FINAL\\_comments\\_on\\_Lahontan\\_Permit\\_\(submitted\\_10\\_28\\_2021\).pdf](https://www.yourtahoeplace.com/uploads/pdf-public-works/TWSA_FINAL_comments_on_Lahontan_Permit_(submitted_10_28_2021).pdf)

TWSA Project Staff summary:

[https://www.yourtahoeplace.com/uploads/pdf-public-works/TKPOA\\_CMT\\_TWSA\\_Staff\\_Summary\\_Antideg\\_10152021.pdf](https://www.yourtahoeplace.com/uploads/pdf-public-works/TKPOA_CMT_TWSA_Staff_Summary_Antideg_10152021.pdf)

**TENTATIVE RESOLUTION GRANTING AN EXEMPTION** TO THE AQUATIC PESTICIDE DISCHARGE PROHIBITION IN THE WATER QUALITY CONTROL PLAN FOR THE LAHONTAN REGION FOR THE CONTROL METHODS TEST OF HERBICIDES AND OTHER TECHNIQUES TO REDUCE AQUATIC INVASIVE PLANTS IN THE TAHOE KEYS LAGOONS  
[https://www.waterboards.ca.gov/lahontan/board\\_decisions/tentative\\_orders/2021/tkweedsres.pdf](https://www.waterboards.ca.gov/lahontan/board_decisions/tentative_orders/2021/tkweedsres.pdf)

**TENTATIVE WASTE DISCHARGE REQUIREMENTS AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT** FOR TAHOE KEYS PROPERTY OWNERS ASSOCIATION TAHOE KEYS LAGOON AQUATIC WEEDS CONTROL METHODS TEST  
[https://www.waterboards.ca.gov/lahontan/board\\_decisions/tentative\\_orders/2021/tkweedspermit.pdf](https://www.waterboards.ca.gov/lahontan/board_decisions/tentative_orders/2021/tkweedspermit.pdf)

**MITIGATION MONITORING AND REPORTING FOR** THE CONTROL METHODS TEST OF HERBICIDES AND OTHER TECHNIQUES TO REDUCE AQUATIC INVASIVE PLANTS IN THE TAHOE KEYS LAGOONS  
[https://www.waterboards.ca.gov/lahontan/board\\_decisions/tentative\\_orders/2021/tkweedsmmrp.pdf](https://www.waterboards.ca.gov/lahontan/board_decisions/tentative_orders/2021/tkweedsmmrp.pdf)

**LAHONTAN STAFF REPORT**  
[https://www.waterboards.ca.gov/lahontan/water\\_issues/programs/tahoe\\_keys\\_weed\\_control/docs/tkweedstaff.pdf.pdf](https://www.waterboards.ca.gov/lahontan/water_issues/programs/tahoe_keys_weed_control/docs/tkweedstaff.pdf.pdf)

**AMENDED TKPOA APPLICATION/PLAN 2021 DOCUMENTS** [www.tahoekeysweeds.org](http://www.tahoekeysweeds.org)



## Administration

The Board meeting scheduled for 9/1/21 was held on Oct. 6, 2021 in response to the Caldor Fire situation in South Lake Tahoe.

Staff facilitated correspondence with members and regulators during the Caldor Fire emergency.

Staff continues to work with regional agencies and monitoring of water quality related to Caldor Fire impacts and Aquatic Algae Blooms. Regional water quality impacts have been minimal this year despite drought and fires. <https://www.tahoedailytribune.com/news/initial-lake-tahoe-water-clarity-study-findings-promising-after-caldor-fire/>

“Nov. 2021. The Tahoe Science Advisory Council launched a rapid response scientific study to gather samples of smoke and ashfall from the Caldor Fire, to analyze the impacts of the Caldor Fire on Lake Tahoe. The project was funded by the League to Save Lake Tahoe League with additional support provided by the Tahoe Regional Planning Agency, the state of California and Nevada and the Tahoe Fund. It included real-time data gathering into changes in algae growth, the presence of clarity-diminishing particles, and other ecological dynamics at play in the lake. According to The League, some of the nutrient and bacterial analysis are still being processed at the lab, courtesy of South Tahoe Public Utility District, but they do have some findings to share. Pipe Keepers with The League sampled and tested stormwater during the late October storm. While initial results are positive, the lake did not get out of the fire unscathed. “The Lake did receive some sediment loading (clarity-degrading runoff) from the storm,” Joseph said. “There are other impact; things like ash fall, long term impacts to soils, as well as plant and tree growth (and therefore animal life) in burned areas, smoke effects, and more. Though several of those things aren’t in the water, they do impact the Lake.” League funding research through the University of Nevada, Reno, Desert Research Institute and UC Davis Tahoe Environmental Research Center will give them a better understanding of some of those long-term impacts. The League is continuing regular, long-term water sampling and monitoring efforts, especially for areas impacted by the Caldor Fire to check for impacts.”

A special issue of *Tahoe In Depth* featured an article about STPUD’s emergency response during the crisis. (pg. 5) [https://www.trpa.gov/wp-content/uploads/CaldorFire\\_12pgs\\_No20\\_FINAL\\_web.pdf](https://www.trpa.gov/wp-content/uploads/CaldorFire_12pgs_No20_FINAL_web.pdf)

---

## Municipal water crucial in fight against the Caldor Fire

By Shelly Thomsen  
SOUTH TAHOE PUBLIC UTILITY DISTRICT

“This firefight would have looked a lot different without access to South Tahoe Public Utility District’s fire hydrants,” said Brad Zlendick, fire chief for Lake Valley Fire Protection District. “It wasn’t just firefighters out there; the District’s crews were working alongside us to make sure we had water where we needed it, when we needed it.”

South Tahoe Public Utility District (STPUD) provides water to the community of South Lake Tahoe. Prior investments in high-capacity wells, upsizing waterlines, and installing fire

hydrants enabled STPUD to provide continuous high-volume water for the firefight.

“Despite the majority of our staff being evacuated, I’m really proud that our team continued to perform, working around the clock to ensure firefighters had adequate water to protect our community,” said John Thiel, general manager for STPUD.

Prior to the fire, STPUD staff removed hazardous fuels and critical spare parts from field sites. As power outages rolled through town, crews drove throughout the fire zone turning on and refueling generators to power water tanks and booster stations. STPUD worked with fire

personnel to turn off sprinklers that were running continuously and drawing down water tanks, preserving more than 2.8 million gallons per day for the firefight. It is important for property owners to remember in future fire evacuations to turn off sprinklers to ensure firefighters have enough water supply and pressure to fight the fire.

The intensive use of STPUD’s fire hydrants to fill water trucks and fight the fire stressed the aging and undersized water system. “Amid thick smoke and raining ash, our water crew was busy fixing more than a dozen leaks to maintain adequate water flow and pressure,” said Thiel.

While the herculean effort of firefighters, police, and utility workers kept the Caldor Fire from entering the neighborhoods, additional investments are needed to upsizing waterlines and booster stations to increase fire hydrant flow throughout STPUD’s service area.

STPUD continues to work with local, state, and federal partners to secure additional grant funds for fire suppression infrastructure.

*Shelly Thomsen is the public affairs and conservation manager for the South Tahoe Public Utility District.*

Staff continues to monitor the monthly TRPA Shorezone Project Review Committee Project Application Meetings.

Staff facilitated the trademark renewal process with consultant (Brand Geek) for DRINK TAHOE TAP®; and I DRINK TAHOE TAP®; trademark is valid to 2026.

We continue to collaborate with the Tahoe Environmental Research Center (TERC) and Sierra Watershed Education Partnership (SWEP) to support regional peer student on-line education efforts.

Most (on-site) student activities are still on hold due to Covid-19.

Sierra Beck conducted a Sierra Nevada University (50 hour) service-learning project creating Instagram content and marketing materials (#where2fill) for DRINK TAHOE TAP (®).

A DRINK TAHOE TAP (®) ad is running year-round in the Tahoe.com regional print publication and website.

### TWSA Watershed Control Program Annual Report

Staff is engaged in the production of the TWSA 2021 Annual Report; in conjunction with review and comment needed for the Tahoe Keys Control Methods Test project materials release. Staff will be heavily engaged in environmental project document review and analysis on that project from Sept. 2021 to spring 2022. Tentative publishing date for the Annual Report is 12/10/21.

### Micro-Plastics Reduction Education Project

<https://www.epa.gov/newsreleases/us-epa-awards-nearly-100000-address-microplastic-pollution-lake-tahoe>

<https://www.trpa.org/wp-content/uploads/Researchers-studying-impact-of-microplastics.pdf>

Staff is managing the reporting requirements for the NDEP 319h Source Water Protection Microplastics Education and Reduction) Grant which will close on 12/31/21. This project is a collaborative effort by Tahoe Environmental Research Center (TERC) researchers and regional educators. Microplastics are defined as any type of plastic fragment that is less than 5 mm in length. Plastics enter the natural environment from a variety of sources including cosmetics, clothing, and industrial processes. They break into smaller and smaller fragments by sunlight and physical abrasion from wind and waves, but never disappear. Research has shown microplastics entering the food chain, leaching chemicals, and showing up in soil and drinking water.

Extensive microplastics research has been conducted in marine research; however, the research of its impacts on freshwater ecosystems is limited. TERC is working with the Desert Research Institute (DRI), Clean Up the Lake, the League to Save Lake Tahoe, Raley's stores, Sierra Watershed Education Partnerships, and Tahoe Water Suppliers Association, to lead the research and education efforts at Lake Tahoe in this emerging field.

#### Project Coordinators:

- Heather Segale & Elise Matera, UC Davis TERC
- Ashley Phillips & Missy Mohler, SWEP
- Madonna Dunbar, IVGID/TWSA
- Sarah England, Raley's

#### Student Groups:

- Envirolution Club, North Tahoe High School
- Envirolution Club, Truckee High School

- Roots & Shoots Club, Incline High School
- Generation Green, South Tahoe High School

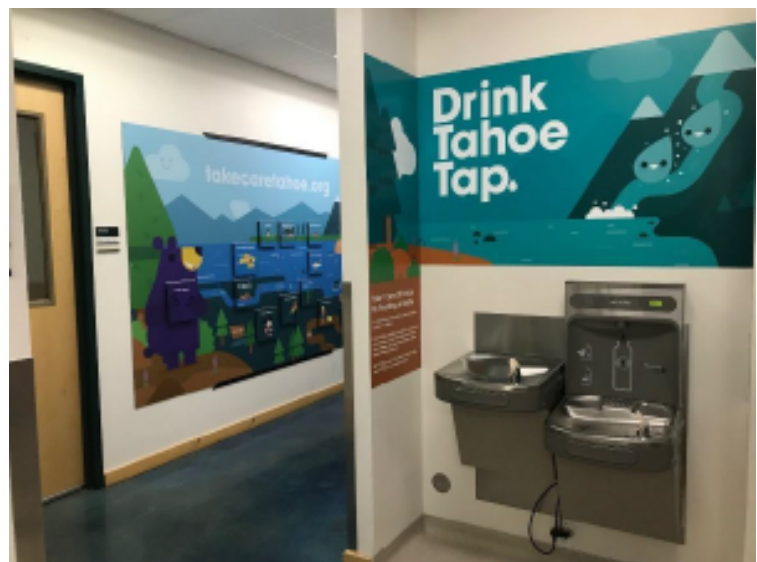
The microplastics reduction education project highlights include a new Exhibition which opened in June at the TERC Center in Incline Village, Nevada. <https://tahoe.ucdavis.edu/microplastics>

A second exhibit is being developed for the Sand Harbor Visitor Center for 2022 installation.



**Water Refill Station and additional Microplastics Signage was installed at Tahoe Science Center**

As part of the microplastics display, UC Davis and the Tahoe Water Suppliers Association installed a water refill station at the Tahoe Science Center in Incline Village, NV. Custom signage was created to reinforce Tahoe’s sourcewater protection – tap water connection.



Lakewide Microplastics Sampling:

Aug. 2021

The most comprehensive characterization of microplastics in the Lake Tahoe Basin to date is occurring. There has been no report provided on micro-plastics sampling efforts to date, but there was recent publicity:

<https://www.sierranevadaally.org/2021/08/07/researchers-look-for-sinks-of-microplastics-pollution-in-lake-tahoe/>

<https://ucscsciencenotes.com/feature/lake-tahoes-pristine-legacy-threatened-by-microplastics/>

Raley's / Drink Tahoe Tap Collaboration

The Raley's stores produced, funded and stocked custom 11,000 bottles for this campaign.

These are bottles in 116 Raley's stores in to support the Drink Tahoe Tap campaign.

Extensive details are provided in earlier Board reports.

Refill Stations:

Grants: The TWSA/Tahoe Fund Water Bottle Filling Station Grant Program has become active again with easing of COVID restrictions for businesses. To date, 17 grants have been issued (\$11,000) with several applications active. New signage has been developed for the refill stations. <https://www.yourtahoeplace.com/news/twsa-water-bottle-refill-station-grant-program>

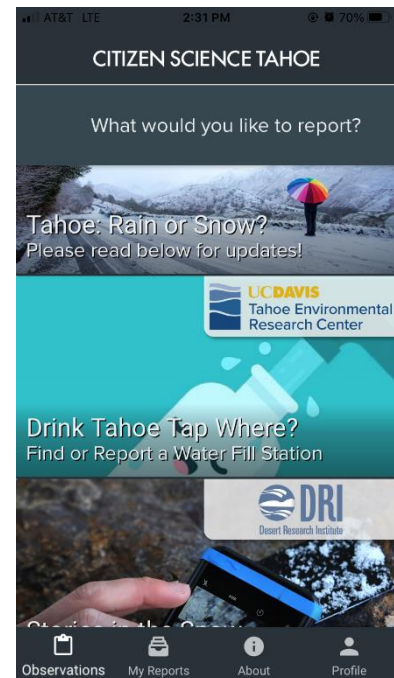
Find a Station:

50 fill station locations are presently logged on the map/apps.

- Tahoe Citizen Science App:  
<https://citizensciencetahoe.org/home>

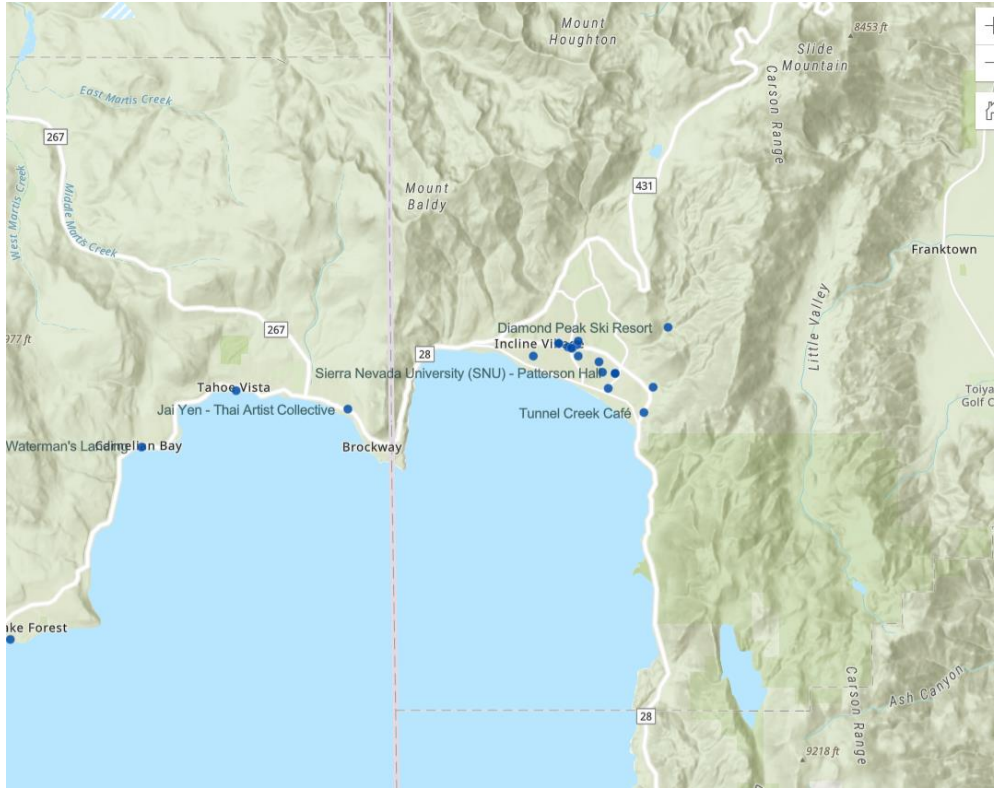
TERC'S 2022 Tahoe Citizen Science App is now active with a DRINK TAHOE TAP refill station feature.

There is also an





ARC GIS Web Map of DRINK TAHOE TAP refill locations: <https://bit.ly/30gkspB>



<https://www.kolotv.com/content/news/Tahoe-business-owners-could-add-water-refill-station-inside-stores--525119571.html>

A Take Care Tahoe focus group on DRINK TAHOE TAP is meeting to develop collateral for short term rental and lodging outreach. Staff participated in a “Tahoe Community Based Social Marketing Professional Workshop” hosted by TRPA and the Tahoe Care Partnership in spring 2021. The four-part series was facilitated by Conservation Science Partners, Inc. The goal is to use social science to refine Take Care outreach messaging to create better behavior change. CBSM builds behavior chains for each focal behavior, after identifying key barriers and benefits to promote for each focal behavior. This training series was offered from funds raised with the Tahoe 50<sup>th</sup> anniversary commemorative coin. Through the process 3 themes were identified for further action; one is that a small group is going to target a high end hotel/resort property and see if they will replace bottled water with Tahoe Tap options.

A second Take Care Tahoe focus group is addressing ways to increase compliance with dog owners on picking up dog waste to protect the watershed.

Staff has been monitoring the efforts of Clean Up the Lake as they conduct the 72 mile lake-wide cleanup. Staff participated in the Media Event held on 11/10/2021. Staff has not acted on the Board approved \$5000 match fundraiser yet with the organization; but both directors anticipate an effort in spring 2022.

Staff attends the Nearshore Aquatic Weeds Working Group (NAAWG) quarterly.

