



TRUCKEE MEADOWS WATER AUTHORITY
Board of Directors

AGENDA

Wednesday, June 19, 2019 at 10:00 a.m.
Sparks Council Chambers, 745 4th Street, Sparks, NV

Board Members

Chair Vaughn Hartung
Member Neoma Jardon
Member Jenny Brekhus
Member Paul Anderson

Vice Chair Kristopher Dahir
Member Jeanne Herman
Member Naomi Duerr

NOTES:

1. The announcement of this meeting has been posted at the following locations: Truckee Meadows Water Authority (1355 Capital Blvd., Reno), Reno City Hall (1 E. First St., Reno), Sparks City Hall (431 Prater Way, Sparks), Sparks Justice Court (1675 E. Prater Way, Sparks), Washoe County Courthouse (75 Court St., Reno), Washoe County Central Library (301 South Center St., Reno), Washoe County Administration (1001 East Ninth St., Reno), at <http://www.tmwa.com>, and State of Nevada Public Notice Website, <https://notice.nv.gov/>.
2. In accordance with NRS 241.020, this agenda closes three working days prior to the meeting. We are pleased to make reasonable accommodations for persons who are disabled and wish to attend meetings. If you require special arrangements for the meeting, please call (775) 834-8002 at least 24 hours before the meeting date.
3. Staff reports and supporting material for the meeting are available at TMWA and on the TMWA website at <http://www.tmwa.com/meeting/> or you can contact Sonia Folsom at (775) 834-8002. Supporting material is made available to the general public in accordance with NRS 241.020(6).
4. The Board may elect to combine agenda items, consider agenda items out of order, remove agenda items, or delay discussion on agenda items. Arrive at the meeting at the posted time to hear item(s) of interest.
5. Asterisks (*) denote non-action items.
6. Public comment is limited to three minutes and is allowed during the public comment periods. The public may sign-up to speak during the public comment period or on a specific agenda item by completing a "Request to Speak" card and submitting it to the clerk. In addition to the public comment periods, the Chairman has the discretion to allow public comment on any agenda item, including any item on which action is to be taken.
7. In the event the Chairman and Vice-Chairman are absent, the remaining Board members may elect a temporary presiding officer to preside over the meeting until the Chairman or Vice-Chairman are present (**Standing Item of Possible Action**).
8. Notice of possible quorum of Western Regional Water Commission: Because several members of the Truckee Meadows Water Authority Board of Directors are also Trustees of the Western Regional Water Commission, it is possible that a quorum of the Western Regional Water Commission may be present, however, such members will not deliberate or take action at this meeting in their capacity as Trustees of the Western Regional Water Commission.

1. Roll call*
2. Pledge of allegiance*
3. Public comment — limited to no more than three minutes per speaker*
4. Approval of the agenda (**For Possible Action**)

¹The Board may adjourn from the public meeting at any time during the agenda to receive information and conduct labor-oriented discussions in accordance with NRS 288.220 or receive information from legal counsel regarding potential or existing litigation and to deliberate toward a decision on such matters related to litigation or potential litigation.

5. Approval of the minutes of the May 23, 2019 meeting of the TMWA Board of Directors **(For Possible Action)**
 6. Presentation of results of 2019 legislative activities and bills — John Zimmerman and Steve Walker, Walker & Associates **(For Possible Action)**
 7. Presentation by Precision Water Resources Engineering on their climate change scenario results to be included in the 2020-2040 Water Resource Plan — Bill Hauck and Shane Coors, Precision Water Resources Engineering*
 8. Discussion and possible authorization to General Manager to enter into Agreement with the State of Nevada, Washoe County, and the Cities of Reno, Sparks, and Fernley to fund Nevada's share of the Federal Water Master's annual Truckee River Operating Agreement expenses for 2020, 2021, and 2022 — Bill Hauck **(For Possible Action)**
 9. Discussion and possible action, and direction to staff regarding the adoption of TMWA's 2035 Water Facility Plan — Scott Estes **(For Possible Action)**
 10. PUBLIC HEARING ON RATE AMENDMENT (*continued from May meeting*)
 - A. Introduction and first reading of amendments to TMWA Rate Schedule BSF - Business Services Fees and Rate Schedule WSF - Water System Facility Charges revising area fee, supply and treatment, and storage unit costs — Scott Estes **(For Possible Action)**
 - B. Public comment — limited to limited to no more than three minutes per speaker*
- CLOSE PUBLIC HEARING
11. Update regarding status of Farad property and discussion and possible direction to staff — John Zimmerman and Pat Nielson **(For Possible Action)**
 12. Discussion and possible adoption of Resolution No. 275, determining that it is in the best interest of TMWA to sell the Farad property as surplus property and authorizing staff to initiate the sale process and solicit bids for the purchase of the Farad property for future Board consideration — John Zimmerman and Pat Nielson **(For Possible Action)**
 13. Discussion and action on nomination and election of Chairman and Vice Chairman and request for Board adoption of Resolution No. 276 appointing a Chairman and Vice Chairman for Fiscal Year 2020 — Mark Foree **(For Possible Action)**
 14. General Manager's Report*
 15. Public comment — limited to no more than three minutes per speaker*
 16. Board comments and requests for future agenda items*
 17. Adjournment **(For Possible Action)**

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TRUCKEE MEADOWS WATER AUTHORITY
MINUTES OF THE MAY 23, 2019
DRAFT MEETING OF THE BOARD OF DIRECTORS

The Board of Directors met on Thursday, May 23, 2019, at Sparks Council Chambers., 745 4th Street, Sparks, Nevada. Chair Hartung called the meeting to order at 10:14 a.m.

1. ROLL CALL

Members Present: Paul Anderson, Kristopher Dahir, Naomi Duerr, Vaughn Hartung, Jeanne Herman and Alternate Devon Reese.

Members Absent: Jenny Brekhus and Neoma Jardon

A quorum was present.

2. PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Ron Smith, City of Sparks Mayor.

3. PUBLIC COMMENT

Chair Hartung welcomed the visiting Dr. Janusz Karwot, President of the Board, Rybnik (Poland) Water and Sewage Company, who is working with the University of Nevada on collaboration related to water technology.

4. RECOGNITION OF TMWA VICE CHAIR RON SMITH FOR HIS YEARS OF SERVICE

Chair Hartung recognized Ron Smith for serving on the TMWA Board of Directors, his commitment to TMWA's mission and wished him all the best.

Mark Foree, TMWA General Manager, stated Mr. Smith has been the only board member he personally recruited and appreciated his dedication and integrity on serving; it has been a pleasure.

The Board of Directors expressed their appreciation of his service, his great work and wished him all the best on his recovery.

Mr. Smith thanked the Board and appreciated the opportunity to serve.

5. APPROVAL OF THE AGENDA

Upon motion by Member Dahir, second by Alternate Member Reese, which motion duly carried by unanimous consent of the members present, the Board approved the agenda.

6. APPROVAL OF THE MINUTES OF THE APRIL 17, 2019 MEETING

Upon motion by Member Anderson, second by Member Herman, which motion duly carried by unanimous consent of the members present, the Board approved the April 17, 2019 minutes.

7. DISCUSSION AND POSSIBLE ACTION, AND DIRECTION TO STAFF REGARDING 2019 LEGISLATIVE ACTIVITIES, CURRENT BILLS, AND TMWA RECOMMENDED POSITIONS ON LEGISLATIVE PROPOSALS

Steve Walker, TMWA Lobbyist, updated the Board on the status of water bills and bills the Board has taken a position of either support or oppose. Mr. Walker noted the bills that failed to meet the deadline and those bills that are exempt. He provided an overview of the following bills: AB30 (3M bill) has gone through several amendments and will go to interim session; AB62 (extend time to complete construction of projects to divert water) is on the Secretary's desk with another amendment; AB132 (bill which does not deny employment to a new employee if they test positive for marijuana between 2 to 5 nanograms of THC), TMWA opposed this bill, but it has passed both houses; SB207 (requiring apprentices for vertical construction), as of this meeting, unsure of its status; SB236 (allows for replacing a well within 300 feet crossing parcels, and own both parcels, without doing a point of diversion), TMWA supported this bill and passed out of the Assembly; SB245 (increases the award in tort actions from \$100k to \$250k and adds a new class for gross negligence with a liability maximum of \$1M), the Assembly has taken no action; SB334 (prohibits certain governmental entities from contracting with broadband Internet access service providers) and SB340 (requires prevailing wages be paid to delivery personnel), TMWA opposes these bills, bills are exempt, but no hearing has been scheduled.

Michael Pagni, TMWA General Counsel, stated SB250 (water rights tied to parcel map or permit, amendment accepted by the state engineer and bill sponsor), it has been approved out of Senate and it is now in the Assembly, staff continue to work on amendments; SB358 (revision to definition of what qualifies as a renewable energy system), amendments were passed and TMWA's hydro facilities are no longer excluded from the bill.

John Zimmerman, TMWA Water Resources Manager, informed the Board staff would bring back a final update in June after the legislative session ended.

No action taken.

8. PUBLIC HEARING ON RATE AMENDMENT

A. INTRODUCTION AND FIRST READING OF AMENDMENTS TO TMWA RATE SCHEDULE WSF - WATER SYSTEM FACILITY CHARGES REVISING AREA FEE, SUPPLY AND TREATMENT, AND STORAGE UNIT COSTS AND TO TMWA RATE SCHEDULE BSF - BUSINESS SERVICES FEES

Scott Estes, TMWA Director of Engineering, acknowledged staff who contributed their time and expertise in developing the 2035 Water Facility Plan, which was essential in updating the WSF and BSF rate schedules: Keith Ristinen, Dave Kershaw, and Holly Flores, Principal Engineers, and Brooke Long, Senior Planning Engineer.

Mr. Estes presented the changes and updates to the WSF and BSF rate schedules. Pursuant to prior Board direction, growth pays for growth and the amendments to TMWA's WSF and BSF rate schedules apply only to developers applying for new or expanded water service, and do not affect customer rates. Mr. Estes explained the proposed rate increases to the WSF and BSF rate schedules in detail, and explained that while the rates increased in many categories there was also a decrease of the denominator (demand of growth) in many categories such that the actual overall increase was not as significant as it may first appear. In one of the examples given, the increase will be \$348 per single-family residence for new residential development. He further explained the reason for the time it took to update the fees was due to the economic downturn and acquiring the Washoe County systems just as the economy picked up again, which took extra staff time to conduct their analysis of the systems. Mr. Estes also pointed out that not all area fees are increasing. The Area 10 Fee is decreasing by a significant amount because the TMWA Supply-Treatment Fee is no longer applicable (the Vidler resource will be used). The Area 15 Fee will also decrease significantly due to using the new lower maximum day demand factor which coincidentally resulted in no change in the denominator (demand of growth).

At this point the Board discussed the potential effective date of the increase if it were adopted (July 1, 2019) after the second hearing in June and the possibility of staged implementation of the proposed fees over time or delaying the timing of implementation, and the impact on affordable housing (the delay in updating the fees has benefited the developers for the last six years). Staff noted that delaying implementation would lead to further increases in the future in order to equalize lost revenue in the interim. The Board requested staff to evaluate the impact of delay on developers and return with more information (specifically the overall cost impacts to all areas considering both the fee increases and the lower demand factors) for Board consideration at the next meeting.

B. PUBLIC COMMENT

Mark Herrmann, developer in Reno, stated the residents would not pay builders costs initially, but it would eventually pass onto homeowners.

CLOSE PUBLIC HEARING

Upon motion by Member Herman, second by Alternate Reese, which motion duly carried by unanimous consent of the members present, the Board approved to continue the first reading of the proposed amendments to the WSF and BSF fee schedules to the next meeting.

9. PRESENTATION OF FINANCIAL PERFORMANCE FOR THE QUARTER ENDED MARCH 31, 2019

Matt Bowman, TMWA Financial Controller, informed the Board that not much had changed in overall performance since the last update: change in net position was \$10.8m more than budget; operating revenue was \$1.3m higher than budget year-to-date, but lower in the third quarter due to lower water usage by customers and ongoing maintenance at the Fleish plant; operating expenses are \$3.0m under budget; nonoperating expenses are \$2.5m less than budget due to higher investment earnings; and capital contributions were \$4.0m more than budget, driven by higher water rights will-serve sales and developer contributions.

10. PUBLIC HEARING ON ADOPTION OF BUDGET

A. DISCUSSION AND ACTION ON REQUEST FOR ADOPTION OF RESOLUTION NO. 274: A RESOLUTION TO ADOPT THE FINAL BUDGET FOR THE FISCAL YEAR ENDING JUNE 30, 2020 AND THE 2020-2024 FIVE-YEAR CAPITAL IMPROVEMENT PLAN

Mr. Bowman presented the final budget for fiscal year ending June 30, 2020. The only change to the tentative budget presented at the March 20, 2019 Board meeting is a favorable increase in the change in net position of \$300,000 due to an increase in hydroelectric revenue estimates.

Joe Petrelli, TMWA Financial Analyst, presented the changes to the 2020-2024 Capital Improvement Plan, resulting in a net increase of \$2.23m in FY 2020 and total spending across five years increased \$300,000.

PUBLIC COMMENT

There was no public comment

Upon motion by Alternate Member Reese, second by Member Herman, which motion duly carried by unanimous consent of the members present, the Board adopted Resolution No. 274: A resolution to adopt the final budget for the Fiscal Year ending June 30, 2020 and the 2020-2024 Five-Year Capital Improvement Plan.

CLOSE PUBLIC HEARING

11. GENERAL MANAGER'S REPORT

Mark Foree informed the Board staff continues to work with the State of Nevada on usage of Marlette Lake water including a possible long term option and expect to complete the agreement within the next few weeks; TMWA had an extremely successful Smart About Water day with approximately 232 people in attendance at Idlewild Park on May 4. Thanks to all the staff who worked so hard to prepare for this great event.

12. PUBLIC COMMENT

There was no public comment.

13. BOARD COMMENTS AND REQUESTS FOR FUTURE AGENDA ITEMS

Member Duerr thanked staff for their analysis on the facility charges and developer fees, and to delay the second reading to August for an effective date in September would be a good consideration.

14. ADJOURNMENT

With no further discussion, Chair Hartung adjourned the meeting at 12:01 p.m.

Approved by the TMWA Board of Directors in session on _____.

Sonia Folsom, Recording Secretary



STAFF REPORT

TO: Chairman and Board Members
THRU: Mark Foree, General Manager
FROM: John Zimmerman, Manager of Water Resources
DATE: June 11, 2019
SUBJECT: **Presentation of results of 2019 legislative activities and bills**

The 2019 Legislative Session ended on June 3rd. Attached is a list of all bills TMWA either supported or opposed and their status. Staff, TMWA lobbyist Steve Walker, and General Counsel Michael Pagni will update the Board regarding the status of all water-related bills, other noteworthy legislation, and anticipated topics to be discussed during the 2019-2020 interim.

Bill	Sponsor	Status / Location	Last Meeting and Action	Tags	Board/Subcommittee Position
AB30	Committee on Natural Resources, Agriculture, and Mining	Revises provisions governing water. (BDR 48-214) Failed Deadline:5/24/201914.3.4	Senate Committee on Natural Resources 5/17/2019 Upon Call of Chair Without recommendation	Water Rights (WR-rights, resources, conservation)	OPPOSE
AB34	Committee on Government Affairs	Revises provisions governing the investment of money held by the State or certain political subdivisions of the State. (BDR 31-476) Secretary of State	Senate Committee on Government Affairs 5/10/2019 1:00 PM Do pass	Financial, Risk Management	SUPPORT
AB51	Committee on Natural Resources, Agriculture, and Mining	Revises provisions governing the management of water. (BDR 48-213) Failed Deadline:4/12/201914.3.1	Assembly Committee on Natural Resources, Agriculture, and Mining 2/27/2019 4:00 PM Heard	Water Rights (WR-rights, resources, conservation)	WATCH
AB62	Committee on Natural Resources, Agriculture, and Mining	Revises provisions related to water. (BDR 48-215) Secretary of State	Senate Committee on Natural Resources 5/16/2019 4:00 PM Amend, and do pass as amended	Water Rights (WR-rights, resources, conservation)	OPPOSE
AB84	Committee on Ways and Means	Provides for the issuance of state general obligation bonds to protect, preserve and obtain the benefits of the property and natural and cultural resources of the State of Nevada. (BDR S-326) Governor	Senate Committee on Finance 6/2/2019 10:00 AM Do pass	Property	SUPPORT
AB86	Committee on Government Affairs	Revises provisions relating to governmental purchasing. (BDR 27-182) Secretary of State	Senate Committee on Government Affairs 5/17/2019 1:00 PM Do pass	Financial, Risk Management	SUPPORT
AB95	Committee on Natural Resources, Agriculture, and Mining	Revises provisions relating to water. (BDR 48-504) Secretary of State	Senate Committee on Natural Resources 5/9/2019 4:00 PM Do pass	Water Rights (WR-rights, resources, conservation)	WATCH

Bill	Sponsor	Status / Location	Last Meeting and Action	Tags	Board/Subcommittee Position
AB101	Daly	Authorizes a private plaintiff to bring an action for a declaratory judgment regarding a violation of state law or a local ordinance by certain governmental entities. (BDR 3-26) Failed Deadline:4/12/201914.3.1	Assembly Committee on Judiciary 2/14/2019 8:00 AM Heard	Financial, Risk Management, Open Meeting, Records, Boards, Elections, Public Works	OPPOSE
AB132	Neal, McCurdy and Flores	Revises provisions governing employment practices. (BDR 53-29) Secretary of State	Senate Committee on Commerce and Labor 5/15/2019 1:30 PM Amend, and do pass as amended	Human Resources	OPPOSE
AB136	Frierson, Benitez-Thompson, Carlton, McCurdy, Daly, Assefa, Backus, Bilbray-Axelrod, Carrillo, Cohen, Duran, Flores, Fumo, Gorelow, Jauregui, Martinez, Miller, Monroe-Moreno, Munk, Neal, Nguyen, Peters, Spiegel, Swank, Thompson, Torres, Watts and Yeager	Makes various changes relating to public construction. (BDR 28-145) Secretary of State	Senate Committee on Government Affairs 5/15/2019 1:00 PM Do pass	Public Works	OPPOSE
AB138	Sprinkle, Carrillo, Flores, Monroe-Moreno, Frierson, Assefa, Backus, Benitez-Thompson, Bilbray-Axelrod, Cohen, Daly, Duran, Fumo, Gorelow, Martinez, Miller, Munk, Neal, Nguyen, Peters, Swank and	Revises provisions governing workers' compensation. (BDR 53-708) Failed Deadline:4/12/201914.3.1		Human Resources	OPPOSE
AB163	Assemblymen Watts, Cohen, Nguyen, Peters and Swank; Senators Brooks and Scheible	Revises provisions governing water conservation. (BDR 48-798) Secretary of State	Senate Committee on Natural Resources 5/9/2019 4:00 PM Amend, and do pass as amended	Water Rights (WR-rights, resources, conservation)	WATCH

Bill	Sponsor	Status / Location	Last Meeting and Action	Tags	Board/Subcommittee Position
AB220	Committee on Ways and Means	Requires the issuance of bonds for environmental improvement projects in the Lake Tahoe Basin. (BDR S-435) Secretary of State	Assembly Committee on Ways and Means 5/30/2019 8:00 AM 5/15 - Do Pass	Financial, Risk Management, Water Quality (NDEP), Water Rights (WR-rights, resources, conservation)	SUPPORT
AB233	Assemblymen Kramer, Hardy and Hafen; Senators Goicoechea, Parks and Settelmeyer	Revises provisions related to water. (BDR 48-45) Secretary of State	Mentioned no jurisdiction Senate Committee on Natural Resources 5/16/2019 4:00 PM Do pass	Property, Water Rights (WR-rights, resources, conservation)	WATCH
AB265	Assemblymen Peters, Swank and Watts; Senators Brooks, Goicoechea and Scheible	Requires the Desert Research Institute to conduct a study concerning water treatment and recycling. (BDR S-901) Failed Deadline:4/23/201914.3.2	Assembly Committee on Natural Resources, Agriculture, and Mining 4/3/2019 4:00 PM Amend, and do pass as amended	Water Quality (NDEP), Water Rights (WR-rights, resources, conservation)	SUPPORT
AB371	Daly	Temporarily requires the reporting of certain information relating to requests for public records by certain governmental entities. (BDR S-16) Assistant Secretary's Desk	Senate Committee on Government Affairs 5/8/2019 1:00 PM Heard, No Action	Open Meeting, Records, Boards, Elections	OPPOSE

Bill	Sponsor	Status / Location	Last Meeting and Action	Tags	Board/Subcommittee Position
SB42		Repeals provisions requiring certain fleets of motor vehicles to use alternative fuels, clean vehicles or vehicles that use alternative fuels. (BDR 43-361)			
	Committee on Growth and Infrastructure	Governor	Assembly Committee on Growth and Infrastructure 5/16/2019 1:30 PM Do pass	Emergency Mgmt, Safety, Motor Vehicles	SUPPORT
SB54		Revises provisions governing the annual reporting requirements of the Tahoe Regional Planning Agency. (BDR 22-205)			
	Committee on Natural Resources	Governor	Assembly Committee on Government Affairs 5/14/2019 8:30 AM Do pass	Governance	WATCH
SB136		Revises the provisions of the Tahoe Regional Planning Compact. (BDR 22-736)			
	Committee on Government Affairs	Governor	Assembly Committee on Government Affairs 5/14/2019 8:30 AM Do pass	Governance	WATCH
SB140		Revises provisions relating to the use of groundwater in certain basins. (BDR 48-541)			
	Committee on Natural Resources	Governor	Assembly Committee on Natural Resources, Agriculture, and Mining 5/15/2019 4:00 PM Amend, and do pass as amended	Water Rights (WR-rights, resources, conservation)	WATCH
SB207		Revises provisions governing apprentices. (BDR 28-740)			
	Senators Brooks, Denis, Cannizzaro, Cancela, Dondero Loop, Harris, Ohrenschall, Parks, Ratti, Scheible, Spearman, Woodhouse; Assemblymen Carrillo, Duran, Martinez and Smith	Governor	Assembly Committee on Government Affairs 5/16/2019 9:30 AM Amend, and do pass as amended	Human Resources, Public Works	OPPOSE
SB231		Revises provisions relating to certain construction. (BDR 28-910)			
	Brooks, Cannizzaro, Parks, Cancela, Denis, Harris, Ohrenschall, Ratti, Scheible and Woodhouse	Governor	Senate Committee on Government Affairs 5/15/2019 1:00 PM After Passage Discussion	Financial, Risk Management, Public Works	OPPOSE

Bill	Sponsor	Status / Location	Last Meeting and Action	Tags	Board/Subcommittee Position
SB232	Settlemeyer	Revises certain provisions related to irrigation districts. (BDR 48-644) Governor	Assembly Committee on Natural Resources, Agriculture, and Mining 5/6/2019 4:00 PM Do pass	Governance, Water Rights (WR-rights, resources, conservation)	WATCH
SB236	Goicoechea, Brooks and Hansen	Establishes provisions relating to a change in the place of diversion of water for certain wells. (BDR 48-635) Governor	Assembly Committee on Natural Resources, Agriculture, and Mining 5/17/2019 Upon Adjournment Amend, and do pass as amended	Water Rights (WR-rights, resources, conservation)	SUPPORT
SB245	Ohrenschall, Cannizzaro, Ratti, Parks, Pickard, Brooks, Cancela, Denis, Dondero Loop, Spearman and Woodhouse	Revises provisions relating to civil actions. (BDR 3-965) Governor	Assembly Committee on Judiciary 6/3/2019 8:00 AM Heard	Financial, Risk Management, Governance	OPPOSE
SB250	Settlemeyer, Goicoechea, Hardy, Hansen and Seevers Gansert	Revises provisions relating to the dedication of water rights. (BDR 48-664) Governor	Assembly Committee on Natural Resources, Agriculture, and Mining 5/15/2019 4:00 PM Amend, and do pass as amended	Water Rights (WR-rights, resources, conservation)	OPPOSE, unless amended
SB280	Settlemeyer, Kieckhefer and Goicoechea	Revises provisions relating to state lands. (BDR 26-975) Failed Deadline:4/12/201914.3.1	Senate Committee on Natural Resources 4/4/2019 4:00 PM Heard, No Action	Property, Water Rights (WR-rights, resources, conservation)	OPPOSE, as written

Bill	Sponsor	Status / Location	Last Meeting and Action	Tags	Board/Subcommittee Position
SB334	Senator Cannizzaro; Assemblywoman Bilbray-Axelrod	Establishes provisions relating to net neutrality. (BDR 27-68) Assistant Secretary's Desk	Senate Committee on Government Affairs (Floor Meeting) 4/10/2019 11:45 AM Re-refer	Financial, Risk Management, Governance, Information Tech	OPPOSE
SB340	Dondero Loop, Parks, Brooks, Cancela, Cannizzaro, Ratti and Woodhouse	Revises provisions relating to public works. (BDR 28-808) Assistant Secretary's Desk	Senate Committee on Finance 5/27/2019 8:00 AM Not Heard	Public Works	OPPOSE
SB358	Brooks, Cannizzaro, Denis, Spearman, Woodhouse, Ohrenschall, Parks, Scheible and Washington	Revises provisions relating to the renewable energy portfolio standard. (BDR 58-301) Governor	Joint Meeting of the Senate Committee on Growth and Infrastructure and Assembly Committee on Growth and Infrastructure 5/23/2019 Upon Adjournment Mentioned No Jurisdiction	Energy	OPPOSE, unless amended

Projected Climate Change Impacts to TMWA Water Supply

A State-of-the-Art Analysis of Impacts to the
Tahoe/Truckee Basin and TMWA's Water
Supply Outlook Due to Climate Change


June 19, 2019

Shane Coors, PE, Precision Water Resources Engineering, LLC
Caleb Erkman, PE, Precision Water Resources Engineering, LLC
Bill Hauck, Truckee Meadows Water Authority
Kara Steeland, Truckee Meadows Water Authority



Precision Water Resources Engineering

“Stewardship Through Technology”

- Founded in 2008, headquartered in Loveland, Colorado
- We develop and apply state-of-the-art technological water management tools in close collaboration with water managers of large, complex and contentious water systems
- Industry leader in development and application of RiverWare modeling tools. (www.riverware.org) 
- Long-term ongoing projects in :
 - Truckee-Carson River Basin
 - Colorado River Basin
 - Arkansas River Basin
 - Colorado-Big Thompson Project
 - San Juan River Basin
- Clients include:
 - Federal Agencies
 - State Agencies
 - Municipalities
 - Research Institutions



PRECISION
WATER RESOURCES ENGINEERING

Water for the Seasons (2014-2019)



Water for the Seasons partners scientists with community stakeholders in the Truckee-Carson River System to explore new strategies and solutions for dealing with extreme climate events, such as droughts and floods. Funded by a \$3.8M grant from the National Science Foundation and the U.S. Department of Agriculture, this four-year research and outreach program uses a collaborative modeling methodology which strategically links scientific research with community problem-solving. The goal of this program is to assess and enhance community climate resiliency, or ability to adapt to extreme climatic conditions, in snow-fed arid land river systems.



PARTNERS



SPONSORED BY



Water for the Seasons – Study Team



Climate Modeling (Scripps
Institution of Oceanography/USGS)



Hydrologic Modeling (PRMS)



System Operations Modeling
(RiverWare)



Stakeholder Interaction /
Economics Modeling

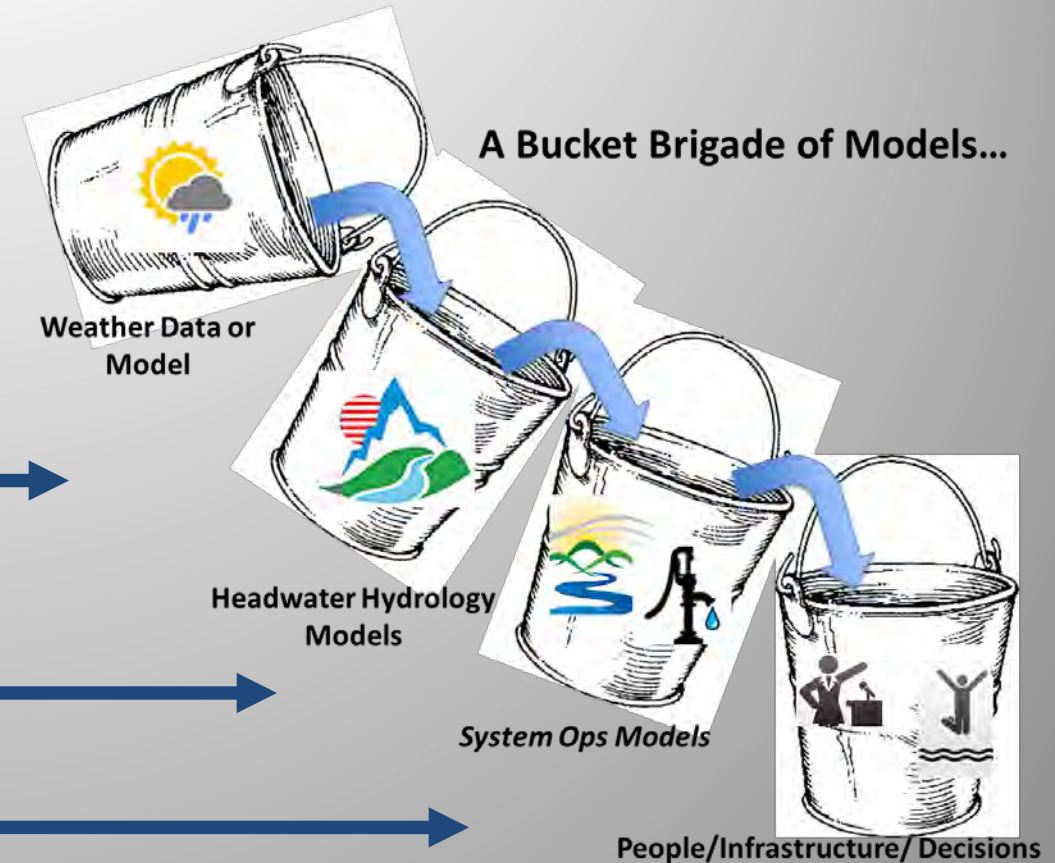


Figure courtesy of Mike Dettinger, USGS

Water for the Seasons Activities and Outcomes



- Six Stakeholder Advisory Group (SAG) Meetings – Meetings between Study Team and stakeholders (including TMWA), hosted at DRI with presentations from Study Team and facilitated interaction among all participants
- Numerous professional journal articles and published studies
 - Notably a journal article on Climate Change impacts at Lake Tahoe
- Climate Change hydrology scenarios were developed
 - Extreme drought sequences
 - High and Low frequency Climate Change Scenarios
 - Historical hydrology with warming
 - Climate Change hydrology Ensembles from raw GCM climate output
- Final summary report for the entire project is being drafted



TMWA Climate Change Analysis

Impetus for Climate Change Study

- Leverage state-of-the-art “Water for the Seasons” study products (models and data)
- Provide material and tools for addressing Climate Change in the Water Supply Report
- Remain current with the latest climate change science and how it may impact TMWA in the future

Study Overview

- Utilizing Climate Change hydrology data developed as a part of the Water for the Seasons Study, simulate Tahoe/Truckee system operations including TMWA system operations
- Perform 24 system operations model runs beginning in 2019 and going out to 2099 (3 ensembles of 8 model runs)
- Collect output and analyze system performance and impacts for each run
- Compare performance of the TMWA system under climate change to its performance under historical conditions

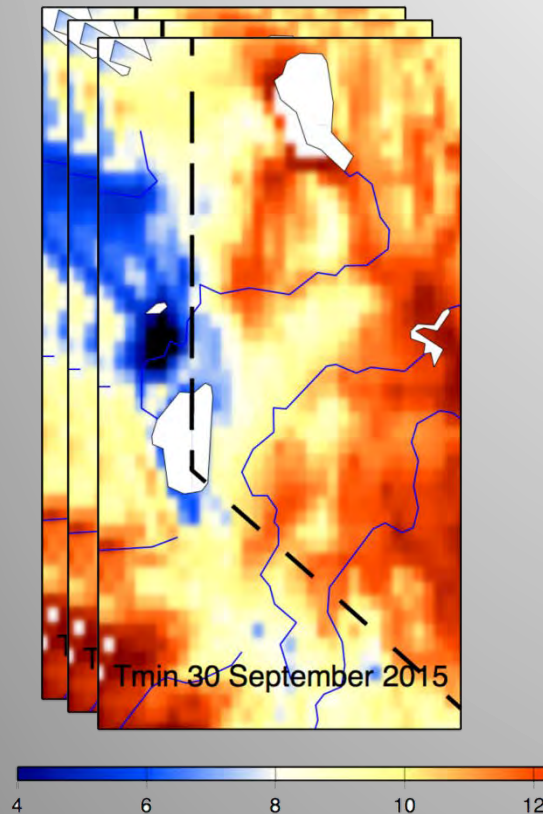
GCM Selection (Lynn et al., 2015)

- Using a group of several simulations from different General Circulation Models (GCMs) for planning studies is the current best practice to consider the range and uncertainty of future climate projections
- 3-step model screening process was developed to identify a subset of GCMs to use for California water resources investigations



Selected GCMs

General Circulation Models Ensembles (3X8)