Staff is monitoring the ongoing situation with PCE issues and uranium detection in the Tahoe Keys municipal wells. [https://www.tahoedailytribune.com/news/tahoe-keys-association-addresses-uranium-in-water/?fbclid=IwAR2BEJ2JRVj0tDwh6Qig2-Waub3Vtx3ewdDhuRvoRx\\_P3FTTpb5qf0H53cA](https://www.tahoedailytribune.com/news/tahoe-keys-association-addresses-uranium-in-water/?fbclid=IwAR2BEJ2JRVj0tDwh6Qig2-Waub3Vtx3ewdDhuRvoRx_P3FTTpb5qf0H53cA)

The 'Cigarette Bin Collection Project' initiated between TWSA, League to Save Lake Tahoe and Keep America Beautiful (KAB) began region-wide bin distribution/installation in June 2019. More than 125 bins are installed now in the Basin. More than 8,000 butts have been recorded for collection (this is from a portion of the distributed containers). KAB has provided 250 metal cigarette filter collection bins to IVGID Waste Not (for TWSA) for distribution and use within the Tahoe Basin. Project is ongoing.

#### **Professional Development/Other:**

Volunteer Hours = 75 (Sept. 25, 2021 Blue Crew community cleanup event)

Sierra Beck conducted a Sierra Nevada University (50 hour) service-learning project creating content and marketing materials for DRINK TAHOE TAP's @where2fill Instagram campaign.

<https://www.instagram.com/where2fill/>

Joe Hill, TWSA support staff, became a certified Sustainability Excellence Associate (SEA) with the International Society of Sustainability Professionals (ISSP). <https://gbci.org/sustainabilityexcellence>

Description of Sustainability Excellence: "Credential holders help organizations and communities of all types integrate sustainability best practice throughout business operations. The SEA and SEP credentials provide third-party verification of competency in the field of sustainability and recognize individuals who have the skills to foster innovation, transform culture and lead sustainability initiatives for organizations and communities throughout the world."

TWSA/Waste Not staff trained in FEMA Incident Command modules I-100 and I-700.

The potential AmeriCorps team of 'Tahoe Aquatic Weed Control Operators (TAWCOs)' has been put on hold; with the team deciding to hold on the project to 2023. Current site logistics for the divers are challenging with boat traffic concerns. This project would put together a staffed team of 6 AmeriCorps members who are trained in underwater hand removal methods. The divers would concentrate on hand pulling and diver suction AIS removal for shoreline areas in South Lake Tahoe areas scheduled for hand removal treatment. A proposal is being drafted where the League to Save Lake Tahoe (League) and Tahoe RCD would host six half-year positions (22.5 weeks/900 hours per position) as part of the Sierra Nevada Alliance Partnership (SNAP) summer/fall 'Serve the Sierra' AmeriCorps program. Planning partners include TWSA, League to Save Lake Tahoe, Tahoe RCD.

**INCLINE VILLAGE GENERAL IMPROVEMENT DIST**  
G/L TRANSACTION DETAIL

19

From Date: 07/01/2021  
To Date: 11/12/2021  
From Account: 200-28-990  
To Account:  
Exclude Accounts With No Activity  
Run Date: 11/12/2021  
User: mod

TWSA total deferral (reserve) as of 6/30/2021 = \$174,111.60

G/L#	EFFECTIVE DATE	DESCRIPTION	STPSOURCE	JE#	DEPOSIT	CHECK	VENDOR	VENDOR INVOICE#	INVOICE TYPE	PO	PROJECT	DEBIT	CREDIT	BALANCE
200-28-990-4417		Service & User Fees										Balance	Forward	0
	07/12/2021	TWSA Membership Dues FY2022	AJ	GL	360198								28,855	28,855 CR
	08/05/2021	North Tahoe Public Utility Distr	AJ	GL	361527								14,370	43,225 CR
	08/05/2021	Tahoe City Utility Distr	AJ	GL	361527								16,739	59,964 CR
	08/05/2021	Glenbrook Water Coopratve	AJ	GL	361527								7,221	67,185 CR
	08/05/2021	Kingsbury General	AJ	GL	361527								11,580	78,765 CR
	08/05/2021	Round Hill General Impr Distr	AJ	GL	361527								6,567	85,332 CR
	09/24/2021	Edgewood Companies	AJ	GL	364992								10,043	95,375 CR
	09/24/2021	Lakeside Park Assoc	AJ	GL	364992								6,200	101,575 CR
	09/24/2021	Douglas County NV	AJ	GL	364992								19,478	121,053 CR
		TOTAL										0	121,053	121,053 CR
200-28-990-4510		Operating Grants - State										Balance	Forward	0
	08/19/2021	NDEP MicroPlastics Grant Receipt	AJ	GL	366095								13,163	13,163 CR
		TOTAL										0	13,163	13,163 CR
200-28-990-5010		Regular Earnings										Balance	Forward	0
	07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							1,473		1,473
	07/30/2021	PAYROLL FOR 073021	AJ	PR	361016							2,104		3,578
	07/31/2021	PAYROLL FOR 081321	AJ	PR	361606							1,065		4,643
	08/01/2021	TAHOE WATER SUPP LIERS ASSOCIAT	AJ	GL	364585							185		4,828
	08/13/2021	PAYROLL FOR 081321	AJ	PR	361605							1,065		5,894
	08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							2,122		8,015
	08/31/2021	PAYROLL FOR 091021	AJ	PR	363655							1,009		9,025
	09/01/2021	July 16 Vacation Accrual	AJ	GL	367691							185		9,210
	09/10/2021	PAYROLL FOR 091021	AJ	PR	363656							404		9,614
	09/10/2021	Sept 10 Vacation Accrual	AJ	GL	367693							185		9,799
	09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							2,170		11,969
	09/24/2021	Sept 24 Vacation Accrual	AJ	GL	367694							188		12,157
	09/30/2021	PAYROLL FOR 100821	AJ	PR	365455							1,777		13,935
	10/08/2021	PAYROLL FOR 100821	AJ	PR	365453							296		14,231
	10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							2,097		16,328
	10/30/2021	PAYROLL FOR 110521	AJ	PR	367163							1,616		17,944
		TOTAL										17,944	0	17,944
200-28-990-5050		Taxes										Balance	Forward	0
	07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							115		115
	07/30/2021	PAYROLL FOR 073021	AJ	PR	361016							166		281
	07/31/2021	PAYROLL FOR 081321	AJ	PR	361606							81		362
	08/13/2021	PAYROLL FOR 081321	AJ	PR	361605							81		443
	08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							161		604
	08/31/2021	PAYROLL FOR 091021	AJ	PR	363655							115		719

G/L#	20	EFFECTIVE DATE	DESCRIPTION	STPSOURCE	JE#	DEPOSIT	CHECK	VENDOR	VENDOR INVOICE#	INVOICE TYPE	PO	PROJECT	DEBIT	CREDIT	BALANCE
		09/10/2021	PAYROLL FOR 091021	AJ	PR	363656							46		765
		09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							163		927
		09/30/2021	PAYROLL FOR 100821	AJ	PR	365455							141		1,068
		10/08/2021	PAYROLL FOR 100821	AJ	PR	365453							23		1,091
		10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							164		1,256
		10/30/2021	PAYROLL FOR 110521	AJ	PR	367163							164		1,420
			TOTAL										1,420	0	1,420
200-28-990-5100			Retirement Fringe Ben										Balance	Forward	0
		07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							267		267
		07/30/2021	PAYROLL FOR 073021	AJ	PR	361016							373		640
		07/31/2021	PAYROLL FOR 081321	AJ	PR	361606							187		827
		08/13/2021	PAYROLL FOR 081321	AJ	PR	361605							187		1,015
		08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							373		1,388
		08/31/2021	PAYROLL FOR 091021	AJ	PR	363655							267		1,654
		09/10/2021	PAYROLL FOR 091021	AJ	PR	363656							107		1,761
		09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							376		2,137
		09/30/2021	PAYROLL FOR 100821	AJ	PR	365455							326		2,463
		10/08/2021	PAYROLL FOR 100821	AJ	PR	365453							54		2,517
		10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							380		2,897
		10/30/2021	PAYROLL FOR 110521	AJ	PR	367163							380		3,277
			TOTAL										3,277	0	3,277
200-28-990-5200			Medical Fringe Ben										Balance	Forward	0
		07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							563		563
		08/13/2021	PAYROLL FOR 081321	AJ	PR	361605							307		870
		08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							563		1,434
		09/10/2021	PAYROLL FOR 091021	AJ	PR	363656							307		1,741
		09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							563		2,304
		10/08/2021	PAYROLL FOR 100821	AJ	PR	365453							307		2,611
		10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							563		3,175
		11/05/2021	PAYROLL FOR 110521	AJ	PR	367164							307		3,482
			TOTAL										3,482	0	3,482
200-28-990-5250			Dental Fringe Ben										Balance	Forward	0
		07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							43		43
		08/13/2021	PAYROLL FOR 081321	AJ	PR	361605							25		68
		08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							43		112
		09/10/2021	PAYROLL FOR 091021	AJ	PR	363656							25		136
		09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							43		180
		10/08/2021	PAYROLL FOR 100821	AJ	PR	365453							25		205
		10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							43		248
		11/05/2021	PAYROLL FOR 110521	AJ	PR	367164							25		273
			TOTAL										273	0	273
200-28-990-5300			Vision Fringe Ben										Balance	Forward	0
		07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							5		5
		08/13/2021	PAYROLL FOR 081321	AJ	PR	361605							3		8
		08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							5		13
		09/10/2021	PAYROLL FOR 091021	AJ	PR	363656							3		16
		09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							5		21
		10/08/2021	PAYROLL FOR 100821	AJ	PR	365453							3		24
		10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							5		29
		11/05/2021	PAYROLL FOR 110521	AJ	PR	367164							3		32
			TOTAL										32	0	32
200-28-990-5400			Life Ins Fringe Ben										Balance	Forward	0
		07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							3		3
		08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							3		7
		09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							3		10
		10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							3		14
			TOTAL										14	0	14
200-28-990-5500			Disability Fringe Ben										Balance	Forward	0
		07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							12		12



G/L#	21	EFFECTIVE DATE	DESCRIPTION	STPSOURCE	JE#	DEPOSIT	CHECK	VENDOR	VENDOR INVOICE#	INVOICE TYPE	PO	PROJECT	DEBIT	CREDIT	BALANCE
		07/30/2021	PAYROLL FOR 073021	AJ	PR	361016							9		21
		08/13/2021	PAYROLL FOR 081321	AJ	PR	361605							9		30
		08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							12		41
		09/10/2021	PAYROLL FOR 091021	AJ	PR	363656							9		50
		09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							12		62
		10/08/2021	PAYROLL FOR 100821	AJ	PR	365453							9		71
		10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							12		83
		11/05/2021	PAYROLL FOR 110521	AJ	PR	367164							9		93
			TOTAL										93	0	93
200-28-990-5600			Unemployment Fringe Ben										Balance	Forward	0
		07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							24		24
		07/30/2021	PAYROLL FOR 073021	AJ	PR	361016							33		57
		07/31/2021	PAYROLL FOR 081321	AJ	PR	361606							17		73
		08/13/2021	PAYROLL FOR 081321	AJ	PR	361605							17		90
		08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							33		123
		08/31/2021	PAYROLL FOR 091021	AJ	PR	363655							24		146
		09/10/2021	PAYROLL FOR 091021	AJ	PR	363656							9		156
		09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							33		189
		09/30/2021	PAYROLL FOR 100821	AJ	PR	365455							29		218
		10/08/2021	PAYROLL FOR 100821	AJ	PR	365453							5		223
		10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							34		256
		10/30/2021	PAYROLL FOR 110521	AJ	PR	367163							34		290
			TOTAL										290	0	290
200-28-990-5700			Work Comp Fringe Ben										Balance	Forward	0
		07/16/2021	PAYROLL FOR 071621	AJ	PR	360055							37		37
		07/30/2021	PAYROLL FOR 073021	AJ	PR	361016							52		89
		07/31/2021	PAYROLL FOR 081321	AJ	PR	361606							26		115
		08/13/2021	PAYROLL FOR 081321	AJ	PR	361605							26		141
		08/27/2021	PAYROLL FOR 082721	AJ	PR	362787							52		193
		08/31/2021	PAYROLL FOR 091021	AJ	PR	363655							37		230
		09/10/2021	PAYROLL FOR 091021	AJ	PR	363656							15		244
		09/24/2021	PAYROLL FOR 092421	AJ	PR	364807							52		297
		09/30/2021	PAYROLL FOR 100821	AJ	PR	365455							45		342
		10/08/2021	PAYROLL FOR 100821	AJ	PR	365453							8		349
		10/22/2021	PAYROLL FOR 102221	AJ	PR	366515							53		402
		10/30/2021	PAYROLL FOR 110521	AJ	PR	367163							53		455
			TOTAL										455	0	455
200-28-990-6030			Professional Consultants										Balance	Forward	0
		08/13/2021	TM/SM Reg Renewal	SYS	AP	362851	776954	Law Office of Lara Pearson LTD., PBC	2016	Default Invoice			3,500		3,500
		08/31/2021	Gov't filing fees - Filing fee for 1 Class	SYS	AP	363790	777018	Law Office of Lara Pearson LTD., PBC	2018	Default Invoice			1,700		5,200
			TOTAL										5,200	0	5,200
200-28-990-7010			Advertising - Paid										Balance	Forward	0
		07/01/2021	Side Banners	SYS	AP	362522	776916	Tahoe.com	8564	Default Invoice			63		63
		07/01/2021	Side Banners	SYS	AP	362525	776916	Tahoe.com	9874	Default Invoice			63		125
		07/14/2021	"TENVCST" - Citizen Science Tahoe App Participating Partner	SYS	AP	360385	776700	The Regents of the University of California	2021.07.14	Default Invoice			1,000		1,125
		07/21/2021	Roadie Sponsorship 2021	SYS	AP	361311	776788	Tahoe City Downtown Association, INC	2607	Default Invoice			250		1,375
		07/29/2021	Reimbursement from	SYS	AP	361362	776789	The Regents	01-620995	Default			2,500		3,875

G/L#	22	EFFECTIVE DATE	DESCRIPTION	STPSOURCE	JE#	DEPOSIT	CHECK	VENDOR	VENDOR INVOICE#	INVOICE TYPE	PO	PROJECT	DEBIT	CREDIT	BALANCE
			TWSA for \$2500 and include IVGID for \$500 of partial expenses incurred by the UCD Tahoe Environmental Research Center for Assembly and Distribution of the "Tahoe :State if the Lake Report2021"					of the University of California	88	Invoice					
		07/30/2021	Magazine S21	SYS AP	362523		776916	Tahoe.com	9018	Default Invoice			548		4,423
		07/30/2021	Side Banners	SYS AP	362524		776916	Tahoe.com	9873	Default Invoice			63		4,486
		09/01/2021	Side Banners	SYS AP	365960		777309	Tahoe.com	9876	Default Invoice			63		4,548
		09/24/2021	TWSA Sponsorship Tahoe Film Fest Dec 2-5,2021	SYS AP	365593		777255	Tahoe Film Fest	1294	Default Invoice			750		5,298
		09/27/2021	IN NORTH TAHOE BUSINESS,Co branding Drink Tahoe TAP / MPTB and annual membership renewal	AJ GL	366322								700		5,998
		09/30/2021	Side Banners	SYS AP	365961		777309	Tahoe.com	9875	Default Invoice			63		6,061
		10/01/2021	Side Banners	SYS AP	366896		777401	Tahoe.com	9877	Default Invoice			63		6,123
			TOTAL										6,123	0	6,123
200-28-990-7310		07/27/2021	Computer License & Fees ADOBE CREATIVE CLOUD,Adobe creative suite current price pro rated	AJ GL	361913								Balance 11	Forward	0 11
200-28-990-7405		07/19/2021	TOTAL Office Supplies Operating Supply	SYS AP	362062		776864	Rainbow Printing & Office Supplies, Inc.	61986	Default Invoice			Balance 100	Forward	0 100
200-28-990-7415		07/27/2021	TOTAL Operating RENO TAHOE PROMOTIONS,SWP hoodies student stipends - NDEP grant	AJ GL	361913								Balance 1,618	Forward	0 1,618
		08/27/2021	AMZN MKTP US 2E0289UJ2,TWSA: hoses, dog bags	AJ GL	364158								161		1,779
		08/27/2021	BLT RESTAURANT SUPPLY, LL,Water Station Parts	AJ GL	364158								152		1,931
		08/27/2021	AMAZON.COM 2P1AK9J40 AMZN,TWSA: hoses, dog bags	AJ GL	364158								18		1,949
		08/27/2021	AMZN MKTP US 2P5QK5Z80,TWSA: hoses, dog bags	AJ GL	364158								127		2,076

G/L#	23	EFFECTIVE DATE	DESCRIPTION	STPSOURCE	JE#	DEPOSIT	CHECK	VENDOR	VENDOR INVOICE#	INVOICE TYPE	PO	PROJECT	DEBIT	CREDIT	BALANCE
		08/27/2021	AMZN MKTP US 2P8D21JF0,TWSA: hoses, dog bags	AJ	GL	364158							211		2,288
		09/01/2021	Pilot Project to Reduce Sourceater Plastic Pollution at Lake Tahoe	SYS	AP	365132	777202	The Regents of the University of California	61222731	Default Invoice			362		2,650
		10/05/2021	TWSA Water Fill Station Grant Program - Field 4@ NTPUD Regional Park installed outdoor water station	SYS	AP	365980	777292	North Tahoe PUD	2021.10.05	Default Invoice			1,000		3,650
		10/18/2021	PPE	SYS	AP	366430	5372	Tahoe Supply Company LLC	P209140	Default Invoice			100		3,750
		10/21/2021	MITTEN DOG BAG 2000/CS 2PLY	SYS	AP	366777	777359	A-#1 Chemical, Inc	7005568	Default Invoice			1,694		5,444
		10/31/2021	Acct 4244 - Oct 2021 In-Store Chg	SYS	AP	367672	777494	Village Ace Hardware	4244- Oct 2021	Default Invoice			60		5,504
			TOTAL										5,504	0	5,504
200-28-990-7470		07/27/2021	Printing & Publishing STICKER	AJ	GL	361913							Balance	Forward	0
			MULE,outdoor water station stickers										127		127
		07/31/2021	Record Sign Shop July 2021 - 21-997 - 12-Water station grant signs	AJ	GL	361285							278		405
		07/31/2021	CNB12777-01 PW Copier Base 07/30/21-07/31/21	SYS	AP	362168	5126	Sierra Office Solutions	IN2037047	Default Invoice			63		468
		08/01/2021	CNB12777-01 PW Copier Base 08/01/21-08/31/21	SYS	AP	362167	5126	Sierra Office Solutions	IN2077779	Default Invoice			63		531
		09/08/2021	CNB12777-01 PW Copier Base 09/01/21-09/30/21	SYS	AP	364786	5258	Sierra Office Solutions	IN2126430	Default Invoice			63		594
		09/09/2021	Layout for alcove and hallway for US Davis Science Center filling station.	SYS	AP	364780	777088	Brontosaurus , LLC	FillSta	Default Invoice			2,000		2,594
		09/28/2021	CNB12777-01 PW Copier Overage 06/30/21-09/29/21	SYS	AP	365658	5318	Sierra Office Solutions	IN2159899	Default Invoice			18		2,612
		10/04/2021	CNB12777-01 PW Copier Overage 10/30/21-10/31/21	SYS	AP	366527	5371	Sierra Office Solutions	IN2175807	Default Invoice			63		2,675
		10/27/2021	STICKER MULE, reprint drink tahoe tap stickers 1300 units	AJ	GL	367631							974		3,649
		10/27/2021	STICKER MULE, Drink Tahoe Tap hang tag w sticker STR outreach	AJ	GL	367631							231		3,880
		10/27/2021	IN POPPYCOLORLLC,Cu stom graphics TERC Drink Tahoe Tap display	AJ	GL	367631							1,633		5,513
		11/02/2021	CNB12777-01 PW	SYS	AP	367389	5434	Sierra Office	IN2243390	Default			63		5,576

G/L#	EFFECTIVE DATE	DESCRIPTION	STPSOURCE	JE#	DEPOSIT	CHECK	VENDOR	VENDOR INVOICE#	INVOICE TYPE	PO	PROJECT	DEBIT	CREDIT	BALANCE
		Copier Overage 11/30/21-11/30/21					Solutions		Invoice			5,576	0	5,576
		TOTAL										5,576	0	5,576
200-28-990-7685		Travel & Conferences										Balance	Forward	0
	07/27/2021	LOGMEIN	AJ	GL	361913							5		5
		GOTOMEETING,TWSA monthly toll free number												
	08/27/2021	LOGMEIN	AJ	GL	364158							5		10
		GOTOMEETING,monthl y toll free conference line												
	09/27/2021	LOGMEIN	AJ	GL	366322							5		15
		GOTOMEETING,monthl y toll free line charge												
	10/27/2021	LOGMEIN	AJ	GL	367631							5		20
		GOTOMEETING,monthl y toll free charge for web meetings												
		TOTAL										20	0	20
200-28-990-7840		Telephone										Balance	Forward	0
	09/21/2021	1st QTR Stipend 7/1/2021 - 9/30/2021	SYS	AP	364652	5250	MADONNA DUNBAR	1stQTR Stipend 21-22	Default Invoice			48		48
		TOTAL										48	0	48
200-28-990-7980		Central Services Allocation Cs										Balance	Forward	0
	08/01/2021	July Central Service Allocation	AJ	GL	367620							734		734
		TOTAL										734	0	734
		<b>GRAND TOTAL</b>										<b>50,594</b>	<b>134,216</b>	<b>83,622 CR</b>

#### STPUD Transition to Associate Member:

The South Tahoe Public Utility District requests the TWSA Board's approval to transition from a voting member back to an associate member of TWSA. The STPUD has been affiliated with Tahoe Water Suppliers since the association formed. The STPUD was originally an associate member and transitioned to a voting member in February, 2017. As the only groundwater provider in the TWSA, the STPUD is not required to submit an annual surface water report, which is a major benefit for TWSA members. The STPUD is currently working on lobbying efforts at the state and federal level and would like to invest these funds to help our region in that capacity.

Shelly Thomsen

Public Affairs and Conservation Manager

South Tahoe Public Utility District

[sthomsen@stpud.us](mailto:sthomsen@stpud.us)

(530) 543-6208

notes: MD received this request via email Wed 8/11/2021 5:06 PM  
STPUD 2021-22 dues = \$13,451



To: Tahoe Water Suppliers Association (TWSA) Board of Directors:

Heavenly Ski Resort would like to request Heavenly Water System's:

CA0900587 Heavenly Sky Deck

CA0900660 Heavenly Creek Station

CA0900665 Heavenly Gondola

NV0002218 Heavenly East Peak Lodge

For admission to the Association, as an Associate Member.

Becoming a part of the Tahoe Water Suppliers Association would be informative, supportive, and beneficial. As California, Nevada and local county regulations advance, Heavenly Ski Resort aspires to ensure the water we provide to our guests and employees is clean and safe.

Thank you for your consideration,

**Ryan Smith**

Senior Manager

Building Maintenance

Heavenly Mountain Resort

C: 805.797.5824 | O: 775.586.4430

[rsmith2@vailresorts.com](mailto:rsmith2@vailresorts.com)



Madonna:

My name is Jeff McDaniel and I am on the Board of Director's for the Logan Creek Estates GID. We have our own water system that we maintain for our local residents and it was recommended from our current water system engineering company, Lumos and Associates, that we should reach out to your organization to see about becoming members. I wanted to learn a bit more about TWSA and was hoping that you might be able to help me with general information and membership requirements.

I can be reached at the following.

Thank you,

Jeff McDaniel

[jeff@mcdaniel.net](mailto:jeff@mcdaniel.net)

Cell: (209) 482-8562

MD received request on Mon 10/11/2021 5:19 PM

## **Tahoe Water Suppliers Association (TWSA) Agreement 2016**

This Tahoe Water Suppliers Agreement is entered into this December 8, 2016, by and between Douglas County (“Zephyr Cove, Skyland, Cave Rock”), Incline Village General Improvement District (“IVGID”), Glenbrook Water Cooperative (“Glenbrook”), Round Hill General Improvement District (“Round Hill”), Kingsbury General Improvement District (“Kingsbury”), Edgewood Water Company (“Edgewood”), Lakeside Park Association, North Tahoe Public Utility District (“NTPUD”), South Tahoe Public Utility District (“STPUD”), Tahoe City Public Utility District (“TCPUD”) (collectively referred to herein as the “Parties” or “Water Supplier”).

### **Recitals**

1. Each of the Parties owns and operates a public water system within the Lake Tahoe Basin (Basin).
2. In order to assure a safe water supply and promote responsible use of a natural resource water suppliers must conduct watershed sanitary surveys on a regular basis, participate in an active watershed protection program, and comply with additional requirements and regulations.
3. The Parties desire to create the Tahoe Water Suppliers Association whose purpose is to develop, implement and maintain an effective watershed control program in order to satisfy recommendations in watershed sanitary surveys, advocate for the protection of Lake Tahoe as a viable source of drinking water and to satisfy additional state and federal requirements.

NOW, THEREFORE, based upon the foregoing, the Parties hereto agree as follows:

### **ARTICLE I**

#### **INTENT**

With the execution of this agreement, it is the intent of the Parties to provide for the establishment of the Tahoe Water Suppliers Association (“Association”) to assist the Parties in:

- a) Meeting federal and state requirements for filtration avoidance and other requirements; promulgated by the Surface Water Treatment Rule and its amendments.
- b) Maintaining an active watershed management control program, and carrying out the goals of the Association.
- c) Promoting and protecting Lake Tahoe and other sources in the Basin as viable sources of drinking water
- d) Defining the roles and responsibilities of the Executive Director and securing funding for the Executive Director to coordinate and execute the activities of the Association.

### **ARTICLE II**

#### **CREATION OF THE TAHOE WATER SUPPLIERS ASSOCIATION**

Section 2.1. Establishment of Association. The Parties to this Agreement agree to establish the Tahoe Water Suppliers Association with the authority and responsibilities set forth in this Agreement.

Section 2.2. Executive Director. IVGID shall designate one of its staff persons to act as the Executive Director for the Association and IVGID may assign additional staff to perform the activities of the Association.

Section 2.3. Association Board. The Association shall be managed by the Board of Directors (“Board”). The Board shall consist of one representative appointed by each dues paying Water Supplier. The position of Board Chair and Vice Chair will be elected annually by the Board. The Board shall also have the position of Vice Chair to act as Chair in their absence. The Chair shall conduct the Association Board meetings and participate with the Executive Director



in preparation of the agenda. The Chair shall act as the spokesperson for the Association Board on matters of concern to the Association or assign this to the Vice Chair or Executive Director, or other members of the Board.

Water Suppliers List

Douglas County – Zephyr Cove  
 Douglas County – Skyland  
 Douglas County – Cave Rock  
 Edgewood Water Company  
 Glenbrook Water Cooperative  
 Incline Village General Improvement District  
 Kingsbury General Improvement District  
 Lakeside Park Association  
 North Tahoe Public Utility District  
 Round Hill General Improvement District  
 South Tahoe Public Utility District  
 Tahoe City Public Utility District

Section 2.4. Duties. The Board shall be responsible for implementing the terms and conditions of this Agreement including, without limitation, the following:

- 2.4.1 Setting of periodic meetings to insure dissemination of information and discussion of issues.
- 2.4.2 Providing for cooperation among the Parties and with local, state and federal agencies and private entities with respect to watershed evaluation and watershed management.
- 2.4.3 Providing for the prevention of watershed degradation through advertising and education, conducting studies, retaining consultants as needed.
- 2.4.4 Developing a budgeting and funding process that ensures that the Association's cooperative efforts will be adequately staffed and funded.

Section 2.5. Appointment Alternatives. Each of the Parties to this Agreement shall name an alternate Board member representative to act in the event a Party's appointed Board representative is not in attendance at the meeting. In the event that the Party's appointed Board member is not in attendance at the meeting, the alternate Board member shall be entitled to one (1) vote in conducting the business of the Board. A Board member may also assign its voting privileges by standard proxy provisions.

Section 2.6 Meetings.

- 2.6.1. Regular Meetings. Regular meetings of the Board shall be held at least quarterly or at such other time as decided by the Board majority and shall be held at such place as the Chair or members of the Board may determine. Members can attend via conference call or other electronic communication methods.
- 2.6.2. Special Meetings. Special meetings of the Board may be called by or at the request of the Chairman or any two (2) members of the Board, and shall be held at such place as the Chairman or members of the Board may determine.
- 2.6.3 Emergency Meeting. An emergency meeting can be convened at any time with 100% concurrence of the Board members and shall be held at such place as the Chairman or members of the Board may determine.

Section 2.7 Notice of Meetings. Meeting notices will be posted according to Nevada Revised Statutes 241 and the California Brown Act, whichever is more restrictive. The Board shall be given notice of meetings and meeting agenda packets, delivered personally, sent by email, or sent by mail to each Board member at the Board member's address as provided in the Association records. If mailed, such notice shall be deemed to be delivered when deposited in the United States mail in a sealed envelope, so addressed, with postage thereon prepaid.

Section 2.8. Quorum. A majority of the members of the Board shall constitute a quorum for the transaction of business at any meeting of the Board. Each water supplier as listed in Section 2.3 is entitled to one vote. A single person may represent more than one water supplier and therefore have more than one vote.

Section 2.9. Voting Requirements. An affirmative vote of a majority members of the Board at any meeting shall be required to take action. Votes can be either voice votes or other methods of tabulating votes by electronic communication means.

Section 2.10. Books and Records. The Board shall keep correct and complete books and records of account, minutes of its proceedings and record giving the names and addresses of the members entitled to vote. All books and records of the Board shall be kept at a location determined by the Board and may be inspected by any Board member, or that member's agent or attorney, for any proper purpose at any reasonable time. Records shall be retained in accordance with record retention policies.

### ARTICLE III

#### CHARGES

Section 3.1. Establishment. Consistent with this Agreement, the Board shall establish charges to be paid by each Party to finance all necessary activities. Necessary activities are those identified by the Board in an approved annual budget.

Section 3.2. Apportionment of Charges. Parties shall pay the percentages of the annual budget. Each party's costs include shared program costs and dependent program costs, other than STPUD which pays 10% of total TWSA costs. Shared program costs are defined as 25% of TWSA staff costs and 75% of TWSA operating costs and account for activities that are necessary for all members. The shared costs effort does not vary based on size of the member's service area. Dependent program costs are defined as 75% of TWSA staff and 25% of TWSA operating. The dependent costs account for activities such as mapping and monitoring that inherently are more time and resource demanding for members with larger service areas and greater number of customers/connections than members with smaller services areas and customers/connections. Shared costs are appropriated equally to all Parties while, dependent costs are proportioned according to the size of the service area, customers, and connections.

Section 3.3. Use of Funds. Funds received from such charges shall be used for those purposes for which the Association has established.

Section 3.4. Budget and Charges. The Executive Director shall prepare an annual budget that will include a budget for all anticipated shared program and dependent program costs by the third quarterly meeting proceeding the budget year which begins on July 1<sup>st</sup>. The Board shall review and direct charges to the budget proposal and shall approve an annual budget at the March Meeting. The charges paid by each Party for the succeeding budget year shall be based on the approved budget.

Section 3.5. Account. The Executive Director will establish an account called the Tahoe Water Suppliers Association Account ("Account") to be used exclusively for purposes of the Association. Annual budget will determine the amount budgeted in the Account. The budget will be prorated for the Parties according to Section 3.2 and billed out on or about July 1 annually and become due 45 days later. Any monies not utilized during the budget year will be allocated to the next budget cycle unless allocated to the TWSA reserve fund. IVGID manages the reserve fund.

Section 3.6. Account Disbursements. All disbursements from the Account will be used for expenditures authorized by the Board in accordance with this Agreement. Except as otherwise provided in this section, the Board shall approve all TWSA programs and related payments from the Account in the annual Association budget process. The TWSA Director is authorized to approve all transactions as already defined and specified in the approved Association budget. Payments

of \$500 or less may be made by the Executive Director for actions not previously approved or detailed in the Association budget. All disbursements from the Account of greater than \$500 and less than \$1,000 shall require the approval of the Chairman for actions not previously approved or detailed in the Association budget. All disbursements from the Account \$1,000 or greater shall require approval of the majority of the Board for actions not previously approved or detailed in the Association budget.

#### ARTICLE IV

##### MEMBERSHIP PROCESS

Section 4.1. Admission of New Association Members. Public Water Systems desiring to join the Association shall submit a written request for consideration. The Board shall consider and discuss the request at a regularly scheduled Board meeting and conduct a vote on whether to admit the new member at a following regularly scheduled Board meetings. Public Water Systems requesting consideration of admission shall not have interests in conflict with TWSA's Mission Statement. A prospective member must receive approval by a minimum of at least 75% of the whole Board at the regularly scheduled meeting. Membership dues will be prorated for the current budget year based on the date of becoming a member and will become payable within 45 days of issuing the membership bill.

#### ARTICLE V

##### MISCELLANEOUS

Section 5.1. No Joint Venture / No Joint Power Authority. The Parties specifically acknowledge that no Party is acting as the agent of any other Party in any respect, and that each Party is an independent entity with respect to the terms, covenants and conditions contained in this Agreement. None of the terms or provisions of this Agreement shall be deemed to create a partnership between or among the Parties in their businesses, operations, affairs, or otherwise; nor shall it cause them to be considered joint ventures, joint power authority or members of any joint enterprise.

Section 5.2. No Third-Party Beneficiary. This Agreement is not intended, nor shall it be construed, to create any third-party beneficiary rights in any person or entity that is not a Party to this Agreement.

Section 5.3 Entire Agreement. This written Agreement constitutes the entire Agreement between the Parties with respect to the subject matter of the Agreement and supersedes all negotiations, prior agreements, and understandings between the Parties with respect to the subject matter.

Section 5.4. Further Actions. Each Party agrees to take all reasonable actions, to do all reasonable things, and to execute any and all documents and writings that may reasonably be necessary or proper to achieve their purposes and objectives of this Agreement.

Section 5.5. Good Faith. The Parties recognize and adopt the covenant of good faith and fair dealing in carrying out this Agreement.

Section 5.6. Modification. The Parties may not modify the terms of this Agreement except by approval of 75% of all Association members.

Section 5.7. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Nevada.

Section 5.8. Construction. The Parties acknowledge that each had the benefit of legal counsel, has had an opportunity to review this Agreement with its legal counsel, and that this Agreement shall be construed as if jointly drafted by all Parties.

Section 5.9. Counterparts. This Agreement may be executed by the Parties in counterparts, each of which shall be deemed an original instrument, and all of which shall constitute one and the same instrument.

Section 5.10. Notices. Any and all notices or other communications required or permitted by this Agreement or by law

to be served on or given to any Party by any other Party, shall be in writing, and shall be deemed duly served and given when personally delivered to the Party to whom it is directed, or in lieu of such personal service, then deposited in the United States Mail, first class postage prepaid, addressed to the Party at its last known address.

Section 5.11. Severability. In the event that any provision of this Agreement shall be held to be invalid or otherwise unenforceable, the Parties agree that the remaining provisions shall be valid and binding on the Parties hereto.

Section 5.12. Clarifying Statement. No member is delegating any of its authority or granting any right to act on its behalf by participation, except as to the specific tasks and revenues referenced. This Agreement provides no authority to bind its members.

Section 5.13. Termination. Any Party to this Agreement may withdraw from the Association for the upcoming year by giving notice of withdrawal to the other Parties at any time. No refund will be made of sums paid under this Agreement.

####

**Last page has ASSOCIATE MEMBERSHIP DEFINED 6/14/08**

## **Tahoe Water Suppliers Association (TWSA) Agreement 2007**

This Tahoe Water Suppliers Agreement is entered into this first day of July, 2007, by and between Douglas County (“Zephyr Cove, Skyland, Cave Rock”), Incline Village General Improvement District (“IVGID”), Glenbrook Water Company (“Glenbrook”), Round Hill General Improvement District (“Round Hill”), Kingsbury General Improvement District (“Kingsbury”), Edgewood Water Company (“Edgewood”), North Tahoe Public Utility District (“NTPUD”), Tahoe City Public Utility District (“TCPUD”) (collectively referred to herein as the “Parties”).

### **Recitals**

1. Each of the Parties owns and operates a public water system within the Lake Tahoe Basin, which water systems rely all, or in part, upon surface water from Lake Tahoe as their source of water supply.
2. The public water systems of each of the Parties, other than Round Hill, Cave Rock and Skyland, are presently exempt from filtration requirements under the Safe Drinking Water Act (SDWA) and applicable regulations.
3. In order to assure a safe water supply and avoid the significant capital and annual operating and maintenance costs associated with filtration treatment, water suppliers must conduct watershed sanitary surveys on a regular basis, participate in an active watershed protection program, and comply with additional requirements.
4. The Parties desire to create the Tahoe Water Suppliers Association whose purpose is to develop, implement and maintain an effective watershed control program in order to satisfy recommendations in watershed sanitary surveys, advocate for the protection of Lake Tahoe as a viable source of drinking water, and to satisfy additional state and federal requirements.