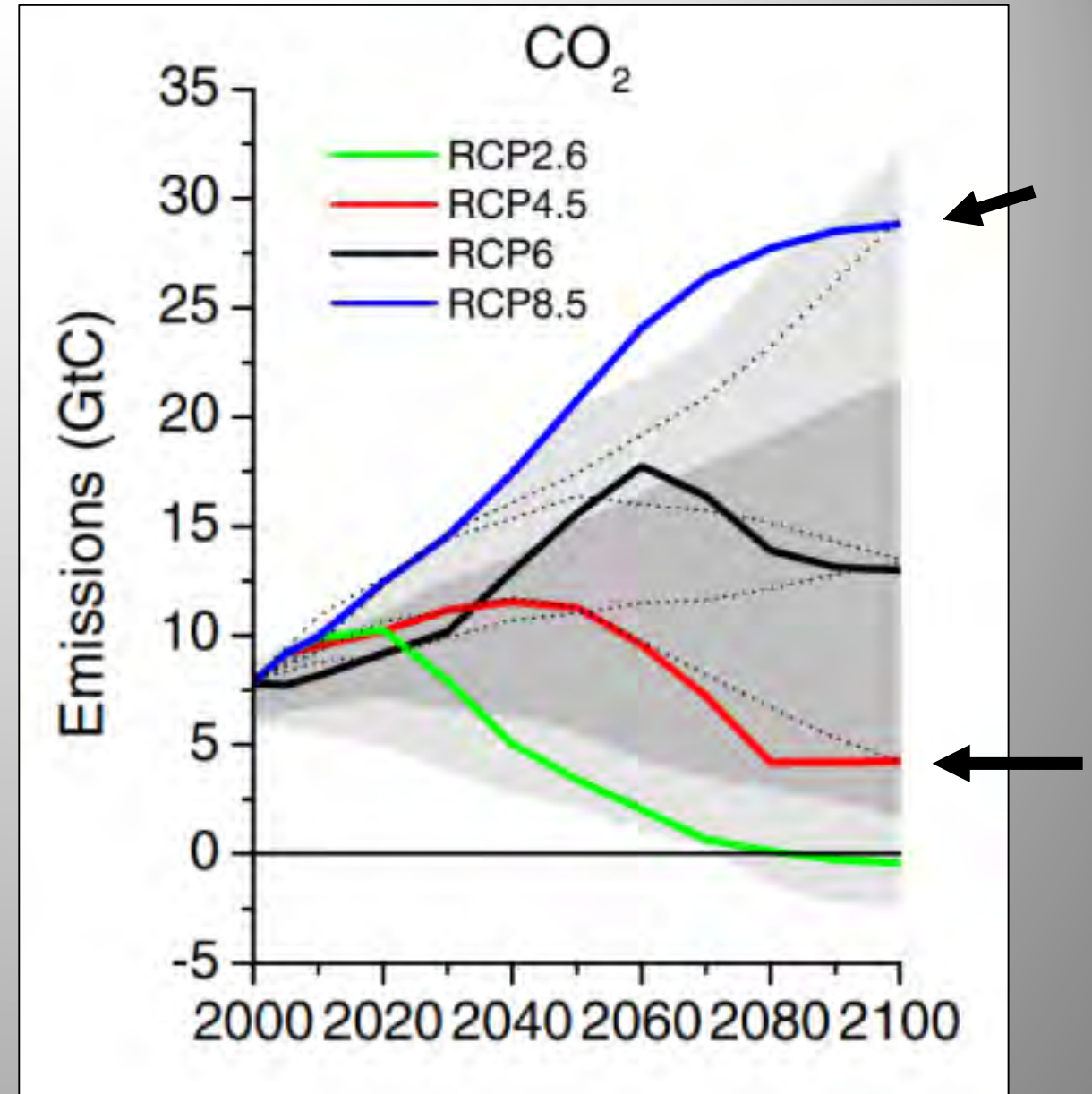
Models with all data

CanESM2
CCSM4
CNRM-CM5
HadGEM2-CC
HadGEM2-ES
MIROC5
bcc-csm1-1
GFDL-ESM2M

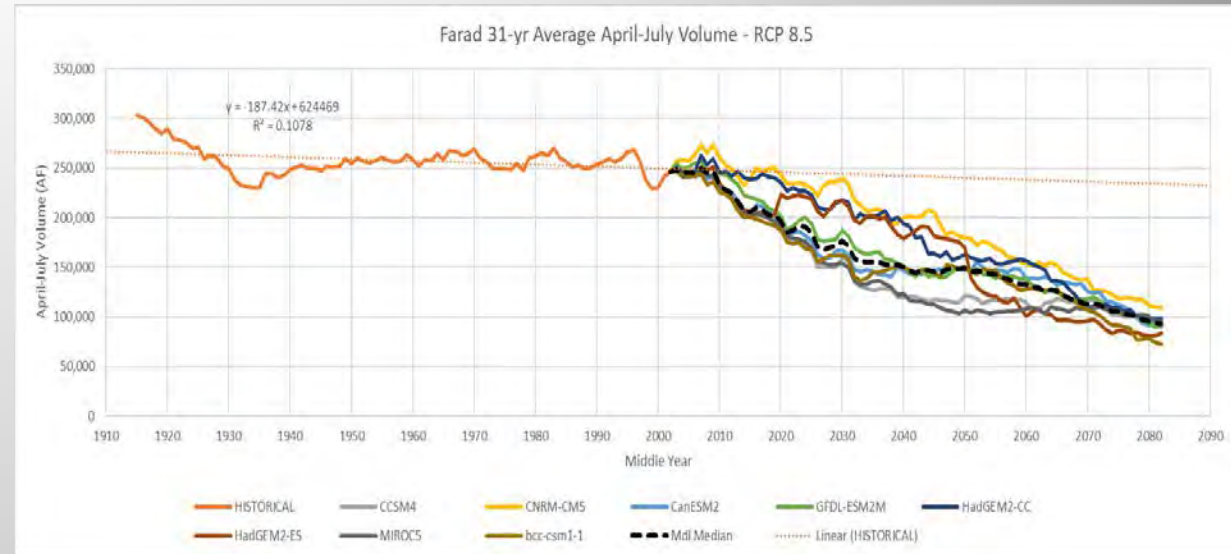
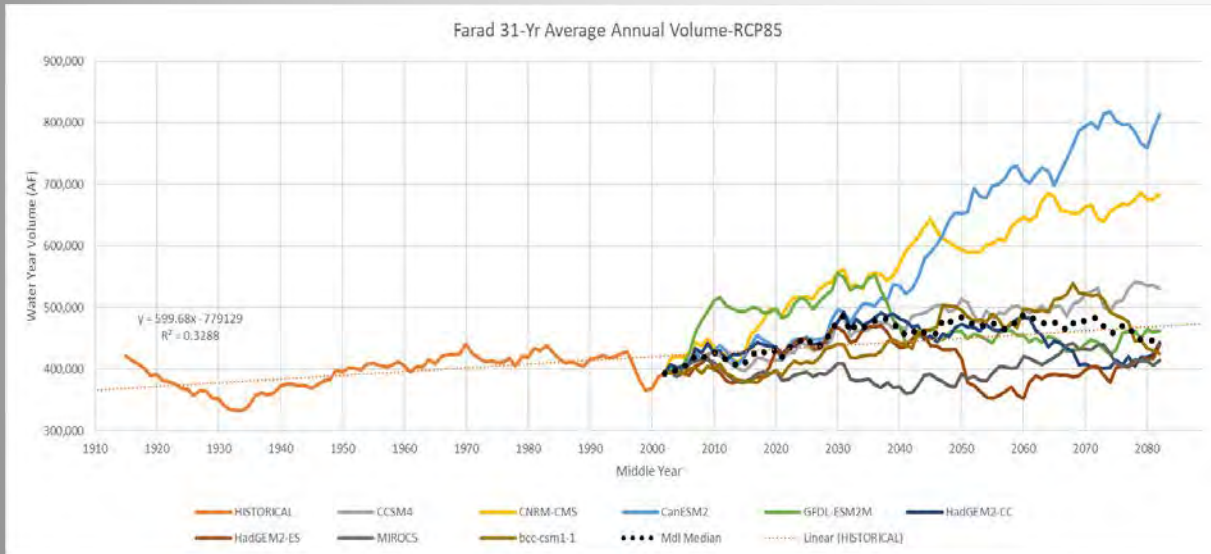
These models contained all the forcing data needed for both the hydrology and the lake evaporation models.

Representative Concentration Pathway (RCP)

- RCP 4.5 - Emissions peak around mid century at around 50% higher than 2000 levels and then decline rapidly over 30 years and then stabilize at half of 2000 levels
- RCP 8.5 - Nightmare scenario in which emissions continue to increase rapidly through the early and mid parts of the century.
- Historical – Historical level of emissions (used as a reference scenario for comparison purposes)

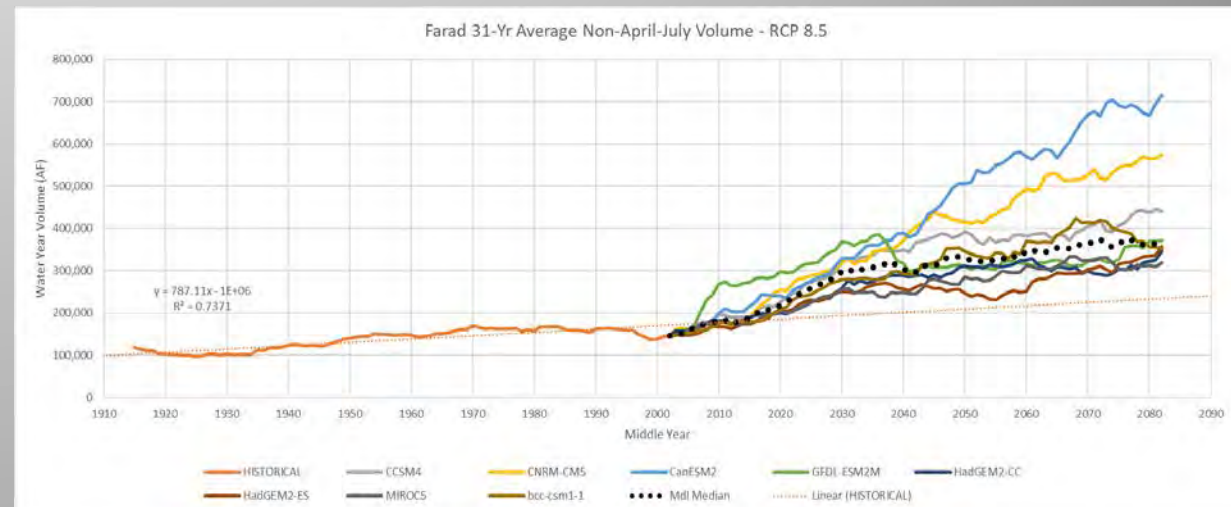


Climate Change Hydrology Observations



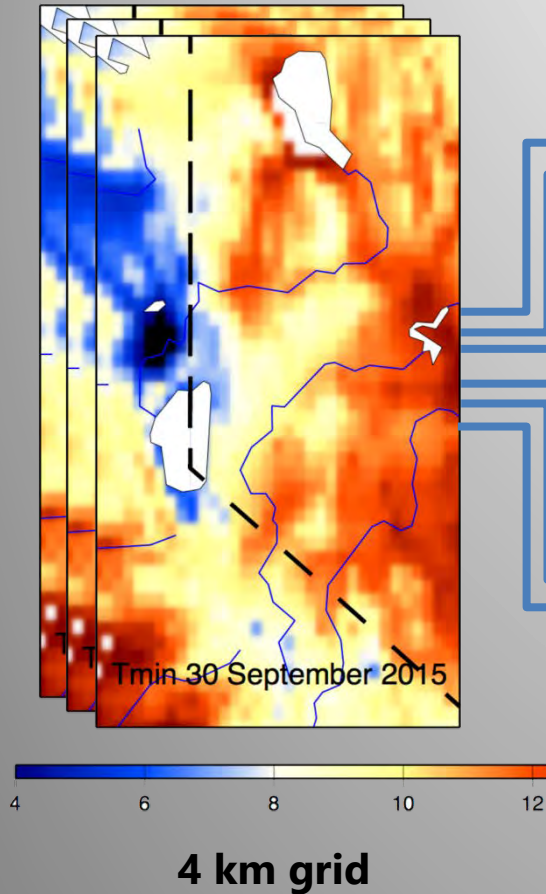
RCP8.5 Scenario Ensemble – Truckee Basin Supply Characteristics

- Annual Volume shows good continuity between historical observed volumes and projected volumes
- Annual volume shows slight increase over time
- Historical runoff season (April – July) volume shows abrupt significant decrease
- Non-runoff season (August – March) volume shows significant and abrupt increase
- Note the significant variance among individual GCM model-based hydrology within a given scenario ensemble



Modeling Schematic

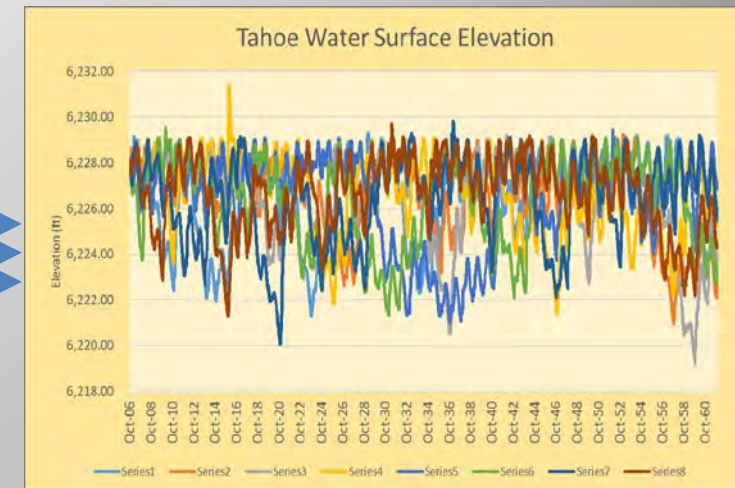
General Circulation Models Ensemble (2X8)



Upper Truckee
Watershed
GSFLOW Model

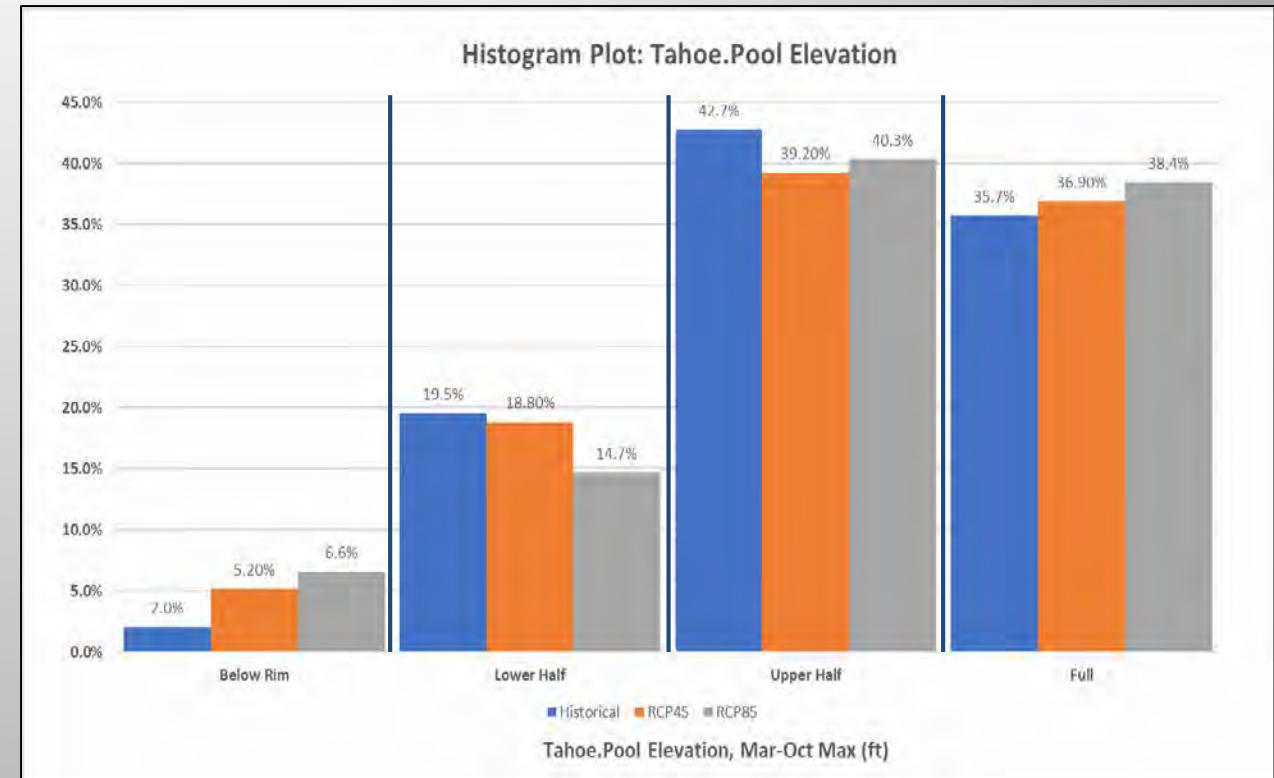
CRLE Reservoir
Evaporation
Model

Truckee River
Operations
RiverWare
Model



Result #1 – Lake Tahoe Peak Elevation

- Max legal elevation – 6229.1 ft
- Rim elevation – 6223.0 ft
- In a typical year Tahoe peaks around June and bottoms out around October
- In climate change Tahoe more frequently peaks below the rim (more severe droughts)
- In climate change Tahoe more frequently fills and peaks above the max
- Average peak elevations (+6220 ft)
 - Historical – 7.3 ft
 - RCP4.5 – 7.2 ft (-0.1 ft)
 - RCP8.5 – 7.3 ft (-0.0 ft)
 - No significant change from historical
- Average fall minimum elevation (+6220 ft)
 - Historical – 5.4 ft
 - RCP4.5 – 4.7 ft (-0.7 ft)
 - RCP8.5 – 4.5 ft (-0.9 ft)
 - Annual low elevation is significantly lower
- **Increased evaporation and increased inflow result in more annual volatility in lake elevations**



Results #2 – Truckee Flow at Farad Gage

- The Farad gage measures flow on the Truckee River near the California/Nevada state line
- Let the Historical runs define a Low, Med, and High thresholds
 - Low - 33% (< 568 cfs)
 - Med – 33% (568 cfs – 730 cfs)
 - High - 33% (>730 cfs)
- RCP4.5 runs show increased high flow years and decrease in med and low flow years
 - Low – 26.5%
 - Med – 25.0%
 - High – 48.5%
- RCP8.5 runs show further increase in high flow years and further decrease in low flow years
 - Low – 12.7%
 - Med - 24.7%
 - High – 62.7%



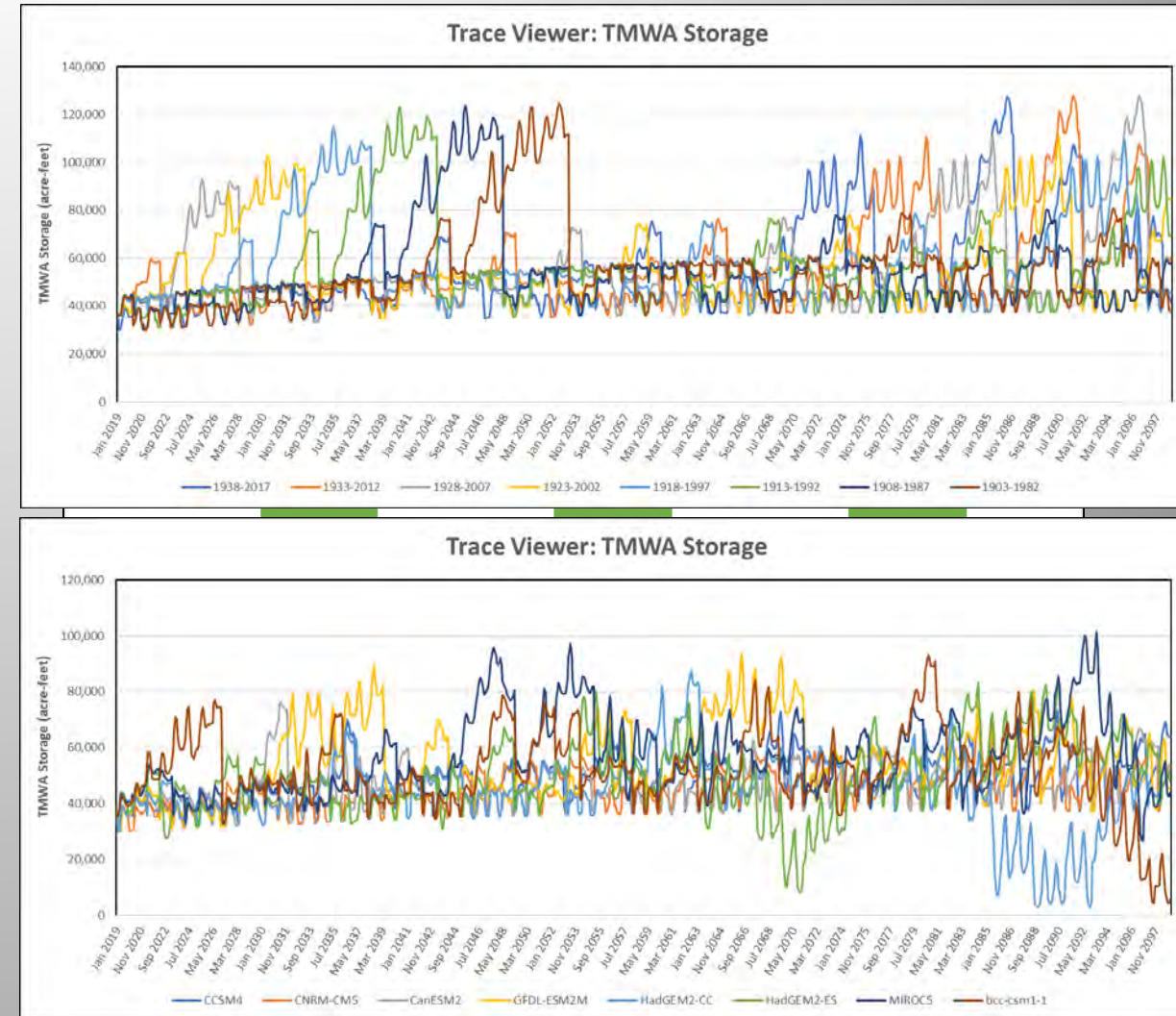
Results #3 – Drought Designation Frequency

- Drought as defined by TROA. (TROA 3.D)
 - Drought designation allows TMWA to store additional water
 - Drought designation allows certain types of water to be used under certain conditions
- Drought frequency
 - Historical – 19.8%
 - RCP4.5 – 30.9%
 - RCP8.5 – 30.6%
- Drought frequency increases in both climate change scenarios by ~10% over historical
- Interesting that flows in the Truckee on average go up in climate change (previous slide), but drought frequency increases as well
- More water comes down the river, but less efficiently for Floriston Rate users (TMWA)



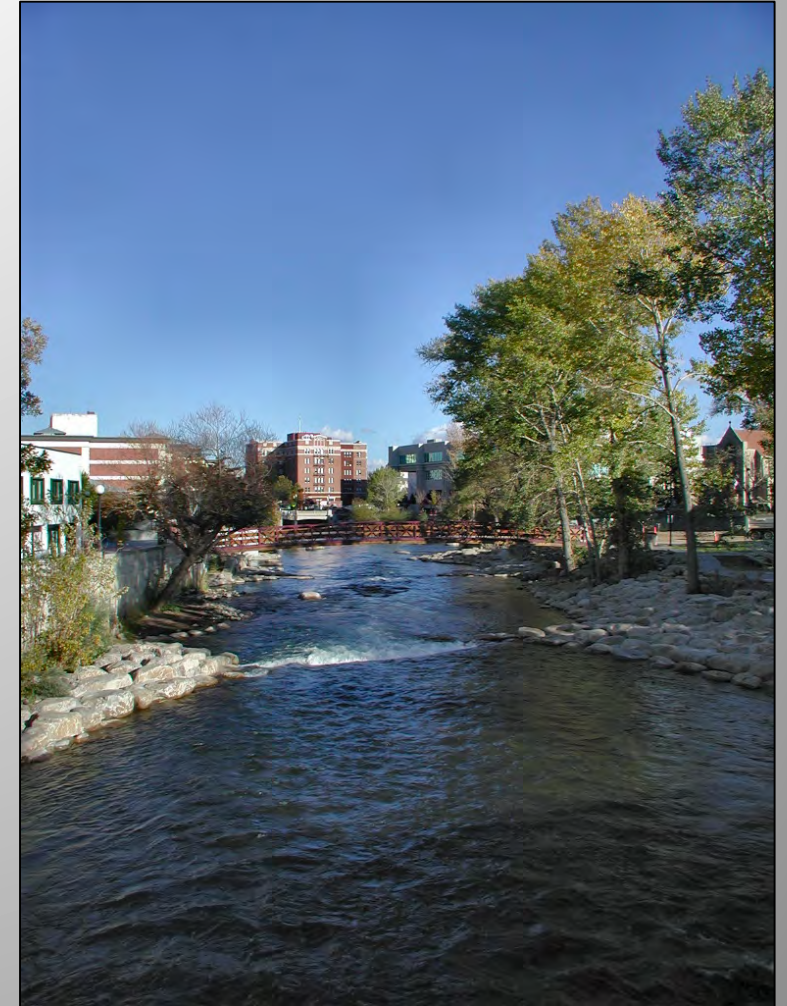
Results #4 – TMWA Drought Supply Reliability

- TMWA drought supply includes several categories of storage in multiple Truckee basin reservoirs
- In the Historical scenario, TMWA's drought supply never gets into "Low" category
- In the RCP4.5 Scenario, drought supply goes into the Low category in 3% of years, and is never exhausted (shortage)
- In the RCP8.5 Scenario, drought supply goes into the "Low" category in 12% of years and is exhausted in less than 1% of years (shortage).
 - In the late 2080's and 2090s there are 4 occurrence of shortage (out of 640 years)
- Climate change stresses TMWA's supply reliability but does not result in shortage until 2080's in the 2 driest models in the most severe climate change ensemble (RCP8.5)



Conclusions

- Future climate is highly uncertain (significant variability in individual model runs)
 - There is consensus that the future will be warmer
 - Some models show the future being a little drier
 - More models show the future being wetter
- There is consensus that increased volatility throughout the system is to be expected; greater emissions seems to translate to greater hydrologic volatility
- Though on average there is more water in the climate change projections, it comes in more concentrated time frames resulting in an inability to store or use it to meet water rights efficiently
- Thus more frequent and more severe drought occurs
- Though stressed to a greater degree, TMWA's supply is robust and reliable in climate change



Questions?

06-19-19 BOARD Agenda Item 7



STAFF REPORT

TO: Board of Directors
THRU: Mark Foree, General Manager
FROM: Bill Hauck, Senior Hydrologist
DATE: June 11, 2019
SUBJECT: Discussion and possible authorization to General Manager to enter into Agreement with the State of Nevada, Washoe County, and the Cities of Reno, Sparks, and Fernley to fund Nevada's share of the Federal Water Master's annual Truckee River Operating Agreement expenses for 2020, 2021, and 2022

RECOMMENDATION

That the TMWA Board authorize the General Manager to enter into the proposed Joint Funding Agreement (attached) between TMWA, the State of Nevada, Washoe County, the City of Reno, the City of Sparks and the City of Fernley to cover Nevada's annual share of TROA administration expenses for fiscal years 2020, 2021, and 2022.

DISCUSSION

The cost to administer the Truckee River Operating Agreement (TROA) is approximately \$1,500,000 million dollars annually. Per TROA Section 2.C.2, Nevada's Share of the TROA administration expenses is 40% of the total, which equates to approximately \$600,000 per year. The TROA Administrator has federal funding in place to cover the expenses of TROA administration through Fiscal Year 2019, which ends September 30, 2019. Those federal dollars have run out, however, and funding is needed for this upcoming Fiscal Year (2020), and subsequent years, to cover the cost of administering TROA. The Nevada State Engineer made it clear that the State would not be able to provide funding for TROA expenses because the State of Nevada requires that certain expenses associated with administration of interstate river systems be paid by the beneficiaries of those expenses. Accordingly, the Nevada TROA Parties (TMWA, Washoe County, Reno, Sparks, and Fernley) would be responsible for the Nevada share of TROA expenses.

After a year+ of negotiation amongst the Nevada Parties discussing the merits and benefits of TROA and how it specifically benefits each, staff recommended that TMWA pay 60% of Nevada's share of the expenses. This comes out to approximately \$360,000 per year. Each of the remaining Parties have agreed to pay 10% or \$60,000 per year. These estimated costs and

the proposed budget provided by the TROA Administrator for the next two fiscal years are shown in Exhibit A of the attached Joint Funding Agreement. Staff attempted to obtain a longer-term arrangement for financial certainty, however, the Parties settled on funding the next three fiscal years only. The Joint Funding Agreement requires the Parties to negotiate in good faith for the apportionment of funding for future fiscal years and if they cannot reach an agreement by June 30, 2022, then the matter will be resolved through binding arbitration to be conducted by the Truckee River Special Hearing Officer, if possible, or another qualified arbitrator.

FISCAL IMPACT

TMWA's approved O&M budget for FY20 includes \$360,000 for this expense in the CAFR under Services and Supplies.

JOINT FUNDING AGREEMENT

This Joint Funding Agreement (hereinafter referred to as this “Agreement”) is made and entered into this ____ of _____, 2019 by and among the State of Nevada, the Department of Conservation and Natural Resources, Division of Water Resources (hereinafter “Nevada”), Truckee Meadows Water Authority (hereinafter “TMWA”), the County of Washoe (hereinafter “Washoe County”), the City of Reno (hereinafter “Reno”), the City of Sparks (hereinafter “Sparks”), and the City of Fernley (hereinafter “Fernley”), and collectively referred to as the “Parties.”

RECITALS

1. Each of Nevada, TMWA, Washoe County, Reno, Sparks, and Fernley is a party to the Truckee River Operating Agreement dated September 6, 2008 (the “Operating Agreement”).
2. Section 2.C.2 of the Operating Agreement provides for the apportionment of the expenses of administration of the Operating Agreement among the United States, California, and Nevada.
3. Pursuant to Section 2.C.2(c), Nevada’s share of the expenses of administration of the Operating Agreement is 40% (the “Nevada Share”).
4. Section 2.C.3 of the Operating Agreement requires the Administrator to prepare and distribute to the Scheduling Parties and Signatory Parties an annual budget for funding requirements of the Operating Agreement.
5. After the Administrator’s annual budget is distributed, a majority of Nevada, California, and the United States must either approve the annual budget as submitted, or modify it, and thereafter it is submitted as approved or modified to the Orr Ditch Court for ratification.

6. At the present time, the State of Nevada requires that certain expenses associated with administration of interstate river systems be paid by the beneficiaries of those expenses.

7. One of the principal purposes of the Operating Agreement is to provide for the operation of Truckee River Reservoirs in a flexible and coordinated manner to meet multiple water use objectives, including reliable water supply and drought protection for municipal and industrial uses, instream flows for fish and wildlife, water quality, and recreation.

8. TMWA, Washoe County, Reno, Sparks, and Fernley are beneficiaries of that operation and management of Truckee River Reservoirs.

9. The Administrator has submitted proposed tentative budgets for each of the fiscal years beginning October 1, 2019 to September 30, 2020, and October 1, 2020 to September 30, 2021 (the “Tentative Budgets”).

10. The Tentative Budgets are not binding, have not been approved, and could change.

11. The Administrator has not submitted a tentative budget for the fiscal year October 1, 2021 to September 30, 2022.

NOW, THEREFORE, the Parties hereto, intending to be legally bound hereby, and in consideration of the mutual covenants and promises herein contained, agree as follows:

ARTICLE I

Recitals Part of Agreement

The foregoing Recitals are incorporated herein by this reference, and shall form a part of this Agreement as if recited herein at length.

ARTICLE II

Definitions

For purposes of this Agreement, words which appear with the first letter capitalized and which are not otherwise defined herein shall have the meanings given them as set forth in the Operating Agreement. When not capitalized or otherwise defined herein, words shall have their ordinary meaning.

ARTICLE III

Apportionment of Nevada Share of Operating Agreement Administration Expenses

For the fiscal years beginning October 1, 2019, October 1, 2020 and October 1, 2021, Nevada's share of the administration expenses of the Operating Agreement as finally approved in accordance with the Operating Agreement will be paid 60% by TMWA, 10% by Washoe County, 10% by Reno, 10% by Sparks, and 10% by Fernley. Each party will pay its share of those expenses to Nevada by no later than September 1st prior to the beginning of the next fiscal year. The payments will be made to Nevada by means of an electronic payment as directed by Nevada. Nevada will timely transmit the Nevada Share to the Administrator as required by the Operating Agreement and approved budget. Attached hereto as Exhibit A is a table showing what each party will be obligated to pay based upon a projected budget of \$1,500,000.00.

ARTICLE IV

Apportionment of Nevada Share for Fiscal Years After October 1, 2021

Through their respective representatives, TMWA, Washoe County, Reno, Sparks, and Fernley agree to in good faith consider and attempt to reach agreement on how the Nevada Share should be apportioned among them for fiscal years after the year commencing October 1, 2021. Those representatives will complete that consideration on or before June 30, 2022. If an agreement is reached on such apportionment by June 30, 2022, the Parties will memorialize that agreement by an amendment to this Agreement. Until such time as TMWA, Washoe County, Reno, Sparks,

and Fernley reach a different agreement concerning such apportionment, they will apportion and pay the Nevada Share as provided in Article III. If an agreement on apportionment of the Nevada Share is not reached by June 30, 2022, the apportionment shall be resolved as provided in Article V.