NOW, THEREFORE, based upon the foregoing, the Parties hereto agree as follows:

### **ARTICLE I**

#### **INTENT**

With the execution of this Agreement, it is the intent of the Parties to provide for the establishment of the Tahoe Water Suppliers Association (“Association”) to assist the Parties in:

- a) Meeting federal and state requirements for filtration avoidance; promulgated by the Surface Water Treatment Rule of the SDWA.

- b) Defining the roles and responsibilities of the executive director and the participating water suppliers in meeting federal and state requirements for filtration avoidance, maintaining an active watershed management control program, and carrying out the goals of the association.
- c) Securing funding for the executive director to coordinate the activities of the association.

## ARTICLE II

### CREATION OF TAHOE WATER SUPPLIERS ASSOCIATION

Section 2.1. Establishment of Association. The Parties to this Agreement agree to establish the Tahoe Water Suppliers Association with the authority and responsibilities set fourth in this Agreement.

Section 2.2. Executive Director. The Incline Village General Improvement District shall designate one of its staff persons to act as the Executive Director for the Association.

Section 2.3. Association Board. The Association shall be managed by the Board of Directors (“Board”). The Board shall consist of one representative appointed by each Water Supplier. The position of Board chairman will annually rotate by lot to other Board members without replacement. The chairman will be responsible for scheduling all meetings and distributing information to Parties.

<b>Water Supplier List</b>
Douglas County
Edgewood Water Company
Glenbrook Water Company
Incline Village General Improvement District
Kingsbury General Improvement District
North Tahoe Public Utility District
Roundhill General Improvement District
Tahoe City Public Utility District

Section 2.4. Duties. The Board shall be responsible for implementing the terms and conditions of this Agreement including, without limitation, the following:

- a) Setting of periodic meetings to ensure dissemination of information and discussion of issues;
- b) Providing for cooperation among the Parties and with local, state and federal agencies and private entities with respect to watershed evaluation and watershed management;
- c) Providing for the prevention of watershed degradation through advertising and education; and
- d) Developing a budgeting and funding process that ensures that the Association’s cooperative efforts will be adequately staffed and funded.

Section 2.5. Appointment Alternatives. Each of the Parties to this Agreement shall name an alternate Board member representative to act in the event a Party’s appointed Board representative is not in attendance at a meeting. Each alternate shall receive notices of meetings with an invitation to attend. In the event that the Party’s appointed Board member is not in attendance at the meeting, the alternate Board member shall be entitled to one (1) vote in conducting the business of the Board.

## Section 2.6. Meetings.

2.6.1. Regular Meetings. Regular meetings of the Board shall be held quarterly on the third Friday of September, December, March and June or at such other time as decided by the Board majority and shall be held at such place as the Chairman or members of the Board may determine. The Board may provide by Resolution the time and place for holding additional regular meetings without notice.

2.6.2. Special Meetings. Special Meetings of the Board may be called by or at the request of the Chairman or any two (2) members of the Board, and shall be held at such place as the Chairman or members of the Board may determine.

2.6.3. Emergency Meeting. An emergency meeting can be convened at any time with 100% concurrence of the Board Members and shall be held at such place as the Chairman or members of the Board may determine.

Section 2.7. Notice of Meetings. Meeting notices will be posted according to Nevada Revised Statutes 241 and the California Brown Act, whichever is more restrictive. The Board shall be given no less than ten (10) and not more than sixty (60) days prior written notice of Special Meetings, delivered personally, sent by email, or sent by mail to each Board member at the Board member's address as provided in the Association records. If mailed, such notice shall be deemed to be delivered when depositing in the United States mail in a sealed envelope, so addressed, with postage thereon prepaid. Any member may waive notice of any meeting. The attendance of a Board member at any meeting shall constitute a waiver of notice of such meeting, except where a member attends a meeting for the express purpose of objecting to the transaction of any business because the meeting is not lawfully called or convened. Notice of Meetings shall indicate the business to be transacted at the meeting.

Section 2.8. Quorum. A majority of the members of the Board shall constitute a quorum for the transaction of business at any meeting of the Board.

Section 2.9. Voting Requirements. An affirmative vote of five (5) members of the Board at any meeting shall be required to take action.

Section 2.10. Books and Records. The Board shall keep correct and complete books and records of account, minutes of its proceedings and record giving the names and addresses of the members entitled to vote. All books and records of the Board shall be kept at a location determined by the Board and may be inspected by any Board member, or that member's agent or attorney, for any proper purpose at any reasonable time.

## **ARTICLE III**

### **CHARGES**

Section 3.1. Establishment. Consistent with this Agreement, the Board shall establish charges to be paid by each Party to finance all necessary activities. Necessary activities are those identified by the Board in an approved annual budget.



Section 3.2. Apportionment of Charges. Parties shall pay the percentages of the annual budget. Each party's costs include shared program costs and dependent program costs. Shared program costs are defined as, 25% of staff costs and 75% of operating costs and account for activities that are necessary for all members. The work effort does not vary based on the size (definition will be added here) of the member's service area. Dependent program costs are defined as 75% of staff and 25% of operating. The dependent costs account for activities such as mapping and monitoring that inherently are more time and resource demanding for members with larger service areas and customer bases than members with smaller service areas and customer bases. Shared costs are appropriated equally to all Parties while, dependent costs are proportioned according to the size of the service area.

Section 3.3. Use of Funds. Funds received from such charges shall be used for those purposes for which the Association has established.

Section 3.4. Budget and Charges. The executive director shall prepare an annual budget that will include a budget for all anticipated shared program and dependent program costs by February 15th proceeding the budget year which begins on July 1st. The Board shall review and direct charges to the budget proposal and shall approve an annual budget at the March Meeting. The charges paid by each party for the succeeding budget year shall be based on the approved budget.

Section 3.5. Account. The Executive Director will establish an account called the Tahoe Water Suppliers Association Account ("Account") to be used exclusively for purposes of the Association. Annual budget will determine the amount budgeted in the Account. The budget will be prorated for the Parties according to Section 3.2 and billed out on or about July 1st annually and become due 45 days later. Any monies not utilized during the budget year will be allocated to the next budget cycle.

Section 3.6. Account Disbursements. All disbursements from the Account will be used for expenditures authorized by the Board in accordance with this Agreement. Except as otherwise provided in this section, the Board shall approve all TWSA programs and related payments from the Account. Payments of \$500 or less may be made by the Executive Director. All disbursements from the Account of greater than \$500 and less than \$1,000 shall require the approval of the chairman, all disbursements from the Account \$1,000 or greater shall require approval of the majority of the board.

#### **ARTICLE IV**

Article IV is not used.

#### **ARTICLE V**

#### **MISCELLANEOUS**

Section 5.1. No Joint Venture/No Joint Power Authority. The Parties specifically acknowledge that no Party is acting as the agent of any other Party in any respect, and that each Party is an independent entity with respect to the terms, covenants and conditions contained in this Agreement. None of the terms or provisions of this Agreement shall be deemed to create a partnership between or among the Parties in their businesses, operations, affairs, or otherwise; nor shall it cause them to be considered joint ventures, joint power authority or members of any joint enterprise.



Section 5.2. No Third-Party Beneficiary. This Agreement is not intended, nor shall it be construed, to create any third-party beneficiary rights in any person or entity that is not a Party to the Agreement.

Section 5.3. Assignment. No Party may assign its rights and obligations under this Agreement without the prior approval of the other Parties hereto.

Section 5.4. Successors. The terms of this Agreement shall be binding upon and inure to the benefit of the successors in interest of the Parties hereto.

Section 5.5. Entire Agreement. This written Agreement constitutes the entire Agreement between the Parties with respect to the subject matter of the Agreement and supersedes all negotiations, prior agreements, and understandings between the Parties with respect to the subject matter.

Section 5.6. Further Actions. Each Party agrees to take all reasonable actions, to do all reasonable things, and to execute any and all documents and writings that may reasonably be necessary or proper to achieve their purposes and objectives of this Agreement.

Section 5.7. Good Faith. The Parties recognize and adopt the covenant of good faith and fair dealing in carrying out this Agreement.

Section 5.8. Modification. The Parties may not modify the terms of this Agreement except by written consent of all the Parties.

Section 5.9. Notices. All notices or other communications made pursuant to this Agreement shall be in writing and shall be delivered personally (by hand or facsimile), emailed, or mailed, return receipt requested, to the Parties at their addresses as indicated at the execution page of this Agreement and as provided in the Association records.

Section 5.10. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Nevada.

Section 5.11. Construction. The Parties acknowledge that each had the benefit of legal counsel, has had an opportunity to review this Agreement with its legal counsel, and that this Agreement shall be construed as if jointly detailed by all Parties.

Section 5.12. Counterparts. This Agreement may be executed by the Parties in counterparts, each of which shall be deemed an original instrument, and all of which shall constitute one and the same instrument.

Section 5.13. Notices. Any and all notices or other communications required or permitted by this agreement or by law to be served on or given to any Party by any other Party, shall be in writing, and shall be deemed duly served and given when personally delivered to the party to whom it is directed, or in lieu of such personal service, then deposited in the United States Mail, first class postage prepaid, addressed to the Party at its last known address.

5.14. Severability. In the event that any provision of this Agreement shall be held to be invalid or otherwise unenforceable, the parties agree that the remaining provisions shall be valid and binding on the parties hereto.

5.15. Clarifying Statement. No member is delegating any of its authority or granting any right to act on its behalf by participation, except as to the specific tasks and revenues referenced. This agreement provides no authority to bind its members.

5.16. Termination. Any party to this Agreement may withdraw from the Association for the upcoming year by giving notice of withdrawal to the other parties at any time. No refund will be made of sums paid under this agreement.

In WITNESS WHEREOF,

The Parties hereto have executed this Agreement on the date and year above first written:

**DOUGLAS COUNTY (ZEPHYR, CAVE ROCK, SKYLAND WATER COMPANIES)**  
CARL RUSCHMEYER, COUNTY ENGINEER  
P.O. BOX 218  
MINDEN, NV 89423  
BY: \_\_\_\_\_

**INCLINE VILLAGE GENERAL IMPROVEMENT DISTRICT**  
JOE POMROY, DIRECTOR OF PUBLIC WORKS  
1220 SWEETWATER  
INCLINE VILLAGE, NV 89451  
BY: \_\_\_\_\_

**GLENBROOK WATER COMPANY**  
ROBERT RAMSDELL, BOARD CHAIRMAN  
P.O. BOX 3002  
STATELINE, NV 89449  
BY: \_\_\_\_\_

**ROUND HILL GENERAL IMPROVEMENT DISTRICT**  
CAMERON MCKAY, DISTRICT MANAGER  
P.O. BOX 976  
ZEPHYR COVE, NV 89448  
BY: \_\_\_\_\_

**KINGSBURY GENERAL IMPROVEMENT DISTRICT**  
JACK JACOBS, GENERAL MANAGER  
P.O. BOX 2220  
STATELINE, NV 89449

BY: \_\_\_\_\_

**EDGEWOOD WATER COMPANY**  
STEVE SEIBEL, WATER COMPANY SUPERVISOR  
P.O. BOX 5400  
STATELINE, NV 89449  
BY: \_\_\_\_\_

**NORTH TAHOE PUBLIC UTILITY DISTRICT**  
LEE SCHEGG, PUBLIC WORKS DIRECTOR  
PO BOX 139  
TAHOE VISTA, CA 96148  
BY: \_\_\_\_\_

**TAHOE CITY PUBLIC UTILITY DISTRICT**  
BILL BACK, DIRECTOR OF PUBLIC WORKS  
PO BOX 5249  
TAHOE CITY, CA 96143  
BY: \_\_\_\_\_

**Membership Addendum:**

**The Tahoe Water Suppliers Association Agreement is modified to include new membership as approved by the TWSA Board vote recorded on 6/20/08:**

**1. Full membership for Lakeside Park Association**

**LAKESIDE PARK ASSOCIATION**  
**BOB LODING (TITLE)** \_\_\_\_\_  
**ADDRESS** \_\_\_\_\_

**BY:** \_\_\_\_\_

**2. Associate\* membership for South Tahoe Public Utility District**

**SOUTH TAHOE PUBLIC UTILITY DISTRICT**  
**DENNIS COCKING (TITLE)** \_\_\_\_\_  
**ADDRESS** \_\_\_\_\_

**BY:** \_\_\_\_\_

**\* Associate membership is an auxiliary status, based on support of common watershed protection goals. Members of this status have no voting privileges, nor dues obligations at the time of adoption, until further notice.**

DRAFT

**Membership Addendum:**

The Tahoe Water Suppliers Association Agreement is modified to include new membership as approved by the TWSA Board vote recorded on 6/20/08:

**1. Full membership for Lakeside Park Association**

LAKESIDE PARK ASSOCIATION

BOB LODING (TITLE) WATER SYSTEM MANAGERADDRESS POBox 1775, Zephyr Cove NV 89448BY: Bob Loding**2. Associate\* membership for South Tahoe Public Utility District**

SOUTH TAHOE PUBLIC UTILITY DISTRICT

DENNIS COCKING (TITLE) PUBLIC INFORMATION OFFICERADDRESS 1275 Meadow Crest Drive, SLT, CA 96150BY: Dennis Cocking

\* Associate membership is an auxiliary status, based on support of common watershed protection goals. Members of this status have no voting privileges, nor dues obligations at the time of adoption, until further notice.



1220 Sweetwater Road  
Incline Village NV 89451  
[www.drinktahoetap.org](http://www.drinktahoetap.org)  
[www.tahoeh2o.org](http://www.tahoeh2o.org)

**TWSA Membership:**

Cave Rock Water System  
Edgewood Water Company  
Glenbrook Water Cooperative  
Incline Village GID  
Kingsbury GID  
Lakeside Park Association  
North Tahoe PUD  
Round Hill GID  
Skyland Water Company  
South Tahoe PUD  
Tahoe City PUD  
Zephyr Water Utility



10/28/2021

Submitted to Lahontan Water Board via:

[lahontan@waterboards.ca.gov](mailto:lahontan@waterboards.ca.gov) and [Russell.Norman@waterboards.ca.gov](mailto:Russell.Norman@waterboards.ca.gov)

To the Lahontan Regional Water Quality Water Board,

On behalf of the Tahoe Water Suppliers Association (TWSA) Board of Directors, we submit comments based from the following documents:

**TENTATIVE RESOLUTION GRANTING AN EXEMPTION TO THE AQUATIC PESTICIDE DISCHARGE PROHIBITION IN THE WATER QUALITY CONTROL PLAN FOR THE LAHONTAN REGION FOR THE CONTROL METHODS TEST OF HERBICIDES AND OTHER TECHNIQUES TO REDUCE AQUATIC INVASIVE PLANTS IN THE TAHOE KEYS LAGOONS**

[https://www.waterboards.ca.gov/lahontan/board\\_decisions/tentative\\_orders/2021/tkweedsres.pdf](https://www.waterboards.ca.gov/lahontan/board_decisions/tentative_orders/2021/tkweedsres.pdf)

**TENTATIVE WASTE DISCHARGE REQUIREMENTS AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR TAHOE KEYS PROPERTY OWNERS ASSOCIATION TAHOE KEYS LAGOON AQUATIC WEEDS CONTROL METHODS TEST**

[https://www.waterboards.ca.gov/lahontan/board\\_decisions/tentative\\_orders/2021/tkweedspermit.pdf](https://www.waterboards.ca.gov/lahontan/board_decisions/tentative_orders/2021/tkweedspermit.pdf)

**MITIGATION MONITORING AND REPORTING FOR THE CONTROL METHODS TEST OF HERBICIDES AND OTHER TECHNIQUES TO REDUCE AQUATIC INVASIVE PLANTS IN THE TAHOE KEYS LAGOONS**

[https://www.waterboards.ca.gov/lahontan/board\\_decisions/tentative\\_orders/2021/tkweedsmmrp.pdf](https://www.waterboards.ca.gov/lahontan/board_decisions/tentative_orders/2021/tkweedsmmrp.pdf)

**LAHONTAN STAFF REPORT**

[https://www.waterboards.ca.gov/lahontan/water\\_issues/programs/tahoe\\_keys\\_weed\\_control/docs/tkweedstaff.pdf.pdf](https://www.waterboards.ca.gov/lahontan/water_issues/programs/tahoe_keys_weed_control/docs/tkweedstaff.pdf.pdf)

**AMENDED TKPOA APPLICATION/PLAN 2021 DOCUMENTS**

[www.tahoekesweeds.org](http://www.tahoekesweeds.org)

### TWSA Board Comments:

1. The TWSA Board acknowledges the significant investment of resources over a long period of time by the regulators, scientists, stakeholders, facilitation teams, project proponents and interested parties. We are now reviewing a project built from years of ongoing discussion, research and stakeholder input.

We acknowledge the extensive requirements which have been developed for planning, implementation, communications, mitigation, monitoring and reporting for the proposed project. There is a tremendous amount of information presented before us.

As a note on process: during the first several weeks of this comment period, the Application information posted on the [www.tahoekeyseeds.org](http://www.tahoekeyseeds.org) website was the outdated 2019 project description. This is unfortunate because the updated 2021 application used to draft the Lahontan documents under review contained important revised information about the actual project but was not updated until October 1. As such, we request that the public comment period be extended so that the public has the full benefit to review and comment on all of the current documents.

2. The TWSA Board continues to support Action Alternative 1 (AA1 = non-herbicide tests only) identified in the DEIR as the “environmentally superior alternative”. Action Alternative 1 would proceed only with tests of non-herbicide methods of aquatic weed control. Under this alternative, no treatments with herbicides would be conducted, and other elements of the test program (i.e., ultraviolet light, LFA, and Group B methods) would be as described above for the Proposed Project. This alternative was identified as the environmentally superior alternative (Section 5.7).

Analysis provided in multiple documents determines that Lake Tahoe is not at risk from this proposed test of mixed methods. The reports include analysis of the estimated possible public exposure if there were a release into the lake (if mitigations failed). One of TWSA’s biggest concerns have been - would there be any threat to the lake’s source water intakes and municipal water supply? This scenario has been very well analyzed, and it appears to be very well mitigated.