ARTICLE V

Resolution of Apportionment of Nevada Share After October 1, 2021

If TMWA, Washoe County, Reno, Sparks, and Fernley are unable to agree on apportionment of the Nevada Share among them by June 30, 2022, then upon notice by any party to the others, the apportionment shall be finally resolved by binding arbitration by the Truckee River Special Hearing Officer acting as the selected arbitrator. The rules and procedures of the Truckee River Special Hearing Officer shall be the rules for the arbitration. The decision of the Truckee River Special Hearing Officer shall be final. The costs and fees associated with the arbitration shall be determined and assessed by the Truckee River Special Hearing Officer as provided in Section 2.C.4 of the Truckee River Operating Agreement. If the Truckee River Special Hearing Officer cannot or will not serve as the selected arbitrator, representatives of TMWA, Washoe County, Reno, Sparks and Fernley will select an alternate arbitrator approved by all of them. TMWA, Washoe County, Reno, Sparks and Fernley shall adjust payments made by them under this Agreement between October 1, 2022 and the final decision of the arbitrator to conform to that decision.

ARTICLE VI

Modification of Administrator Budget

On receipt of the Administrator's annual budget pursuant to Section 2.C.3 of the Operating Agreement, representatives of the Parties will meet and confer with respect to whether Nevada should approve it or request that it be modified. Nevada shall exercise its authority to approve or seek modification of the annual budget in a manner consistent with a vote of at least three of TMWA, Washoe County, Reno, Sparks and Fernley, acting through their respective representatives. If at least three of TMWA, Washoe County, Reno, Sparks and Fernley, acting through their respective representatives, cannot agree on approval or modification of the annual budget, then Nevada may approve or seek modification as it deems best in its reasonable judgment. TMWA, Washoe County, Reno, Sparks or Fernley each retain any and all rights they currently have to independently provide comment on the budget to Nevada, California and the United States, and to contest the budget in the Orr Ditch Court, whether the budget is or is not approved or modified by the vote required by this Article VI, and nothing contained in this Agreement shall be construed as a waiver by any party hereto of any rights held by that party under the Operating Agreement or any statute, rule, regulation provision, or doctrine of state or federal law.

ARTICLE VII

Miscellaneous

Section 7.1 Agreement Executed Without Coercion. The parties hereto acknowledge that each is making this Agreement of its own free will and volition, and acknowledge that no coercion, force, pressure or undue influence has been used against any party in the making of this Agreement either by the other party to this Agreement or by any other person or persons.

Section 7.2 Notices. All notices required or permitted to be given by law or by the terms of this Agreement shall be in writing and shall be considered given upon personal service of

a copy on the party to be served, or by mailing such notice by certified mail, return receipt requested, postage prepaid, addressed to the parties as follows:

- a. Notices to State of Nevada shall be sent to:

Division of Water Resources
Attn: State Engineer
901 S. Stewart Street, Suite 1003
Carson City, Nevada 89701

- b. Notices to Truckee Meadows Water Authority shall be sent to:

Truckee Meadows Water Authority
Attn: General Manager
1355 Capital Boulevard, Reno, Nevada 89502
P.O. Box 30013
Reno, Nevada 89520-3013

- c. Notices to Washoe County shall be sent to:

Washoe County
Attn: David Solaro, ARCH., P.E., Asst. County Manager
Director of Community Services Department
1001 E. 9th Street, Reno, Nevada 89512

- d. Notices to City of Reno shall be sent to:

City of Reno
Attn: Director of Public Works
1 E. First Street, Reno, Nevada 89501
P.O. Box 1900, Reno, Nevada 89505

- e. Notices to City of Sparks shall be sent to:

City of Sparks
Attn: Public Works Director
431 Prater Way
Sparks, Nevada 89431-0857

- f. Notices to City of Fernley shall be sent to:

City of Fernley
Attn: City Manager
595 Silver Lace Boulevard
Fernley, Nevada 89408

The parties may change the address to which notices are sent by a notice in writing to the other Parties.

Section 7.3 Consent. Whenever the approval or consent of any party is required for any purpose under this Agreement, that approval or consent will not be unreasonably withheld or delayed.

Section 7.4 Waiver. Neither a course of conduct, nor any waiver by either party with respect to a default or breach of any provision of this Agreement by the other party, shall operate or be construed as a waiver of any subsequent default or breach, or as a modification of this Agreement.

Section 7.5 Captions. The captions of this Agreement do not in any way limit or amplify its terms and provisions.

Section 7.6 Binding on Successors. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and to their respective successors and assigns for all time.

Section 7.7 Authorship. This Agreement has been reviewed by attorneys representing the respective parties. For the purposes of interpretation of this Agreement, no party shall be deemed to have been the drafter of this Agreement.

[THIS SPACE INTENTIONALLY LEFT BLANK]

Section 7.8 Good Faith and Fair Dealing. The Parties shall implement the provisions of this Agreement in good faith and shall observe all standards of fair dealing with respect thereto.

IN WITNESS WHEREOF, the Parties hereto have executed and delivered this Agreement as of the date and year first above written.

STATE OF NEVADA

TRUCKEE MEADOWS WATER
AUTHORITY

By: _____
State Engineer, Division of Water Resources

By: _____
General Manager

Approved as to Form:

Deputy Attorney General

CITY OF RENO

COUNTY OF WASHOE

By: _____
Mayor

By: _____
Chairman, Board of County Commissioners

Approved as to Form:

Approved as to Form:

Deputy City Attorney

Deputy District Attorney

Attest: _____
City Clerk

Attest: _____
County Clerk

CITY OF SPARKS

CITY OF FERNLEY

By: _____
Mayor

By: _____
Mayor

Approved as to Form:

Approved as to Form:

Deputy City Attorney

Deputy City Attorney

Attest: _____
City Clerk

Attest: _____
City Clerk

EXHIBIT A
to Joint Funding Agreement

Party Shares Based Upon a Projected \$1,500,000.00 Budget:

<u>Party</u>	<u>Percent of Total</u>	<u>2019-2020</u>	<u>2020-2021</u>
TMWA	60%	\$ 360,000	\$360,000
Washoe County	10%	60,000	60,000
Reno	10%	60,000	60,000
Sparks	10%	60,000	60,000
Fernley	10%	60,000	60,000
Total:	100%	\$600,000	\$600,000

TMWA'S 2015-2035 WATER FACILITY PLAN UPDATE

June 19, 2019

Page 1 of 4



STAFF REPORT

TO: Board of Directors
THRU: Mark Foree, General Manager
FROM: Scott Estes, Director of Engineering
DATE: 11 June 2019
SUBJECT: Discussion and possible action, and direction to staff regarding the adoption of TMWA's 2015-2035 Water Facility Plan

SUMMARY

- TMWA has completed an update of its Water Facility Plan for the 2015-2035 planning period (2035 WFP). This is the first update that includes former Washoe County water systems.
- The 2035 WFP establishes maximum day demands for growth projections presented in the previously approved Water Resource Plan and determines where the growth will occur.
- The primary product of the 2035 WFP is a Capital Improvement Plan (CIP) which feeds into the Funding Plan and provides the basis for revised developer Facility Charges.
- The 2035 WFP analyzes actual metered use data to develop demand factors for each rate class. The demand factors will be used to calculate maximum day demands for new business projects.
- The 2035 WFP examines service levels and the ability of the water system to meet the requirements in NAC 445A both now and in the future and will be submitted to the Health Authority.

RECOMMENDATION

As the reference/support document for these important functions, staff is requesting Board approval of the 2035 WFP prior to approving/implementing revised Facility Charges and new business demand factors.

DISCUSSION

The objectives of the 2035 WFP were to:

1. Analyze existing and future service levels and determine if service levels comply with NAC requirements.
2. Determine the facilities and required in-service dates to serve projected growth.
3. Determine if modifications are necessary to facility recommendations in the previous WFP.
4. Present revised unit demand factors and peak day factors for each rate class.
5. Identify revised in-service dates and update cost estimates for recommended water system facilities to provide the basis for updating TMWA's funding plan and developer facility charges.
6. Identify facility improvements necessary to meet current fire flow requirements.

TMWA'S 2015-2035 WATER FACILITY PLAN UPDATE

June 19, 2019

Page 2 of 4

7. Analyze the ability of the water system to continue operating with the loss of supply from the Truckee River.

Major findings and conclusions presented in the 2035 WFP include:

- Water use on a per unit basis has decreased and future demands have been adjusted downward accordingly. Large surface water supply and treatment projects (like Chalk Bluff Phase 4) will be delayed – possibly out to around 2050.
- Major drivers of the decrease in demands include:
 - A change from 2-day to a 3-day per week irrigation schedule in 2010
 - Implementing a fully metered system in 2010
 - A permanent reduction in demand from conservation during the 2014-15 drought
- Unit demands used to calculate fees for most new business projects should be reduced (commercial irrigation is the exception).
- Areas of growth have not changed, so many of the facilities recommended in previous WFP's will still be required, but the timing of projects will be delayed.
- New or expanded Facility Plans are proposed for West Reno (W. 4th St. main, Anselmo BPS); Southwest Reno (pump station consolidation); Off-River Supply facilities; and Mt. Rose (maximum day support for the Mt Rose WTP under drought conditions).
- Prioritized fire flow improvements should be pursued as a long-term project. Other fire flow capacity improvements (main replacements) should be constructed during major road reconstruction projects.
- To increase the diversity of the water supply and maximize utilization of groundwater sources, the next major supply project to be constructed should be the Sparks Groundwater Treatment Plant. Phase 1 is now anticipated for 2036.

Regarding the decrease in demands and the recommendation to revise unit demands for new business projects, the existing and proposed factors are as follows:

Rate Code	Description	Old MDD (GPM)	Proposed MDD (GPM)	MD:AD Peaking Factor
GMWS	Commercial	AFA x 1.17	AFA x 1.08	1.58
MIS	Metered Irrigation	AFA x 0.38	AFA x 1.73	2.54
MMWS	Metered Multi-Unit Residential	0.15 gpm/unit	0.14 gpm/unit	1.37
RMWS	Metered Residential	see below	see below	2.13

MDD = Maximum Day Demand

GPM = Gallons Per Minute

Note the significant increase in the proposed commercial irrigation demand factor. Historically, the maximum day of use always occurred on a residential watering day. Under the previous 2-day per week irrigation schedule, commercial irrigation demand did not contribute (if the business was following the schedule) to the peak day demand and so the demand factor was very small. That is not the case under the 3-day per week schedule, which is reflected in the revised demand factor.

TMWA'S 2015-2035 WATER FACILITY PLAN UPDATE

June 19, 2019

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Residential water use has decreased significantly. Peak residential use is influenced most by irrigation demand and total peak use is a function of lot size. The analysis of actual metered use data indicates that MDD vs. lot size fits a curve described below:

Equation Form: (Regression Constant) x SQRT(Lot Size, SF)

Old Equation: MDD (gpm) = 0.0090 x SQRT(Lot Size, SF)

New Equation: MDD (gpm) = 0.0066 x SQRT(Lot Size, SF)

$$\frac{\text{New Equation Constant}}{\text{Old Equation Constant}} = \frac{0.0066}{0.0090} = 0.73$$

<u>Acre</u> <u>Lot Size</u>	<u>SF</u> <u>Lot Size</u>	<u>OLD</u> <u>MDD</u>	<u>NEW</u> <u>MDD</u>	<u>RATIO</u>
	6000	0.7	0.5	0.73
	7000	0.8	0.6	0.73
	8000	0.8	0.6	0.73
	9000	0.9	0.6	0.73
	10000	0.9	0.7	0.73
0.25	10890	0.9	0.7	0.73
	12000	1.0	0.7	0.73
	13000	1.0	0.8	0.73
	14000	1.1	0.8	0.73
0.33	14520	1.1	0.8	0.73
0.50	21780	1.3	1.0	0.73

Due to significant deviation from the curve (data scatter) for lot sizes greater than about 1.25 acres, the MDD for SFR use will be capped at 1.5 GPM.

Regarding the improvements recommended in the 2035 WFP, total expenditures for the 20-year period are estimated to be:

Water Facility Expenditures 2015-2035

Facility Category	Total Cost	Cost Allocated To Growth
Supply	\$ 99,400,000	\$ 82,300,000
Storage	\$ 23,900,000	\$ 17,600,000
Distribution	\$103,800,000	\$ 89,400,000
Totals	\$227,100,000	\$189,300,000

TMWA'S 2015-2035 WATER FACILITY PLAN UPDATE

June 19, 2019

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Regarding NAC Compliance, the 2035 WFP found that:

- Treatment and production capacity is adequate through at least 2035 (NAC 445A.6672, adequate to meet MDD & PHD).
- Total capacity is adequate through at least 2035 (NAC 445A.66725, adequate to meet MDD w/Alternative Pumping Capacity + Storage).
- Overall, a system-wide storage surplus will exist through 2035; however, there are some minor deficiencies within specific tank/pressure zones. The available Alternative Pumping Capacity and/or capacity available through system interties satisfies these deficiencies (NAC 445A.6674 adequate pressure and fire flow, .66745 operating storage, .6675 emergency reserve, .66755 alternative pumping capacity).
- There are some legacy pressure and fire flow deficiencies (especially in former Washoe County systems) that will need further analysis to determine the most efficient and cost-effective remedy.

A noticed public workshop for the 2035 WFP was conducted on May 29, 2019 at TMWA offices. Notice of the workshop was also sent to the email list of the Builders Association of Northern Nevada. Four people attended the workshop.

2015-2035

WATER SYSTEM FACILITY PLAN

UPDATE

JULY 2018



Photo By: Jackie Heidelberger,
TMWA Maintenance Coordinator

Photo Of: Pump Installation at
Hunter Creek Pump #4



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SECTION 1

INTRODUCTION

BACKGROUND:

The 2035 Water Facility Plan (WFP) update is the third WFP prepared since the inception of TMWA in June 2001. The initial facility plan (2025 WFP) was approved in 2004 at a time when the rate of new development was nearing its peak. The second facility plan (2030 WFP) was published in 2010 in the midst of a recession caused by the fallout from the subprime mortgage financial crisis which produced a virtual halt to new development activity in the Truckee Meadows. The economic slowdown; loss of jobs and subsequent increase in residential vacancies; and to a lesser extent the effects of price elasticity resulting from conversion to an essentially fully metered system combined to produce a significant reduction in peak day water use. Other factors contributing to the decrease in peak day use include conversion from a 2-day per week outdoor watering schedule to a 3-day per week irrigation schedule in 2010 and a certain amount of demand hardening (a permanent decrease in water use) when TMWA asked its customers to conserve near the end of the most recent drought period in the summer/fall of 2014 and 2015. Comparisons of actual max day demands to the projections presented in the first two WFP's are summarized below:

2005-2017 Actual MDD vs WFP Projections

Year	2025 WFP MDD (MGD)	2030 WFP MDD (MGD)	Actual MDD (MGD)
2005	152.6		148.3
2006	154.2		140.8
2007	155.7		136.7
2008	157.3		133.2
2009	158.8		128.8
2010	160.4	136.8	123.2
2011	163.5	138.9	119.9
2012	166.5	141.0	125.6
2013	169.6	143.3	121.4
2014	172.6	145.2	119.7
2015	175.7	146.9	125.6
2016	178.0	148.6	139.6
2017	180.3	150.4	139.5

Even though it appears that the Truckee Meadows has entered another building boom period, the growth in peak day water use currently remains subdued. The slight uptick in peak day demand shown above after 2015 can be attributed to the

consolidation of former Washoe County water systems (17.9 MGD added in 2015) with the TMWA system on December 31, 2014. Based on revised/current projections, the max day demand on TMWA's supply and distribution facilities is anticipated to increase to about 197 MGD in 2035. This represents a more middle of the road forecast of the growth rate in max day demands as compared to those presented in the two previous WFPs. Although long-term population studies indicate that the various models converge around 2060, it appears that the long-term trend of per capita water use is slightly downward, or at best flat. A comparison of the 2025-2035 WFP max day demands with the current projections is presented as follows:

2010-2035 MDD Projections

Year	2025 WRP MDD (MGD)	2030 WRP MDD (MGD)	2035 WRP MDD (MGD)
2010	160.4	136.8	n/a
2015	175.7	146.9	159.7
2020	187.1	157.2	174.5
2025	197.6	166.8	185.3
2030	n/a	171.9	193.1
2035	n/a	174.9	197.3

The 2025 WFP concluded a comprehensive engineering analysis that thoroughly examined both the state of the existing TMWA system and provided a blueprint for future expansion to meet a future MDD of almost 198 MGD. Therefore, based on current demand projections and where that growth is occurring, it is not necessary to reinvent the wheel and the current WFP can focus on verifying or modifying recommended capacities and facility sizing, re-establishing priorities and determine the revised timing of recommended improvements.

Acquisition of the former Washoe County water systems represented a major change for TMWA. Although many of these systems were adjacent to TMWA systems and could be integrated fairly easily and quickly, TMWA had virtually no planning background or operational knowledge of these systems until pre-merger facility/operating assessments began in mid-2010. Besides the adjacent systems located in the Truckee Meadows, five "satellite" systems were also acquired including Stampmill in Wadsworth, Truckee Canyon at Mustang, Sunrise Estates in Pleasant Valley, Old Washoe Estates, and Lightning W in Washoe Valley. The transformation in service territory is depicted in the current retail service area map shown in Figure 1.

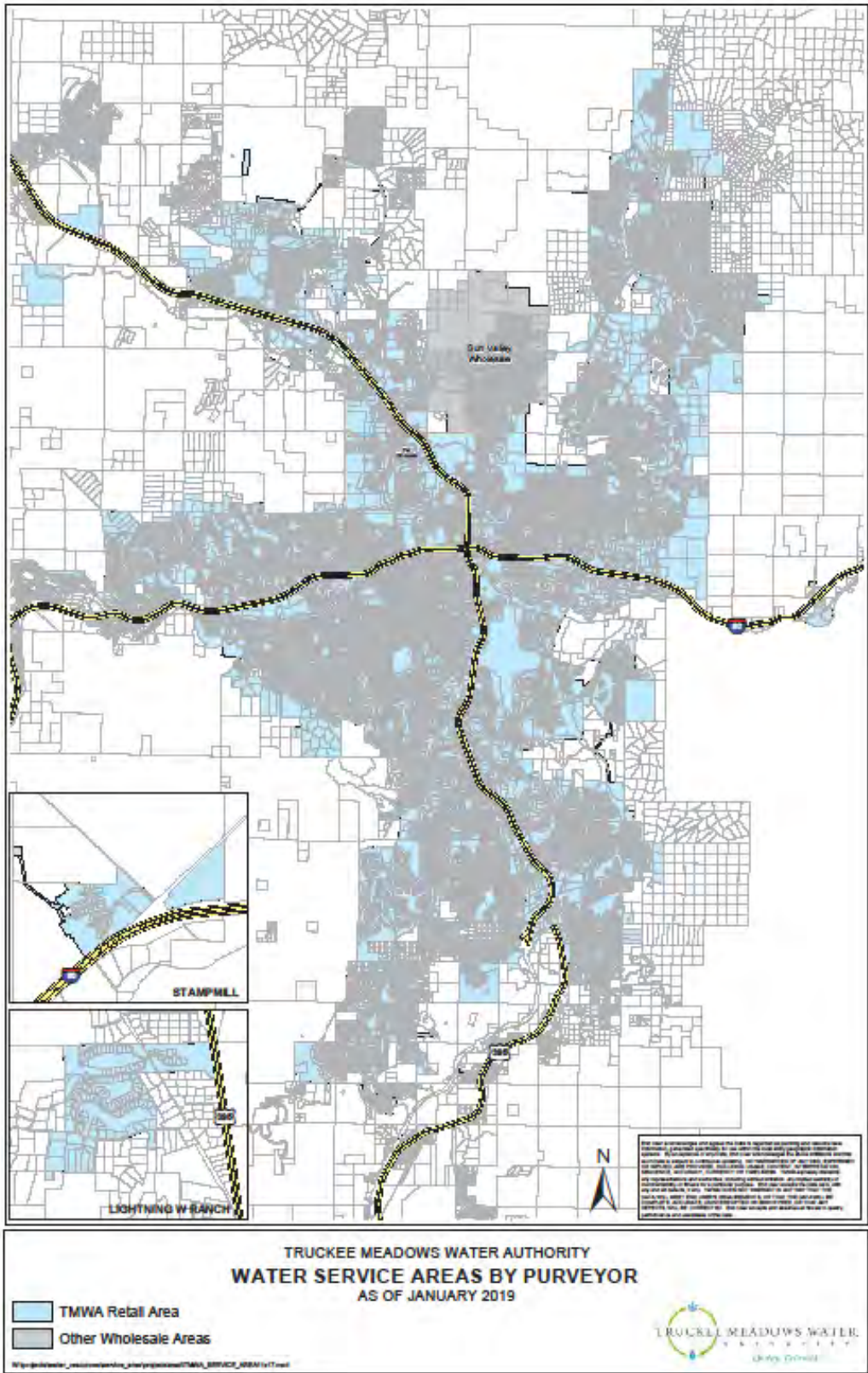


FIGURE 1

Most former County systems relied 100 percent on existing groundwater resources. Perhaps the most significant issue that had to be addressed post-merger was the viability of existing groundwater resources in former County systems, especially the Arrowcreek/Mt Rose/Galena area where groundwater levels had dropped up to 80 feet over a 10-year period.

Significant facilities acquired in the merger included the Fish Springs Groundwater Importation System capable of delivering up to 8,000 AFA to the North Valleys areas through a 30+ mile long, high pressure transmission pipeline. In response to the severe drought years of 2014 and 2015, this off-river source of supply was quickly integrated into the North Valleys systems through construction of the 24-inch Lemmon Drive water main.

Another trend that has been unfolding for several years that could have major implications for the TMWA water system is the continual increase in fire flow demand as established by the local Fire Authorities. This subject will be presented in greater detail in subsequent sections of this report.

Based on the issues described above, the primary objectives of the 2035 WFP are:

1. Analyze existing service levels in former County water systems and determine if service levels comply with NAC requirements.
2. Determine the facilities and required in-service dates to serve growth in former County water systems.
3. Determine if modifications are necessary to facility recommendations made in the previous WFP.
4. Present revised unit demand factors and peak day factors for each rate class.
5. Identify revised in-service dates and update cost estimates for recommended water system facilities. This information will provide the basis for updating TMWA's funding plan and developer facility charges.
6. Identify facility improvements necessary to meet current fire flow requirements.
7. Analyze the ability of the water system to continue operating with the loss of supply from the Truckee River.

THE WATER FACILITY PLAN IN REVIEW:

An impressive amount of water system infrastructure has been constructed in the past 18 years. Major accomplishments include:

- Replacement of the North Virginia pumping system and the Stead-Silver Lake pumping system with a \$30 million combined supply system meeting the needs of growth and existing customers.

- Replacement of the rock and rubble diversion structure for the Glendale WTP with a new, modern fish and boater friendly concrete diversion structure to insure the ability to capture and treat privately owned stored water during drought conditions and to take advantage of the full treatment capacity of the Glendale facility.
- Construction of a new effluent pumping station at the Glendale WTP along with the first four phases of the NE Sparks Feeder Main to supply the growing area of Spanish Springs Valley.
- Acquisition and permitting of a site for the future Sparks GWTP which will diversify the overall water supply and provide additional drought supply.
- Completion of the Highland Ditch Improvement Plan which allows 100% of the raw water supply to the Chalk Bluff WTP to be provided via gravity-flow and significantly increases the reliability of the raw water supply to our most important treatment facility.
- Integration of the Fish Springs groundwater supply into the TMWA system providing additional operational flexibility and drought protection.

Major facility challenges facing TMWA in the future include integration of the supply from the Mt. Rose WTP into the local distribution system on the fan and expanding conjunctive use in that region; potential treatment of poor quality groundwater (primarily nitrate removal) in Spanish Springs; expanding supply capacity to the South Truckee Meadows; replacement of backbone transmission mains in the gravity zones; and expansion of the water system into the Verdi area.

Based on the planning and analysis presented herein, staff is recommending improvements with the following estimated costs over the 20-year planning period between 2015-2035:

Water Facility Expenditures 2015-2035

Facility Category	Total Cost	Cost Allocated To Growth
Supply	\$ 99,400,000	\$ 82,300,000
Storage	\$ 23,900,000	\$ 17,600,000
Distribution	\$103,800,000	\$ 89,400,000
Totals	\$227,100,000	\$189,300,000

The types of project costs not allocated to growth include fire flow deficiencies, off-river reliability, replacement of existing wells, storage for existing customers and major main replacements. Other supply project costs not allocated to growth include a portion of the Mt Rose WTP and the proposed Spanish Springs Nitrate Treatment Plant that will treat existing groundwater supplies.

SECTION 2

WATER USE AND DEMANDS

BASE CASE DEMAND

Before future demands can be considered in the planning process, a base case condition needs to be established which accurately quantifies and distributes existing demands by geographic location. For this WFP, the billing data for 2012 has been established as the base case condition of average daily usage. Water use in 2012 was higher than metered use in the 2013-2015 period even though the number of services increased. This is primarily due to effects of extreme drought experienced in the summer/fall of 2014 and 2015 when TMWA publicly requested its customers to conserve at least 10 percent. The billed water use for new services added between 2012 and 2015 was added to this base demand to create the initial 2015 base demand for the 2035 WFP.

As previously mentioned, water demands for the current 2035 WFP differ from previous WFP's due to:

- A conversion from a 2-day per week irrigation schedule to a 3-day per week irrigation schedule in 2010.
- Consolidation of former County water systems into the TMWA system effective December 31, 2014.
- A conversion of all residential flat rate customers to a metered rate in October 2015.
- A public request by TMWA for its customers to reduce water use by at least 10 percent in the summer/fall of 2014 and 2015.

To be conservative, this WFP assumes a 10 percent non-revenue water (or unaccounted for water) use factor even though a mass balance analysis may reflect a slightly lower value.

Future maximum day demand projections were based on analyzing three different growth patterns: (1) TMRPA Rapid Early Growth with Historic Growth Pattern (Dec 2016); (2) TMWA New Business Inquiries from 2014 to present; and (3) TMWA Vacant Parcel Analysis. Using the three growth patterns to bracket potential growth rates in specific geographical locations, engineering judgement was then applied to generate the final regional growth percentages, which were then applied to the overall growth in demand presented in the 2035 Water Resource Plan approved by the TMWA Board in March 2016. The max day projections for the 20-year planning period of 2015-2035 is presented in Appendix A.

UNIT DEMANDS & PEAKING FACTORS

With system-wide billing data linked to the GIS mapping system it is possible to establish average unit demand factors for each service/parcel and to compile the average monthly demand for each rate class within specific pressure zones. In the past, daily meter reads obtained during the peak summer months provided data for establishing average day to maximum day peaking factors; however, daily meter read studies have not been performed in recent years. As a result, water production data and changes in storage volumes acquired by the Supervisory Control and Data Acquisition (SCADA) system for the South Truckee Meadows and the pre-merger TMWA system were analyzed to establish peak day consumption values. These peak day values and average monthly metered use data were then utilized to generate a peak day to maximum month peaking factor. The average value produced by this analysis was a peaking factor of 1.15. Application of this peaking factor to average day of max month metered use data allows the establishment of the maximum day demand and the average day to maximum day peaking factor for each rate class as shown in Table 1 below.

TABLE 1

AVERAGE USE & PEAKING FACTORS BY RATE CLASS

Rate Code	Description	Avg Day Demand (gpm)	Max Day Demand (gpm)	Max Day Peaking Factor
GMWS	Commercial	1.42	2.24	1.58
MIS	Metered Irrigation	2.16	5.48	2.54
MMWS	Metered Multi-Unit Residential	0.10	0.14	1.37
RMWS	Metered Residential	0.38	0.74	2.13

Notes:

1. Average Day Demands are 2012 metered use data plus 10% non-revenue loss factor.
2. Max Day Demands are Average Day of Max Month x 1.15 Peaking Factor.
3. Max Day to Average Day peaking factors are the average for 2010-2013.
4. Residential demands are based on the system wide median value. Residential MDD is calculated on a lot-size basis to account for domestic + irrigation.

Historically, the system wide maximum day peaking factor has been in the range of 1.9-2.0. Areas that are predominantly single family residential have historically shown higher peaking factors than other uses. The maximum day of use has historically occurred on a residential irrigation day during extended periods of high temperatures. However, with the change to a 3-day per week irrigation schedule, commercial irrigation now occurs on the peak day and irrigation peak factors exceed residential peak factors. The result is a significant increase in projected peak day irrigation demands and an associated increase in facility charges for that use. Table 2 shows the maximum day of water production for the last 13 years.

TABLE 2 - HISTORICAL PEAK DAYS

Year	Peak Day	Demand (MGD)
2005	Wednesday, July 20	148 ⁽¹⁾
2006	Wednesday, July 26	141
2007	Wednesday, August 1	137
2008	Wednesday, July 9	133
2009	Sunday, July 26	129
2010	Tuesday, July 20	123 ⁽²⁾
2011	Tuesday, August 9	120
2012	Thursday, July 12	126
2013	Sunday, July 21	121
2014	Thursday, July 3	120 ⁽³⁾
2015	Tuesday, August 18	126 ⁽³⁾⁽⁴⁾
2016	Tuesday, August 2	140
2017	Tuesday, July 18	140
2018	Tuesday, July 17	145

- (1) Highest peak day demand recorded (back to back 107 degree days).
 (2) 3-days per week irrigation schedule implemented in 2010
 (3) Drought year – water conservation requested
 (4) Merger completed - County demands (17.9 MGD) included

Utilizing rate class specific peaking factors improves the accuracy of maximum day estimates by pressure zone since each zone has a specific mix of various use categories. Peak hour demands are estimated by multiplying the maximum day demand by a peaking factor. Experience has shown that the peak hour factor will range from about 1.3 to 2.0 depending upon the level of mixed use in the zone. Analysis of metered use data from zones with reasonably accurate flow metering and either mixed use or 100 percent residential use suggests that a zone with 100 percent single family residential will have a peak hour multiplier of about 1.8 to 2.0, while a 50 percent single-family residential allocation will be closer to 1.3. Without zone specific hourly demand information, it is necessary to validate the assumed hourly peaking factors by calibration of the hydraulic model against available historical SCADA data.

As previously discussed, since the last (2030) WFP, water use has decreased even while population and the number of services continue to increase (reference Figure 3.1 of the 2035 WRP below), thus it is recommended that unit demands be reset for calculating new business /developer fees. Since lower unit demands also result in lower buildout demands, the changes are not anticipated to significantly change the total cost of developer fees since the unit costs of Area Fees and STS Fees will increase, but they will be multiplied by a smaller max day demand.

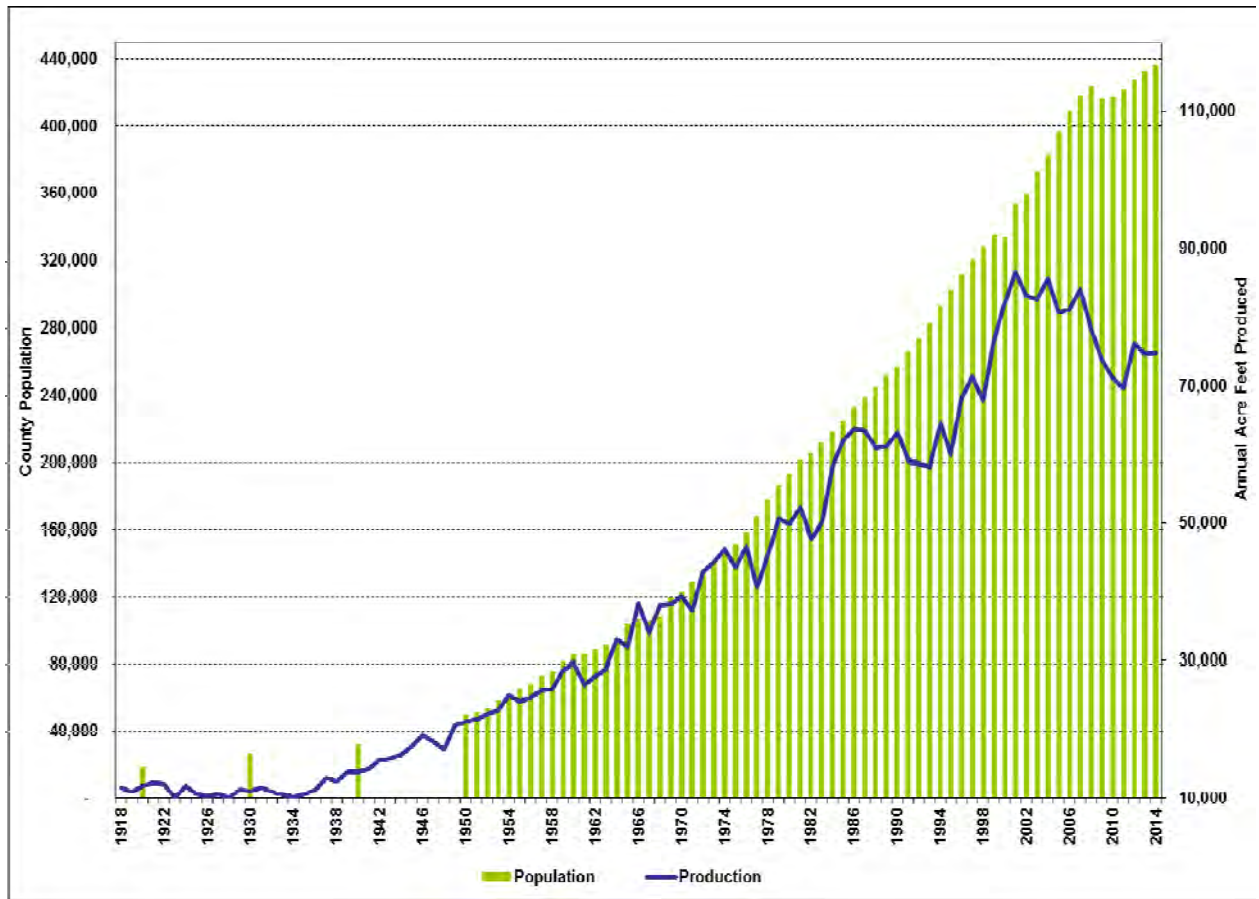


Figure 3-1. Comparison of Washoe County Population to Water Production (2035 WRP)

UNACCOUNTED FOR LOSSES

Unaccounted for water is typically reported or estimated as 7-15 percent for the water utility industry, with 10 percent being a commonly reported value. Unaccounted for water includes demand from hydrant testing, unauthorized use, leakage and meter inaccuracy or failure. The selected 10 percent unaccounted for value may be conservative since mass balance calculations indicate a lower value. However, the mass balance method is only as good as the accuracy of metered source pumping or water production flow values as compared to metered consumption data. Water meters have a range of anticipated accuracy which can be impacted by meter age and service conditions. Compounding inaccuracies in older meters operating under predominately low flow conditions can reach a level of 10-20 percent degradation in accuracy. TMWA does have an active main replacement program associated with street repaving projects and TMWA aggressively pursues repairing leaks and sources of leakage. TMWA has also developed a main replacement program which identifies priorities from an engineering perspective for this important rehabilitation category. A future smart meter replacement program should produce a trend of reducing losses by identifying potential leaks on the customer side much more quickly.