Documentation provided estimates the possible level of potential active ingredients at drinking water intakes, at <0.9 µg/L. Additionally, with reasoning, the baseline water quality objectives of Non Detect (ND) for Endothall, Triclopyr, and Rhodamine WT are provided. This is where the TWSA *2014 Lake Tahoe Flow Modeling, Potential Pathogen Transport and Risk Modeling Report*<sup>1</sup> and the CMT movement of active ingredients out of the West Channel into Lake Tahoe, then move throughout our source water.

Tahoe’s sheer volume of water (between the treatment areas and the intakes), coupled with timing, mitigation and monitoring for the project provides a safety factor for drinking water wells or lake intakes. In the end, the final safety factor is based on dilution.

Though the Draft EIR/EIS states that the proposed CMT will not significantly impact filtration exemption, care needs to be taken to protect source water for future use. At this time, the Safe Drinking Water Act’s (SDWA) Surface Water Treatment Rule’s (SWTR) exemption criteria, focus on turbidity and bacteriological composition. The same Safe Drinking Water Act is constantly updated to protect potable water from chemicals, including the Unregulated Contaminant Monitoring Rule (UCMR) and Disinfectants and Disinfection Byproducts Rules (DBPR).

---

<sup>1</sup> LAKE TAHOE FLOW MODELING, POTENTIAL PATHOGEN TRANSPORT AND RISK MODELING, June 2014, [https://www.yourtahoepace.com/uploads/pdf-public-works/Schladow\\_Risk\\_Assessment\\_Phase\\_2\\_Final\\_Report\\_Jun\\_2014\\_FINAL.pdf](https://www.yourtahoepace.com/uploads/pdf-public-works/Schladow_Risk_Assessment_Phase_2_Final_Report_Jun_2014_FINAL.pdf)



It is logical to apply the same theory to filtration exemption and future criteria for chemical composition.

Concurrent with this document review period, the CA State Water Resources Control Board, Division of Drinking Water, is discussing policy change to ensure that the State Water Board develops the analytical methods to detect lower concentration of contaminants in drinking water to support the development of new or lower drinking water standards. The State Water Resources Control Board unanimously approved the resolution, *"AUTHORIZING THE EXECUTIVE DIRECTOR OR DESIGNEE TO ENTER INTO AN INTERAGENCY AGREEMENT WITH THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE FOR CONSULTING SERVICES ON ANALYTICAL METHODS AND RESEARCH FOR THE DRINKING WATER PROGRAM"* on 10/19/2021.

This resolution will ensure that the state water board develops the analytical methods to detect low concentrations of contaminants in drinking water to support the development of new or lower drinking water standards. Fiscal Impact, the interagency agreement will be for an amount not to exceed \$6,218,479 over three years.

3. US EPA and Californian EPA both recognize Lake Tahoe as an "Outstanding National Resource Water, Tier 3. (ONRW). There are only two ONRWs within California. Our understanding of this designation drives the logic of only testing non-chemical methods on a larger scale, before approving an exemption to permit an herbicide discharge.

TWSA views the introduction of herbicides (even as a 'one-time' test) into Lake Tahoe, as a Tier 3 Outstanding National Resource Water with 6 filtration exempt water systems (out of 60 nationally), as a last resort, and only after all possible non-chemical methods have been tested on a larger scale. Is herbicide application, even for testing, really the right approach in a Tier III ONRW of international significance? A realistic assumption is that a successful test indicates a future large-scale project, potentially with herbicides. We do understand Lahontan reserves the right to NOT permit future use.

4. We continue to support the testing of (Group B) non-herbicide methods at a larger scale, before chemical treatment is considered. Specifically, greater use of Diver Assisted Suction Harvesting (DASH) for larger scale treatment. The DASH method is highly selective and effective. Divers manually remove the entire plant which reduces concerns over re-growth or nutrient loading from plant die-off. (Table 7. Application, April 30, 2021, pg. 67-68).

5. We support greatly expanding the scale of use for the Laminar Flow Aeration (LFA) testing scope. Laminar Flow Aeration has excellent results as a water quality improvement for reducing sediment depth and decreasing sediment nutrient content. It is also proposed as a mitigation to offset low level Dissolved Oxygen (should these conditions occur). Nutrients available in sediment has been determined as the main 'food source' in the Keys' nutrient cycle. TKPOA has instituted non-point source management protocols to reduce ongoing runoff loading. This emphasis is critical to ongoing success. Please see this report on LFA used regionally: <https://www.clean-flo.com/wp-content/uploads/2020/05/Ski-Run-Marina-First-Year-Report-Jan-2020.pdf>

6. The Antidegradation Analysis (AA) (offered in Attachment G / Order / Section VII. Maximum Benefit to the People of the State) has statements in the findings which need further clarification. Specifically, Item 4 (in an interesting interpretation) SUPPORTS THE USE OF HERBICIDE for an ability to protect Tahoe's 'outstanding aesthetic' standard.

This statement sets precedent that herbicides are an acceptable option at small scale in an ONRW Tier 3; in the scope of tools for environmental restoration. The AA supports a presumption that the primary beneficial uses of Lake Tahoe ONRW 3 status is for clear, blue waters. The focus should be on the pristine water quality that provides surface water filtration exempt water quality for our customers, exempt or otherwise. The AA prioritizes the project goal for clarity standard rather than overall water quality.

7. Closing off the Keys, or installing a boat lock system, could also rapidly and successfully achieve a lake wide goal to limit the spread of invasive weeds from boating activity. Existing vector controls from the channels and marinas can certainly be enhanced. Restricting boating would directly reduce the spread of weeds. Boating is a known vector for the spread of the weeds (per Lahontan staff report), but reducing boating is not part of the equation.

8. Multiple pre-and-post-project notifications have been defined for contact to the area water providers potentially affected by the project.

a) In the Application's Communication Plan 6.2. Water Purveyors section - there is clear instruction for 30 day minimum pre-project notification to: TWSA; STPUD, LUKINS, TKPOA water companies.

b) However, the language in the tentative WDR permit is not quite as defined and potentially requires greater scope of notification.

Has staff developed the full scope of notification/ mailing list required to include private intakes or other water providers? The TWSA assumes no responsibility for proving notification to any other water providers (other than TWSA member agencies).

c) The Application states that the 30-day notification will be via USPS to TWSA, STPUD, Lukins, and TKPOA; however, the Draft WDR states the discharger must provide via Certified Mail, or equivalent, to water purveyors whose source water relies on the surface water and/or groundwater wells designated to be under the direct influence of the surface water.

9. Coontail is a floating (non-rooted) native aquatic plant considered to be growing at nuisance level. It contributes a considerable amount biomass. Is it targeted for mechanical removal or treatment with herbicides? There is not much mention of its management in the permit.

10. Cost information is presented in greater detail in the 2021 Application. However, this information is not presented in a consistent manner and will become a larger decision factor for any larger scale project. A consistent method should be established for evaluating costs to be inclusive of permitting, mitigation and monitoring. Cost for CEQA DEIR/DEIS analysis; mitigation, monitoring and reporting should be included towards the cost of herbicides. Information presented by agency staff, in public meetings, has acknowledged the herbicide component of the proposed project as the piece that triggered the need for full CEQA analysis; all other methods require less intensive review.

11. Per anti-degradation guidance (*40 CFR § 131.12 (2)*), the Non-Point Source Plan should be augmented with ongoing storm-water and fertilizer management improvements to reduce land-based, non-point source loading. Such enhancements could include: requiring buffer strips with a designated 'turf setback' requirement zone (removing turf from edge of water landscaping), nitrogen fertilizer restrictions, and the addition of storm drain inlet filters. Storm water was identified as a secondary major contributor to water column nutrient loading in the DEIR. The Keys water conditions are a result of ongoing, unmitigated

conditions from land-based activities. It is clearly stated in anti-degradation policy that all cost-effective and reasonable BMP's must be in place before the State authorizes degradation of high quality waters.

12. A requested analysis on the socio-economic impacts to the DRINK TAHOE TAP® brand was determined outside the scope of this DEIS. (Pg. 3.1-15). Tahoe Tap is an award winning, high quality tap water. The DRINK TAHOE TAP® brand and corresponding goodwill has been developed for more than 10 years regionally and receives broad community, regional and national support. The introduction of herbicides may have a strong impact on consumer confidence in the tap water, despite the precautions and mitigations. We were under the assumption that this question is being evaluated as part of anti-degradation analysis. But it appears that the impacts to our trademarked brand was not considered.

These articles support our concerns:

<https://www.wqpmag.com/tapping-filtration>

<https://tahoe.ucdavis.edu/microplastics>

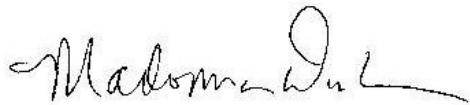
<https://www.raleys.com/our-purpose/sustainability-initiatives/>

<https://www.winsightgrocerybusiness.com/retailers/how-raleys-fighting-food-waste>

13. In addition to this letter, the Tahoe Water Suppliers Association has commissioned an independent review of this Tentative Resolution, Tentative WDR and NPDES Permit, and Mitigation Monitoring and Reporting for the Control Methods Test by Water Quality & Treatment Solutions Inc. The consultant comments are forthcoming and we ask these also be included as part of the formal record.

Thank you for the opportunity to comment.

Respectfully Submitted on behalf of the Tahoe Water Suppliers Association Board,



Madonna Dunbar, TWSA Executive Director



Suzi Gibbons, TWSA Board Chair



# TECHNICAL MEMORANDUM

Water Quality & Treatment Solutions, Inc.  
*An Environmental Engineering & Science Consulting Company*

www.WQTS.com

**Date:** November 1, 2021

**To:** [lahontan@waterboards.ca.gov](mailto:lahontan@waterboards.ca.gov)  
[Russell.Norman@waterboards.ca.gov](mailto:Russell.Norman@waterboards.ca.gov)

**cc:** Madonna Dunbar, TWSA **WQTS Project No.:** 0108.0010

**From:** Dan Askenaizer, D. Env.

**Project:** Draft Discharge Permit, Staff Report, Board Resolution Review

**Re:** Tahoe Keys Weeds Control Test

---

## INTRODUCTION

Water Quality & Treatment Solutions, Inc. (WQTS) is a specialty environmental engineering and science consulting company.

WQTS was requested by the Tahoe Water Suppliers Association to provide a review of the draft Resolution, Waste Discharge Requirements, NPDES Permit and the Mitigation Monitoring and Reporting for the Control Methods Test; scheduled for decision by the Lahontan Water Board.

## GENERAL REVIEW AND COMMENT

The discussion of the potential for the application of endothall, triclopyr, Rhodamine WT, and lanthanum-modified clay to impact water quality appears to be well described and thorough. For each of the herbicides, the dissipation rate appears to be “weeks and months, not years.” The analysis identifies the impact on water quality as a temporary impact. Clearly, however, the intent will be to use herbicides to a much greater extent. We note as stated by the Lahontan Regional Board, approval of this test does not mean that a larger scale application will automatically be approved. We anticipate significant pressure to expand the use of herbicides if deemed to be successful approach...and to deny a discharge application for a larger scale use would be significantly more difficult if herbicide test results are successful as anticipated.

The Best Available Technology Economically Achievable (BAT), Best Conventional Pollutant Control Technology (BCT), and Best Management Practices provided are appropriate to minimize potential impacts and address concerns as they occur. The “Additional BMPs typically not employed for aquatic weed control projects using aquatic herbicides” that go above and beyond to make sure that

the herbicides are mostly contained to the treatment area and that residue dissipates as anticipated.

As stated by numerous interested parties, there are significant concerns with the fact of using herbicides within Lake Tahoe water, one of only two Outstanding Natural Resource Waters (ONRW) in California.

#### **ADDITIONAL COMMENTS**

The following presents comments on specific sections of the documents.

1. In May 1990 the California State Water Resources Control Board (SWRCB) issued guidance<sup>1</sup> for the implementation of the anti-degradation policy in California, it states the following regarding ONRWs:

“...no discharge which will lower existing water quality shall be allowed.”

This statement appears to be supported by the decision flow chart for discharges that accompanied the 1990 APU 90-004 document. That flow chart indicates that if a water body is an ONRW, then the “Action [is] prohibited.”

We request that the Lahontan Regional Board clarify whether the approval of the test of herbicides is consistent with this specific language in the SWRCB’s APU 90-004.

2. As stated in the TKPOA exemption application, “...mechanical harvesting has been the primary means of AIS control in the Tahoe Keys lagoons since the 1980s.” Other statements support the idea that harvesting was implemented primarily to improve navigable conditions, rather than controlling the weeds (e.g., “Regardless of the size of the machine used, the plants in target areas must be harvested multiple times during the growing season to maintain navigable conditions). It does not appear that up to now a variety of non-chemical control methods have been rigorously tested and vetted. Even as it must have been obvious that harvesting was not working, and in fact was likely making things worse (as stated in the Draft Environmental Impact Study that harvesting, “...appears to be enhancing aquatic weed infestation in the lagoons by means of fragmentation.”) the practice continued year after year. Granting an exemption and allowing the test of herbicides and the likely intent to pursue herbicide use on a much larger scale in the future, as opposed to aggressively testing and vetting non-chemical approaches, appears to be a reward for a failed approach rather than aggressively testing what non-chemical treatment approaches could achieve.

---

<sup>1</sup> State Water Resources Control Board, Administrative Procedures Update, 90-004, May 1990 “Antidegradation Policy Implementation for NPDES Permitting.”

3. An antidegradation analysis consists of two basic steps. First, the applicant must demonstrate that the discharge is necessary to accommodate important social or economic development. Second, the applicant must demonstrate that no reasonable alternatives exist that would provide the needed result without authorizing a new discharge into a surface water. The proposal to use (test) herbicides in Lake Tahoe fails to meet these steps. Our understanding is that non-chemical methods (notably Laminar Flow Aeration (LFA) at the Ski Run Marina) have proved quite successful at reducing invasive species. Our understanding is that LFA, is being currently being tested on a limited basis in the lagoons of Tahoe Keys. Why not expand the acreage of lagoons treated with LFA now?
4. Lahontan Regional Board and the TRPA should consider not allowing weed harvesting to continue during the three-year test period. To continue to allow harvesting during this time would introduce an unknown and uncontrolled variable in the testing of weed control methods. Similarly, during the three-year test period the Lahontan Regional Board should impose a three-year moratorium on recreational boating within the lagoons. Both of these steps would be consistent with the goal of providing an accurate test of methods to control the invasive plants. Moratoriums on harvesting and boating should be considered as supportive of achieving the maximum benefit to the people of California.
5. Under Section VII of the Waste Discharge Requirements, the draft permit states that the discharger will monitor for the presence of hazardous algal blooms by testing for nutrients, chlorophyll and the cyanotoxins presented in Table 1 below:

**TABLE 1: CYANOTOXIN INDICATORS**

<b>Cyanotoxin</b>	<b>Indicator Level</b>
Microcystins	≥ 0.8 µg/L
Anatoxin-a	Detection
Cylindrospermopsin	≥ 1.0 µg/L

At the present time it is not known what causes cyanobacteria to release their toxins into the environment. We were not able to determine whether or not the analytical method will include a step to lyse algal cells that may be present and thus release any internal toxins. It is possible that cyanobacteria may be present in the lagoons but have not released toxins. Monitoring only for cyanotoxins would not necessarily indicate whether or not cyanobacteria are present. If there is any indication of an increase in algal cells (visual, increase in chlorophyll-a) we recommend that several monitoring events include total algal cells and algal speciation in addition to monitoring for cyanotoxins.

In addition, in May 2021, the California Office of Environmental Health Hazard Assessment (OEHHA) released recommended drinking water Notification Levels for the cyanotoxins presented in Table 2 below:

**Table 2: OEHHA Recommended Cyanotoxin Notification Levels**

<b>Cyanotoxin</b>	<b>Recommended Notification Level</b>
Microcystins	0.03 µg/L
Anatoxin-a	4 µg/L
Cylindrospermopsin	0.3 µg/L
Saxitoxin	0.6 µg/L

We recommend that saxitoxin be included in the list of cyanotoxins monitored, and that the OEHHA recommended notification levels be used as caution triggers instead of the values presented in Table 1.

6. Order No. R6T-2014-0059 requires the proposed discharger to develop and implement a non-point source water quality management plan. Much has been made about the fact that the existing invasive species are currently the major source of nutrient cycling in the lagoons. However, the draft Environmental Impact Statement identified stormwater as the second leading source of nutrients in the lagoons. If the invasive plants disappeared tomorrow, the existing nutrient levels in stormwater runoff likely would be sufficient to support the reemergence of invasive species.
7. Endothall has a drinking water Public Health Goal (PHG) of 94 µg/L. The proposal includes significant steps to mitigate the likelihood of endothall reaching a drinking water surface water intake at the PHG level. Should that occur, however, and the public water system detects endothall above the PHG, the system would be obligated to report that information to the State Water Resources Control Division of Drinking Water and its customers.
8. In previous documentation, the TKPOA had proposed the use of a third herbicide, Florpyrauxifen-benzyl (ProcellaCOR). The draft Staff Report states:

“ProcellaCOR is not yet approved for use in California by the California department of Pesticide Regulation and, therefore, will not be considered by the Lahontan Water Board as part of this exemption.”

However, the April 30, 2021, TKPOA Application to Test Combinations of Aquatic Weed Control Methods states that ProcellaCOR



“has recently been approved and registered by US EPA and classified as a “reduced risk” pesticide, meaning that it is used at a few parts per billion with very low or no risk to non-target organisms. This latter herbicide will only be tested if it is approved by the California Environmental Protection Agency Department of Pesticide Regulations (CalEPA-DPR), which is anticipated in 2021....Once florpyrauxifen-benzyl (ProcellaCOR™) is registered in California, it can be approved for use by Lahontan Regional Water Quality Control Board as part of an NPDES permit. If it is not added to the list of approved herbicides by 2021, then this herbicide would be tested after it is added to the list for NPDES permits (i.e., a later year).”

This statement by the TKPOA appears to be completely at odds with the spirit and approach of the test and appears to be contrary to the position in the Staff Report.

## State Water Resources Control Board

### NOTICE OF PUBLIC WORKSHOP AND OPPORTUNITY FOR PUBLIC COMMENT

#### PROPOSED STANDARDIZED METHODS FOR TESTING AND A TESTING AND REPORTING PLAN FOR MICROPLASTICS IN DRINKING WATER

**NOTICE IS HEREBY GIVEN** that the State Water Resources Control Board (State Water Board) will receive public comments on standardized analytical methods for monitoring microplastics in Drinking Water (hereafter Methods) and four-year plan for testing and reporting microplastics in drinking water (hereafter Plan). Written comments must be received by **12:00 noon on Wednesday, December 22, 2021**.

**NOTICE IS ADDITIONALLY HEREBY GIVEN** that the State Water Board will hold a workshop at the time and place described below to receive information and solicit public input regarding the draft Methods and Plan. This is an informal stakeholder meeting where a quorum of the State Water Board may be present, but the Board will take no formal action. The workshop will begin with a staff presentation summarizing the draft Methods and Plan, followed by an opportunity for oral and written public comments. State Water Board staff will answer questions related to the draft Methods and Plan.

#### **State Water Board Workshop**

**Wednesday, November 17, 2021, at 9:00 a.m.**

Video and Teleconference Only

(This meeting will occur in remote presence only as a result of the COVID-19 emergency and as authorized by Government Code 11133)

Video Broadcast: <https://video.calepa.ca.gov/>

Additional information about participating telephonically or via the remote meeting solution will be available at least 10 days before the hearing at the [Remote Meeting page \(https://www.waterboards.ca.gov/board\\_info/remote\\_meeting/\)](https://www.waterboards.ca.gov/board_info/remote_meeting/). This public meeting is currently scheduled to take place via video and teleconference only, but the format may be changed in the future to also allow for in-person attendance. Any person desiring to receive future notices about changes to the date, time, location, or format of the public hearing should sign up for the Lyris e-mail list, as described below.

### **BACKGROUND**

The California Safe Drinking Water Act requires the State Water Board to administer provisions relating to the regulation of drinking water to protect public health, including, but not limited to, conducting research, studies, and demonstration programs relating to

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

the provision of a dependable, safe supply of drinking water, enforcing the federal Safe Drinking Water Act, adopting and implementing regulations, and conducting studies and investigations to assess the quality of water in domestic water supplies. Under the act, implementing regulations are required to include, but are not limited to, monitoring of contaminants and requirements for notifying the public of the quality of water delivered to customers.

In 2018, Senate Bill 1422 added section 116376 to the Health and Safety Code, requiring the State Water Board, on or before July 1, 2020, to adopt a definition of microplastics in drinking water. Section 116376 further requires the State Water Board no later than July 1, 2021, to (1) adopt a standard methodology to be used in the testing of drinking water for microplastics; (2) adopt requirements for four years of testing and reporting of microplastics in drinking water, including public disclosure of those results; (3) if appropriate, consider issuing a notification level or other guidance to aid consumer interpretations of the results of the testing required pursuant to this section; and (4) accredit qualified laboratories in California to analyze microplastics. This statute permits the State Water Board to implement this section through the adoption of a policy handbook that is not subject to the regular rulemaking requirements of the Administrative Procedure Act.

The State Water Board has contracted with the Southern California Coastal Water Research Project to conduct an interlaboratory validation of analytical methods for monitoring microplastics in drinking water, convene an expert workshop to develop guidance to aid consumer interpretation of monitoring results, and provide training for ELAP staff and third-party laboratory assessors to accredit qualified laboratories to analyze microplastics.

Two methods were validated through the inter-laboratory comparison study involving twenty-two laboratories. Participating laboratories collaborated with State Water Board staff to determine best practices and develop accreditation criteria for laboratories. On September 28, 2021, copies of the standardized methods for extraction and analysis of microplastics in drinking water developed by SCCWRP were posted on the State Water Board website ([www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/microplastics.html](http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/microplastics.html)). The proposed standardized analytical method is undergoing external peer review as required by Health and Safety Code section 57004.

Staff intend to present the Methods and Plan to the State Water Board for consideration of adoption at the Board's February 15, 2022 meeting.

## **DOCUMENT AVAILABILITY**

The proposed Methods and Plan and related documents and information are available on the State Water Board's internet web site at: [https://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/microplastics.html](https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/microplastics.html). You may request a paper copy of the documents by contacting Scott Coffin at [Scott.Coffin@waterboards.ca.gov](mailto:Scott.Coffin@waterboards.ca.gov).

The workshop agenda will be available at least 10 days before the workshop at the State Water Board calendar page ([http://www.waterboards.ca.gov/board\\_info/calendar/](http://www.waterboards.ca.gov/board_info/calendar/)).

## **SUBMISSION OF WRITTEN COMMENTS**

Any interested person, or their representative, may submit written comments relevant to the proposed Methods and Plan to the Clerk to the State Water Board. Any written comments pertaining to this Methods and Plan, regardless of the method of transmittal, must be received by the Clerk to the State Water Board no later than **12:00 p.m. (noon) on Wednesday, December 22, 2021**, and addressed to:

Jeanine Townsend, Clerk to the Board  
State Water Resources Control Board  
P.O. Box 100, Sacramento, CA 95812-2000 (mail)  
1001 I Street, 24th Floor, Sacramento, CA 95814 (hand delivery)

Please indicate in the subject line: **“Comment Letter – Microplastics in Drinking Water Methods and Plan.”**

Comments may be submitted electronically (e-mail), by facsimile, U.S. Mail, or courier as described below. Oral comments will be accepted at the November 17, 2021 workshop. Comment letters may be submitted electronically, in PDF text format if less than 15 megabytes in total size, to the Clerk to the Board via e-mail at [commentletters@waterboards.ca.gov](mailto:commentletters@waterboards.ca.gov). If the file is greater than 15 megabytes in total size, submit the comments by fax at (916) 341-5620; address the fax to “Clerk to the Board.” U.S. Mail must be received (not postmarked) at the State Water Board offices by the close of the comment period.

Note: Due to COVID-19, all persons hand delivering submittals must first schedule an appointment with staff by contacting [Scott.Coffin@waterboards.ca.gov](mailto:Scott.Coffin@waterboards.ca.gov). All hand delivered submittals must arrive and be dated and time stamped prior to 12:00 p.m. (noon) on Wednesday, December 22, 2021.

The State Water Board requests but does not require that written comments sent by mail or hand-delivered be submitted in triplicate.

The State Water Board requests but does not require that, if reports or articles in excess of 25 pages are submitted in conjunction with the comments, the commentator provide a summary of the report or article and describe the reason for which the report or article is being submitted or is relevant to the proposed definition.

All comments, including email or fax transmissions, should include the author’s name and U.S. Postal Service mailing address in order for the State Water Board to provide copies of any notices for proposed changes to the regulation text on which additional comments may be solicited.

Please note that under the California Public Records Act (Gov. Code, §6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

## WEBCAST INFORMATION

Live video and audio broadcasts of the public workshop and consideration of adoption meeting, for attendees that are solely interested in watching and not participating, will be available via the internet and can be accessed at the [CalEPA Public Meeting Live Webcasts page](https://video.calepa.ca.gov) (<https://video.calepa.ca.gov>).

## ACCESSIBILITY

Telecommunications Device for the Hearing Impaired (TDD) users may contact the California RelayService at (800) 735-2929 or voice line at (800) 735-2922. A broadcast of the hearing will be available via internet and can be accessed at <https://video.calepa.ca.gov>.

## FUTURE NOTICES

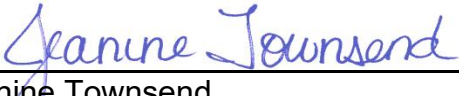
The State Water Board will hold the public workshop at the time noted above. Any change in the date, time, and place of the workshop or Board meeting will be noticed through the e-mail distribution list. Any person desiring to receive future notices concerning the draft Methods and Plan, including any changes to the notice of public meeting and consideration of adoption, must sign up for the e-mail distribution list. To sign up for the distribution email list, access the E-mail List Subscription form, select the box for 'Drinking Water Program Announcements' (located within the section entitled 'Drinking Water'), and provide the required information. The subscription form is located at:

[http://www.waterboards.ca.gov/resources/email\\_subscriptions/swrcb\\_subscribe.shtml](http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml)

## CONTACT INFORMATION

Please direct questions regarding this notice to Scott Coffin, Ph.D. at [Scott.Coffin@waterboards.ca.gov](mailto:Scott.Coffin@waterboards.ca.gov)

October 26, 2021  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Jeanine Townsend  
Clerk to the Board

**FINAL REPORT**

17 August 2021

For the project entitled:

**Prioritizing Behavior Change Efforts for the Take Care Tahoe Campaign**

Submitted to:

Amy Barry  
Tahoe FundCrew Stover  
Tahoe Fund

By:

Stacy A. Lischka, PhD – Lead Scientist  
Brett G. Dickson, PhD – Chief Scientist

## Executive Summary

We engaged the Take Care Tahoe Outreach Committee in a 2 month workshop series in May-June 2021, to prioritize and select key behaviors around which to build behavior change campaigns. In addition to learning about the foundations of the Community Based Social Marketing approach to behavior change, workshop participants developed programs and planned for their implementation and evaluation. The results of these workshops are detailed in the full report, however, here we provide a brief summary of the main highlights, for each focal behavior workshop participants selected.

### **Focal behavior 1: All dog waste is bagged and thrown away, in neighborhoods and on trails.**

*Key Barriers and Benefits:* High impact barriers: unpleasant smells from picking up waste, lack of awareness of potential bacterial contamination, not having access to bags or containers, not remembering to pick up bagged waste left on the trail. High impact benefits: a cleaner trail/space to walk in, feelings of self-worth at keeping the area clean, and improved water quality.

*Proposed Strategy:* Prompts, social norms, and feedback.

*Piloting and Evaluation:* Monitor impact at 2 trails (1 high use, 1 low use). Pre-implementation monitoring includes counting the number of bagged dog waste left on the trail. Once strategies are implemented, monitoring the number of bagged dog wastes found along the trail continues. Long term monitoring of the number of bagged and unbagged dog waste, executed by the Blue Crews, will serve as evaluation.

### **Focal behavior 2: Residents and visitors use reusable water bottles to drink Tahoe tap water at home, in rentals, and at hotels.**

*Key Barriers and Benefits:* High impact barriers: convenience, safety, taste/smell. High impact benefits: cost savings in not purchasing bottles of water, avoiding the use of single-use plastic bottles reduces waste, reduction in waste can contribute to a feeling of making a sustainable decision with positive impacts for the community.

*Proposed Strategy:* Structural changes/convenience, social diffusion, and commitments.

*Piloting and Evaluation:* Piloting will focus on a single luxury hotel with an existing commitment to sustainability (Edgewood Tahoe Resort). The goal will be to convince the hotel stop automatically providing water in single-use plastic bottles in all rooms. Pre-implementation monitoring will include the number of bottles of water purchased each month by the hotel, the cost of these bottles of water, the number of water bottle refilling stations on site, the number of visitors to the hotel, and the volume/weight of plastic waste that is produced by the hotel. The pilot would also include a similarly sized, near-by hotel where the same information would be collected and rates of change could be compared. Monitoring of the same information will continue at the control and treatment hotels during and after program implementation. Evaluation data should include the number of hotels automatically providing single-use plastic water bottles over time across the Tahoe basin, as well as the number of public bottle refilling stations available.



**Focal behavior 3: Residents of the Tahoe region implement defensible space wildfire preparedness plans.**

*Key Barriers and Benefits:* High impact barriers: lack of time, ability, or tools to accomplish the work, limitations on the actions that renters can take, lack of awareness of conditions and the role of defensible space in reducing risk to homes, cost of taking actions. High impact benefits: reduced risk of the impacts of wildfire on the home and their community, aesthetic improvements resulting from removal of vegetation and brush, cost savings on insurance, a sense of community resulting from actions that benefits individuals and the community.

*Proposed Strategy:* Commitments, Social Diffusion

*Piloting and Evaluation:* Piloting involves choosing a small number (1-2) neighborhoods in communities around the basin. In each, select 3 sets of 1-3 blocks in which to hold a Defensible Space Day event. In one neighborhood, the event would consist only of information provisioning activities (e.g. speakers on how to take action, etc.), serving as the control neighborhood. In the second neighborhood, information provisioning would occur, plus recruiting residents to sign a pledge. The third community event would include information provisioning, pledge signing, as well as the distribution of yard signs. The impact of the program would be monitored using existing data from several community organizations who already have programs to monitor defensible space across communities in the basin. Long term evaluation of the outcomes of these programs can be accomplished using existing data on defensible space from CAL-fire, Tahoe Fire & Fuels Team, the Fire Adapted Communities Program, or LIDAR and GIS data from national sources.

## Introduction

The Take Care Tahoe campaign aims to create a future where “Lake Tahoe is an environmental success story and a global role model for sustainability.” Further, the campaign’s mission is to “expand environmental education and connect more people with Lake Tahoe to nurture a culture of stewardship and sustainability.” To achieve these goals, the campaign focuses on reaching an audience of frequent visitors to Lake Tahoe who have a high level of interest in the region and residents of the basin. In order to successfully focus campaign efforts, it will be critical to identify priority behaviors around which to focus outreach and behavior change efforts, audiences to target with behavior change efforts, and methods to evaluate the effectiveness of messaging.

The Community-Based Social Marketing (CBSM, McKenzie-Mohr 2011) framework is an empirically-based process, steeped in social science theory and research, which can guide strategic decisions about the development and execution of behavior change efforts. The CBSM approach includes identifying key behaviors, understanding barriers and benefits to the behavior among target audiences, developing strategies to achieve behavior change, and evaluating and refining approaches. Application of this framework can aid in the development of effective and efficient behavior change campaigns, focused on the most impactful behaviors, and facilitate learning and evaluation; all of which will aid the Take Care Tahoe Outreach Team in achieving their goals.

*Project objective:* Develop a plan for the Take Care Tahoe campaign which strategically identifies priority behaviors for behavior change and evaluation efforts. Select 2-4 high priority behaviors around which to focus development of a Take Care Tahoe behavior change campaign and plan for evaluation of the campaign.

## Methods

We conducted a series of 4 workshops, as well as additional background research and facilitated discussions, with the Take Care Tahoe Outreach Committee between April and June 2021. The workshops were focused on components of the CBSM process (Figure 1). Workshop 1 included an introduction to the CBSM approach and behavior identification. Workshop 2 covered barrier and benefit identification. Workshop 3 covered strategy development (Appendix A), and workshop 4 covered piloting and evaluation. In addition to workshops, we conducted follow up surveys with participants to identify focal behaviors and rank barriers and benefits, and held additional 1 hour sessions to allow for additional discussion of strategy development. In addition to feedback provided by participants in these workshops, we conducted background, literature-based research on barriers and benefits, existing behavior change programs for focal behaviors, and piloting strategies. The results of all components of the CBSM approach are summarized below. Notes from workshop sessions have been provided to the Take Care Tahoe Outreach Committee leads.

**Figure 1.** Community Based Social Marketing (CBSM) process.



## Results

### *Behavior selection*

To identify focal behaviors to focus strategy development, Take Care Tahoe Outreach Committee members provided a list of 8 potential focal behaviors to the participants to discuss. Through discussion and a follow up, online survey, participants provided categorical information on predicted impact, penetration, and probability for the 8 behaviors. This information was summarized over 15 survey responses, and the 8 potential behaviors were ranked (Table 1). Our final set of focal behaviors were:

- 1) All dog waste is bagged and thrown away, in neighborhoods and on trails;
- 2) Residents and visitors use reusable water bottles to drink Tahoe tap water at home, in rentals, and at hotels; and
- 3) Residents of the Tahoe region implement defensible space wildfire preparedness plans.

For each of these 3 highest priority focal behaviors, we identified barriers and benefits, strategies, and piloting and evaluation plans through the remaining 3 workshops and additional input mechanisms. Below, the results of these steps are summarized for each behavior.

**Table 1.** Potential focal behaviors for CBSM strategy development. Behaviors with medium and high overall ranks, were merged to create our 3 final focal behaviors. Results are based on online survey of workshop participants (n=15).

Behavior	Impact	Probability	Penetration	Overall rank
At recreation sites without trash cans, all trash is taken away	low	medium	low	low
At all sites, cigarette butts are disposed of properly	low	Low	medium	low
At developed campgrounds, all campers extinguish all campfires fully	low	medium	low	low
On all trails, all dog waste is bagged and thrown away	low	Low	high	medium
In neighborhoods, all dog waste is bagged and thrown away	low	medium	medium	medium
Residents and visitors to the region use a reusable water bottle when out and about	medium	medium	high	medium
Residents and visitors to the region drink Tahoe tap water at home, in rentals or hotels	medium	medium	medium	medium
Residents of the Tahoe region have wildfire preparedness plans	high	medium	high	high

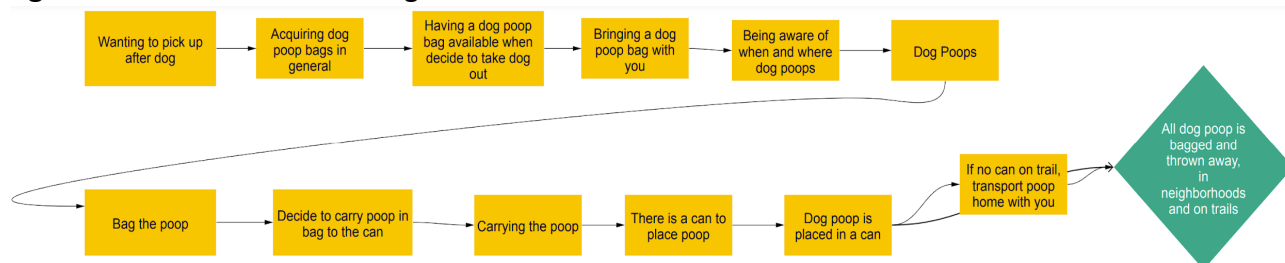
### **Focal Behavior 1:** All dog waste is bagged and thrown away, in neighborhoods and on trails

#### Behavior Chain

The first focal behavior selected by participants dealt with decreasing the amount of dog waste that is left on trails and in neighborhoods. Over the course of our discussions and planning, this group focused in on cleaning up dog waste on recreational trails, in particular. This behavior involves several key steps, as described by the behavior chain developed by participants (Figure 2). First, dog owners must want to pick up their dog's waste. Once dog owners are out with their dogs, they must have access to bags to pick up dog waste and know where/when their dog has defecated. Once a dog has defecated, the owner must pick up the waste, bag it, and, finally, carry it to and deposit it in a trash container. If containers are not available, the owner must carry the bag and waste to another location to dispose of it. An interesting component of this focal behavior is that many hikers/walkers bag their dog's waste, and leave it on the trail, but do not put these filled bags into a waste container. Bagged waste may be forgotten on the trail (when the dog owner intends to pick the bag up on the way back to their vehicle or an area with waste containers), or may be intentionally left (when the dog owner believes someone else will pick up the bagged waste at a later time.) The fact that many dog owners take several steps

along the behavior chain, including bagging their dog's waste, yet do not achieve the final behavior (depositing the bagged waste into an appropriate garbage container) indicates that addressing this step in the behavior chain may be a critical piece to achieving the behavioral goal.