SECTION 3

TREATED WATER STORAGE

Treated water storage serves several purposes. Storage is provided to equalize the demand on the water supply over a daily period. Storage is also relied upon to provide water to meet fire suppression requirements, provide a degree of operational flexibility when maintenance and repair of treatment and supply facilities are necessary and provide system reliability in emergency situations. Total Storage requirements consist of Operating, Emergency and Fire Storage components.

There are several sections of the NAC 445A regulations that are directly applicable to operating, fire and emergency storage components; however, there are also sections pertaining to “capacity” that include combinations of treatment, storage and pumping capacities under various demand conditions. The sections that apply to storage only will be referenced below and the general or combined capacity sections will be referenced in a later section of this WFP.

OPERATING STORAGE

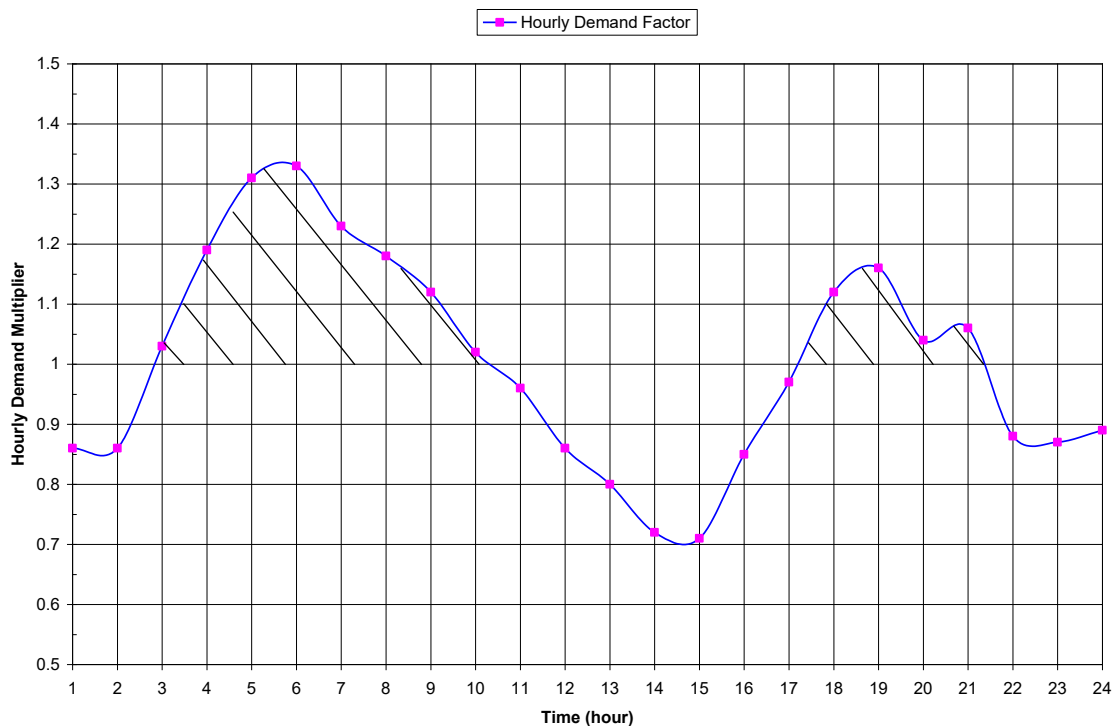
NAC 445A.6672, .6674 and .66745 address operating storage. Operating storage is necessary to supply peak water demands that exceed system production capacity from treatment plants, wells and pump stations. Constructing supply and treatment facilities with sufficient capacity to meet instantaneous peak water demands is inefficient and uneconomical since a significant amount of plant capacity will remain idle for a majority of the time. In addition, most treatment processes are not amenable to rapid and constant changes in flow rate. TMWA supply, treatment and pumping facilities are designed to meet maximum day demands. Therefore, operating storage requirements are based on the volume of water needed to supply peak demands that exceed the average demand on the maximum day of use.

Selection of the desired operating storage volume is highly dependent upon production or pumping capacity, the time of pumping for pumped storage systems and the magnitude of the hourly variation in water use. With a metered supply source and accurate tank levels, a demand curve showing the hourly variation in demand over a 24-hour period can be plotted for any pressure zone as presented in Figure 2 below. For the maximum day scenario, the y-value of 1.00 (100 percent) represents the average demand on the maximum day and, for TMWA, also represents the “design” production and/or pumping rate. The area under the curve above the y-value of 1.00 (see hatched area) represents the volume of operational storage that should be provided to meet the hourly demands that exceed the available production or pumping capacity. Analysis of the diurnal demand curve for TMWA’s gravity zones in 2010 (Figure 2) indicates a need for

only about seven percent of the average demand as operational storage assuming a steady supply equal to the maximum day demand. It should be noted that the seven percent value is somewhat conservative, since it does not reflect the areas under the y-value of 1.00 (but above the curve) where operational storage is being replenished. To provide some flexibility for equipment outages and supply disruptions, TMWA provides 15% of the maximum day demand of the tank zone as the operating storage component.

Figure 2

Gravity Zone Peak Water Use Pattern



A decision to provide more than 15 percent of the maximum day demand as operational storage depends on several factors including the estimated peak hour demand, the physical ability to pump at rates greater than the max day, the economic benefits of employing off-peak pumping, the incremental cost of the larger tank, and whether redundant capacity is unavailable making it is necessary to rely on a 100 percent equipment utilization factor during the peak use period. In any zone, if the steady supply is compressed into a 12-hour period (or less), as for off-peak pumping, the required operating storage volume can easily reach between 30 and 50 percent of the maximum daily use. The trend in electric rates over the last 15 years has been to shift more costs from the old demand charge component to a new facility charge component. The facility charge is based on connected kW load and is applicable when any of the equipment is operated during the month. If the trend continues, there will be less and less incentive to perform off-peak pumping. Since development within a new tank zone normally takes a

significant period of time to reach buildout, the lower turnover rate of the large volume of stored water can create taste, odor and other water quality problems such as disinfection byproducts. Therefore, there is less motivation to provide excess storage beyond what is absolutely required to operate the system in a safe and reliable manner in compliance with regulations. The incremental first cost of additional operational storage primarily depends on excavation and grading requirements for the site, which is normally relatively small. However, due to the previously discussed factors, it is concluded that a minimum operational storage component equal to 15 percent of the max day demand is appropriate in most cases. Operational storage is provided for all demand classes, including wholesale demands, unless positive flow control can limit or cap the wholesale maximum day demand.

FIRE STORAGE

Subsection 2 of NAC 445A.6674 states that fire storage requirements must be calculated according to the requirements of the fire authority and that the health authority shall evaluate the design of a public water system based upon appropriate documentation of those requirements.

Fire storage is provided for the welfare of the general public so that water for fire suppression is available at all times. Required fire flows are assigned to new development projects by the local fire protection agency having jurisdiction in the area based on the International Fire Code (IFC). The evaluation process takes into account several factors including type of construction, flammability of construction materials and square footage of the structure. Storage for fire protection is calculated by multiplying the required fire flow by the required time necessary to control or extinguish the fire. Since water storage facilities generally serve widespread areas containing mixes of commercial and residential uses, the required fire storage volume for a particular area or pressure zone must be based on the largest fire flow demand within that area. All three local fire agencies (City of Reno, City of Sparks, Truckee Meadows Fire Protection District) have adopted a version of the International Fire Code (IFC) to set required fire flow. Typical fire flow requirements in the Reno-Sparks area are 1,000-2,750 gallons per minute (gpm) for residential, 3,000-3,750 gpm for commercial, and 4,000+ gpm for large industrial development depending on the aforementioned criteria. These fire flow demands are inclusive of internal fire sprinkler system supply which may reduce the required hydrant flow, but usually not the overall fire flow demand. The required fire flow duration is a function of the required flow and can vary from two hours for flows up to 2,750 gpm, up to four hours for a fire flow of 4,000 gpm.

Fire storage requirements for existing pumped storage systems must be addressed on a zone-by-zone basis and are based on the largest fire flow requirement in that zone. In each of TMWA's major gravity zones, a fire flow demand of 4,000 gpm for four hours is provided. In continuous pumping zones without storage facilities, it is assumed that fire storage is provided from the zone

providing suction supply to the area, which may be a tank or a gravity zone reservoir. Fire storage for multiple simultaneous fire flow demands in the same zone are not explicitly provided or planned for; however, this level of redundancy could be accommodated through use of emergency storage reserves. In zones with multiple storage tanks, fire storage can be distributed as long as the total requirement is met and the storage is accessible. A certain amount of fire storage must be provided within every pressure zone; however, it does not necessarily have to be provided for wholesale customers who generally maintain their own storage facilities.

Historically, going back to the 1970's when significant growth began to occur in the region, required fire flow for residential development in the unincorporated areas was on the order of 500 gpm. Even into the early 2000's, region-wide residential fire flow was no larger than 1,200-1,500 gpm. The larger fire flow requirements for in-fill projects located in fully developed areas can be very problematic – especially when storage tanks were sized to meet much smaller fire flows and space for an additional tank is non-existent. Even if it is possible to continuously reallocate excess storage to the fire storage component, the physical limitations of the distribution system may not provide enough capacity to deliver the higher fire flow.

EMERGENCY STORAGE

NAC 445A.6675 and NAC 445A.66755 apply to emergency storage requirements. Emergency storage provides water for domestic use when equipment fails, distribution or treatment facilities are inoperable, or when natural disasters or emergency conditions curtail normal water supplies. The magnitude of this storage component depends on the susceptibility of system components to failure, the time needed to obtain replacement parts and make repairs, the reliability and diversity of supply sources, system operational constraints which could affect the availability of alternate supplies, and the physical configuration of the system which could affect the ability to transfer supply from zone to zone.

Curtailment or unavailability of surface water supplies due to a non-persistent contaminant spill in the Truckee River is a realistic, but low probability threat. TMWA is fortunate to have a diverse water supply consisting of both surface water and ground water. The minimum water supply necessary to meet the essential sanitary and culinary needs of the community is approximately equal to the total system demand on a typical winter day (indoor use only). Based on historical records, this demand level is about 50 percent of the average day demand for the year. Under this criterion, the current ground water production capacity of about 95 MGD (contiguous Truckee Meadows area) is adequate to supply the essential water needs of the community during an emergency situation where the surface water supply is temporarily unavailable. The 95 MGD of ground water capacity could theoretically provide a minimum emergency supply to a system with an average day demand of about 190 MGD.

An off-river supply scenario under 2035 average day demand is discussed in the Gravity Zone report contained in this WFP. In summary, with the construction of several strategically located bypasses to transport excess well capacity from former County systems, the production output from the future Sparks Groundwater Treatment Plant (2030), the Longley Groundwater Treatment Plant, the Mt. Rose Water Treatment Plant (2020) and treatment of poor quality groundwater at the Glendale WTP, the TMWA water system can continue to supply the essential water needs of the community during an emergency situation where the supply from the Truckee River is not available.

Another reliability concern is the ability to treat highly turbid river water. Historically, summer thunderstorms in the Gray Creek and/or Bronco Creek drainages of the Truckee River have produced extreme raw water turbidities during times of very high water use. This issue was originally addressed and evaluated during the planning phase for conversion of the Hunter Creek and Highland treatment plant sites to treated water storage facilities. The decision to implement solids handling processes at the Glendale WTP resulted in a reduction in recommended emergency storage volume at Hunter Creek and Highland, but significantly increased the reliability of the surface water treatment plants. Based on the available record, the worst turbidity event on the river occurred during the period of 7/15/92 to 7/21/92, producing average 3-, 5- and 7-day raw water turbidities of 1051, 874 and 543 Nephelometric Turbidity Units (NTU's, a measure of water clarity), respectively. Both surface water treatment facilities are capable of treating and handling an average total suspended solids (TSS) loading of about 1300 mg/L (1 TSS \approx 1 NTU in this range) for four days. If raw water and water recovery basins are expanded (planned in conjunction with construction of Chalk Bluff Phase 4), the average solids handling capability of the Chalk Bluff WTP would be increased slightly to a level of about 1750 mg/L for the four-day design period. It is noted that during the initial 8-12 hours of a significant (i.e. magnitude and duration) turbidity event, it is anticipated that surface water production will be reduced appropriately to allow process refinement and necessary adjustments to be made. Under these assumptions, a significant amount of system wide emergency storage would be required along with all available groundwater capacity.

TMWA's current design standard is to provide an emergency reserve equal to at least one average day of use. Based on the estimated 2035 maximum day demand and an overall 2:1 max day to average day peaking factor, the 2035 average day demand should be on the order of 98 MGD. As for the other storage components, it is necessary to evaluate emergency storage requirements for existing pumping zones and pumped storage systems on a zone-by-zone basis since it is necessary to determine whether there is a physical means to deliver additional supply from, or transfer surplus to, adjacent areas.

EVALUATING EXISTING STORAGE VOLUMES

Because storage design/sizing criteria and required fire flows change over time, TMWA's storage requirements for existing pumped storage systems must be addressed on a zone-by-zone basis. Fifty percent of TMWA's storage tanks were designed and constructed more than 25 years ago under criteria (fire flow, development projections, zone boundaries, unit demands, tank sizing philosophy, etc.) which were undoubtedly different than those in use today. For these reasons, some systems may not have the storage volume desired under current criteria.

Due to the critical nature of the emergency and fire storage components, it may be reasonable to assume that the operating storage component would provide some flexibility when faced with a storage deficit. Based on the previously discussed sizing criteria, some flexibility is provided with an operating storage component equal to at least 15 percent of the average maximum day demand. For existing zones, one possible methodology to establish whether adequate storage exists consists of subtracting the required emergency storage volume and the required fire storage volume from the total storage available to yield the available operating storage component. Under this methodology, if the available operating storage volume is less than 15 percent of the maximum day demand, it may be necessary to increase alternative pumping capacity, add storage, or construct interties with adjacent zones having excess capacity. Unless the original tank site can accommodate a second tank, it is usually very difficult and sometimes impossible, to acquire suitable property (due to zoning and elevation constraints, permitting issues, etc.) to construct additional storage tanks in areas of existing development. If an accurate daily demand curve has been developed for the zone from meter and tank data, the necessary incremental volume between the max day and peak hour demands can be determined; however, this bare minimum operating volume would not provide any buffer should there be a disruption in supply.

Alternatively, if total storage required exceeds the storage provided under normal sizing criteria, the deficiency can be assigned to excess storage capacity in an adjacent tank zone, or at one of the large gravity zone reservoirs depending on whether alternative pumping capacity is provided.

CURRENT STORAGE REQUIREMENTS

As previously discussed, overall system storage values do not reflect the requirements within specific pressure zones. A storage surplus in a particular tank zone may not provide any benefit if it is not possible to transfer that surplus to areas with deficiencies. In general, TMWA pressure zones are backed up by at least one regulated intertie supplied by gravity flow from higher elevation tank zones. The following presents an analysis of current (2020) storage requirements for the major gravity and pumping systems.

2020 SYSTEM WIDE STORAGE

From a system-wide standpoint, in 2020, approximately 138 MG of storage will be required and about 174 MG of storage will be provided, producing an apparent storage surplus of about 36 MG. The available storage does not include treatment plant tanks used as chlorine contact chambers. Surplus storage in one tank zone is not necessarily available to other tank zones with storage deficiencies; however, surplus storage in the Hunter Creek and Highland reservoirs is physically available to other “downstream” zones. A macro-level analysis of the 2020 storage requirements for the major gravity zones and geographical areas is summarized in Table 3.

Table 3 - 2020 SYSTEM-WIDE STORAGE REQUIREMENTS

Zone or Geographical Area	Total Storage Provided (MG)	Minimum Storage Required (MG)	Storage Surplus or (Deficit) (MG)
Hunter Creek Gravity	34.00	3.86	30.14
Highland Gravity	25.50	18.84	6.66
Sparks Gravity	6.00	21.58	(15.58) ⁽¹⁾
Southwest Reno	11.40	12.29	(0.89) ⁽²⁾
North Reno	28.32	21.11	7.21
Northwest Reno	18.51	14.74	3.77
South Truckee Meadows	28.42	26.90	1.52
NE Sparks/Spanish Springs	21.35	18.15	3.20
TOTALS	173.50	137.47	36.03

Notes:

1. Surplus storage in the Hunter Creek Reservoir is readily available to the Sparks Gravity zone via gravity flow primarily through the Urban, Nixon and Prater Regulating Stations and several other smaller pressure regulating stations.
2. The majority of the deficit in the SW Reno area is made up by alternative pumping capacity (standby power) at the Hunter Creek/Ross pump station. The balance of the deficit can be made up from excess storage in the Skyline system delivered via the Manzanita PRS/bypass.

2020 INDIVIDUAL TANK ZONE STORAGE

Major pumped storage systems that take suction directly or indirectly off the gravity zones were congregated into the geographical areas listed in Table 4. The 2020 storage tables in Appendix B present the results for each major pumping system located in these geographical areas. The storage tables break down the required storage volume for each system into operating, fire and emergency components. Well production, alternative pumping capacity and interties to adjacent systems are identified. Surplus storage and storage deficits are discussed below along with a high-level description of water supply to the area.

Southwest Reno

The Southwest Reno area includes Caughlin Ranch, Skyline, pumping systems south of West Plumb Lane and Lakeridge/Ridgeview. Although the Highland Gravity zone provides suction supply to the Lakeridge/Ridgeview system, the supply comes from the Hunter Creek Reservoir through the Nixon/Monroe and Urban/Plumas regulators. The remainder of the Southwest area is supplied directly from the Hunter Creek Reservoir. Due to its elevation, the 3.0 MG Caughlin Ranch tank is capable of supplying water to the entire area under emergency conditions. Under a normal service scenario that now includes most of the old continuous pumping zones in the Southwest Reno area, the Caughlin Ranch tank contains a small surplus. However, under an area-wide power outage, the tank is also required to supply the Daniel Webster continuous pumping system and the Markridge 2 continuous pumping zone. In addition, there are storage deficiencies in the Southwest Terrace tank zone and the Ridgeview/Lakeridge tank zone that need to be addressed.

By 2020, the Southwest area shows an overall storage deficit of about 0.9 MG; however, over 50 percent of the deficit can be satisfied by existing alternative pumping capacity at the Hunter Creek/Ross pump station (standby generator) located at the Hunter Creek Reservoir site. Depending on the extent of a power outage in the area, the Ridgeview/Lakeridge deficit can be greatly reduced by excess storage in the Skyline 1 & 2 tanks, but a normally closed valve on Dant would need to be manually opened. In addition, the Lakeside Well (1.1 MGD) discharges directly into the Lakeside/Plumas zone. There are several options available to correct or modify the storage deficiencies in the area. One option would be to add standby power to the proposed Southwest pumping system which would ultimately deliver water to both the Lakeridge and Ridgeview tanks. Another recommended alternative is to add a 1.5 MG storage tank to the existing Caughlin #5 continuous pumping zone when the upper part of the zone develops. Another option to reduce the deficit will become available with future phases of The Ridges development above Plateau Road, which will complete an emergency intertie to the Caughlin #3 zone from The Ridges tank.

North Reno

The North Reno area includes the area surrounding the Highland Reservoir (UNR to Keystone Ave.), Sun Valley, Valley Road, Socrates, North Virginia, Stead, Silver Lake, Horizon Hills and Lemmon Valley. There are two major pumping systems that provide redundancy and operational flexibility to the area. One is the North Virginia/Stead pumping system which takes suction from the Highland Reservoir and discharges into the Raleigh Heights storage tanks (8 MG total) through about six miles of high pressure 36" and 30" transmission main. From the hydraulic hub of the Raleigh Heights tanks, water can be delivered by gravity flow to Stead/Silver Lake, Lemmon Valley, Sun Valley, Socrates/Valley Road and the entire North Virginia corridor. The other major pumping system is the Fish Springs groundwater importation system which can currently deliver up to 8,000 acre-feet per year (AFA) to the 2.5 MG Terminal Tank located in the north end of Lemmon Valley. The

Terminal Tank discharges through about ten miles of 30" and 24" high pressure transmission pipe on Lemmon Drive. This pipeline can serve the entire Lemmon Valley area via pressure regulated interties and ultimately connects to the North Virginia system via a SCADA controlled valve station at North Virginia. This station allows Fish Springs water to be supplied by gravity flow to Stead/Silver Lake and the entire North Virginia corridor. The intertie also allows Raleigh Heights storage to back up the Fish Springs supply and may also supply Fish Springs water to future growth in Cold Springs.

With current facilities and no new improvements, the storage deficit in the Sun Valley system will be about 1.0 MG by 2020. This deficit will be erased through construction of the proposed Sun Valley #2 tank (scheduled to be in service in the summer of 2021). An apparent deficit of 0.67 MG in the Stead/Silver Lake system is taken care of by the large (6 MG) storage surplus in the Raleigh Heights tanks. In addition, the Stead/Silver Lake system has about 4.9 MGD of groundwater capacity backed up by standby generators and Lemmon Valley has about 3.5 MGD of groundwater capacity (dual electric circuits). Ultimately, when the Fish Springs resource is fully dedicated, about 1.5 MG of operating storage will be required at the Terminal Tank to meet peak demands on the system. A second 2.5 MG Terminal tank is proposed for 2023 depending on the rate of actual growth.

Northwest Reno

This area includes West Seventh St, Kings Row, Northgate, Somerset, Mogul and Verdi. The primary supply for the area comes from the Hunter Creek Reservoir and the Chalk Bluff WTP effluent pumps. The Northwest system is highly interconnected and has a large amount of alternative pumping capacity with standby generators at Chalk Bluff, Mae Anne/McCarran (east side pump train), Beaumont and Somerset pumping systems. An overall storage surplus of about 3.8 MG is anticipated for 2020 in the Northwest Reno area and all tank zones have adequate emergency supply. New storage is planned for the Verdi area when the area west of Somerset develops. With acquisition of the Boomtown water facilities, Boomtown storage (2 MG) will be available to back up the lower Verdi area. The Boomtown system also has about 1.3 MGD of groundwater capacity.

South Truckee Meadows

The South Truckee Meadows (STM) area consists of a lower area that includes Hidden Valley, Longley/South Virginia, Double Diamond and STMGID East and an upper area which includes STMGID West and the Arrowcreek/Mt Rose/St James systems. From the Double Diamond area, the service area rises over 2000 feet in elevation, topping out at the Mt. Rose 3 tank which has an overflow elevation of about 6680 feet. Except for the Longley/South Virginia system, all STM water systems were formerly owned and operated by Washoe County. Historically, the Hidden Valley system was supplied with TMWA surface water; however, in 2007 a groundwater treatment plant was constructed by the County that became the primary source of supply to the area. After the merger of TMWA and County water systems in 2015, the treatment process was deactivated and the facility's effluent

pumps used to deliver surface water to Hidden Valley. Historically, the Double Diamond and STMGID East systems were supplied with TMWA wholesale surface water, but the systems located on the upper Mt. Rose fan relied 100 percent on local groundwater supply.

By 2020, the lower area shows an overall storage surplus of about 0.5 MG. An apparent storage deficit in the Zolezzi tank is satisfied with alternative pumping capacity (generator) at the South Hills pump station. The lower area also has about 10 MGD of groundwater capacity.

The upper area shows an overall storage surplus of about 1 MG in 2020. The upper zones are highly interconnected, but generally in a one-way direction via gravity flow through pressure regulating stations. There are minor storage deficits in the Arrowcreek 1 tank zone and in the Mt. Rose 1/4 tank zone depending on the fire storage requirements. A more significant storage deficit of about 0.8 MG will exist in the STMGID 4/5 zone. This deficit will be satisfied with alternative pumping capacity (generator) at the proposed (2020) STMGID conjunctive use pump station and pipeline in Arrowcreek Parkway.

Northeast Sparks & Spanish Springs Valley

Northeast Sparks (NES) is made up of original TMWA systems including D'Andrea, The Vistas, Wingfield Springs and Kiley Ranch. The Spanish Springs Valley (SSV) area consists of former County systems including Spring Creek and Desert Springs. The primary supply to the NES systems comes from the Glendale WTP, but the area does contain one 4.3 MGD well. All NES systems have alternative pumping capacity backed up by standby generators. The SSV systems receive a baseload supply of surface water through interties at Canoe Hill, Lazy 5 and Campello and the peak supply is provided by about 8.4 MGD of local groundwater.

In 2020, an overall storage surplus of about 2.4 MG is forecast for the NES systems. There are no single zone deficiencies to address; however, there are three continuous pumping zones in the area.

The SSV area also shows an overall storage surplus in 2020. There is a minor storage deficiency in the Spring Creek 3/4 tank zone, but there is also 3.7 MGD of alternative pumping capacity (dual circuits) from wells within the zone.

Satellite Systems

Five satellite (non-contiguous to PWS190) water systems were acquired as a result of the merger. Three of them (Sunrise, Old Washoe Estates, Lightning W) are located in the Pleasant Valley and Washoe Valley areas south of Reno. The Truckee Canyon system is located at Mustang just east of Sparks and the Stampmill system is located near Wadsworth. There are minor storage deficiencies at Sunrise and Lightning W, but the deficiencies are mitigated by alternative pumping capacity (standby generators) at the wells.

Continuous Pumping Zones

The Spanish Springs 1, Wingfield Hills, Satellite Hills, Point View, Longley and Huffaker pump zones operate as continuous pumping zones. A new above ground pump station with standby power will replace the existing Satellite Hills facility in 2018 and a main tie will be extended to the Spanish Springs 1 zone that will allow retirement of that pump station. Future development in the Vistas is anticipated that will allow for a main tie between the Vista 3 tank and the Wingfield Hills pump zone. The Vista 3 tank was oversized for the Wingfield Hills demand when the tank was constructed in 2008. The Point View pump zone receives some emergency protection from a check valve intertie to the discharge side of the Pyramid pump station, but pressure at the top of the zone is less than 10 psi. The Longley pump station has a 288 kW standby generator and the zone is also backed up by interties to the Double Diamond system at South Meadows Parkway and at The Alexander Apartments. The Huffaker pump station is equipped with a 150 kW standby generator.

FUTURE STORAGE REQUIREMENTS

2035 SYSTEM WIDE STORAGE

From 2020 to 2035, the total maximum day demand (MDD) is anticipated to increase by 22.8 MGD. From a system-wide standpoint, in 2035, approximately 155 MG of storage will be required and about 191 MG of storage will be provided, producing an apparent storage surplus of about 35 MG. As noted in the previous section, surplus storage in one tank zone is not necessarily available to other tank zones with storage deficiencies; however, surplus storage in the Hunter Creek and Highland reservoirs is physically available to other “downstream” zones. A macro-level analysis of the 2035 storage requirements for the major gravity zones and geographical areas is summarized in Table 4.

Table 4 - 2035 SYSTEM-WIDE STORAGE REQUIREMENTS

Zone or Geographical Area	Total Storage Provided (MG)	Minimum Storage Required (MG)	Storage Surplus or (Deficit) (MG)
Hunter Creek Gravity	34.00	3.89	30.11
Highland Gravity	30.60	19.31	11.29
Sparks Gravity	6.00	22.28	(16.28) ⁽¹⁾
Southwest Reno	11.40	12.61	(1.21) ⁽²⁾
North Reno	32.57	25.35	7.22
Northwest Reno	20.01	16.71	3.30
South Truckee Meadows	32.02	30.39	1.63
NE Sparks/Spanish Springs	24.10	24.67	(0.57)
TOTALS	190.70	155.57	35.13

Notes:

1. Surplus storage in the Hunter Creek Reservoir is readily available to the Sparks Gravity zone via gravity flow primarily through the Urban, Nixon and Prater Regulating Stations and several other smaller pressure regulating stations.
2. The deficit in the SW Reno area does not reflect alternative pumping capacity (standby power) at the Hunter Creek/Ross pump station and at the proposed Southwest pump station that will consolidate several existing pump zones.

The system-wide storage surplus forecast for 2035 is very similar to the surplus indicated in Table 4 for 2020. This is because most of the growth is anticipated to occur in the foothills surrounding the Truckee Meadows and each project will be required to construct and dedicate storage facilities. The 2035 storage table includes 10 new storage tanks in the areas where this growth is expected to occur. In addition, 5 MG of storage will be added to the Highland Gravity zone to increase reliability (Highland Reservoir) and improve tank turnover (Rattlesnake).

2035 INDIVIDUAL TANK ZONE STORAGE

The 2035 storage tables in Appendix B present the results for each tank zone located in the geographical areas listed above. The storage tables break down the required storage volume for each system into operating, fire and emergency components. Well production, alternative pumping capacity and interties to adjacent systems are identified. The discussions below will not repeat the information already presented in the 2020 storage section, but will focus on changes and modifications to system storage in each area.

Southwest Reno

By 2035, without additional storage facilities or improvements, the Southwest area will have an overall storage deficit of about 1.2 MG. The deficit can be eliminated by providing alternative pumping capacity at the proposed Southwest pump station (standby generator) and the addition of a storage tank in the Caughlin 5 pump zone. The proposed Southwest pump station is included in the current 5-year CIP with construction beginning in FY 2023 and having an in-service date of FY 2024. The proposed tank in the Caughlin 5 zone is not included in the storage table and is subject to the schedule of new development in the area; however, it is very likely that this growth will have occurred by 2035. The proposed emergency intertie to the Caughlin #3 zone from The Ridges tank is also likely to be in place by 2035, but the primary purpose of the tie is to provide fire flow and emergency support.

North Reno

With the addition of the Sun Valley 2 tank and a new tank with a location to be determined (potentially in Cold Springs), there will be a storage surplus of about 7 MG in the North Reno area by 2035. A second Terminal Tank will probably be added by this time, but the volume will be required as operating storage to meet peak demands on the constant baseline flow from the Fish Springs system, so it is not included in the total.

Northwest Reno

An overall storage surplus of about 3.3 MG is anticipated by 2035 in the Northwest Reno area and all tank zones will have adequate emergency supply. The storage surplus will eventually decrease as new demand is added in the Verdi area.

South Truckee Meadows

By 2035, the lower area shows an overall storage surplus of about 1 MG. It is likely that additional storage will be required in the Double Diamond area to satisfy an apparent deficit there, but an intertie to a slightly oversized tank in an area above would also work. The upper area shows an overall storage surplus of about 0.5 MG in 2035. The minor storage deficits in Arrowcreek 1 tank zone and in the Mt. Rose 1/4 tank zone may require additional storage depending on the fire storage requirements. Interties to other tank zones may also eliminate the deficits.

Northeast Sparks & Spanish Springs Valley

In 2020, an overall storage deficit of about 0.8 MG is forecast for the NES/SSV systems. The deficits are in the Spanish Springs/Pyramid zone of NES and in the Desert Springs 3/Spring Creek 6 zone of SSV. Although alternative pumping capacity would eliminate the NES deficit, it may be prudent to build additional storage due to the remote location (regarding source of supply). Additional storage is proposed for the Desert Springs 3/Spring Creek 6 zone of SSV.

Satellite Systems

Minor storage deficiencies in the Satellite Systems can be mitigated by alternative pumping capacity (standby generators) at the wells, but it may be prudent to add smaller second tanks at these locations to provide storage for extended maintenance events such as when the primary tank requires recoating.

SECTION 4

GROUNDWATER RESOURCES

TMWA utilizes groundwater as a seasonal peaking supply and as a drought reserve. Groundwater use is subject to annual withdrawal limits set by the State Engineer. Under a conjunctive use approach, the State Engineer has authorized TMWA to pump (original TMWA wells) up to 16,000 acre-feet per year (AFA) during non-drought years and up to 22,000 AFA for three consecutive years during drought periods. The allowance for 22,000 AFA during drought periods is predicated upon TMWA having “banked” sufficient volumes of water either through ASR, or by using less than 16,000 acre-feet per year during non-drought periods. TMWA has consistently been able to manage its groundwater pumping to meet this requirement. In the extremely dry drought year of 2015, TMWA pumped 24,510 AFA (combined/merged system) and recharged 3,873 AFA.

As a result of the merger with Washoe County, TMWA inherited an additional 34 active production wells contiguous to the original TMWA water system. A number of these wells were the sole source of supply for systems located on the upper Mt. Rose fan (Basin 88). Due to the required continuous operation to meet system demands, water level declines in some of these wells approached 80 feet over the previous ten years. Because of the magnitude of the declines and the number of domestic wells in the area, Washoe County established a domestic well mitigation program in the area where municipal pumping was concentrated. Post-merger, TMWA inherited the mitigation program and has prioritized efforts to implement a conjunctive use management plan for the Mt. Rose fan.

Groundwater use is also subject to water quality related constraints and controls such as the running annual average (RAA) method of compliance with arsenic concentration standards; and pumping required by the groundwater remediation district to remove and control the spread of perchloroethylene (PCE), in the groundwater supply. Former Washoe County production wells are also subject to water quality issues including arsenic and nitrate. A very good summary of groundwater resource issues is presented in Appendix 2.9 of the current Water Resource Plan (2016 Basin Summary). Issues associated with water quality and quantity that impact facility requirements are discussed in greater detail below.

GROUNDWATER QUALITY ISSUES

TMWA has directly or indirectly dealt with groundwater quality issues for a number of years. Historically TMWA attempted to locate and design its wells such that aquifer areas and water bearing strata with inferior quality water (i.e. high in iron, manganese, arsenic) were avoided. This was accomplished by implementing detailed exploration techniques and performing discrete sampling and testing of water bearing formations so that only those strata with higher water quality are

screened for production. Even so, as drinking water standards became more stringent, a number of groundwater wells had to be abandoned, treated or converted to non-potable use. At the same time, it has become extremely difficult to develop new groundwater sources with sufficient productivity and water quality in the Truckee Meadows region.

TMWA's groundwater resource is extremely important to the community in terms of its value as a peaking, emergency and drought resource. To maintain the viability of the groundwater resource, TMWA's general approach relative to groundwater includes the following elements.

- Preservation of existing groundwater wells. This is being performed by closely monitoring water quality, developing and implementing a wellhead protection program and adding treatment facilities when necessary and deemed feasible.
- Development of future wells where treatment can be avoided. This is becoming increasingly difficult to accomplish as water quality regulations become more stringent and as areas of high quality groundwater become harder to find.
- Implementing treatment for new groundwater wells. Based on the need to develop additional peak and off-river capacity, it is anticipated that treatment for the removal of arsenic, iron and manganese will be required.

Arsenic

Naturally occurring arsenic is present in many groundwater supplies in northern Nevada. The original US Environmental Protection Agency (EPA) arsenic standard of 50 parts per billion (ppb) was placed into effect in 1975. Three TMWA wells (Pezzi, Poplar #1 and Terminal) were impacted by the original standard. These wells were isolated from the distribution system and piped to the Glendale Treatment Plant where arsenic could be removed utilizing conventional surface water treatment processes and techniques. In 2006, the EPA reduced the arsenic standard from 50 ppb to 10 ppb. The new lower standard impacted nine additional TMWA wells. The basic elements of TMWA's arsenic compliance plan (approved by the Nevada Department of Environmental Protection, NDEP) are as follows:

- Piping of the Mill Street, Greg Street, and Corbett Wells to the Glendale Plant where the water can be treated via conventional surface water techniques, or blended with treated surface water.
- Six other wells (Keitzke, Morrill, High, Silver Lake, Poplar #2 and Sparks Avenue) are pumped seasonally, recharged and/or blended with treated surface water in the distribution system to achieve compliance.

Several former Washoe County production wells located in Spanish Springs Valley and Double Diamond have also been impacted by arsenic and have been taken out of production. Nitrate contamination from septic systems has also impacted wells in Spanish Springs and has become a major water quality issue.

PCE

Perchloroethylene (PCE), has impacted some wells near the urban center of Reno. PCE is a volatile organic chemical that has been historically used as a solvent in industrial and dry-cleaning operations. For many years PCE waste was indiscriminately dumped and it percolated and infiltrated the groundwater aquifer. Five existing wells impacted by PCE above the drinking water standard of 5 ppb are being treated for PCE removal with an air stripping process. Three stripping towers are used: one at the Mill Street location for the Mill Street and Corbett wells; one at Kietzke Lane for the Kietzke Lane well; and one at the Morrill well location for the High Street and Morrill Avenue wells. The operation of these wells is coordinated with the PCE Remediation District (administered by Washoe County), since the treatment also serves to “clean up” the aquifer. It is expected that the treatment of these wells will continue for PCE removal. Additionally, PCE is present in the Poplar No. 2 and Sparks Avenue wells. TMWA is currently working with the PCE Remediation District to plan appropriate mitigation for these wells.

Aquifer Storage and Recovery (Recharge)

Since the early 1990’s, TMWA has actively participated in an Aquifer Storage and Recovery (ASR) program. Approximately 2,500 to 3,000 acre-feet per year (814-977 MG) of treated surface water can be injected and stored in the aquifer during the off-peak months. This “stored water” can then be extracted during the peak demand months or during periods of drought.

The implementation of the ASR program provides several benefits to the community. First, it has helped to mitigate minor water quality issues in selected wells. The treated surface water has been shown to provide a “bubble” of high quality water at the wellhead which significantly reduces total concentrations of regulated constituents such as iron, manganese and arsenic when the well is pumped to the distribution system. The second benefit is that withdrawals from ASR storage do not count against the annual groundwater cap as set by the State Water Engineer. This provides for some banking of groundwater which can subsequently be used during drought periods.

GROUNDWATER CAPACITY

The maximum well production capacity from original TMWA wells is approximately 63 MGD. TMWA would like to increase well production capacity to about 77 MGD (7,700 AF in the peak month). This additional well capacity will increase peak day capacity and increase off-river reliability; however, it is highly likely that development of new groundwater sources will require expensive treatment facilities. Therefore, the timing of expanding groundwater capacity will depend on when additional peak capacity is required and also on how resilient existing storage and groundwater facilities are in response to an off-river supply scenario.

As noted previously, 34 active production wells contiguous to the TMWA service area were added to the TMWA system as a result of the merger with DWR and STMGID. These wells have a combined maximum day capacity of 29.3 MGD. Another 10 wells with a combined capacity of about 1.7 MGD are located in the five non-contiguous satellite systems and there are currently five production wells with a combined capacity of 14.8 MGD in the Fish Springs system. See Table 5 for details on individual and area specific groundwater capacity.

Prior to implementation of TROA, groundwater played a vital part in meeting demand during drought conditions. This was due, in large part, to the need to minimize the use of Privately Owned Stored Water (POSW) in case drought conditions persisted. Under TROA, modeling efforts now indicate that even during an extreme 12-year long drought occurring in 2039-2050 when peak day demands will exceed 190 MGD, there will be sufficient surface water available that groundwater production can be limited to 60 MGD. A summary of the analysis is included in the appendix.

Of course, adequate groundwater production is a highly desirable thing, especially from a reliability perspective. Based on the TROA model results above, additional capacity would not be technically required until peak day demands approach 191 MGD (assuming a 10 percent water production buffer is adequate). However, prior to reaching this overall demand level, delivering supply to growth in outlying areas will result in substandard distribution system pressures in the existing Northeast Sparks areas. When that time comes (approximately 2036), TMWA will be well positioned to efficiently complete a phased construction of the proposed Sparks GWTP. The wells have been drilled and constructed; the WTP property has been acquired and a Special Use Permit has been issued for the facility. Phase 1 will produce up to 7.6 MGD and Phase 2 will add another 4.3 MGD of treated water production capacity.

Groundwater production can decrease with time due to chemical deposition on well screens and from mechanical wear of pumping equipment. In addition, hydrologic limitations (i.e. well interference) and drought cycles that decrease groundwater levels and thus lower pump discharge can also impact the instantaneous and daily production from the wells. TMWA constantly evaluates well production to determine if well rehabilitation or pump replacement is warranted. Due to these possible constraints, it may be necessary to develop more than the “design” well capacity to obtain the desired net groundwater production capacity.

TABLE 5 – 2018 MAXIMUM DAY WELL CAPACITY (Orig. TMWA Wells)

NO.	ZONE	WELL	MGD	MGD
1	GLENDAL	¹ PEZZI	2.2	
2	GLENDAL	¹ POPLAR #1	2.2	
3	GLENDAL	¹ TERMINAL	1.7	
4	GLENDAL	² MILL	3.1	
5	GLENDAL	² CORBETT	1.9	
6	GLENDAL	¹ GREG	1.5	
7	HIGHLAND	³ HIGH	2.1	2.1
8	HIGHLAND	³ MORRILL	1.8	1.8
9	HIGHLAND	³ KIETZKE	3.2	3.2
10	HIGHLAND	DELUCCHI	0.8	0.8
11	HIGHLAND	EL RANCHO	1.3	1.3
12	HIGHLAND	FOURTH	1.6	1.6
13	HIGHLAND	GLEN HARE	1.4	1.4
14	HIGHLAND	HOLCOMB	1.1	1.1
15	HIGHLAND	PATRIOT	1.9	1.9
16	HIGHLAND	LAKESIDE	1.1	1.1
17	HIGHLAND	LONGLEY LANE	2.1	2.1
18	HIGHLAND	SIERRA PLAZA	2.0	2.0
19	HIGHLAND	S. VIRGINIA	1.5	1.5
20	HIGHLAND	VIEW	2.3	2.3
21	HIGHLAND	HUFFAKER PL.	0.9	0.9
22	HIGHLAND	INNOVATION	1.2	1.2
23	HUNTER	HUNTER LK	3.1	3.1
24	HUNTER	RENO HIGH	3.5	3.5
25	HUNTER	SWOPE	0.8	0.8
26	SPARKS	21st	2.0	2.0
27	SPARKS	GALLETTI	2.2	2.2
28	SPARKS	POPLAR #2	2.2	2.2
29	SPARKS	NUGGET	0.8	0.8
			53.5	40.9
30	LEMMON VALLEY	⁴ AIR GUARD	1.6	
31	LEMMON VALLEY	⁴ SILVER KNOLLS	1.7	
32	LEMMON VALLEY	⁴ SILVER LAKE	3.5	
			4.9	4.9
33	SPANISH SPRINGS	HAWKINGS	4.3	4.3
			62.7	50.1

1. Wells must be treated at Glendale WTP. Only used occasionally since they displace SW capacity.
2. PCE wells that are treated at Glendale WTP. PCE remediation requires pumping of these wells.
3. Wells are treated for PCE and discharge directly into the distribution system.
4. Distribution system capacity limits total groundwater output to a combined 4.9 MGD.

TABLE 5 – CONTINUED (Former DWR Wells)

	Well Name	(GPM)	(MGD)
1	Arrowcreek 1	220	0.32
2	Arrowcreek 2	450	0.65
3	Arrowcreek 3	400	0.58
4	Tessa East	600	0.86
5	Tessa West	400	0.58
6	Mt Rose 3	300	0.43
7	Mt Rose 5	700	1.01
8	Mt Rose 6	550	0.79
9	St James 1	170	0.24
10	St James 2	170	0.24
11	STMGID 1	750	1.08
12	STMGID 2	250	0.36
13	STMGID 3	450	0.65
14	STMGID 11	500	0.72
15	STMGID 4	200	0.29
16	STMGID 5	450	0.65
17	STMGID 6	1,450	2.09
18	STMGID 12	750	1.08
19	STMGID 7	140	0.20
20	Thomas Creek 1	400	0.58
Subtotal		9,300	13.39

1	Desert Springs 1	370	0.53
2	Desert Springs 2	400	0.58
3	Spring Creek 2	500	0.72
4	Spring Creek 5	800	1.15
5	Spring Creek 6	1,800	2.59
6	Spring Creek 7	2,000	2.88
Subtotal		5,870	8.45

	Well Name	(GPM)	(MGD)
1	Fish Springs A	3000	4.32
2	Fish Springs B	2000	2.88
3	Fish Springs C	1500	2.16
4	Fish Springs D	1500	2.16
5	Fish Springs E	2250	3.24
	Fish Springs F	0	0
Subtotal		10,250	14.76

1	Lem. Valley 5	800	1.15
2	Lem. Valley 6	180	0.26
3	Lem. Valley 7	450	0.65
4	Lem. Valley 8	600	0.86
5	Lem. Valley 9	400	0.58
Subtotal		2,430	3.50

1	Lightning W 1	70	0.10
2	Lightning W 2	110	0.16
3	Lightning W 3	220	0.32
4	Sunrise 1	200	0.29
5	Stampmill 1	80	0.12
6	Stampmill 2	70	0.10
7	Truck. Canyon 1	80	0.12
8	Truck. Canyon 3	100	0.14
9	Old Washoe 3	150	0.22
10	Old Washoe 4	120	0.17
Subtotal		1,200	1.73

1	Dbl Diamond 1	500	0.72
2	Dbl Diamond 3	1,800	2.59
3	Hidden Valley 5	450	0.65
Subtotal		2,750	3.96

<u>NO. WELLS</u>	<u>DESCRIPTION</u>	<u>CAPACITY (MGD)</u>
34	Contiguous to PWS 190	29.30
10	Satellite Systems	1.73
5	Fish Springs	14.76

Note: Fish Springs capacity is limited to current BPS capacity of 9.36 MGD. Well F has not been equipped yet.

SECTION 5

SURFACE WATER RESOURCES

The Truckee River and its tributaries provide the surface water supply for operation of TMWA's two surface water plants, the Chalk Bluff Plant in northwest Reno, and the Glendale Plant in west Sparks. During most years TMWA relies on flow from Lake Tahoe which is conveyed by the Truckee River to the raw water intakes of the plants. During extended drought periods, TMWA can call upon drought reserves at Donner Lake, Independence Lake, and "contract storage" within Stampede and Boca Reservoirs. Operation of the Truckee River system is very complex and has been extensively litigated over the years. Implementation of TROA has been shown to be a real game-changer for TMWA in regard to how resilient surface water supplies can be in response to drought conditions.

SURFACE WATER TREATMENT PLANT CAPACITIES

Chalk Bluff Water Treatment Plant

The first phase of the Chalk Bluff Water Treatment Plant (CBWTP) was placed into service in 1994. Plant capacity has since been expanded twice (1996 and 2004) to allow for the retirement of older, non-compliant plants (Highland, Hunter Creek and Idlewild) and to meet increasing demands. The CBWTP now serves as TMWA's base plant and is "first on and last off" from an operations perspective. The plant is located on a 120-acre site at the northwest corner of McCarran Boulevard and W. Fourth Street in northwest Reno. The Phase 3 expansion of the plant along with subsequent approval of increased filter loading rates, resulted in a revised net production capacity of 90 MGD. The treatment plant has been designed for an ultimate net production capacity of 120 MGD.

The CBWTP incorporates the following components and processes:

- Raw water delivery from two different systems, the Orr Ditch pump station and the Highland Canal.
- Pre-settling basins and mechanical screens for the removal of floating debris, heavy grit and sediment.
- Chemical storage and feed systems.
- Coagulation, flocculation, sedimentation and filtration systems.
- Filter backwashing and solids handling/removal systems.
- Disinfection and clearwell storage to provide contact time.
- Treated water pumping into two different major pressure zones.

There are no significant limitations on plant operation. The CBWTP is equipped with treatment systems designed to handle peak turbidity events on the Truckee River system and is capable of operating at its design rate under drought conditions.

Raw water to the plant can be delivered via two efficient diversion weirs. The first and oldest diversion weir, the Washoe Dam, diverts water into the Washoe Hydro Canal. The Highland Canal, with a diversion gate off the Washoe Canal, then transports water via gravity flow to the plant. The Highland Canal has existed since the 1880s and has undergone extensive improvements over the last 10-15 years. Up until 2010, several constrictions limited the capacity of the canal to about 55 MGD; however, the April 2008 earthquake that damaged a section of wooden flume in the Mogul area raised significant concerns regarding the vulnerability of the plant's water supply. As a result, completion of the canal master plan improvements was accelerated and the plant's treatment capacity of 90 MGD can now be supplied 100 percent by gravity flow from the Highland Canal. In addition, it is estimated that the cumulative effect of completion of the canal improvements has reduced leakage losses from the canal by several hundred acre feet annually.

From an operational perspective, canal water is considered "cheap and reliable" water as compared to the pumping required from the Chalk Bluff weir facility which is located on the river, about 1000 feet south of the CBWTP. The Orr Ditch Pump Station (ODPS), consisting of nine parallel pumping units (plus one reserve), lifts the raw water diverted from the weir approximately 200 feet in elevation to the plant above the river. Limitations relative to the Chalk Bluff weir include the requirement to pass at least 20 CFS of flow downstream of the weir (only required when actually diverting from the facility), even under low flow conditions where the only water in the river may be releases from TMWA's upstream reservoir storage. Other constraints include capacity (approximately 68 MGD vs the 90 MGD plant capacity) and the cost of pumping. With the expanded gravity flow capacity of the Highland Canal, the ODPS has been relegated to backup duty yielding estimated electrical cost savings of about \$360,000 per year.

Glendale Water Treatment Plant

The Glendale Water Treatment Plant (GWTP) was placed into service in 1976 and initially operated as a direct filtration plant with direct pumping from the filters into the distribution system. Over the years, improvements have been made to the GWTP to incorporate the same basic treatment processes found at the CBWTP. The GWTP is currently used as a peaking plant to provide critical peak period supply to Sparks and Southeast Reno. It is normally not operated in the off-peak period (November through April), since system demands do not require its operation and because it is more efficient to consolidate off-peak operations at the CBWTP. Upon completion of the Glendale Diversion project, Phase 4 of the Sparks Feeder Main and the Effluent Pumping Improvements in 2011, the GWTP is now able to deliver approximately 38 MGD (net treatment capacity of 34.5 MGD plus 3.5 MGD of "arsenic blend wells") into the distribution system. Although the GWTP normally discharges its entire output into the Sparks zone where the production is needed to maintain tank levels and service pressures in the peak summer months, the effluent pump station also has a bank of pumps designed to deliver water into the Highland zone.

Mt Rose Water Treatment Plant

Construction of the Mt Rose Water Treatment Plant (MRWTP) began in FY 2019 and the facility is scheduled to be in-service in FY 2021. The MRWTP is located at the north end of Callahan Road and will treat up to 4 MGD of surface water diverted from Whites Creek. The MRWTP will discharge into the Arrowcreek Tank 3 zone on the upper Mt Rose Fan and will provide a sorely needed source of peak supply and conjunctive use supply for an area where demands are anticipated to increase almost 50 percent (to about 7.3 MGD) by 2035. By not having to rely 100 percent on local groundwater to meet demands, it is hoped that aquifer water levels in the area will stabilize and possibly even recover somewhat. Several distribution system improvements will be required to firm up the maximum day yield of the creek water rights and to fully integrate the new source into the service area which consists of several tank and pressure zones.

SECTION 6

NAC 445A CAPACITY REQUIREMENTS

The sections of the NAC 445A regulations applicable to Capacity include:

NAC 445A.6554 “Alternative pumping capacity” defined. ([NRS 445A.860](#)) “Alternative pumping capacity” means a source of water, including a well, or a facility for pumping from a source of water, which:

1. Can provide a public water system with regular or emergency supplies of water in areas that do not have an adequate storage of water that is accessible by gravity; and
2. Is equipped with an independent, reliable supply of power that is available during periods when the normal supply of power fails, which:

(a) Consists of:

- (1) An emergency generator; or
- (2) A standby prime mover that operates by internal combustion; or

(b) Is obtained from an electric substation or other source other than the normal supply of power.

(Added to NAC by Bd. of Health, eff. 2-20-97)

NAC 445A.65665 “Capacity for the development and treatment of water” defined. ([NRS 445A.860](#)) “Capacity for the development and treatment of water” means the facilities and appurtenances of a public water system that provide finished water, treated if necessary, to the distribution system.

(Added to NAC by Bd. of Health, eff. 2-20-97)

NAC 445A.6588 “Emergency” defined. ([NRS 445A.860](#)) “Emergency” means a situation in which an unusual calamity, including a flood, fire, storm, earthquake, drought, civil disturbance, accidental spill of a hazardous material or similar occurrence, disrupts the provision of water by a public water system or endangers the quality of water provided by a public water system.

(Added to NAC by Bd. of Health, eff. 2-20-97)

NAC 445A.6652 “Total capacity” defined. ([NRS 445A.860](#)) “Total capacity” means the capacity of a public water system to supply the water demanded by its customers within its area of service during all conditions except emergencies.

(Added to NAC by Bd. of Health, eff. 2-20-97)

NAC 445A.6672 Existing systems: Minimum capacities; minimum pressure and velocity of water; total capacity of groundwater system; timely completion of water projects. ([NRS 445A.860](#)) A supplier of water for an existing public water system shall:

1. Ensure that the public water system maintains a sufficient capacity for the development and treatment of water, and a storage capacity of sufficient quantity, to satisfy the requirements of all users of the public water system under the conditions of maximum day demand and peak hour demand.
2. Ensure that the residual pressure in the distribution system is:

- (a) At least 20 psi during conditions of fire flow and fire demand experienced during maximum day demand;
- (b) At least 30 psi during peak hour demand; and
- (c) At least 40 psi during maximum day demand.

☐ Unless otherwise justified by an engineer and approved by the Division or the appropriate district board of health, high head losses must be avoided by maintaining normal water velocities at approximately 8 feet per second during all conditions of flow other than fire flow.

3. If the public water system relies exclusively on water wells as its source of water, ensure that the total capacity of the system is sufficient to meet:

(a) The maximum day demand, fire flow and fire demand when all the facilities of the system are functioning; or

(b) The average day demand, fire flow and fire demand when the most productive well of the system is not functioning,

☐ whichever is greater. When computing total capacity for this purpose, credit must be given for any storage capacity.

4. Ensure that water projects are completed in such a manner as to meet the actual maximum day demand, peak hour demand, fire flow and fire demand for developments of property in the area of service of the public water system.

(Added to NAC by Bd. of Health, eff. 2-20-97; A by Environmental Comm'n by R194-08, 10-27-2009)

NAC 445A.66725 Existing systems: Determination of total capacity preparation, maintenance and dissemination of certain information, analyses, plans and reports. ([NRS 445A.860](#)) A supplier of water for an existing public water system shall:

1. Determine the total capacity of the public water system through engineering analyses that use historical data or other guidelines or parameters accepted by the engineering profession and, upon request, submit documentation of that capacity to the Division or the appropriate district board of health. When analyzing the total capacity of the public water system with regard to requirements for maximum day demand, only the alternative pumping capacity and the storage capacity of the public water system may be considered as sources of supply.

2. When assessing the total capacity of the public water system and the need for water projects to meet future commitments, use a network hydraulic analysis of the public water system. The analysis must be prepared by an engineer.

3. Prepare a plan for the timely completion of any water projects required to meet the anticipated needs of developers of property within the area of service of the public water system and, upon request, provide a copy of the plan to the Division or the appropriate district board of health.

4. Maintain:

(a) A current list of the users of the public water system.

(b) A copy of each pending acknowledgment of water service it has issued.

5. Provide to the Division or the appropriate district board of health, upon request and at no charge, any data, technical information or engineering analyses or reports necessary to determine the acceptability of any technologies, processes, products, facilities or materials associated with the design, construction, operation or maintenance of the public water system.

(Added to NAC by Bd. of Health, eff. 2-20-97; A by Environmental Comm'n by R194-08, 10-27-2009)

NAC 445A.6674 Storage capacity. ([NRS 445A.860](#)) Except as otherwise provided in [NAC 445A.66755](#):

1. A supplier of water shall ensure that:

(a) An existing public water system maintains a storage capacity that, as determined by an engineer on the basis of historical data, accepted engineering judgment and a network hydraulic analysis, is sufficient to ensure that the total capacity of the public water system will meet current and anticipated demands for water while maintaining the pressures indicated in [NAC 445A.6711](#).

(b) A new public water system maintains a storage capacity that is sufficient to provide the amount of water required for sufficient operating storage, emergency reserve and fire demand.

2. Storage requirements for fire demand must be calculated according to the requirements of the fire authority. The Division or the appropriate district board of health shall evaluate the design of a public water system based upon appropriate documentation of those requirements.

3. A supplier of water for an existing public water system shall ensure that the total storage capacity and capacity of booster pumps for each zone of pressure in the distribution system are sufficient to meet the maximum day demand within that zone. Water stored in a higher zone of pressure may be provided to serve a lower zone of pressure if:

(a) An appropriate pressure regulator is installed between the zones; and

(b) The requirements for the higher zone of pressure are not compromised.

(Added to NAC by Bd. of Health, eff. 2-20-97; A by Environmental Comm'n by R194-08, 10-27-2009)

NAC 445A.66745 Operating storage. ([NRS 445A.860](#)) Except as otherwise provided in [NAC 445A.66755](#):

1. An existing public water system must maintain an operating storage in such an amount as an engineer determines, based upon historical data and the system's capacity for the development and treatment of water, to be sufficient for the system to meet requirements for maximum day demand.

2. A new public water system must, except as otherwise justified by an engineer and approved by the Division or the appropriate district board of health, maintain an operating storage equal to 700 gallons for each residential equivalent in the area of service of a metered system and 1,225 gallons for each residential equivalent in the area of service of an unmetered system.

(Added to NAC by Bd. of Health, eff. 2-20-97; A by Environmental Comm'n by R194-08, 10-27-2009)

NAC 445A.6675 Emergency reserve. ([NRS 445A.860](#)) Except as otherwise provided in [NAC 445A.66755](#):

1. An existing public water system must maintain an emergency reserve in such an amount as an engineer determines appropriate on the basis of the best available local information.

2. A new public water system must maintain an emergency reserve equal to 75 percent of the amount of operating storage of the system.

(Added to NAC by Bd. of Health, eff. 2-20-97)

NAC 445A.66755 Existing systems: Exemption from storage requirements. ([NRS 445A.860](#)) An existing public water system is not required to comply with the requirements of [NAC 445A.6674](#), [445A.66745](#) and [445A.6675](#) if the system has a sufficient alternative pumping capacity to meet requirements for maximum day demand, peak hour demand and fire flow.

(Added to NAC by Bd. of Health, eff. 2-20-97)

COMPLIANCE WITH NAC 445A CAPACITY REQUIREMENTS

NAC 445A.6672 states that an existing public water system should maintain sufficient capacity for the development and treatment of water and a storage capacity of sufficient quantity, to satisfy the requirements of all users of the public water system under the conditions of maximum day and peak hour demand. Compliance with this section is demonstrated in previous discussions concerning TMWA's pump and storage sizing criteria and how its production and pumping facilities are designed to meet maximum day demands and its operating storage component provides the incremental capacity to meet peak hour demands. In addition, previous discussions concerning surface water and ground water production capacities show that for PWS 190, TMWA's capacity for the development and treatment of water is 216.5 MGD, which far exceeds current (174.5 MGD in 2020) and future (197.3 MGD in 2035) maximum day demands.

Existing (2020) Water Production Capacity

TMWA's existing (2020) capacity for the development and treatment of water is summarized in Table 6.

TABLE 6 - 2020 TREATMENT & PRODUCTION CAPACITY

Facility	Capacity (MGD)
Chalk Bluff WTP	90.0
Glendale WTP	34.5
Groundwater	92.0
TOTALS	216.5 MGD

Notes:

1. Groundwater capacity includes wells in PWS 190 (Truckee Meadows) and Fish Springs (booster pump capacity), but does not include satellite systems.
2. The Mt Rose WTP (anticipated in 2021) is not included above. The 3.6 MGD Longley Groundwater Treatment Plant is not included above.

NAC 445A.66725 further states that for an existing public water system, the total capacity should be determined through engineering analyses that use historical data or other guidelines or parameters accepted by the engineering profession; and when analyzing the total capacity of the system with regard to requirements for maximum day demand, only the alternative pumping capacity and the storage capacity of the public water system may be considered as sources of supply. The definition of “total capacity” in NAC 445A.6652 references the public water system’s capacity to meet demands “within its area of service” which indicates this is a system-wide capacity requirement.

Compliance with this section is demonstrated through TMWA’s use of actual 2012 metered use data to determine the base maximum day demand, peaking factors, unit demand factors and the following discussions relating to storage and alternative pumping capacity.

Existing (2020) Available Operating & Emergency Storage

The diurnal demand curve (hourly demand pattern) for the gravity zones during the peak day was previously introduced in Figure 2. The demand curve shown in Figure 2 includes the effect of all demands on the gravity zones including base booster pump stations and wholesale demands. Analysis of this data indicates that with a steady source of supply equal to the maximum day demand (represented by a y-value of 1.00 on the chart), a storage volume of about seven percent of the maximum day demand is required to meet the peak hour demand.

TMWA’s current design standard is to provide an operational storage component of at least 15 percent of the maximum day demand to provide flexibility to accommodate the potential failure of mechanical equipment, or to allow avoidance of peak period electrical charges when possible. This is two times the volume indicated by the diurnal curve analysis.

The requirements of Section 1 of NAC 445A.66725 for determining peak day capacity by considering only alternative pumping capacity and storage capacity of the system does not refer to a particular storage component (operating, fire, emergency) or combination thereof. The fact that “only” alternative pumping and storage capacity should be considered (and not other capacity such as treatment capacity) would imply an issue of reliability under an emergency situation with loss of primary power and thus infers that emergency storage could be utilized to satisfy those requirements.

A detailed accounting of storage requirements is presented and discussed in the Storage sections and the appendices of this report. For the purposes of establishing the storage available to meet overall system capacity requirements, the operating and emergency storage components provided are summarized in Table 7 below.

TABLE 7 - 2020 AVAILABLE OPERATING & EMERGENCY STORAGE

Zone	Total Storage Provided ⁽¹⁾ (MG)	Less Required Fire Storage (MG)	Available Emergency & Operating Storage (MG)
Hunter Creek Gravity	34.00	0.96	33.04
Highland Gravity	25.50	2.04	23.46
Sparks Gravity	6.00	0.96	5.04
Southwest Reno	11.40	1.80	9.60
North Reno	28.32	7.23	21.09
Northwest Reno	18.51	3.15	15.36
South Truckee Meadows	28.42	8.43	19.99
NE Sparks/Spanish Springs	21.35	3.68	17.67
Totals	173.50	28.25	145.25
Less Emergency Storage (1 Average Day) ⁽²⁾			83.86
Available Operating Storage			61.39

Notes:

1. Storage provided includes tanks that are scheduled to be complete and in-service by 2020, but does not include treatment plant clearwell storage.
2. Emergency storage (one average day) does not include the demand of wholesale customers who have their own storage.

Existing (2020) Alternative Pumping Capacity

The Chalk Bluff and Glendale WTP's are provided with two sources of electrical power (there are physically two separate electrical feeds into both facilities) and thus meet the reliability requirements of "alternative pumping capacity". Switching between the primary electrical circuit to the secondary circuit at Chalk Bluff is automatic should the primary circuit fail. With the additional standby generation improvement projects at Glendale (2018) and at Chalk Bluff (2019), the entire treatment and pumping processes at both locations will be 100 percent covered with backup power. At Chalk Bluff, this was accomplished in part by completion of the Highland Canal improvements that allow a raw water supply equal to 100 percent of Chalk Bluff's treatment capacity to be delivered to the plant by gravity flow. On the finished water side, the 48-inch main from Chalk Bluff to the Highland zone provides a gravity flow capacity of about 22 MGD, providing additional operational flexibility during a power outage. Alternative source pumping capacity for the system as a whole is summarized in Table 8.

TABLE 8 – 2020 ALTERNATIVE SOURCE PUMPING CAPACITY

Source	Pumping Capacity (MGD)	Primary Power Circuit	Secondary Power Circuit
Chalk Bluff WTP		Reno 204	NW 216
Treatment Plant	90		1440 kW Genset
Hunter Creek Pumps	41		2000 kW Genset
Highland Pumps	40		2000 kW Genset
Northgate Pump	8.6		2000 kW Genset
Glendale WTP		Glendale 211	Valley Rd 246
Low Lift Pumps	35		300 kW Genset
Treatment Plant	34.5		500 kW Genset
Highland Pumps	12.5		1600 kW Genset
Sparks Pumps	34.5		1600 kW Genset
ALT. PUMPING CAPACITY	124.1 ⁽¹⁾		

Notes:

1. Total alternative pumping capacity based on Chalk Bluff pumping to Hunter Creek, Highland and Northgate simultaneously; and at Glendale, pumping to Sparks only.
2. Additional redundancy for the Chalk Bluff Highland pumps is provided by the gravity flow (approx. 22 MGD) capacity of the existing Highland pipelines.
3. Additional redundancy for both Hunter Creek and Highland pressure zones is provided by the Idlewild transfer station.
4. Additional alternative source pumping capacity from the Silver Lake wells is not included above (standby power generator).

NAC Total Capacity Compliance - Existing System

Having established the available alternative source pumping capacity and the available operating and emergency storage of the existing system, total system capacity requirements are summarized in Table 9 for NAC 445A.6672 and in Table 10 for NAC 445A.66725.

TABLE 9 - 2020 TOTAL CAPACITY - NAC 445A.6672

Component	Capacity (MGD)	Demand (MGD)	Surplus/ (Deficit)
Surface Water Production	124.5		
Groundwater Production	92.0		
Operating Storage ⁽¹⁾	61.4		
Total Capacity	277.9		
Max Day Demand ⁽²⁾		174.5	103.4
Peak Hour Demand ⁽²⁾		235.6	42.3

Notes:

1. Available operating storage is a system-wide value and does not indicate deficits within specific tank zones.
2. Max Day Demand determined from 2012 metered use plus growth. Peak Hour Demand estimated at 1.35xMDD per Figure 2.