**Figure 2.** Behavior chain for dog waste behavior.



### Barriers and Benefits

Along the behavior chain described above, workshop participants identified a number of key barriers and benefits. Through a brainstorming session and a follow-up survey, we classified these barriers and benefits into high impact barriers/benefits, and lower impact barriers/benefits (Figure 3). High impact barriers to disposing of dog waste appropriately related to the negative aspects of picking up and carrying waste (smell, etc.), a lack of awareness that dog waste is a source of bacterial contamination, not having access to bags or waste containers along trails, lack of consequences for not picking up waste, and not remembering to pick up bagged waste left on the trail. High impact benefits of this behavior include a cleaner trail/space to walk in, feelings of self-worth at keeping the area clean, and improved water quality.

From additional background research on published accounts of efforts to understand dog waste disposal behaviors, we learned that among dog owners who left unbagged poop along natural trails, they most commonly felt that dog waste was natural/biodegradable and therefore did not need to be cleaned up, cleaning up dog waste was unpleasant, there were no trash containers to deposit the waste in, and the rules requiring dog waste cleanup were illegitimate (Webely and Siviter 2006, Lowe et al. 2014). Those who did clean up their dog's waste felt strong social pressure to do so and were concerned about bacterial contamination and disease spread (Webely and Siviter 2006, Lowe et al. 2014).

There appears to be a significant difference in people's motivations and perceptions of the need to pick up dog waste depending on the environment. In fact, Lowe et al. (2014) found that more than 1/3 of survey respondents felt they should not have to pick up dog waste in natural areas. In multiple studies, more dog waste was found in parks and natural areas, especially near access points, than in neighborhoods or along sidewalks (Webely and Siviter 2006, Lowe et al. 2014). However, in a study in Boulder, Colorado, researchers found that nearly ¾ of observed dog walked did properly pick up and carry away their dog's waste in natural areas (Romo et al. 2019). Picking up waste was more common among owners with dogs on leash, than those walking dogs off-leash.

**Figure 3.** Barriers and benefits identified for dog waste behavior.

### Strategies

Workshop participants chose to develop strategies to address the barrier of people forgetting to pick up bagged poop and the benefit of contributing to a clean/pleasant area to walk and hike. They chose to address these barriers and benefits through application of prompts, social norms, and feedback. They discussed using signs that display descriptive norms about picking up dog waste (for example, “75% of dog owners who use this trail pick up their dog’s waste.” Placing these signs along trails where dog waste is a serious issue and in areas of trails where bags and/or waste are most commonly left can help them serve as prompts. These prompt/normative messaging signs would be most effective if they also contained photos of people executing the desired behavior, especially if the people portrayed in the photos represented a wide range of trail users (casual walkers, hikers, backpackers, young, old, etc.). Participants also suggested actions that would help reinforce the desired behavior by making the social norm visible, such as installing clear garbage containers so that trail users could see bags of waste in the desired location (the trash container) or creating an audible reminder every time that someone deposited dog waste into a garbage container.

Finally, they suggested using feedback to make trail users aware of the progress being made toward achieving the goal of reducing dog waste on trails. Feedback in this context would be most effective if it were paired with social norm messages and reported information such as the number of dog waste bags deposited in trash containers or the weight of dog waste appropriately disposed of. Information about bacterial load or other waste-related water quality data could also be useful feedback.

### Piloting and Evaluation

Workshop participants identified several opportunities to pilot these strategies in the Tahoe region. First, they suggested selecting 2 trails along a gradient of the problem (one with little left waste and with lots of left waste) to monitor the amount and location of waste left before rolling out strategies. Then, they suggested implementing strategies and continuing to monitor the amount of left waste on a weekly to bi-weekly basis. All visible waste should be removed during these monitoring periods so that change in the rates of left waste can be monitored. Monitoring should occur on the same day and time, for each sampling period, and with the same number of days between sampling periods, for consistency. To assess the impact of the pilot, the number of bags and/or piles of left waste can be compared on the same trail. Calculating per day or per week rates might be helpful for comparisons. In order to understand seasonal differences in behavior, participants suggested re-running the pilot in summer and in winter.

Participants identified several opportunities for long-term evaluation of the effectiveness of a behavior change program. First, the leveraging any data about the number/weight of bagged and unbagged dog waste collected by Blue Crews would be an excellent period metric for changes in this behavior. Second, water quality and bacterial load data are already collected by several organizations in the basin. Leveraging this data into feedback signs and as an indicator of progress would be very useful. Both of these data sources would be ideal, as they are built on a foundation of existing data collection that is likely to continue through time.

## Recommendations

### *Strategy recommendations*

Reducing the amount of dog waste along trails will likely take a combination of structural/convenience and behavioral fixes. In addition to the strategies suggested by workshop participants, and those described below, a major barrier to achieving the final, critical step in this behavior (getting the bagged waste into a trash container) is the placement and availability of trash containers. Making a structural investment in adding trash containers along trails and staff to empty them may seem like a big investment in resources. However, it may end up being nearly the same investment as would be required to implement and monitor/evaluate a behavior change effort focused on increasing the number of trail users who take bagged waste with them when they leave the trailhead. Locating these containers in areas where bagged waste is commonly left (see information gathering recommendations below) will have the largest possible impact on the number of bags left on trails.

Addressing the issue of making the desired behavior more visible will be a critical component of success in this behavior change effort, as right now, the undesired behavior (leaving bagged dog waste along the trail) is very visible, likely reinforcing social norms that proper disposal is not the most common or expected behavior. In the early stages of resetting the normative beliefs of trail users, it may even be useful to have periodic clean-up of bagged dog waste that is left on the trail, just to reduce its prevalence on the trail and visibility to trail users. If this strategy is implemented, scheduling waste clean-up during time periods when trails are least used would help to avoid users assuming that trail clean-up will occur regularly.



*Information gathering recommendations*

Several key pieces of information would ensure that the implementation of the strategies described above is as effective as possible. This information could be collected in a variety of ways, and at multiple points throughout the process of developing and implementing a behavior change program.

The first piece of information that would be useful is understanding where the issue of left dog waste is the biggest problem. This information could be gathered by a monitoring effort across a number of recreational trails, with the goal of counting bagged and unbagged waste, as well as the locations where waste is most commonly left. Monitoring should occur across the geography where the behavior change effort will be rolled out and cross different types of trails (paved, unpaved, beach access, etc.) and intensity of use (high, medium, low use). To execute this monitoring, staff or volunteers should walk the trail, counting the types of waste observed within segments of the trail. Segments in the range of 100-500 m will allow the greatest specificity in the application of the findings to behavior change programs and provisioning of trash containers. This monitoring effort does not need to be repeated regularly, as it is simply a way to assess the current state of this issue across the basin. Information collected in this monitoring effort can be used to select pilot sites, add additional trash containers, locate signs or other prompts, and focus implementation of behavior change efforts. This information could also serve as pre-treatment or baseline data to compare with period monitoring once full program implementation is underway.

A second piece of information that would be useful is further research on why dog owners bag dog waste, but do not deposit it into a trash container. This research could involve an in-person survey, focusing especially on trail users that are observed leaving bagged dog waste. It will be important to ensure participants know that they will not face consequences for participating in the survey, especially if they have been observed leaving waste. This effort should focus on identifying barriers and benefits to executing the final step in the behavior chain – depositing bagged waste in a trash container. Once this information is in hand, it can be used to refine strategy implementation.

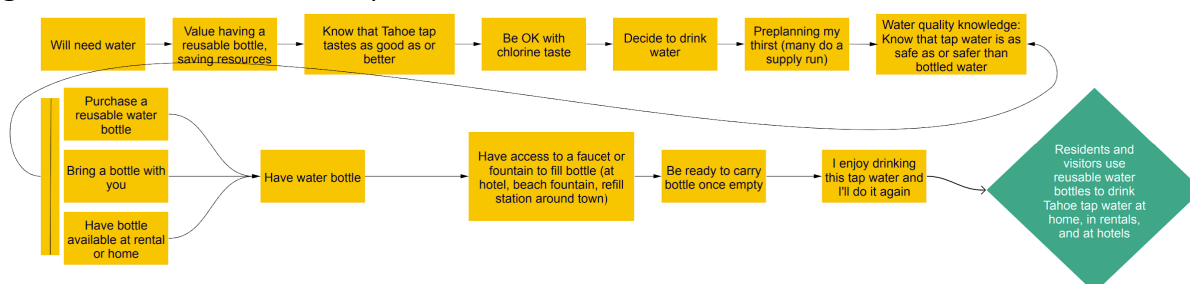
The third piece of information that would be helpful to ensuring the behavior change program is as efficient as possible is adding an effort to understand who is seeing and being affected by the pilot program. The goal of this effort would be to understand the reach of the strategies, as well as more detailed information about if and how they impacted trail users. This could take the form of observations, a brief intercept survey, or focus groups. This rich information will help to refine strategies before full implementation across a variety of locations.

## Focal Behavior 2: Residents and visitors use reusable water bottles to drink Tahoe tap water at home, in rentals, and at hotels

### Behavior Chain

The second focal behavior involved encouraging the use of reusable, refillable water bottles to drink tap water, rather than single-use plastic bottles to drink bottled water. The initial focus was on visitors and residents, across a variety of locations, but the group working on this behavior refined their approach to focus on reducing the availability of single-use plastic bottles of water in hotels, specifically. To achieve the goal of reducing the use of single-use plastic bottles, people will need to recognize their need for water, have positive beliefs about Tahoe tap water, have a reusable bottle to hold tap water, be able to find a place to easily fill their bottle and be willing to repeat the behavior.

**Figure 4.** Behavior chain for tap water behavior.



### Barriers and Benefits

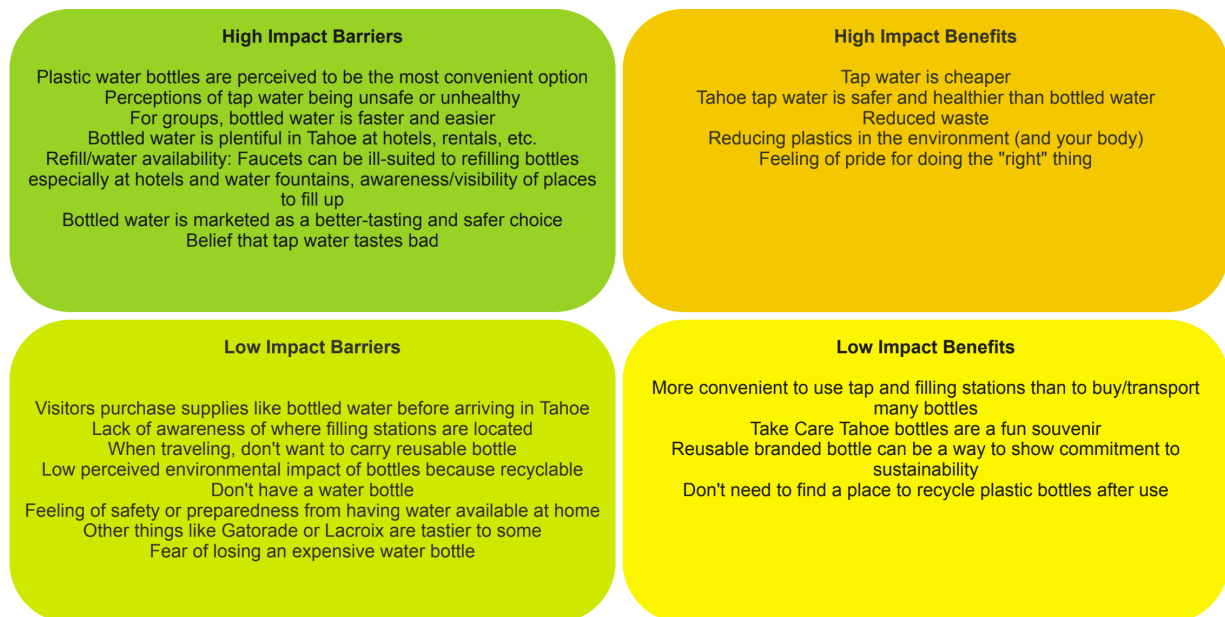
From this understanding of the precursors to the focal behavior, workshop participants identified a number of barriers and benefits to reducing the use of single-use plastic water bottles. The most common barriers to drinking tap water (and, therefore, barriers to avoiding the use of single-use plastic water bottles) fall into 3 categories: 1) convenience, 2) safety, and 3) taste/smell. These barriers were identified by workshop participants and have also been backed up by published literature on the topic. People tend to drink bottled water when they perceived that tap water in a refillable bottle to be a less convenient or available option (Tahoe Environmental Research Center, 2020). This extends to finding access to a filling station to refill bottles and forgetting to bring refillable bottles, as well as the inconvenience of needing to carry a bottle. This issue is further exacerbated by the ubiquity of single-use plastic bottles of water, which are automatically provided at many hotels and by tour companies. In a survey of Tahoe residents and visitors (Tahoe Environmental Research Center, 2020), the widespread access and availability of single-use plastic bottles of water was a very important predictor of their use.

A second set of barriers is that tap water may not be perceived to be as safe or healthy as bottled water, particularly in the face of national news about lead contamination and lack of trust in municipal water suppliers (Doria 2006, Hu et al. 2011). While this perception is unlikely to be a strong motivator among Tahoe area residents (Tahoe Environmental Research Center, 2020), it could be important in determining the actions of visitors to the basin.

The third set of barriers to reducing use of single-use plastic bottled water are perceptions that tap water may have an unpleasant taste or smell in comparison to bottled water, which is perceived to have a more neutral taste and smell (VanDerLinden 2015, Gungor-Demerici et al. 2016). These perceptions are further reinforced by sales and marketing efforts by water bottlers. Interestingly, Tahoe tap water has been shown to be safer, healthier, and better tasting than bottled water, even winning awards for its taste.

Drinking Tahoe tap water has a number of important benefits identified by workshop participants. First, there is a significant cost savings in not purchasing bottles of water for regular consumption. Second, avoiding the use of single-use plastic bottles reduces waste and the amount of plastic entering the environment. This reduction in waste can also contribute to a feeling of making a sustainable decision with positive impacts for the community. This last benefit, while a widely studied topic in the published literature, does not appear to have a strong impact on decisions about whether or not to drink bottled water (Saylor et al. 2011). In fact, researchers have found widespread beliefs that recycling offsets the environmental impact of single-use plastic water bottles, thus minimizing the impact of this benefit in motivating avoidance of them.

**Figure 5.** Barriers and benefits identified for tap water behavior.



### Strategies

Workshop participants chose to focus strategy development on the barrier of single-use plastic bottles as being more convenient and available than reusable water bottles. They identified an opportunity to have a large impact on single-use water bottle availability and use by working with hotels and other lodging providers to eliminate the automatic provisioning of single-use bottles of water in rooms. They chose to link their strategies to emphasizing the environmental

benefit of reducing single-use plastics. The strategies they chose to implement to address this barrier and benefit are structural changes/convenience, social diffusion, and commitments.

The structural/convenience changes workshop participants involved changing the default choice of having single-use plastic bottles of water available in hotel rooms automatically. By convincing hotels to stop providing single-use plastic bottles of water in every hotel room automatically, the overall impact on the number of these bottles used in the basin could be large. Further, this strategy involves working with a relatively small number of hotels to achieve this large impact, which is more efficient than convincing a large number of individual people to avoid using single-use plastic bottles. The goal of this structural change effort will be to convince hotels to not provide any bottled water, and instead to encourage customers to drink Tahoe tap water. Providing reusable “Drink Tahoe Tap” water bottles provides an extra opportunity to remind customers to avoid single-use plastic bottles, and a way to reinforce social norms if these bottles are widely used in the community. However, reusable bottles come at quite an expense to the hotels, and could become their own source of increased waste if not used properly. Therefore, offering them on an as-needed or for purchase basis may be a compromise option. Further, if hotels feel the need to continue to provide some sort of bottled water to customers, encouraging a switch to boxed or aluminum bottled water may be an alternative, though less desirable, option.

These efforts to reduce the automatic provisioning of single-use bottles of water will initially be focused on a small number of luxury hotels in the basin that have already made public commitments to the sustainability of their hotels. Recruiting these “early adopters” to make changes to their bottled water policies will likely be met with relatively limited resistance, as this action aligns with public commitments to sustainability. However, if there is resistance, providing the hotels with opportunities to be vocal about their changes and the outcomes of those changes (such as press releases and events that offer free publicity to the hotels) could serve as added incentive and the opportunity to influence other hotels through social diffusion.

Finally, the influence of early adopters can be increased if it is paired with commitments. Convincing later adopters to sign commitments to reduce single-use plastics in their hotels could be an avenue toward easing the decision to stop automatically providing bottled water to guests. These commitments would be most effective if they were public, such as the names of participating hotels being published on a Drink Tahoe Tap web page or through signage displayed in hotel lobbies. These commitments reinforce expectations among customers and can serve to motivate actions that require more energy or investment to execute.

### Piloting and Evaluation

Piloting for this set of strategies will focus on a single luxury hotel with an existing commitment to sustainability. A likely option is the [Edgewood Tahoe Resort](#) given its existing commitments and actions to reduce the environmental footprint of its operations. Prior to executing any efforts to change policies about single-use plastic bottles of water, the following information will be collected from the hotel: the number of bottles of water purchased each year, the cost of these bottles of water, the number of water bottle refilling stations on site, the number of visitors to the hotel, and the volume/weight of plastic waste that is produced by the hotel. All of

these data should be summarized seasonally, to separate peak travel times from shoulder seasons. Ideally, the pilot would also include a similarly sized, near-by hotel where the same information would be collected and rates of change could be compared. Once the change is in place and single-use plastic water bottles are no longer provided to guests automatically, the same data should be collected and compared to pre-pilot data. In addition, brief interviews with hotel sustainability and purchasing staff focused on understanding any issues that arose should be a part of the pilot.