TABLE 10 - 2020 TOTAL CAPACITY - NAC 445A.66725

Component	Capacity (MGD)	Demand (MGD)	Surplus/ (Deficit)
Alt. Pumping Capacity	124.1		
Operating Storage ⁽¹⁾	61.4		
Total NAC Capacity	185.5		
Max Day Demand		174.5	11.0

Notes:

1. See Table 7. Available storage is a system-wide value and does not account for transfers between adjacent zones.

Per **NAC 445A.6674**, an existing public water system shall maintain a storage capacity that, as determined by an engineer on the basis of historical data, accepted engineering judgment and a network hydraulic analysis, is sufficient to ensure that the total capacity of the public water system will meet current and anticipated demands for water while maintaining the pressures indicated in NAC 445A.6711. Having shown compliance with the overall storage requirements, subsequent reports on specific areas and pressure zones will present compliance with the pressure requirements of NAC 445A.6711.

SECTION 7

FUTURE FACILITY REQUIREMENTS

The Truckee Meadows region is subject to periodic droughts; therefore, the water resources must be managed and the water system must be designed to deliver water service under both drought and non-drought conditions. Historically, the primary water supply operational objectives were to maximize the use of surface water from the Truckee River to meet demands; to supplement that supply with groundwater supplies during the peak summer months; and avoid or at least delay the release of any Privately Owned Stored Water (POSW - storage in Donner and Independence Lakes). By maximizing the utilization of available surface water capacity in the early and/or late shoulder months, non-drought year groundwater extraction normally does not exceed 12,000 AF annually. If enough surface water is available, non-drought year groundwater extraction can be compressed into the peak irrigation months (July-September) resulting in a higher peak month yield from the resource without exceeding the normal year groundwater extraction limit.

In a drought year, groundwater use increases to avoid the release of POSW. As a result, in a drought year, groundwater extraction is expected to increase to about 22,000 AF. Prior to implementation of the Truckee River Operating Agreement (TROA), resource optimization models indicated that it would be beneficial to develop the capacity to extract about 7,300 AF (77 MGD) of groundwater during the peak month. By developing at least 77 MGD of groundwater capacity, TMWA could meet drought supply objectives while maintaining a production buffer of normal year supplemental groundwater supplies. This increase in normal year maximum day supply would also delay expenditures for construction of other water supply projects.

The basic operating objectives discussed above are still applicable, but TROA is a game-changer in terms of future facility requirements. Under TROA, resource modeling indicates that even under a 12-year worse-than-worse-case drought scenario occurring from 2039-2050, only about 60 MGD of groundwater production would be required to meet those future demands (see the appendices for the summary report of the analysis). This is encouraging when considering the long-term fragile nature of groundwater supplies from both a quantity and quality perspective and with the understanding that additional groundwater supply is very difficult to develop. As discussed in the Groundwater section of this WFP, additional groundwater (or surface water supplies for that matter) will technically not be required in the Truckee Meadows through the 2035 planning period. On a service-level basis, it will be necessary to move forward with the Sparks Ground Water Treatment Plant (SGWTP) sooner (est. 2030), which will also help to address reliability concerns regarding an off-river supply scenario. On a subsystem basis, it will be necessary to develop additional production wells in the

Mt Rose/St James area and possibly also in the Spanish Springs area to meet peak use demands. Pilot studies in Spanish Springs with new treatment technology consisting of biologically active filtration has shown great promise in eliminating nitrate from the existing groundwater supplies.

The conjunctive use of ground and surface water supplies provides many benefits to the TMWA system. An adequate groundwater supply is necessary to maintain water service during periods of drought or other periods when surface supplies are temporarily curtailed. In an emergency situation where surface water was unavailable and mandatory conservation was imposed, groundwater could satisfy the essential indoor water needs of the community for an extended period. TMWA also utilizes its groundwater as a peaking supply to meet seasonal peak use demands that exceed surface water treatment capacity. Strategically located production wells can also reduce distribution system facility requirements by locating a supply source closer to areas of demand that may be located a great distance away from surface water production facilities. A good example is the Hawkings Court well located in Spanish Springs valley.

TMWA has initiated conjunctive use on the Mt Rose Fan area and will continue to develop and implement this operating approach throughout its service area and especially in areas that historically relied on groundwater.

SUMMARY OF FUTURE CAPACITY IMPROVEMENTS

In response to the extremely dry period of 2012-2015, TMWA accelerated construction of three new groundwater sources: Innovation Well, Huffaker Place Well and Double Diamond Well #3. Based on demand projections in the 2030 WFP, the Innovation and Huffaker wells had been scheduled for construction in the 2022-2023 time frame. The 2030 WFP also anticipated that the first phase of the Sparks GWTP would be constructed around 2024; the second phase of the Sparks GWTP would come on-line in about 2030; and ultimately the fourth phase of the Chalk Bluff WTP would be built in about 2037. These former construction timelines were driven by the drought scenario analysis (as opposed to a “normal” year analysis), but not by a wide margin.

Acceleration of the well projects noted above plus completion of the improvements at Glendale (new diversion plus new effluent pumping facilities) and Phase 4 of the Sparks Feeder Main project added about 14 MGD of water production capacity to the TMWA system. This additional capacity buffer plus the resource flexibility of TROA and slightly lower growth in demand combine to push future system-wide capacity projects beyond the current 20-year planning horizon. This projection will be revisited on an ongoing basis during development of the annual capital budget. Although the Sparks GWTP is estimated to be more costly than adding another phase of Chalk Bluff, the groundwater treatment plant is recommended for construction first due to the diversity of supply and additional reliability it will

provide. Demand and capacity for the 20-year planning period is presented in Table 11 below.

TABLE 11 - DEMAND vs PRODUCTION CAPACITY BY YEAR

Year	Estimated Max Day Demand (MGD)	Total Available Capacity (MGD)	Supply Surplus or (Deficit) (MGD)	Surplus or Deficit as a % of MDD
2015	150.8	199.9	49.1	32.6%
2016	153.5	209.3	55.8	36.4%
2017	156.1	209.3	53.2	34.1%
2018	158.8	209.3	50.5	31.8%
2019	161.4	209.3	47.9	29.6%
2020	164.1	210.2	46.1	28.1%
2021	166.1	210.2	44.1	26.6%
2022	168.1	210.2	42.1	25.1%
2023	170.0	210.2	40.2	23.6%
2024	172.0	210.2	38.2	22.2%
2025	174.0	210.2	36.2	20.8%
2026	175.5	210.2	34.7	19.8%
2027	176.9	210.2	33.3	18.8%
2028	178.4	210.2	31.8	17.8%
2029	179.8	210.2	30.4	16.9%
2030	181.3	210.2	28.9	15.9%
2031	182.1	210.2	28.1	15.4%
2032	182.9	210.2	27.3	14.9%
2033	183.8	210.2	26.4	14.4%
2034	184.6	210.2	25.6	13.9%
2035	185.4	210.2	24.8	13.4%

Notes:

1. Max day demands and available capacity do not include the upper Mt Rose Fan areas since these systems are assumed to operate self-sufficiently with surface water from the MRWTP and local groundwater.
2. In general, new/additional capacity is recommended when surplus capacity is reduced to approximately 10 percent.
3. The above does not reflect supply surplus or deficit within individual pressure zones or tank zones.

SECTION 8

SPECIFIC AREA/PRESSURE ZONE FACILITY PLANS

The Truckee Meadows Water Authority's service area currently covers over 160 square miles and serves over 124,000 customers. The distribution system contains almost 2,000 miles of water mains; 88 storage tanks; 82 wells, more than 100 pump stations and 350 pressure regulating stations serving over 300 separate pressure zones. The system extends from a valley elevation of about 4,400 feet to almost 6,700 feet in the Mt. Rose system.

The previous sections have concentrated on system-wide demands and capacities while laying the groundwork for TMWA design and planning criteria as they apply to the NAC 445A regulations. The remainder of this document will focus on specific areas of the system generally defined by the extents of pumped storage zones supplied from the major gravity zones. As previously mentioned, the water facility plan for original (pre-merger) TMWA systems has been in place since 2005 and unless the location or magnitude of growth changes dramatically, TMWA will continue to implement that plan. However, this level of detailed planning work has not been previously performed for former Washoe County systems, so the blueprint will need to be expanded and possibly modified in some areas to incorporate the findings and recommendations presented herein.

The improvements that provide capacity to serve growth, or in some cases also benefit existing customers, are identified herein. The estimated cost of improvements that benefit an entire system or area are entered into Area Fee calculation sheets. Area Fees are collected from new development to insure growth pays for growth. Currently there are a total of 16 Areas where connection fees are collected. These Areas are shown on Figure 3 below. Each Area has a different Area Fee reflecting the fact that a separate and distinct set of improvements is required to provide the necessary capacity to each Area. Probably the best example of this is the Sparks Feeder Main Projects (Phases 1-8) which are primarily located in the Sparks gravity zone, but primarily benefit the extreme Northeast Sparks and Spanish Springs areas. In addition to Area Fees, TMWA also collects, where appropriate, a Supply-Treatment Fee as reimbursement for costs to construct new or expanded treatment facilities, wells and other supply-related projects and a Storage Fee for new or expanded storage project costs that provide capacity for growth. Except for establishing initial facility charges for former County areas, TMWA has not updated its Water System Facility (Rate Schedule WSF) charges since July 2013.

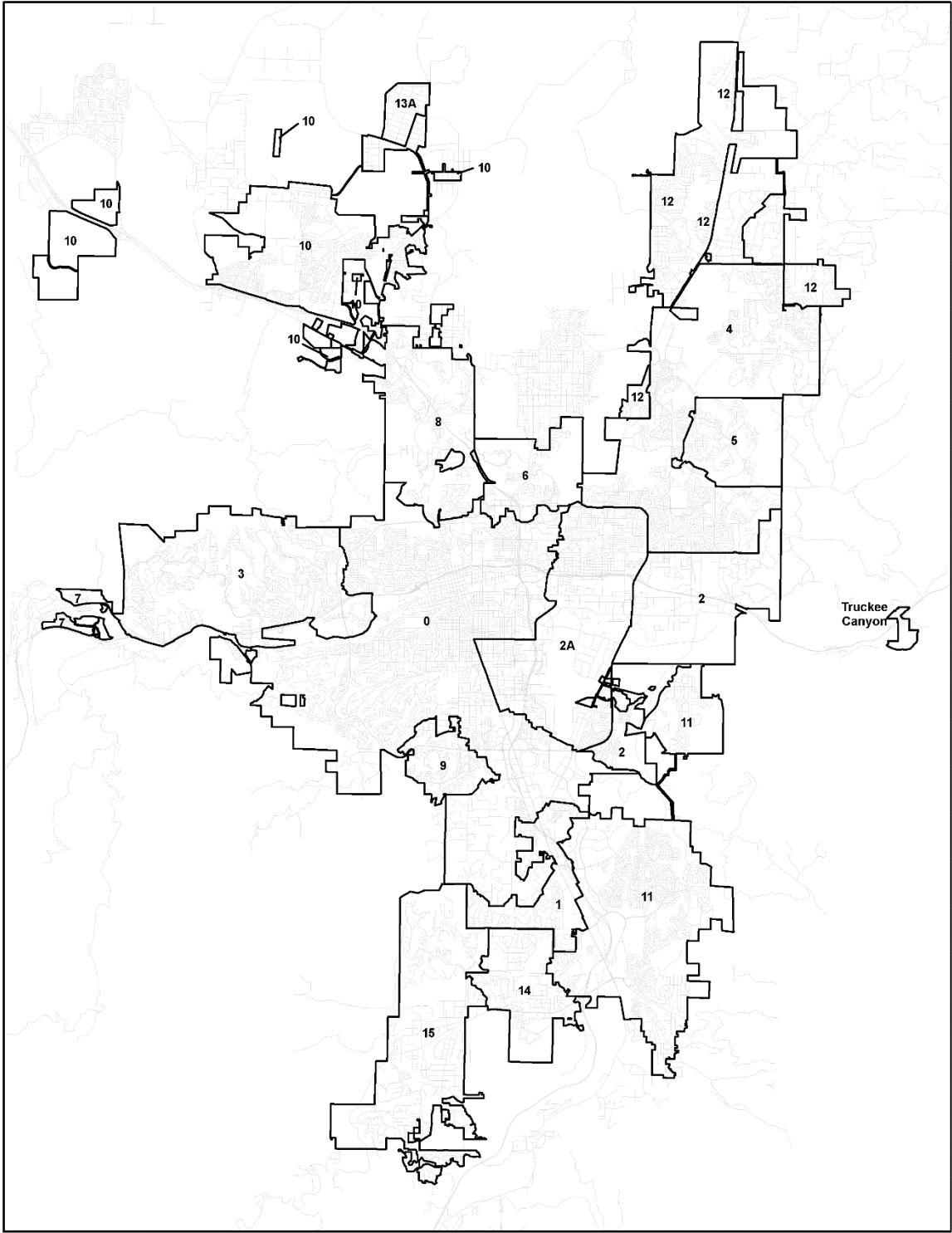


FIGURE 3 – WATER FACILITY FEE AREAS



STAFF REPORT

TO: Board of Directors
THRU: Mark Foree, General Manager
FROM: Scott Estes, Director of Engineering
DATE: 11 June 2019
SUBJECT: **Introduction and first reading of amendments to TMWA Rate Schedule BSF - Business Services Fees and Rate Schedule WSF - Water System Facility Charges revising area fee, supply and treatment, and storage unit costs**
(Continued from May meeting)

SUMMARY

- TMWA has completed an update of its Water Facility Plan for the 2015-2035 planning period (2035 WFP). This is the first update that includes facility recommendations for former Washoe County water systems.
- The primary product of the 2035 WFP is a Capital Improvement Plan (CIP) which provides the basis for revised developer Facility Charges. Facility Charges were last updated in 2013.
- The 2035 WFP also establishes maximum day demands and geographically distributes these demands based on where the growth is anticipated to occur.
- The process of updating developer fees allocates the cost of water facilities required to serve future growth to the Areas that will benefit from the improvements.
- New Business Fees collected by TMWA are significantly less than the cost of providing new business services which include application processing, facility planning, determining water rights dedications and construction inspection. New Business Fees were last updated in 2012.

RECOMMENDATION

Staff submits for the Board's consideration for First Reading the attached redline of TMWA's Rate Schedule WSF-Water System Facility Charges to revise and update Area Fee, Supply and Treatment, and Storage Unit Costs based on current collection of revenues and cost information. In addition, staff submits for the Board's consideration for First Reading the attached redline of TMWA's Rate Schedule BSF-Business Services Fees to revise and update application fees, engineering review fees and inspection fees based on current collection of revenues and cost information. Assuming a Second Reading and adoption of these rate adjustments at the Board's August 21, 2019 meeting, it is recommended that the approved rates become effective Tuesday, September 3, 2019.

DISCUSSION

Rate Schedule WSF contains Area Fee and Facility Charge Unit Costs which are used to calculate fees that TMWA collects from new development to reimburse the utility for facility improvements

REVISIONS TO TMWA'S RATE SCHEDULE WSF & BSF

June 19, 2019

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required to meet the demands of new growth. Area Fee Unit Costs, Supply and Treatment Facility Unit Costs, and Storage Facility Unit Costs apply only to developers applying for new or expanded water service, and do not affect the costs or rates to serve existing customers. In other words, pursuant to prior Board direction on customer rates: growth pays for growth.

Area Fee Unit Costs are applied on a maximum day demand and geographic basis based on the cost to expand the capacity of the water system in specific areas where growth is occurring. Facility Charges is a collective term referring to Supply-Treatment Facility Charges and Storage Facility Charges (STS Charges) that generally apply to growth occurring anywhere in the TMWA system. The only change proposed to the current Area Fee boundaries is the addition of Area 7 (Verdi). Table 1 presents a summary of the proposed changes and provides a comparison with existing Area Fee Unit Costs and Facility Charge Unit Costs.

The proposed increases in the Area Fee Unit Costs shown in Table 1 appear to be extremely large. The magnitude of the increases is due to a decrease in demand, which is the denominator in the calculation of the Unit Costs. The actual fees paid by growth are a result of Unit Costs multiplied by the Maximum Day Demand (MDD). The cost of proposed TMWA fees for a Single Family Residential (SFR) unit on a typical 6000 square foot (SF) lot is shown in Table 2. The cost of proposed TMWA fees for a Multi-Family Residential (MFR) unit are shown in Table 3.

The process to update the Developer Fees are as follows:

1. Utilizing the current WFP determine if recommended improvements are still applicable.
2. Based on current conditions, determine if new/additional improvements are required.
3. Review historical construction costs and recent bid results. Modify and/or add facility cost estimates as needed.
4. Update estimated facility costs with actual costs where applicable.
5. Update Facility Charges collected and Area Fees collected.
6. Update the GPM added/sold in each Area.
7. Calculate New Unit Costs:

Actual Costs Allocated to Growth	
+ Applicable Finance Charges	
+ Estimated Cost of Future Facilities	Expected Growth (GPM)
- <u>Fees Collected</u>	- <u>GPM Added/Sold</u>
= Remaining Cost of Growth	= Remaining GPM

$$\text{Remaining Cost of Growth} \div \text{Remaining GPM} = \text{Unit Cost (\$/GPM)}$$

$$\text{Actual Fee Paid \$\$} = \text{Unit Cost (\$/GPM)} \times \text{MDD (GPM)}$$

The proposed rate changes were presented to a meeting of BANN's I&P Committee on April 18 (50-60 attendees); during public workshops conducted on April 24 (1 attendee) and May 29 (4 attendees); and to the SAC Meeting of June 4. After some discussion regarding a phased approach to the fee increases, the SAC voted to forward a recommendation to the Board to approve the fee increases and to implement the revisions as recommended by staff. The expanded information contained in Tables 1 & 2 were distributed at the public workshop conducted on May 29. The additional information was helpful to the attendees. No other suggestions or significant comments

REVISIONS TO TMWA'S RATE SCHEDULE WSF & BSF

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resulted from any of the workshops. This is the First Reading of staff's proposed revisions to TMWA's WSF and BSF rates. The Second Reading public hearing will be scheduled at the Board's pleasure.

Table 4 presents the results of a high-level analysis to determine the adequacy of existing New Business Fees. New business costs are basically the salaries and benefits of TMWA employees (Project Coordinators, Planning Engineers, Design Review Engineers, Inspectors) who are directly involved in the new business process. Since TMWA is a not-for-profit organization, we only need to ensure that we are covering our actual costs to provide the necessary new business services. A direct comparison of existing and proposed fees is difficult since the fee sheet has been reformatted, but the changes can be gleaned from the red-line version of Rate Schedule BSF. In general, the proposed new business fees are double the existing fees.

REVISIONS TO TMWA'S RATE SCHEDULE WSF & BSF

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TABLE 1**PROPOSED TMWA AREA FEE AND FACILITY CHARGE UNIT COSTS**

Area	Description	(1) Existing Unit Cost	(2) New Unit Cost	Change \$\$	% Change
1	South Truckee Meadows	\$ 958	\$ 1,677	\$ 719	75%
2	Sparks-East Reno	\$ 1,711	\$ 2,627	\$ 916	54%
2A	Sparks-Inside McCarran Ring	\$ 856	\$ 1,313	\$ 457	53%
3	NW Reno-Northgate/Mogul	\$ 1,575	\$ 3,679	\$ 2,104	134%
4	Sparks-Spanish Springs	\$ 2,877	\$ 4,483	\$ 1,606	56%
5	Sparks-The Vistas	\$ 4,555	\$ 7,167	\$ 2,612	57%
6	Sun Valley-Sullivan	\$ 1,309	\$ 2,311	\$ 1,002	77%
7	NW Reno-Verdi	n/a	\$ 7,916	n/a	n/a
8	Sierra-North Virginia	\$ 4,142	\$ 9,260	\$ 5,118	124%
9	Southwest Reno	\$ 1,838	\$ 3,290	\$ 1,452	79%
10	Stead-Silver Lake-Lemmon Valley	\$ 5,057	\$ 6,279	\$ 1,222	24%
11	Southeast Truckee Meadows	\$ 2,828	\$ 4,232	\$ 1,404	50%
12	Spanish Springs ⁽³⁾	\$ 5,789	\$ 9,384	\$ 3,595	62%
13A	Heppner Subdivision	\$ 1,011	\$ 2,085	\$ 1,074	106%
14	STMGID West/Thomas Creek	\$ 655	\$ 815	\$ 160	24%
15	Arrowcreek/Mt Rose	\$12,568	\$12,942	\$ 374	3%
	Truckee Canyon ⁽⁴⁾	n/a	\$ 8,036	n/a	n/a
	Supply-Treatment Facility Charge	\$ 4,163	\$ 6,328	\$ 2,165	52%
	Storage Facility Charge	\$ 772	\$ 1,658	\$ 886	115%

Notes to Table:

- Unit Costs are multiplied by maximum day demand to yield the actual fee. Existing unit costs for TMWA Areas became effective on 7/1/13 and were based on demands added and fees collected through 6/30/12. Existing TMWA fees included Finance Charges in Areas 3, 4, 5, 6, 8, 9 & 10 and STS Facility Charges. Existing unit costs for former County Areas became effective on 1/1/15 and included some finance charges. Changes to Areas 14 and 15 were made in 6/1/15 and the consolidated Area 10 unit cost was established 6/16/16.
- Unit Costs are multiplied by maximum day demand to yield the actual fee. The proposed unit costs are based on demands added and fees collected through 6/30/18. Proposed unit costs are scheduled to go into effect on September 3, 2019 subject to the approval of the TMWA Board of Directors.
- The Area 12 unit cost includes the Area 4 unit cost.
- Truckee Canyon is a satellite system (located at Lockwood) where the water treatment plant capacity was expanded in 2016. There are no other improvements planned at any of the other satellite systems (Stampmill, Sunrise Estates, Old Washoe Estates, Lightning W) at this time.

REVISIONS TO TMWA'S RATE SCHEDULE WSF & BSF

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TABLE 2**WSF FEES PER SFR UNIT ON 6000 SF LOT (MDD = 0.5 GPM)**

Area	Location	Area Fees	Storage Fee	S-T Fee	Total Fees	Comment
1	South Virginia	\$ 839	\$829	\$3,164	\$4,832	
2	Sparks	\$1,314	\$829	\$3,164	\$5,307	
3	NW Reno-Northgate	\$1,840	\$829	\$3,164	\$5,833	
4	NE Sparks-Kiley Ranch	\$2,242	\$829	\$3,164	\$6,235	
5	NE Sparks – The Vistas	\$3,584	\$829	\$3,164	\$7,577	
6	Sun Valley – Sutro	\$1,156	\$829	\$3,164	\$5,149	
7	NW Reno – Verdi	\$3,958		\$3,164	\$7,122	
8	North Virginia	\$4,630	\$829	\$3,164	\$8,623	
9	Southwest Reno	\$1,645	\$829	\$3,164	\$5,638	
10	North Valleys	\$3,140			\$3,140	w/Vidler Resource
11	Double Diamond	\$2,116		\$3,164	\$5,280	
12	Spanish Springs	\$4,692		\$3,164	\$7,856	
14	STMGID W-Thomas Crk	\$ 408		\$3,164	\$3,572	
15	Arrowcreek-Mt Rose	\$6,471			\$6,471	

CHANGE IN FEES PER SFR UNIT ON 6000 SF LOT (vs Existing Fees)

Area	Location	Change in Cost Per SFR Unit	% Change
1	South Virginia	\$ 707	17%
2	Sparks	\$ 655	14%
3	NW Reno-Northgate	\$1,276	28%
4	NE Sparks-Kiley Ranch	\$ 767	14%
5	NE Sparks – The Vistas	\$ 934	14%
6	Sun Valley – Sutro	\$ 778	18%
7	NW Reno – Verdi	n/a	n/a
8	North Virginia	\$2,269	36%
9	Southwest Reno	\$ 897	19%
10	North Valleys	(\$3,315)	(51%)
11	Double Diamond	\$ 386	8%
12	Spanish Springs	\$ 890	13%
14	STMGID W-Thomas Crk	\$ 199	6%
15	Arrowcreek-Mt Rose	(\$2,327)	(26%)
	AVERAGE	\$ 380	12%

REVISIONS TO TMWA'S RATE SCHEDULE WSF & BSF

June 19, 2019

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TABLE 3**WSF FEES PER MFR UNIT (MDD = 0.14 GPM)**

Area	Location	Area Fees	Storage Fee	S-T Fee	Total Fees	Comment
1	South Virginia	\$ 235	\$232	\$886	\$1,353	
2	Sparks	\$ 368	\$232	\$886	\$1,486	
3	NW Reno-Northgate	\$ 515	\$232	\$886	\$1,633	
4	NE Sparks-Kiley Ranch	\$ 628	\$232	\$886	\$1,746	
5	NE Sparks – The Vistas	\$1,003	\$232	\$886	\$2,121	
6	Sun Valley – Sutro	\$ 324	\$232	\$886	\$1,442	
7	NW Reno – Verdi	\$1,108		\$886	\$1,994	
8	North Virginia	\$1,296	\$232	\$886	\$2,414	
9	Southwest Reno	\$ 461	\$232	\$886	\$1,579	
10	North Valleys	\$ 879			\$ 879	w/Vidler Resource
11	Double Diamond	\$ 592		\$886	\$1,478	
12	Spanish Springs	\$1,314		\$886	\$2,200	
14	STMGID W-Thomas Crk	\$ 114		\$886	\$1,000	
15	Arrowcreek-Mt Rose	\$1,812			\$1,812	

CHANGE IN FEES PER MFR UNIT (vs Existing Fees)

Area	Location	Change in Cost Per MFR Unit	% Change
1	South Virginia	\$ 469	53%
2	Sparks	\$ 489	49%
3	NW Reno-Northgate	\$ 657	67%
4	NE Sparks-Kiley Ranch	\$ 574	49%
5	NE Sparks – The Vistas	\$ 698	49%
6	Sun Valley – Sutro	\$ 505	54%
7	NW Reno – Verdi	n/a	n/a
8	North Virginia	\$1,053	77%
9	Southwest Reno	\$ 563	55%
10	North Valleys	(\$ 504)	(36%)
11	Double Diamond	\$ 430	41%
12	Spanish Springs	\$ 707	47%
14	STMGID W-Thomas Crk	\$ 277	38%
15	Arrowcreek-Mt Rose	(\$ 73)	(4%)
	AVERAGE	\$ 428	46%

REVISIONS TO TMWA'S RATE SCHEDULE WSF & BSF

June 19, 2019

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TABLE 4
NEW BUSINESS FEE ANALYSIS

Cost Category	Costs Incurred	Fees Collected	Estimated Collections from Proposed Fees
Inspection	\$1,342,403	\$1,135,530	\$1,222,400
Engineering	\$1,023,267	\$ 445,258	\$ 956,380
Water Rights	\$ 158,685	\$ 64,400	Not Estimated ⁽¹⁾
TOTALS	\$2,524,355	\$1,645,188	

1. Number and type of project not readily available. Annual report to be developed.
2. Costs and Fees for calendar year 2018.

Truckee Meadows Water Authority

RATE SCHEDULES

WSF – WATER SYSTEM FACILITY CHARGES

APPLICABILITY

Pursuant to procedures set forth in Rule 5, Applicants for new Service or Modified Service to a Service Property(ies) are subject to Water System Facility (WSF) Charges. WSF Charges are based on the Maximum Day Demand estimated in gallons per minute (GPM) by the Authority to serve the Service Property(ies) multiplied by the following Unit Costs. WSF Charges will be assessed where applicable and as identified in the Water Service Agreement.

A. Area Facility Unit Cost by Charge Area

	<u>Charge Area</u>	<u>Amount</u>	
0	Central Reno	\$0.00	per GPM
1	South Truckee Meadows	\$9581,677 .00	per GPM
2	Sparks-East Reno	1,7112,627 .00	per GPM
2A	Sparks-Inside McCarran Blvd	8561,313 .00	per GPM
3	Northwest Reno – Northgate/Mogul	1,5753,679 .00	per GPM
4	Sparks – Pyramid/Spanish Springs	2,8774,483 .00	per GPM
5	Sparks – The Vistas	4,5557,167 .00	per GPM
6	Sun Valley-Sullivan Pump Zones	1,3092,311 .00	per GPM
7	Verdi	TBD 7,916 .00	<u>per GPM</u>
8	Sierra-North Virginia Pump System	4,1429,260 .00	per GPM
9	Lakeridge-Plumas Pump System	1,8383,290 .00	per GPM
10	Stead–Silver Lake–Lemmon Valley	5,0576,279 .00	per GPM
11	Southeast Truckee Meadows	2,8284,232 .00	per GPM
12	Spanish Springs	5,7899,384 .00	per GPM
13A	Heppner*	1,0111,349 .00	per GPM
14	STMGID West/Thomas Creek	655815 .00	per GPM
15	Arrowcreek/Mt. Rose**	12,56812,942 .00	per GPM
	<u>Truckee Canyon</u>	<u>8,036.00</u>	<u>per GPM</u>

Where a Service Property is not located within an established Charge Area described above or where the Area Facility Unit Cost for that Charge Area has not been established, applicable Area Facility Unit Costs shall be determined by Authority on a case by case basis and may include charges for on-site and off-site improvements, including Oversizing Costs, to integrate new Water System Facilities or to connect to, expand, relocate or alter existing water Facilities, determined by the Authority as necessary to facilitate annexation of the Service Property into the Authority's Retail Service Area and/or development of the Charge Area or Charge Area Unit Cost to be established, as set forth in the Annexation Agreement or Water Service Agreement between Applicant and Authority.

* Charge Area 13A is subject to an additional charge of \$5,490.00 per lot for on-site distribution improvements.

** Component of fee includes estimated costs of acquiring supplemental resource supply. Fee may be reduced to ~~\$7,648.00~~\$8,641.00 upon Applicant dedication of an acceptable combination of groundwater and creek water rights to satisfy supplemental conjunctive use supply as determined by the Authority pursuant to its Rule 7.

Added: 06/18/03 Amended: 10/01/03; 01/21/04; 03/01/05; 10/18/06; 03/01/08; 05/21/09; 05/21/10; 06/19/13; 10/15/14; 01/01/15; 05/21/15; 06/16/16, 09/03/19

Truckee Meadows Water Authority

RATE SCHEDULES

WSF – WATER SYSTEM FACILITY CHARGES

B. Supply and Treatment Facility Unit Cost By Charge Area

“Supply and Treatment Facility Unit Cost” is the unit cost in dollars per GPM of Maximum Day Demand, representing the cost to construct and finance supply/treatment improvements identified in the Authority’s facility plan.

	<u>Charge Area</u>	<u>Amount</u>	
0	Central Reno	\$ 4,163 <u>6,328</u> .00	per GPM
1	South Truckee Meadows	4,163 <u>6,328</u> .00	per GPM
2	Sparks-East Reno	4,163 <u>6,328</u> .00	per GPM
2A	Sparks-Inside McCarran Blvd	4,163 <u>6,328</u> .00	per GPM
3	Northwest Reno – Northgate/Mogul	4,163 <u>6,328</u> .00	per GPM
4	Sparks – Pyramid/Spanish Springs	4,163 <u>6,328</u> .00	per GPM
5	Sparks – The Vistas	4,163 <u>6,328</u> .00	per GPM
6	Sun Valley-Sullivan Pump Zones	4,163 <u>6,328</u> .00	per GPM
7	Verdi	TBD <u>6,328</u> .00	per GPM
8	Sierra-North Virginia Pump System	4,163 <u>6,328</u> .00	per GPM
9	Lakeridge-Plumas Pump System	4,163 <u>6,328</u> .00	per GPM
10	Stead–Silver Lake-Lemmon Valley*	4,163 <u>6,328</u> .00	per GPM
11	Southeast Truckee Meadows	4,163 <u>6,328</u> .00	per GPM
12	Spanish Springs	4,163 <u>6,328</u> .00	per GPM
13A	Heppner	0.00	per GPM
14	STMGID West/Thomas Creek	4,163 <u>6,328</u> .00	per GPM
15	Arrowcreek/Mt. Rose	0.00	per GPM
	<u>Satellite Systems**</u>	<u>6,328.00</u>	<u>per GPM</u>

* For Area 10 growth dedicating Fish Springs groundwater resources, the Supply-Treatment Facility Unit Cost is 0 (zero).

** Satellite Systems include Truckee Canyon, Stampmill, Sunrise Estates, Old Washoe Estates and Lightning W.

Truckee Meadows Water Authority

RATE SCHEDULES

WSF – WATER SYSTEM FACILITY CHARGES

C. Storage Facility Unit Cost By Charge Area

“Storage Facility Unit Cost” is the unit cost in dollars per GPM of Maximum Day Demand, representing the cost to construct and finance storage improvements identified in the Authority’s facility plan.