Long-term evaluation of these efforts will expand out beyond a single hotel, and assess the impacts of using early adopting hotels to facilitate social diffusion of the action. Evaluation data should include the number of hotels automatically providing single-use plastic water bottles over time, as well as the number of public bottle refilling stations available. If possible, collecting information about the use of these refilling stations (the number of refills during a month or year) would be useful to calculate the offset created by their installation and use.

## Recommendations

### *Strategy recommendations*

The choice of reducing the number of hotels automatically providing single-use plastic bottles to their guests is a very impactful action to reduce plastic water bottle use in the basin. Focusing on this single source of behavior could have outsides impact on the number of single-use bottles distributed and also on the existence and support for social norms supporting the use of reusable bottles. The challenge in this approach will be to move beyond a group of early adopters who likely already believe in social norms about reducing the use of single-use bottles, and convincing more hesitant hotel staff to take this action. One strategy that could help in addressing this issue is to leverage early adopting hotels to provide social proof to less willing hotels of the benefits of making these changes. Benefits could be quantified as cost savings in not purchasing single-use bottles of water, customer reactions and support for the action, and publicity resulting from the decisions. Recruiting staff from the early adopter group to speak with others in the hospitality industry in the basin could help provide social proof, especially if it is done in the context of industry-wide events, association meetings, or other public events. Leveraging influential leaders to become spokespeople can be one of the most influential forms of behavior change there is, so any effort to allow others to carry the message forward is likely to yield positive results. If there are particular hotels that Take Care would like to target, asking early adopter hotel staff to be part of initial conversations could be very effective, as long as they are willing to be vocal about their support for the actions.

### *Information gathering recommendations*

In my background research on barriers and benefits for the use of reusable water bottles, there was little literature that addressed the barriers and benefits to the type of structural change suggested by workshop participants. For this reason, it would be useful to consider brief interviews with hotel sustainability and purchasing staff across a range of hotel types and, potentially, other hospitality-related industries, to better understand the barriers and benefits to a switch to avoiding single-use plastic bottles. This information will help ensure that any

efforts to recruit early adopting or later adopting hotels is responsive to their unique views of the decision.

If hotels are difficult to convince to participate in this effort, information about social norms could also be used to increase their willingness to change. This information could take two forms: information about what other hotels are doing and information about what their customers expect them to do. To collect information about what other hotels are doing, Take Care members could inventory the number of hotels giving (and not giving) single-use plastic bottles automatically, the number of refilling stations available at and around hotels, and the number of hotels in the basin that have made sustainability pledges including a focus on reducing single-use plastic bottles. This information could be collected through observations at hotels across the basin, some available data sources from hospitality industry associations, or a brief online survey. Once this information is collected, summarizing and framing it in such a way that demonstrates how common and accepted the behavior is (eliminating single-use plastic water bottles) could help hotel staff justify the decision to take the same action at their hotels.

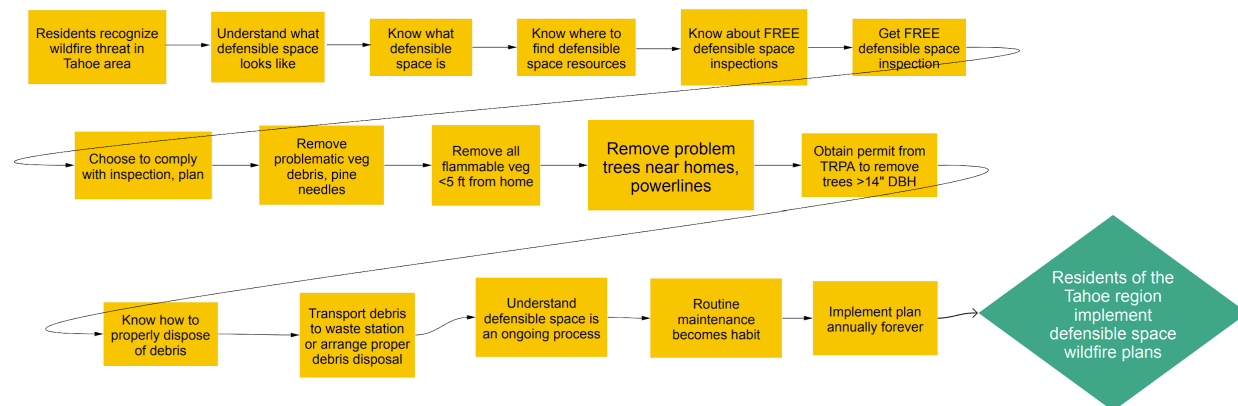
A second type of information about social norms that would be useful to increase hotel participation is information about the expectations of hotel customers. This could take the form of a brief survey to visitors to the basin, with a focus on quantifying how many visitors expect hotels to limit the use of single-use bottles of water, how many approve of that decision, and the importance of limiting single-use plastic bottles to the visitors. Again, summarizing and framing these results to support their impact of describing and reinforcing social norms will be very important in maximizing their impact on hotel staff actions.

### **Focal Behavior 3:** Residents of the Tahoe region implement defensible space wildfire preparedness plans.

#### Behavior Chain

Our third focal behavior involves motivating Tahoe basin residents to take action to increase defensible space around their homes to reduce the risk of damage in the event of a wildfire. The steps to achieving this behavior begin with residents and homeowners recognizing the issues associated with wildfire and having the knowledge that increasing defensible space around their home could be a strategy to reduce their risk. Once homeowners and residents have decided that changes to the space around their homes is an option they would like to explore, there are several resources available in the Tahoe basin to provide free assistance in making a plan. When residents have a plan, they must decide to take action and then act. Taking action requires several steps including potentially needing a permit and disposing of plant debris. Finally, residents and homeowners must continue to take these actions over time by taking annual action to assess and remove problematic plant materials.

**Figure 6.** Behavior chain for wildfire behavior.



### Barriers and Benefits

Workshop participants identified a range of barriers and benefits to Tahoe area residents taking action to increase defensible space. High impact barriers included lack of time, ability, or tools to accomplish the work, limitations on the actions that renters can take, lack of awareness of conditions and the role of defensible space in reducing risk to homes, and the cost of taking actions. High impact benefits identified related to reduced risk of the impacts of wildfire on the home and their community, aesthetic improvements resulting from removal of vegetation and brush, cost savings on insurance, and a sense of community resulting from actions that benefits individuals and the community.

These barriers and benefits are backed up by empirical research on the motivations of homeowners to take action to increase defensible space around their homes. Empirical research in Nevada communities found that the most important drivers of actions to increase defensible space included the owner's perceived risk of wildfire and tolerance for that risk, as well as the cost of the investments (Sisante et al. 2019). There is also significant support for the fact that perceptions of wildfire risk and actions to mitigate it on neighboring lands impact homeowners' decisions about action on their own property (McCaffery 2015). Colorado residents who lived closer to federally managed lands perceived to have high risk of fire and low preparedness actions were more likely to take action on their own property to minimize risk (McCaffery 2015), while residents who perceived their neighbors as having taken significant action were more likely to take action themselves (Stidham et al. 2014). Further, programs that help defray the costs of preparedness action have been shown to increase action among residents of the wildland-urban interface (Harris et al. 2011). Interestingly, McCaffery et al. (2011) found that homeowners felt that preparedness actions were an individual responsibility, and did not expect agencies or others to take action from them, but rather sought assistance in the form of information or financial support from these groups.

**Figure 7.** Barriers and benefits for wildfire behavior.





### Strategies

Workshop participants chose to focus strategy development on addressing the barriers of residents being unaware of the actions their neighbors and community members were taking, as well as not knowing where to get reliable information about wildfire preparedness actions. To address this barrier, the group chose to use social norms and social diffusion strategies to increase the visibility of actions taken within neighborhoods and communities. The group proposed to organize a "Lake Tahoe Defensible Space Day," which could be held on multiple occasions in neighborhoods around the Lake Tahoe area. At these events, residents would be invited to sign a pledge to increase defensible space around their home. In addition, residents who had already increased defensible space, would be given a lawn sign to display indicating that they had already taken action. Finally, speakers at the event would provide information about how to take action and resources to support action (such as community funding opportunities, etc.). In total, these elements could increase awareness of how to act and create the normative belief that wildfire preparation is a common action in the neighborhoods and communities where the program was rolled out. Branding these materials and linking their design to existing "Take Care" materials would further link wildfire preparedness actions to other actions advocated for by the Take Care campaign. This could help recruit new audiences to pay attention to the materials, because of their existing familiarity with and connection to other Take Care campaigns.

### Piloting and Evaluation

Workshop participants identified several opportunities to leverage existing data and outreach efforts to both pilot and evaluate the outcomes of these efforts. They suggested choosing a small number (1-2) neighborhoods in communities around the basin within which to execute their pilot. In each community they would select 3 sets of 1-3 blocks for the pilot areas. In each neighborhood a Defensible Space Day event would be held. In one neighborhood, the event

would consist only of information provisioning activities (e.g. speakers on how to take action, etc.), serving as the control neighborhood. In the second neighborhood, information provisioning would occur, plus recruiting residents to sign a pledge. The third community event would include information provisioning, pledge signing, as well as the distribution of yard signs. This 3-way design to the pilot would allow program managers to assess the cumulative impact of each component of the strategy, and decide which provided the greatest return on investment. The impact of the program would be monitored using existing data from several community organizations who already have programs to monitor defensible space across communities in the basin.

Long term evaluation of the outcomes of these programs can be accomplished using existing data. There are several organizations in the area that measure defensible space around residences, including CAL-fire, Tahoe Fire & Fuels Team, and the Fire Adapted Communities Program. In addition, LIDAR and GIS data can be obtained from national sources to measure changes in vegetation near homes. The availability of these free, easy-to-access, long term data sources is a unique resource for monitoring long term changes in defensible space in the Tahoe Basin.

## Recommendations

### *Strategy Recommendations*

A lack of visibility of defensible space actions is a key barrier to creating and reinforcing norms that support this behavior. However, a more critical barrier preventing homeowners from taking these actions may be the real and perceived costs of cutting trees and vegetation to increase defensible space. The perceived cost of these actions might stop someone from even considering action, and could be a strong enough barrier that no normative messaging (commitments and/or lawn signs) could overcome it. A number of local resources to assist with the planning and execution of these actions exist (e.g. help in making a defensible space plan, partial funding for actions, etc.), although awareness of these programs appears to be relatively low. Sharing information about existing programs alongside normative messages may increase the impact of the programs proposed here. In addition, allocating funding specifically toward defraying costs for residents may be the most important investment groups could make in increasing these behaviors. Further, recruiting resident who access the funding to speak to their neighbors and friends about the programs and benefits for them could be an effective way to increase participation by leveraging social diffusion.

### *Information Gathering Recommendations*

In my background research on wildfire preparedness, I found a wealth of literature exploring a range of preparedness action, but only a few studies that focused specifically on decisions about defensible space and on actions of individual homeowners. In addition, I found almost no research on the barriers and benefits to action among renters or part-year residents. Additional barrier and benefit research focused specifically on the focal actions of interest and the components of the audiences that are likely to face the greatest barriers to action would help tailor programming to the specific needs of the community. Since the Tahoe Basin has a larger

proportion of part-year residents and rental properties, understanding these audiences would be critical to achieving wide-spread change in defensible space-related actions.

In addition to measuring outcomes of commitments and lawn signs in the pilot phase of work, program managers could also consider adding in some qualitative or quantitative effort to understand the impacts of the strategies on residents. This could be as simple as a follow up interview with a small number of people who attended the event. It would be most helpful to include both residents who took action to increase defensible space on their property as well as those who did not. This information could help refine the content of the commitment and lawn signs, as well as suggest additional barriers and benefits that maybe impeding action. Revising the implementation of the strategies (or adding new strategies) could be informed by this information.

## Literature Cited

- Doria, M. 2006. Bottled Water Versus Tap Water: Understanding Consumers' Preferences. *Journal of Water and Health*, 4, 271-276.
- Güngör-Demirci, G., Lee, J., Mirzaei, M. & Younos, T. 2016. How do people make a decision on bottled or tap water? Preference elicitation with nonparametric bootstrap simulations. *Water and Environment Journal*, 30: 243-252.
- Harris, L. M., McGee, T. K., & McFarlane, B. L. 2011. Implementation of wildfire risk management by local governments in Alberta, Canada. *Journal of Environmental Planning and Management*, 54(4), 457-475.
- Hu Z., Morton L.W., & Mahler R.L. 2011. Bottled water: United States consumers and their perceptions of water quality. *International Journal of Environmental Research on Public Health*. 2011;8(2):565-578.
- Lowe, C. N., Williams, K. S., Jenkinson, S., & Toogood, M. 2014. Environmental and social impacts of domestic dog waste in the UK: Investigating barriers to behavioural change in dog walkers. *International Journal of Environment and Waste Management*, 13(4), 331-347.
- McCaffrey, S. 2015. Community wildfire preparedness: A global state-of-the-knowledge summary of social science research. *Current Forestry Reports*, 1(2), 81-90.
- McCaffrey, S. M., Stidham, M., Toman, E., & Shindler, B. 2011. Outreach programs, peer pressure, and common sense: what motivates homeowners to mitigate wildfire risk?. *Environmental Management*, 48(3), 475-488.
- McKenzie-Mohr, D. 2011. *Fostering sustainable behavior: An introduction to community-based social marketing*. Gabriola Island, B.C: New Society Publishers.
- Romo, A., Taff, B., Lawhon, B., VanderWoude, D., Newman, P., Graefe, A., & Schwartz, F. 2019. Dog Owners' Perceptions and Behaviors Related to the Disposal of Pet Waste in City of Boulder Open Space and Mountain Parks. *Journal of Park and Recreation Administration*, 37(2).
- Saylor, A., Prokopy, L. S., & Amberg, S. 2011. What's wrong with the tap? Examining perceptions of tap water and bottled water at Purdue University. *Environmental management*, 48(3), 588–601.
- Sisante A. M., Taylor M. H., Rollins K. S. 2019. Understanding homeowners' decisions to mitigate wildfire risk and create defensible space. *International Journal of Wildland Fire* 28, 901-911.

- Stidham, M., McCaffrey, S., Toman, E., & Shindler, B. 2014. Policy tools to encourage community-level defensible space in the United States: A tale of six communities. *Journal of Rural Studies*, 35, 59-69.
- van der Linden, S. 2015. Exploring Beliefs About Bottled Water and Intentions to Reduce Consumption: The Dual-Effect of Social Norm Activation and Persuasive Information. *Environment and Behavior*, 47(5), 526–550.
- Webley, P. & Siviter, C. 2000. Why Do Some Owners Allow Their Dogs to Foul the Pavement? The Social Psychology of a Minor Rule Infraction. *Journal of Applied Social Psychology*, 30: 1371-1380.

**Appendix A.** Summary of CBSM strategies.

Strategy	When to use	Most effective when....
<b>Commitments</b> – Statements of intent to take action, made to another person	<ul style="list-style-type: none"> <li>- Individuals are motivated to act, but have not yet begun to take action</li> <li>- Can be effective even when barriers are high</li> </ul>	<ul style="list-style-type: none"> <li>- Voluntary</li> <li>- Written</li> <li>- Durable</li> <li>- Public and visible</li> </ul>
<b>Social Diffusion</b> – The way behaviors spread through groups because of social connections and trust	<ul style="list-style-type: none"> <li>- Behaviors are visible</li> <li>- Messengers share an identity (or desired identity) with receivers</li> <li>- Trust in behavior or authorities is low</li> </ul>	<ul style="list-style-type: none"> <li>- Messenger shares multiple identities with receivers</li> <li>- Message is received across multiple, diverse contexts (e.g., school, church, clubs)</li> <li>- Focused on efficacy beliefs (e.g., You can do this, your actions make a difference)</li> <li>- Leverage existing networks and connections between people</li> </ul>
<b>Goal Setting</b> – Formal declaration of number of desired times/frequency of taking action	<ul style="list-style-type: none"> <li>- Individuals have already said they want to take action</li> </ul>	<ul style="list-style-type: none"> <li>- goal setting is accompanied by plan for how to achieve it</li> <li>- Set specific time, place, date for first action</li> </ul>
<b>Social Norms</b> – Beliefs about the common, expected, and acceptable behaviors in a specific context	<ul style="list-style-type: none"> <li>- When uncertainty about how to act is high (e.g., action or situation are novel)</li> <li>- When people aren't already motivated to act</li> </ul>	<ul style="list-style-type: none"> <li>- MUST highlight the desired behavior</li> <li>- Can highlight behavior or approval of behavior</li> <li>- Testimonials from people who take the action are part of the message</li> <li>- Referent group is a group the receiver is/wants to be part of (i.e., closely identifies with)</li> </ul>
<b>Prompts</b> – Memory aids that help to overcome forgetting to do behavior	<ul style="list-style-type: none"> <li>- Forgetting is the major barrier</li> <li>- Habitual/repetitive behaviors</li> </ul>	<ul style="list-style-type: none"> <li>- Presented close in time and space to the behavior</li> <li>- Noticeable, self-explanatory, direct messages</li> <li>- Encourage desired, rather than discourage undesired, behaviors</li> </ul>
<b>Incentives</b> – Financial, status, or other rewards for taking action	<ul style="list-style-type: none"> <li>- When cost is a barrier to action</li> <li>- Inverse incentives can increase the cost of undesirable behavior (e.g., taxes, surcharges)</li> <li>- Single, discrete behavior is the focus</li> </ul>	<ul style="list-style-type: none"> <li>- Provide incentive after the action has occurred</li> <li>- Amount of incentive is scaled to the effort required to accomplish the task</li> <li>- Continuously awarded (can have boomerang effects when removed)</li> </ul>



<p><b>Feedback</b> – Information about the outcomes of actions or progress toward goal</p>	<ul style="list-style-type: none"> <li>- Motivation to achieve the goal is high and pre-existing</li> </ul>	<ul style="list-style-type: none"> <li>- Combined with other strategies</li> <li>- Provided in reference to other’s behavior (e.g., your power use in comparison to your 10 closest neighbors)</li> </ul>
<p><b>Convenience (Choice Engineering)</b> – Changing the physical environment or options available to make the desired behavior the default or easier to accomplish</p>	<ul style="list-style-type: none"> <li>- The desired behavior requires more effort than the undesired behavior or inaction</li> </ul>	<ul style="list-style-type: none"> <li>- Increases benefits</li> </ul>