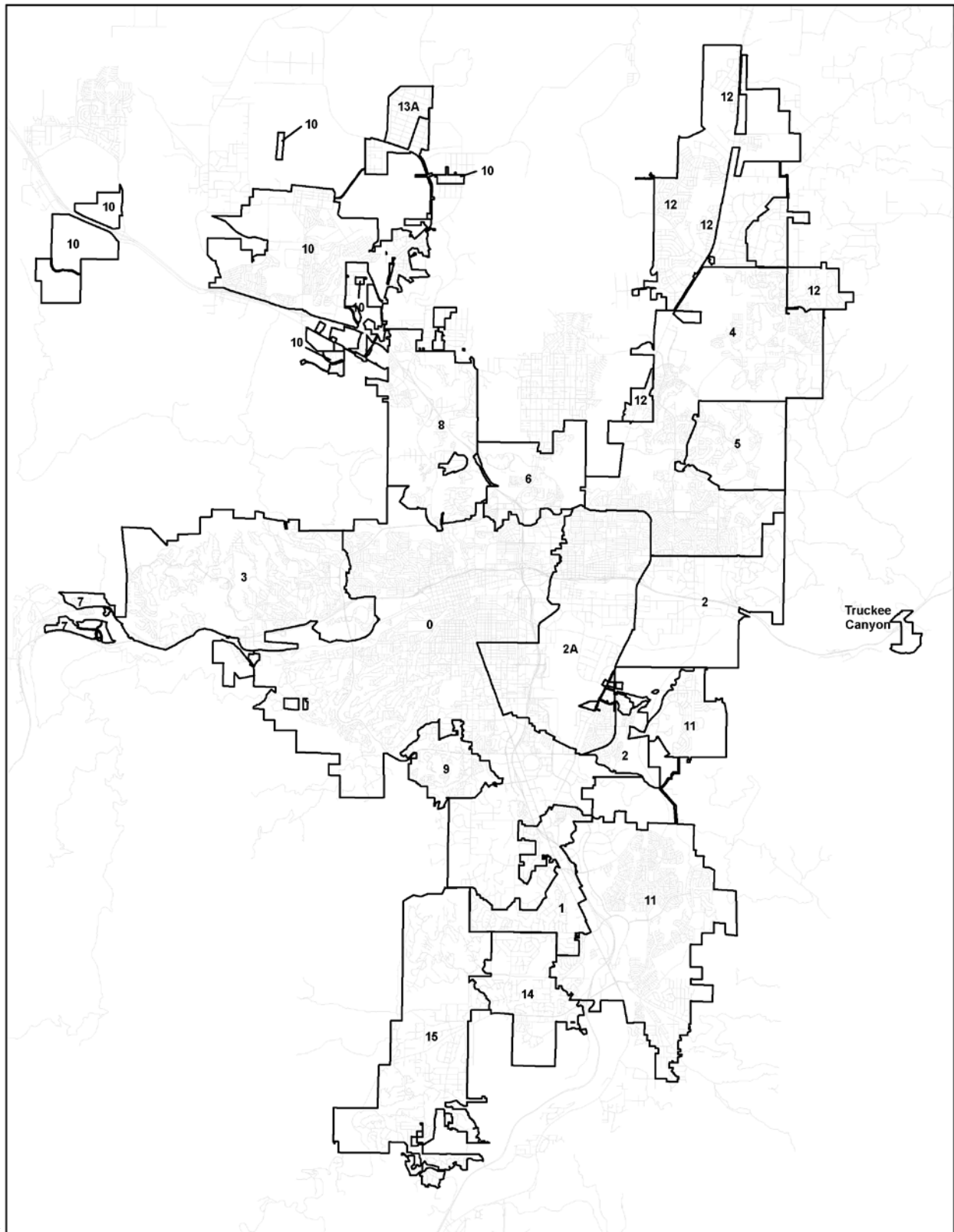
	<u>Charge Area</u>	<u>Amount</u>	
0	Central Reno	\$ 7721,658 .00	per GPM
1	South Truckee Meadows	7721,658 .00	per GPM
2	Sparks-East Reno	7721,658 .00	per GPM
2A	Sparks-Inside McCarran Blvd	7721,658 .00	per GPM
3	Northwest Reno – Northgate/Mogul	7721,658 .00	per GPM
4	Sparks – Pyramid/Spanish Springs	7721,658 .00	per GPM
5	Sparks – The Vistas	7721,658 .00	per GPM
6	Sun Valley-Sullivan Pump Zones	7721,658 .00	per GPM
7	Verdi	TBD 0.00	per GPM
8	Sierra-North Virginia Pump System	7721,658 .00	per GPM
9	Lakeridge-Plumas Pump System	7721,658 .00	per GPM
10	Stead–Silver Lake-Lemmon Valley	0.00	per GPM
11	Southeast Truckee Meadows	0.00	per GPM
12	Spanish Springs	0.00	per GPM
13A	Heppner	0.00	per GPM
14	STMGID West/Thomas Creek	0.00	per GPM
15	Arrowcreek/Mt. Rose	0.00	per GPM
	<u>Satellite Systems</u>	<u>0.00</u>	<u>per GPM</u>

NOTE: The following map depicts only approximate boundaries of the Charge Areas because the Authority’s distribution system undergoes frequent modification, Charge Area boundaries are subject to frequent adjustment and the exact boundaries of the Charge Areas shall be maintained by and may be adjusted from time to time by the General Manager of the Authority. The Authority attempts to keep a current map posted on its website, at www.tmwa.com; however, this map may not show sufficient detail to depict Charge Areas precisely. Pursuant to Rule 5 the Authority will determine the Charge Area and associated Area Facility charges to serve the Applicant’s Service Property(ies) at the time of application based on the most current Charge Area boundary information maintained by the General Manager of the Authority.

Truckee Meadows Water Authority

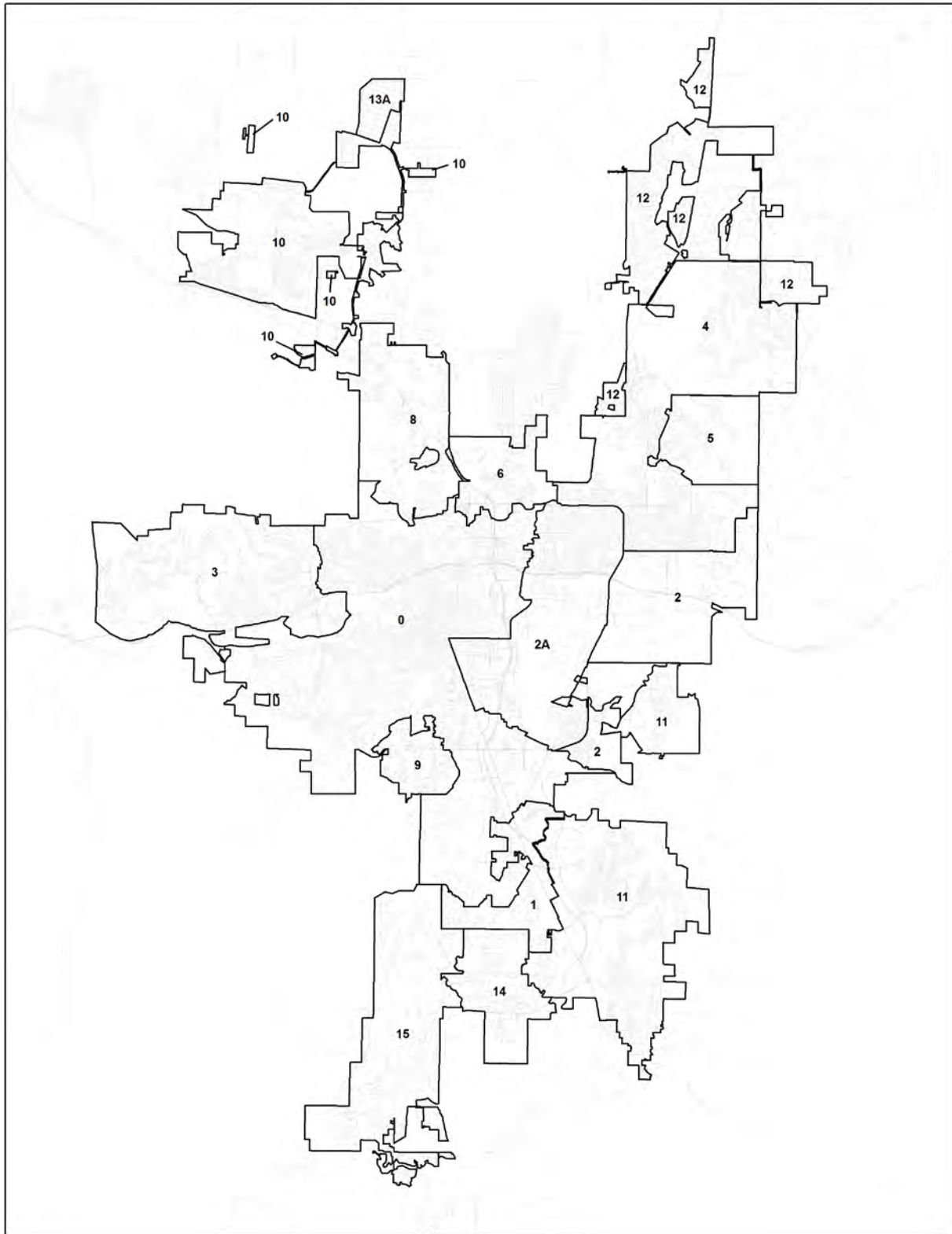
RATE SCHEDULES

WSF – WATER SYSTEM FACILITY CHARGES



Truckee Meadows Water Authority

RATE SCHEDULES

WSF – WATER SYSTEM FACILITY CHARGESAdded: 01/01/15; 05/21/15; 06/16/16, 09/01/19

Truckee Meadows Water Authority

RATE SCHEDULES

BSF - BUSINESS SERVICES FEES

APPLICABILITY

—In order to provide delivery of water to a particular Service Property(ies) due to the addition of new Service or Modified Service to existing water system Facilities, an Applicant is subject to the following business services fees. Business services shall mean services provided by the Authority for the benefit of Applicants for new Service or Modified Service and may include, but are not limited to, modification of an existing Service(s), system planning; design review; permitting; right-of-way or easement acquisition; water rights review; inspection; and document preparation.

SPECIAL DEFINITIONS

“Annexation” is the development of the minimum water system facility plan along with required improvements and required agreements in order to annex single family residence parcels or commercial and multi-family parcels.

~~“Design or Drafting” is the design or drafting by Authority staff of a new or modification to a service for the expansion of a single residential or existing commercial structure, and a construction drawing that will be approved by an Authority engineer exclusive of on-site or off-site water system Facility improvements.~~

“Design Report for NAC Compliance” shall mean the engineering analysis of existing and proposed water system Facilities for new subdivisions, water system planning, and/or expansion. Findings and conclusions from said studies shall be presented in report form to the Washoe County ~~District Health Department~~ District (WCHD) for their approval in compliance with NAC 445A.6666 and 445A.66695. In November 2018, the Authority, NDEP and WCHD entered into an Interlocal Agreement giving Authority the responsibility for design reviews for NAC Compliance. Authority continues to perform hydraulic modeling, supply and storage capacity calculations, etc. but those results are no longer presented to WCHD unless the project is selected for audit.

“Discovery Level 1” is the development of preliminary, major off-site water system Facility requirements along with key assumptions and costs where engineering staff time will be limited to less than twelve (12) hours. Discovery 1 scope of work will be limited to projects and site locations in the Authority’s retail service area, and where extensive engineering planning and design is not required. The Applicant will receive a written description of preliminary off-site requirements and costs. In the event a project application exceeds the minimal planning/design scope of work requirements for Discovery 1, or the site is outside the Authority’s retail service area, the Authority may reclassify and treat the project as a Discovery 2.

Truckee Meadows Water Authority

RATE SCHEDULES

BSF - BUSINESS SERVICES FEES

"Discovery Level 2" is the same as Discovery 1, but planning and design may require over twelve (12) hours of Authority's engineering staff time.

"Hardship Letters" shall be provided upon request by an Applicant for submittal to the State Engineer responding to the Authority's ability to serve the Service Property. The letter only provides an estimate of the costs for the Authority to serve the Service Property. For Service Properties less than 500-feet from the Authority's water system Facilities, the approximate main size, length and cost will be provided. For Service Properties greater than 500-feet from Authority's water system Facilities, the letter will state that the Service Property is over 500-feet from the Authority's water system without an estimate of the costs for the Authority to serve the Service Property.

"Point of Inspection" is water system ~~Facilities~~facilities and associated fittings that attach to a feeder or project main for main connections, Service Taps, Service Pipes, Meter Facilities, valves, vertical offsets, horizontal offsets and trench and backfill requirements.

Applicant shall pay the Authority the applicable Business Service Fees for processing the Application and the installation of water system Facilities necessary to serve the Applicant, shown in the following table.

SPECIAL CONDITIONS

1. Applicant's designs of water system Facilities shall be prepared by or under the direction of and wet-stamped by a Professional Engineer registered in the State of Nevada. After two submittals by Applicant to correct the designs of water system Facilities to Authority's satisfaction, Authority can charge additional, applicable Engineering and Planning Review Fees contained in this Rate Schedule.

Truckee Meadows Water Authority**RATE SCHEDULES****BSF - BUSINESS SERVICES FEES**

	<u>Engineering and Resources</u>	<u>Design-or Drafting-of "W-1" Plan</u>	<u>Inspection-or Distribution Crew</u>
A. Design report or letter for NAC compliance			
1. Final map per phase	\$1,500.00	na	na
2. Tentative Map			
a. Discovery Fee	See Item E	na	na
b. Water Service Acknowledgement Letter	\$100.00	na	na
3. Other new or Modified water system Facilities:			
a. Commercial	\$1,100.00	na	na
b. Multi-tenant	\$1,100.00	na	na
c. Feeder or project main	\$1,100.00	na	na
B. Engineering and planning review, approval, and inspection of water system Facilities			
1. New Service or Modified Service for:			
a. Residential: single service tap with service pipe and meter facility (non-subdivision)	\$150.00	\$500.00	\$150.00
b. Residential: subdivisions, multi-tenant, and commercial/industrial with main	\$720.00	na	\$150.00
i. Add for each point of inspection	\$15.00	na	\$150.00
c. Commercial, industrial, tenant improvements, irrigation, fire protection or non-potable (includes up to three service taps with service pipes and/or meter facilities)	\$300.00	\$750.00	\$150.00
i. Add for each additional service tap	\$150.00	\$250.00	\$150.00
2. Fire hydrant	\$150.00	\$500.00	\$150.00
3. Feeder or project main only	\$720.00	na	\$150.00
a. Add per lineal foot	na	na	\$1.00
b. Add for each point of inspection along main	\$15.00	na	\$150.00
4. Retirements and domestic well disconnections	na	na	\$150.00
C. Installation of a Service Tap by Authority personnel on a pressurized pipe, commonly referred to as a "hot tap"			
1. Tapping up to 2 inch hot tap ("Light" or 2-man crew)	na	na	\$400.00
2. Tapping greater than 2 to 12 inch hot tap ("Heavy" or 4-man crew)	na	na	\$500.00
3. Tapping greater than 12 inches are subject to Authority rules, construction standards, and costs are the responsibility of Applicant	na	na	\$500.00

Added: 06/18/03 Amended: 10/01/03; 07/19/06; 01/19/12; 09/03/19

Truckee Meadows Water Authority**RATE SCHEDULES****BSF - BUSINESS SERVICES FEES**

D.	Pressure regulating station design review and inspection (includes set-up of station)	\$430.00	na	\$2380.00
E.	Due diligence fees for water projects:			
1.	Annexation	\$1,500.00	na	na
2.	Discovery—Level 1	\$720.00	na	na
3.	Discovery—Level 2	\$1440.00	na	na
4.	Hardship Letters:			
a.	For parcel or lot less than 500 ft from the Authority's water system facilities	\$150.00	na	na
b.	For parcel or lot greater than 500 ft from the Authority's water system facilities	\$50.00	na	na
F.	Due diligence for property and water resources			
1.	Due diligence fees to research and verify title of non-permitted water rights, per parcel	\$250.00	na	na
2.	Due diligence fees to research and verify title of permitted water rights, per parcel	\$100.00	na	na
3.	Due diligence fees for tenant improvement or water resource credit(s) per parcel	\$150.00	na	na
4.	Due diligence fees for easement, right-of-way or fee property dedications per parcel	\$150.00	na	na
5.	Preparation of documents including but not limited to Will-Serve Commitment Letter, No Water Rights Required Letter, deeds, banking agreements, state required applications, or Report of Conveyance, per document (fee does not include State, county or other regulatory agency fees)	\$100.00	na	na

Added: 06/18/03 Amended: 10/01/03; 07/19/06; 01/19/12, 09/03/2019

Truckee Meadows Water Authority**RATE SCHEDULES****BSF - BUSINESS SERVICES FEES**

<u>Application Type &/Or New Business Service</u>	<u>Engineering Analysis/Review</u>	<u>Lands or Water Resources</u>	<u>Inspection &/or Crew</u>
<u>A. Residential – Single Service including separation of shared service into single metered services (each additional separate service is a POI)</u>	<u>\$300</u> <u>+\$30 per POI</u>	<u>\$150</u>	<u>\$200</u> <u>+\$50 per POI</u>
<u>B. Commercial Service with up to 3 service taps/service lines/meter facilities (Domestic, Fire & Irrigation) - applies to applications for Industrial, Irrigation, Construction Water</u>	<u>\$700</u> <u>+\$30 per POI</u>	<u>\$450</u>	<u>\$300</u> <u>+\$150 per POI</u>
<u>C. Residential – Subdivision or Multi-Family - Design Review – per final map or phase</u>	<u>\$2,400</u> <u>+\$30 per POI</u>	<u>\$450</u>	<u>\$300</u> <u>+\$150 per POI</u>
<u>D. Tenant Improvement with New or Deficit Demand with no new water facilities required</u>	<u>\$150</u>	<u>\$300</u>	
<u>E. Main Extensions – Alone or with any service</u>	<u>\$1,800</u> <u>+\$30 per POI</u>		<u>\$300, +\$2/LF</u> <u>+\$150 per POI</u>
<u>F. Fire Hydrant or Fire Service (alone, existing main)</u>	<u>\$300</u>	<u>\$150</u>	<u>\$200</u>
<u>G. Additional Engineering Review</u>	<u>\$150</u>		
<u>H. Retirements and Domestic Well Conversions</u>	<u>\$300</u>	<u>\$150</u>	<u>\$200</u>
<u>I. Hot taps up to 2" – by Authority</u>			<u>\$300</u>
<u>- Hot taps >2" up to 12" – by Authority</u>			<u>\$550</u>
<u>- Hot taps >12" – by Licensed Specialty Contractor hired directly by Applicant</u>			<u>\$200</u>
<u>J. Pressure Regulating Stations</u>	<u>\$1,500</u>	<u>\$150</u>	<u>\$7,200</u> <u>(insp. + setup)</u>
<u>K. Annexation (includes Discovery)</u>	<u>\$2,400</u>	<u>\$300</u>	
<u>- Discovery – Level 1</u>	<u>\$2,400</u>		
<u>- Discovery – Level 2</u>	<u>\$3,600</u>		
<u>- Water Service Acknowledgement Letter</u>	<u>\$200</u>		
<u>- Hardship Letter – Parcel <500' from water system</u>	<u>\$200</u>		
<u>- Hardship Letter – Parcel >500' from water system</u>	<u>\$150</u>		
<u>L. Property & Water Rights Research & Documents</u>			
<u>- Research/verify title of non-permitted water rights, per parcel</u>		<u>\$350</u>	
<u>- Research/verify title of permitted water rights, per parcel</u>		<u>\$200</u>	
<u>- Research and establish easements, rights-of-way or fee property dedications, per parcel</u>		<u>\$300</u>	
<u>- Document Preparation including Will-Serve Letter, No Water Rights Required Letter, Banking Agreements, Deeds, etc.</u>		<u>\$150</u> <u>per document</u>	
<u>M. Deferred WSF Fees (subdivisions only) Setup & Document</u>	<u>\$300</u>		
<u>- Meter Set Request, per request, groups or single</u>	<u>\$200</u>		
<u>N. ILA Audit Fee, per Residential, Commercial or Main Project (Applies to Items A, B, C, E and F)</u>	<u>\$100</u>		

Added: 06/18/03 Amended: 10/01/03; 07/19/06; 01/19/12, 09/03/2019

Truckee Meadows Water Authority

DEVELOPER FACILITY CHARGE & NEW BUSINESS FEES UPDATE

June 19, 2019



CALCULATION OF CONNECTION FEES

Actual Expenditures Allocated to Growth
+ Applicable Finance Charges
+ Est. Cost of Future Projects for Growth
- Fees Collected
= Remaining Cost of Growth

Expected Growth, GPM
- GPM Sold
= Remaining GPM

Remaining Cost of Growth ÷ Remaining GPM = Unit Cost \$/GPM

(The Unit Costs are shown in Rate Schedule WSF)

The Connection Fee \$\$ = Unit Cost \$/GPM x Max Day Demand, GPM

CONNECTION FEE FOR A NEW SUBDIVISION LOT

Existing connection fees compared to proposed connection fees for a new house on a typical 6000 SF lot:

<u>Area/Location</u>	<u>Existing Fees</u>	<u>Proposed Fees</u>	<u>Change Per SFR Unit</u>	<u>Change as a % of Exist.</u>
1 – So. Virginia	\$4,125	\$4,832	\$ 707	17%
2 – Sparks-E. Reno	\$4,652	\$5,307	\$ 655	14%
3 – NW Reno	\$4,557	\$5,833	\$ 1,276	28%
4 – Kiley Ranch	\$5,468	\$6,235	\$ 766	14%
5 – The Vistas	\$6,643	\$7,577	\$ 934	14%
6 – Sun Valley/Sutro	\$4,371	\$5,149	\$ 778	18%
7 – Verdi	n/a	\$7,122	n/a	n/a
8 – North Virginia	\$6,354	\$8,623	\$ 2,269	36%
9 – SW Reno	\$4,741	\$5,638	\$ 897	19%
10 – North Valleys	\$6,454	\$3,140	\$(3,314)	(51%)
11 – Double Diamond	\$4,894	\$5,280	\$ 386	8%
12 – Spanish Springs	\$6,966	\$7,856	\$ 890	13%
14 – STMGID West	\$3,373	\$3,572	\$ 199	6%
15 – Mt Rose	\$8,798	\$6,471	\$(2,327)	(26%)
AVERAGES			\$380	12%

CONNECTION FEE FOR AN APARTMENT (MFR)

Existing connection fees compared to proposed connection fees for a new apartment:

<u>Area/Location</u>	<u>Existing Fees</u>	<u>Proposed Fees</u>	<u>Change Per SFR Unit</u>	<u>Change as a % of Exist.</u>
1 – So. Virginia	\$ 884	\$1,353	\$ 469	53%
2 – Sparks-E. Reno	\$ 997	\$1,486	\$ 489	49%
3 – NW Reno	\$ 977	\$1,633	\$ 657	67%
4 – Kiley Ranch	\$1,172	\$1,746	\$ 574	49%
5 – The Vistas	\$1,424	\$2,121	\$ 698	49%
6 – Sun Valley/Sutro	\$ 937	\$1,442	\$ 505	54%
7 – Verdi	n/a	\$1,994	n/a	n/a
8 – North Virginia	\$1,362	\$2,414	\$ 1,053	77%
9 – SW Reno	\$1,016	\$1,579	\$ 563	55%
10 – North Valleys	\$1,383	\$ 879	\$ (504)	(36%)
11 – Double Diamond	\$1,049	\$1,478	\$ 430	41%
12 – Spanish Springs	\$1,493	\$2,200	\$ 707	47%
14 – STMGID West	\$ 723	\$1,000	\$ 277	38%
15 – Mt Rose	\$1,885	\$1,812	\$ (73)	(4%)
AVERAGES			\$448	42%

NEW BUSINESS FEES

- New Business Fees such as application fees, design review fees and inspection fees have not been updated since 2012.
- New Business Fees pay for the time of Project Coordinators, Engineers and Inspectors who are directly involved in the new business process.
- TMWA is a not-for-profit organization, so we are only concerned with covering our actual costs to provide necessary new business services.
- A comparison of new business costs vs. new business fees collected for calendar year 2018 show the following:

	Costs	Fees	Estimated
<u>Category</u>	<u>Incurred</u>	<u>Collected</u>	<u>Collections</u>
Inspection	\$1,342,403	\$1,135,530	\$1,222,400
Engineering	\$1,023,267	\$ 445,258	\$ 956,380
Water Rights	<u>\$ 158,685</u>	<u>\$ 64,400</u>	\$ not est.
Totals	\$2,524,355	\$1,645,188	

END OF PRESENTATION

- QUESTIONS?, DISCUSSION?
- OUTREACH:
 - Developer/New Business Fee Workshop – BANN I&P Committee, April 18, 2019
 - Developer/New Business Fee Workshop – April 24, 2019
 - First Hearing of proposed fees – TMWA Board of Directors Meeting, May 23, 2019 (Hearing continued to June Board Meeting)
 - Water Facility Plan Workshop – May 29, 2019
 - TMWA Standing Advisory Committee (SAC) Meeting – June 4, 2019,
 - First Hearing of proposed fees – TMWA Board of Directors Meeting – June 19, 2019 (Hearing continued from May Board Meeting)
 - Second Hearing of proposed fees – TMWA Board of Directors Meeting - August 21, 2019
 - With Board approval, new rates/fees to go into effect on Tuesday, Sept 3, 2019.

Thank you!

TMWA Board Meeting

Corporate Office:

1355 Capital Blvd., Reno, NV 89502
834-8080
www.tmwa.com



STAFF REPORT

TO: Chairman and Board Members
THRU: Mark Foree, General Manager
FROM: Pat Nielson, Distribution, Maintenance and Generation, Director and John Zimmerman, Water Resources Manager
DATE: June 12, 2019
SUBJECT: **Update regarding status of the Farad property and discussion and possible direction to staff**

SUMMARY

The Farad property is approximately 111 acres consisting of six parcels of land located in Nevada County, California. In June 2018 the Board directed staff to:

1. Obtain an appraisal of the property
2. Grant an access easement to the Tahoe-Pyramid Trail, Inc.
3. Meet with Truckee Donner Land Trust, a non-profit organization, (TDLT) regarding a potential transfer of the property or a conservation easement to TDLT.

Staff has obtained an appraisal, granted an access easement to the Tahoe-Pyramid Trail, and met and spoke with TDLT numerously regarding a potential transfer of the property or a conservation easement. It is now appropriate to update the Board regarding the status of the above-described actions and obtain direction regarding the potential transfer of the property.

DISCUSSION

Appraisal

The appraised value of the property as of November 2018 is \$250,000.¹ The property is currently zoned as open space and the appraiser concluded that the highest and best use of the property would be open space and passive recreational uses. The appraisal accounted for the fact that the property is subject to an access easement to the Tahoe-Pyramid Trail and an easement to Liberty Utilities, a subsidiary of Algonquin Power & Utilities Corp., for a substation, transmission lines, and access.

The appraiser also considered existing zoning for the property (open space) and Nevada County land use restrictions. As the Board may recall, last year staff met with Nevada County

¹ Appraisal by Johnson Perkins and Griffin, Real Estate Appraisers & Consultants.

land use planning officials and discussed options and possibilities for the property. Open space areas in Nevada County are intended to be protected from development and include areas dedicated to recreation, resource and habitat preservation, and protection of environmental resources. In Nevada County, open space districts have relatively few allowable uses and are essentially limited to trails, parks, and playgrounds. Campgrounds, even low-intensity tent-only type camping, are not allowed and would require a zoning change and general plan amendment. This process could take six months to four years to complete depending on the complexity of the change and issues involved. Nevada County is very conservative with amendments and try to avoid them because the plan is intended to be followed as much as possible. And a zoning change would have to be compatible with the surrounding areas, which are zoned open space, private forest, and public forest (state and Federal). Accordingly, a zoning change to recreational use would have the greatest chance of being approved. In a Recreation District, a campground could be allowed, but would require a use permit. The following conditions are likely to be imposed by Nevada County with any land use change.

- 100-foot setback from the Truckee River for all buildings and new construction
- Maintain river access for fisherman and other recreational users
- Establish permanent easement for Tahoe-Pyramid Trail
- No septic systems

Lastly, a land use change would also trigger environmental review under the California Environmental Quality Act and involve the California Office of Historic Preservation, California-Lahontan Regional Water Quality Control Board, and various other governmental and non-governmental agencies and stakeholders. The property is also within a designated flood plain, which could trigger additional conditions and restrictions.

TDLT Discussions

TDLT submitted a letter of interest in acquiring the property in February 2018 in response to TMWA's published request for statements of interest. TDLT also attended the June 2018 Board meeting and expressed its interest in acquiring the property for conservation and recreational values. TDLT also stated that it has no interest in acquiring the existing infrastructure, could not pay the appraised value, and had concerns about future management costs. After that Board meeting, staff had considerable difficulty scheduling a meeting and TDLT was not able to meet with staff until December 2018.

Staff advised TDLT that TMWA's preference would be to transfer fee title to the property in an as-is condition, but would also consider a conservation easement. Staff believes TMWA should transfer fee title to the property instead of granting a conservation easement because with the easement TMWA would still be at risk of any liability for injuries that occur on the property. And based on Nevada County land use restrictions, even if fee title was transferred to a private individual or entity, it is almost certain they would be required to maintain existing public access to the Truckee River and maintain the conservation and recreational values to the public.

In January 2019, TDLT sent a letter to staff requesting TMWA transfer fee title to the property to TDLT for free or grant a conservation and public access easement to TDLT. Staff

sent a letter of intent to TDLT in February 2019 and intended to bring it to the Board for review and approval when TDLT signed it. TDLT continued to express concerns regarding liability and management costs, but stated that it was considering the letter of intent. Last month, however, TDLT advised staff that it needed until this fall to consider the potential transfer because its Board had concerns with liability related to the property and lacked adequate staffing to take over management of the property now. Accordingly, although TDLT remains interested, staff is uncertain whether TDLT will agree to accept fee title to the property because of its concerns with liability and future management and maintenance costs.

Other Interests, Surplus Property Disposal Policy

Staff has been contacted by a person interested in acquiring the property to obtain access to his property across the river. If the Board decided to transfer ownership of the property to a private party, then under TMWA's surplus property disposal policy, the following procedures apply:

1. Obtain two appraisals (unless Board holds a hearing to determine fair market value)
2. General Manager must certify that the property is not useful to TMWA, is not necessary for the efficient operation of the water system, or has been or will be replaced by other property of at least equal value
3. Confer with bond counsel if fair market value exceeds \$100,000 regarding any potential bond implications
4. Adopt a Board resolution determining the sale of the property is in TMWA's best interest
5. Publish notice of the process and deadline to submit sealed bids and of the Board meeting at which sealed bids will be considered
6. Hold a public hearing to open and consider sealed bids (Note: Verbal bids may be accepted if they exceed the highest conforming bid by 5%)

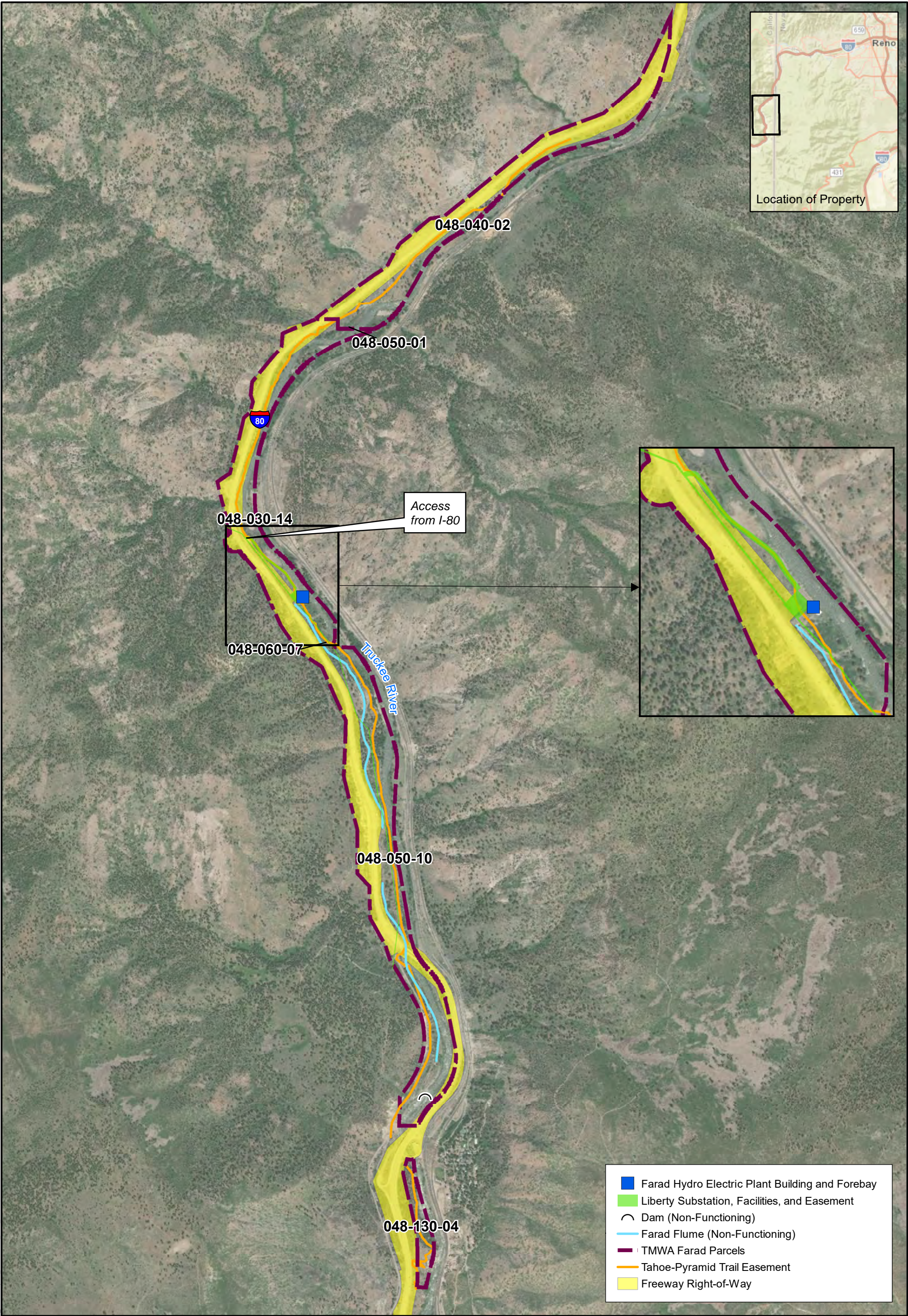
The above-described appraisal and bidding procedures do not apply if the transfer is to a non-profit entity for a public benefit, and thus, would not apply to a transfer to TDLT or similar entity.

RECOMMENDATION

Staff recommends the Board solicit bids from any interested party for the following reasons. First, the property is unusable to TMWA because rebuilding the hydroelectric facilities and operating the plant is not economically feasible. Second, the transfer to TDLT is not certain and TDLT seems very hesitant to acquire fee title to the property in an as-is condition. Third, the bidding process does not exclude non-profits or governments so other interested entities similar to TDLT could submit bids for the Board to consider. Fourth, even if the property is transferred to a private individual or entity, the public access, recreation, and aesthetic values of the property will likely remain mostly unchanged because of its current open space zoning, Nevada County's land use restrictions, and other governmental requirements. Lastly, the Board retains the option to reject all bids.

Staff recommends the property be offered for sale in an “as-is where-is” condition subject to all title defects and faults and require all parcels to be sold as one property to avoid being left with an orphaned piece of land. This would include all existing structures located on the property including, but not limited to, the diversion works, flume, overflow, forebay, penstocks, and powerhouse. TMWA would reserve all water rights and impose a restrictive covenant prohibiting the owner from diverting water from the Truckee River to protect TMWA’s downstream use. TMWA would also reserve the right to allow a third-party to install public restroom facilities on the property at a mutually agreeable location. This requirement would be mainly for Tahoe-Pyramid Trail traffic and to reduce water quality issues along this stretch of the river due to the lack of restroom facilities.

If the Board decides to offer the property for sale, then it should motion to proceed to the next agenda item to start the process required by the surplus property disposal policy.



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FARAD PROPERTY

DATE:	6/17/2019
MAP BY:	JAK
REQUESTED BY:	JZ
SCALE:	0 250 500 1,000 Feet





STAFF REPORT

TO: Chairman and Board Members
THRU: Mark Foree, General Manager
FROM: Pat Nielson, Distribution, Maintenance and Generation, Director and John Zimmerman, Water Resources Manager
DATE: June 13, 2019
SUBJECT: **Discussion and possible adoption of Resolution No. 275, determining that it is in the best interest of TMWA to sell the Farad property as surplus property and authorizing staff to initiate the sale process and solicit bids for the purchase of the Farad property for future Board consideration**

RECOMMENDATION

Staff recommends the Board adopt Resolution No. 275 (attached) determining that it is in the best interest of TMWA to sell the Farad property as surplus property and authorizing staff to initiate the sale process and solicit bids for the purchase of the Farad property for consideration at a future Board meeting (most likely August 2019). Attached is the General Manager's certification that the property is not useful to TMWA or necessary for the efficient operation of the water system. This certification is required by the disposal policy and TMWA's bond resolutions. Bond counsel has confirmed that there are no bond implications to selling the property.

SALE CONDITIONS

As stated in the prior agenda item report, the Farad property should be offered for sale in an "as-is where-is" condition subject to all title defects and faults and require all parcels to be sold as one property to avoid TMWA being left with an orphaned piece of land. This would include all existing structures located on the property including the diversion works, flume, overflow, forebay, penstocks, and powerhouse. TMWA would reserve all water rights and impose a restrictive covenant prohibiting the owner from diverting water from the Truckee River to protect TMWA's downstream use. TMWA would also reserve the right to allow a third-party to install restroom facilities on the property at a mutually agreeable location. This requirement would be mainly for Tahoe-Pyramid Trail traffic and to reduce water quality issues along this stretch of the river due to the lack of restroom facilities. Staff also recommends requiring the sale to be cash-only with all funds due at closing. Staff would work with General Counsel Michael Pagni to prepare a purchase agreement to memorialize these conditions and require all bidders to accept the agreement terms as a prerequisite to being able to submit a bid.

APPRAISALS, NOTICE OF BID OPPORTUNITY, AND PUBLIC HEARING

As required by TMWA's surplus property disposal policy, staff will update the current appraisal and obtain another appraisal. Lastly, staff will publish notice of the process and deadline to submit sealed bids and of the Board meeting at which sealed bids will be considered. Staff anticipates holding the public hearing to review bids during the August 2019 TMWA Board meeting.



STAFF REPORT

TO: Chairman and Board Members
FROM: Mark Foree, General Manager
DATE: June 13, 2019
SUBJECT: **Certification Pursuant to Surplus Property Disposal Policy – Farad Hydroelectric Property**

In accordance with the Policy Regarding Disposal of Surplus TMWA Property adopted by the Board on July 10, 2002 and revised through adoption by the Board on June 18, 2014, the General Manager hereby certifies to the Board of the Truckee Meadows Water Authority that the real property commonly referred to as the Farad hydroelectric property, including the building, wooden flume, diversion works and all fixtures and personal property located thereon, which is more-particularly described in the attached Exhibit A, but expressly excluding any water rights which are reserved by TMWA, is not useful or necessary for the efficient operation of the water system and may be considered surplus property for purposes of the TMWA disposal policy. The subject property has not been operated as a hydroelectric facility since 1997 when the diversion dam was destroyed by extremely high river flows and it is not economically feasible to rebuild and operate the facility. This certification is made for the purpose of facilitating a possible sale or transfer of the subject property in accordance with the foregoing policy.

Dated: June 13, 2019

By: Mark Foree
Mark Foree, General Manager

EXHIBIT A

APN: 048-040-02

All that certain real parcel of land situate within a portion of the Northwest One-quarter (NW1/4) of Section 7, Township 18 North, Range 18 East, Mount Diablo Meridian and a portion of Resultant Parcel 2 as described by Grand Deed in favor of Truckee Meadows Water Authority, recorded as Document No. 2007-13480 on April 27, 2007 in the Nevada County Recorder, State of California.

APN: 048-050-01, 048-030-14, 048-060-07, 048-050-10

All that certain real parcel of land situate within a portion of the East half of Section 12 and a portion of the Northeast quarter of Section 13, Township 18 North, Range 17 East, together with a portion of the Northwest quarter of Section 18, a portion of the West half of Section 19 and a portion of the Northwest quarter of Section 30, Township 18 North, Range 18 East, M.D.M., Nevada County, California, more particularly described as:

Resultant Parcel 3 of a Grant Deed, recorded as File Number 2007-0008431-00 on March 16, 2007, Official Records of Nevada County, California.

APN: 048-130-04

All that certain real parcel of land situate within a portion of Lots 2, 3, 4, 5 and 6 of Section 30, Township 18 North, Range 18 East, Mount Diablo Meridian and a portion of Parcel Fourteen as described by Grand Deed in favor of Truckee Meadows Water Authority, recorded as Document No. 2007-13480 on April 27, 2007 in the Nevada County Recorder, State of California.

TRUCKEE MEADOWS WATER AUTHORITY

RESOLUTION NO. 275

**A RESOLUTION APPROVING THE SALE OF APPROXIMATELY 111 ACRES OF
SURPLUS REAL PROPERTY LOCATED IN NEVADA COUNTY, CALIFORNIA**

WHEREAS, Authority holds record title to approximately 111 acres of real property located in Nevada County, California and which is more-particularly described on the attached Exhibit A (Farad Property). The Farad Property includes the Farad hydroelectric facility and associated infrastructure, building, wooden flume, diversion works and all fixtures and personal property located thereon, but expressly excludes any water rights, which are reserved by Authority.

WHEREAS, pursuant to the Authority's surplus property disposal policy, the General Manager or its designee is authorized to sell and convey real property that is not otherwise necessary for the operations of the Water System if it is in the best interest of the Authority.

WHEREAS, the General Manager has certified in writing to the Board that the Farad Property and associated infrastructure is not useful and is not necessary for the efficient operation of the Authority's water system.

WHEREAS, Authority staff has conferred with bond counsel and determined there is no adverse potential bond implications with proceeding with the transfer and disposition of the Farad Property.

WHEREAS, it is in the best interests of Authority to proceed with the process under the surplus property disposal policy of soliciting bids from interested parties for the purchase of the Farad Property for consideration at a future Board meeting.

**NOW, THEREFORE, THE BOARD OF DIRECTORS OF THE TRUCKEE
MEADOWS WATER AUTHORITY DOES RESOLVE:**

1. The sale of the Farad Property is in the best interests of Authority and is appropriate and justified.
2. The sale of the Farad Property, upon the terms and conditions set forth in the staff report presented to the Board, is hereby approved subject to the receipt and acceptance of a bid for the Farad Property at a future meeting of the TMWA Board.
3. The Farad Property is as described on the attached Exhibit A.
4. There is no minimum price for the submittal of a bid on the Farad Property, but except as otherwise permitted by the surplus property disposal policy or determined by the Board the property should not be sold for less than appraised value.
5. Notice of the sale shall be published once a week for three consecutive weeks.
6. Sealed bids will be opened and considered during the August 21, 2019 TMWA Board meeting, which is scheduled to begin at 10:00 a.m. on Wednesday, August 21, 2019 at the Sparks Council Chambers located at 745 4th Street, Sparks, Nevada.

Upon motion of _____, seconded by _____, the foregoing Resolution was passed and adopted this 19th day of June, 2019, by the following vote of the Board:

Ayes: _____

Nays: _____

Abstain: _____ Absent: _____

Approved this 19th day of June, 2019

Chairman

EXHIBIT A

APN: 048-040-02

All that certain real parcel of land situate within a portion of the Northwest One-quarter (NW1/4) of Section 7, Township 18 North, Range 18 East, Mount Diablo Meridian and a portion of Resultant Parcel 2 as described by Grand Deed in favor of Truckee Meadows Water Authority, recorded as Document No. 2007-13480 on April 27, 2007 in the Nevada County Recorder, State of California.

APN: 048-050-01, 048-030-14, 048-060-07, 048-050-10

All that certain real parcel of land situate within a portion of the East half of Section 12 and a portion of the Northeast quarter of Section 13, Township 18 North, Range 17 East, together with a portion of the Northwest quarter of Section 18, a portion of the West half of Section 19 and a portion of the Northwest quarter of Section 30, Township 18 North, Range 18 East, M.D.M., Nevada County, California, more particularly described as:

Resultant Parcel 3 of a Grant Deed, recorded as File Number 2007-0008431-00 on March 16, 2007, Official Records of Nevada County, California.

APN: 048-130-04

All that certain real parcel of land situate within a portion of Lots 2, 3, 4, 5 and 6 of Section 30, Township 18 North, Range 18 East, Mount Diablo Meridian and a portion of Parcel Fourteen as described by Grand Deed in favor of Truckee Meadows Water Authority, recorded as Document No. 2007-13480 on April 27, 2007 in the Nevada County Recorder, State of California.



TO: Board of Directors
FROM: Mark Foree, TMWA General Manager
DATE: June 11, 2019
SUBJECT: Discussion and action on nomination and election of Chairman and Vice Chairman of TMWA Board of Directors and request for Board adoption of Resolution No. 276 appointing a Chairman and Vice Chairman for Fiscal Year 2020

The Cooperative Agreement forming TMWA requires the Board to appoint a Chairman and Vice Chairman to serve one year terms coinciding with the fiscal year. Said appointments would take effect July 1, 2019 and continue through June 30, 2020.

TRUCKEE MEADOWS WATER AUTHORITY

RESOLUTION NO. 276

A RESOLUTION TO APPOINT OFFICERS

WHEREAS, pursuant to the Truckee Meadows Water Authority Cooperative Agreement among the City of Reno, City of Sparks, and County of Washoe, the Board of Directors is required to appoint a chairman and a vice chairman from its membership; and

WHEREAS, the officers appointed are to hold office for a period of one year commencing the first day of each fiscal year; and

WHEREAS, the last day of the current fiscal year is June 30, 2019, and the terms of the current officers will expire as of that date,

NOW, THEREFORE, BE IT RESOLVED that the Board hereby appoints:

_____ to serve as its chairman for the fiscal year beginning July 1, 2019.

Upon motion of _____, second by _____, the foregoing Resolution was passed and adopted June 19, 2019, by the following vote of the Board:

Ayes: _____

Nays: _____

Abstain: _____

Absent: _____

and

_____ to serve as its vice-chairman for the fiscal year beginning July 1, 2019.

Upon motion of _____, second by _____, the foregoing Resolution was passed and adopted June 19, 2019, by the following vote of the Board:

Ayes: _____

Nays: _____

Abstain: _____

Absent: _____

Truckee Meadows Water Authority
Resolution 276 (continued)

Approved June 19, 2019

Chairman Geno Martini
Truckee Meadows Water Authority

STATE OF NEVADA,)
 : ss.
COUNTY OF WASHOE.)

On this 19th day of June, 2019, Vaughn Hartung, Chairman of the Board of Truckee Meadows Water Authority, personally appeared before me, a Notary Public in and for said County and State, and acknowledged that he executed the above instrument freely and voluntarily and for the purposes therein mentioned.

Notary Public



STAFF REPORT

TO: Board of Directors
FROM: Mark Foree, General Manager
DATE: June 10, 2019
SUBJECT: General Manager's Report

Attached please find the written reports from the Management team including the Operations Report (*Attachment A*), the Water Resource and the Annexation Activity Report (*Attachment B*), the Customer Services Report (*Attachment C*), and the Monthly Conservation Report (*Attachment D*).

Included in your agenda packet are press clippings from May 17, 2019 through June 11, 2019. Also included is a *Tell the Board Submission* from a customer regarding TMWA changing the due date on the bill without being notified. Customer Service contacted the individual, removed the late charges, informed the customer that billing cycles in different areas were changed to make meter read cycles more manageable, and apologized for any inconvenience this caused.



STAFF REPORT

TO: Board of Directors
THRU: Mark Foree, General Manager
FROM: Scott Estes, Director of Engineering
BY: Bill Hauck, Senior Hydrologist
DATE: June 11, 2019
SUBJECT: June 2019 Operations Report

Summary

- Overall, the water supply outlook for the region as of June 11th is very bright
- Upstream reservoir storage will be at maximum capacity in the coming weeks
- Significantly above average river flows are projected through the summer months
- A fully recharged series of upstream reservoirs provides the community an added layer of security against a prolonged drought
- Hydroelectric revenue for May 2019 was approximately \$217,000
- Customer demands are climbing once again after a cooler and wet 2nd half of May

(A) Water Supply

- **River Flows** - Truckee River flows at the CA/NV state line are still significantly above average for this time of year. Discharge was 2,300 cubic feet per second (CFS) this morning. The average flow for June 11th based on 110 years of record is 1,320 CFS.
- **Reservoir Storage** – Reservoirs are being filled. The elevation of Lake Tahoe is 6228.73 feet, about 4/10th of a foot from full. Overall, Truckee River reservoir system storage is in exceptionally good shape as well at about 91% of maximum capacity. Storage values for each reservoir as of 6/11 are as follows:

Reservoir	Current Storage (Acre-Feet)	% of Capacity (Percent)
Tahoe	699,100	94%
Boca	15,723	38%
Donner	8,380	88%
Independence	16,661	95%
Prosser	20,840	70%
Stampede	216,661	96%

In addition to the 25,041 acre-feet of storage in Donner and Independence reservoirs, TMWA has approximately 10,145 acre-feet of water stored between Boca and Stampede reservoirs under the terms of TROA. TMWA's total combined upstream reservoir storage is approximately 35,186 acre-feet as of this time.

- **Runoff and River Flows** - By the time it is all said and done, the volume of springtime runoff in the Truckee River measured at the California state line will have been more than 200% of normal. We are still experiencing flow volumes well in excess of what is considered normal for this time of year. Above-average flows are anticipated in the mainstem of the Truckee River through the end of July.
- **Outlook** - It will end up going down in the books as one of the biggest water years on record. The river system and our upstream reservoirs are fully recharged and the water supply outlook for the region couldn't be any better than it is right now. Lake Tahoe and all the other reservoirs on the Truckee River system will be completely full by mid-summer. With full reservoirs and significantly above-average river flows projected through summer months, Northern Nevada couldn't be positioned any better from a water supply perspective.

(B) Water Production

- **Demand** - Customer demand year-to-date (YTD) is 103% 2018. Consumption continues to increase once again after the noticeably cooler and wet second half of May. Customer demands averaged 106 million gallons per day (MGD) for the first week of June. This was up 22% from the previous week, and was 1% higher than the same week last year. This can be a challenging time of year to forecast demands as they can climb rapidly and drop off suddenly due to changing weather patterns. Overall, surface water is providing about 85% of our supply and groundwater the other 15% right now.

(C) Hydro Production

Generation - Average Truckee River flow at Farad (CA/NV state line) for the month of May averaged 3,126 cubic feet per second (CFS). Both TMWA's Verdi and Washoe Hydroelectric power plants were on the line for the entire month and 100% available. The Fleish plant remained off-line the entire month of May for scheduled improvements and maintenance. Monthly statistics are as follows:

Hydro Plant	Days On-Line	Generation (Megawatt hours)	Revenue (Dollars)	Revenue (Dollars/Day)
Fleish	0	0	\$ 0	\$ 0
Verdi	31	1,569	\$ 113,815	\$ 3,671
Washoe	31	1,410	\$ 103,381	\$ 3,335
Totals	62	2,979	\$ 217,196	\$ 7,006



STAFF REPORT

TO: Chairman and Board Members
THRU: Mark Foree, General Manager
FROM: John Zimmerman, Manager, Water Resources
DATE: 11 June 2019
SUBJECT: Report Water Resources and Annexation Activity

RULE 7

Rule 7 water resource purchases and will-serve commitment sales against purchased water resources through this reporting period:

Beginning Balance	4,510.48 AF
Purchases of water rights	0.00 AF
Refunds	0.00 AF
Sales	– 29.60 AF
Adjustments	– 0.00 AF
Ending Balance	4,480.88 AF

Price per acre foot at report date: \$7,700

FISH SPRINGS RANCH, LLC GROUNDWATER RESOURCES

Through the merger of Washoe County's water utility, TMWA assumed a Water Banking and Trust Agreement with Fish Springs Ranch, LLC, a subsidiary of Vidler. Under the Agreement, TMWA holds record title to the groundwater rights for the benefit of Fish Springs. Fish Springs may sell and assign its interest in these groundwater rights to third parties for dedication to TMWA for a will-serve commitment in Areas where TMWA can deliver groundwater from the Fish Springs groundwater basin. Currently, TMWA can deliver Fish Springs groundwater to Area 10 only (Stead-Silver Lake-Lemmon Valley). The following is a summary of Fish Springs' resources.

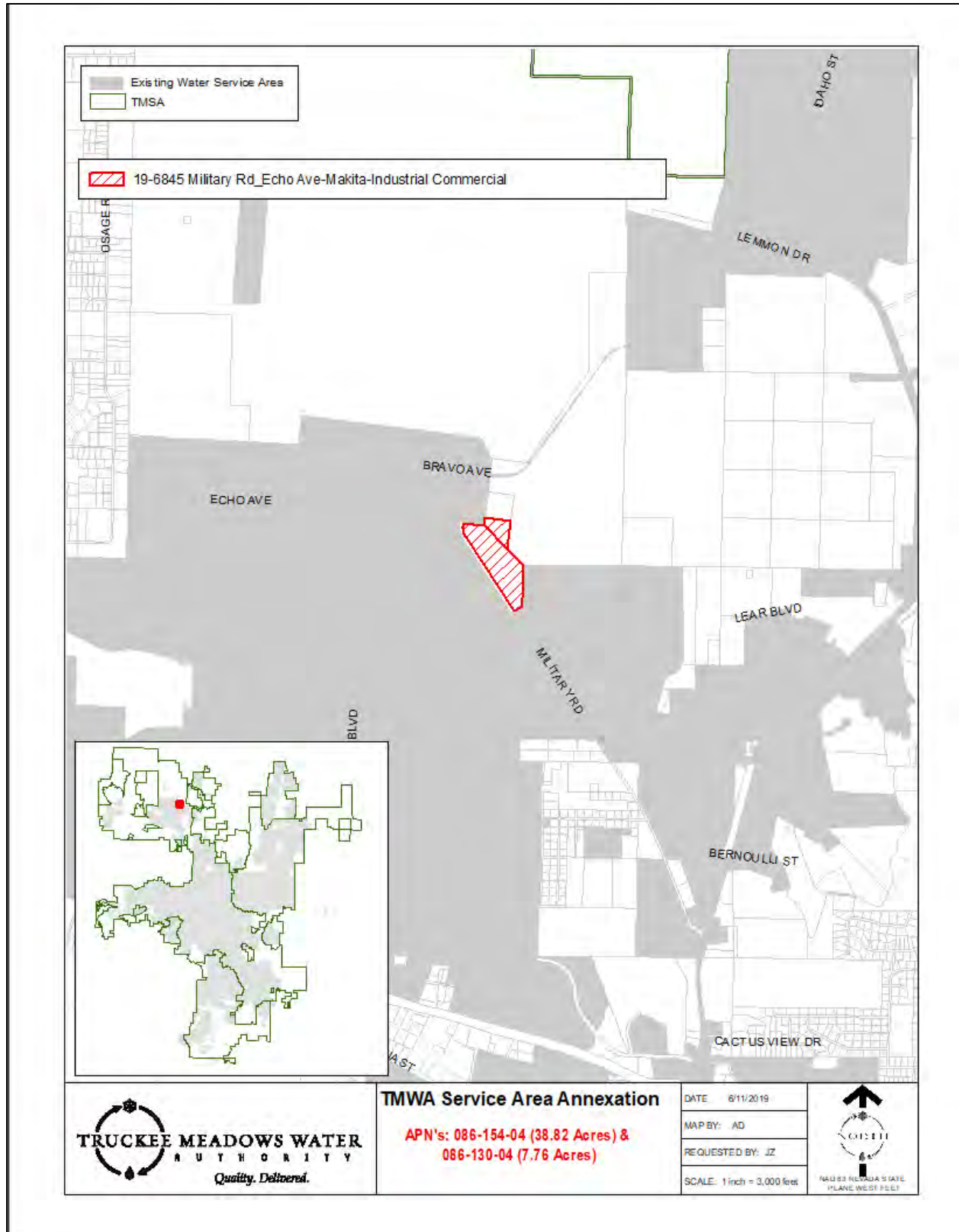
Beginning Balance	7,820.94 AF
Committed water rights	00.00 AF
Ending Balance	7,820.94 AF

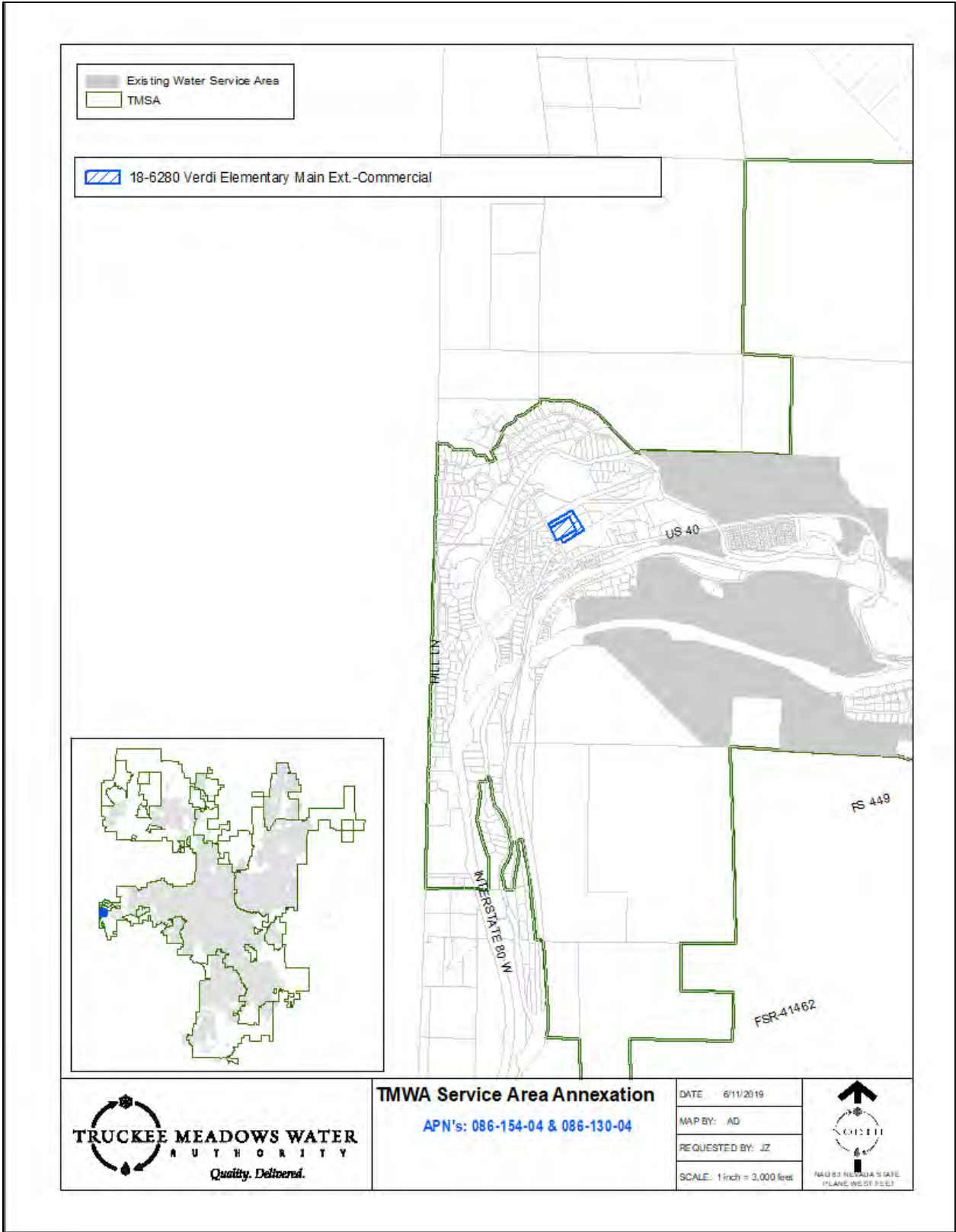
Price per acre foot at report date: \$35,000¹

¹ Price reflects avoided cost of Truckee River water right related fees and TMWA Supply & Treatment WSF charge.

WATER SERVICE AREA ANNEXATIONS

There have been two annexations since the date of the last Board meeting. See attached maps.







STAFF REPORT

TO: Board of Directors
THRU: Mark Foree, General Manager
FROM: Marci Westlake, Manager Customer Service
DATE: June 19, 2019
SUBJECT: May Customer Service Report

The following is a summary of Customer Service activity for May 2019.

Ombudsman

- Several calls this month with no messages.

Communications

Customer outreach in May included:

- Chuck Swegles, Lauren Kunin and Dale Carlon had a Tree Care Workshop and 10 people attended.
- Kara Steeland had a Truckee River Snapshop Day with Sparks Middle School at Rock Park and 20 people attended.
- Lauren Kunin and Tom Stille had a Walking Tour Biodiverse Gardens at Valley Wood Park and 10 people attended.
- Chuck Swegles, Lauren Kunin and Dale Carlon had a Drip System Maintenance workshop and 12 people attended.
- TMWA put on Smart About Water Day at Idlewild Park and 230 people attended.
- Kara Steeland and Laine Christman had a Watershed/Conservation/Treatment workshop at Swope Middle School and 25 students attended.
- Ron Price and Will Raymond had a Water Treatment Plant Tour and 8 people attended.
- Michael Guerra had a Water Treatment/Water Quality Tour and 4 people attended.
- Sean Bjordahl had a Water System Tour and 6 people attended.
- Will Raymond had a Water Quality workshop for WCSD and 45 students attended.

Conservation (2019 Calendar year to date)

- 1540 Water Watcher Contacts
- 681 Water Usage Reviews

Customer Calls – May

- 8,420 phone calls handled
- Average handling time – 4 minutes, 43 seconds per call
- Average speed of answer – 20 seconds per call

Billing – May

- 129,914 bills issued
- 1(0.01%) corrected bills
- 19,833 customers (15.0%) have signed up for paperless billing to date.

Service Orders – May (% is rounded)

- 7,530 service orders taken
- 4,315 (57%) move-ins / move-outs
- 631 (8%) cut-out-for-non-payment and cut-in after receiving payments, including deposits and checks for tamper
- 481 (6%) zero consumption meter checks
- 499 (7%) re-read meters
- 629 (8%) new meter sets and meter/register/ERT exchanges and equipment checks
- 363 (5%) problems / emergencies, including cut-out for customer repairs, dirty water, no water, leaks, pressure complaints, safety issues, installing water meter blankets, etc.
- 260 (4%) high-bill complaints / audit and water usage review requests
- 352 (5%) various other service orders

Remittance – May

- 28,259 mailed-in payments
- 28,173 electronic payments
- 38,965 payments via RapidPay (EFT)
- 17,690 one-time bank account payments
- 6,692 credit card payments
- 882 store payments
- 2,139 payments via drop box or at front desk

Collections – May

- 14,175 accounts received a late charge
- Mailed 8,682 10-day delinquent notices, 6.7% of accounts
- Mailed 1,045 48-hour delinquent notices, 0.8% of accounts
- 148 accounts eligible for disconnect
- 137 accounts were disconnected (including accounts that had been disconnected-for-non-payment that presented NSF checks for their reconnection)
- 0.08% write-off to revenue

Meter Statistics – Fiscal Year to Date

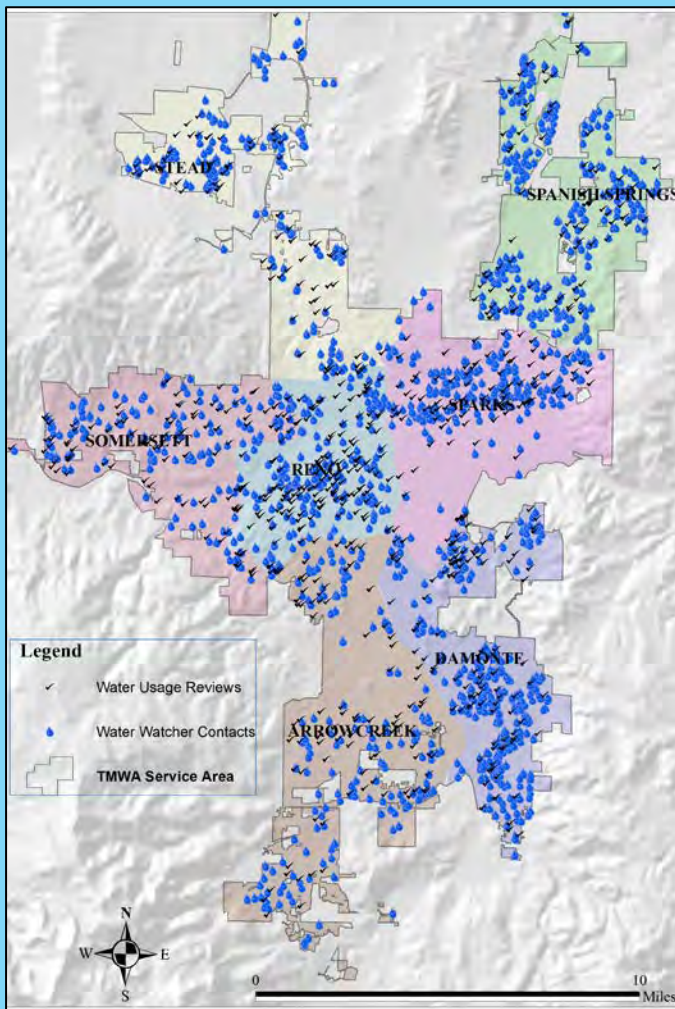
- 0 Meter retrofits completed
- 790 Meter exchanges completed
- 1,590 New business meter sets completed
- 126,758 Meters currently installed



MONTHLY CONSERVATION REPORT – May 2019

SUMMARY – Well, another irrigation season in the Truckee Meadows is in full swing. While it started off cold and snowy, all signs point to a prolonged warming trend. With a growing demand for water, so grows our “educational opportunities” to teach the public about smart water use. Compared to last May we have seen a **doubling** in drive-bys and reports by concerned citizens (over 1,500)! - Conservation Dept.

CONSERVATION CONTACT LOCATION MAP



Water Watcher Contact Initiation Type

Drive-bys	1414
Deliveries	4
Hotline Reports	62
Email Reports	60
Total	1540

Watering Violations Observed

Waste	483
Wrong Day	1033
Wrong Time	52
Total	1568

Water Watcher Actions Taken

Educational Visits	769
A.M. Letters	674
Courtesy Calls	73
No Actions	23
Total	1539

Efficiency Devices Supplied

Faucet Aerators	0
Hose Timers	11
Nozzles	18
Low-flow Shower heads	0
Tree Root Feeder	0
Total	29

Other Conservation Actions

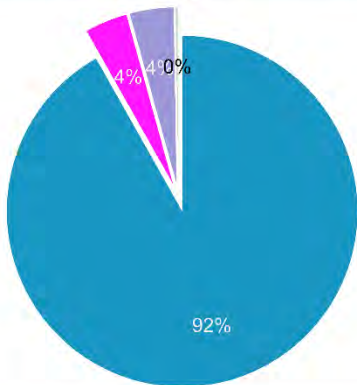
Water Usage Reviews	680
Tree Care Visits	68
Total	748

Attendees at Workshops /Tours

Irrigation System Start-up Workshop #1	16
Irrigation System Start-up Workshop #2	6
Landscape Planning & Design Workshop	23
River-Friendly Landscaping Workshop*	6
Tree Care Workshop	20
Drip System Maintenance Workshop	19
Walking Tour - Valley Wood Park #1	10
Watershed Warrior Workshop*	
Sprinkler System Maintenance Workshop	
Walking Tour - River School Farm	
Walking Tour, Part 2 - Valley Wood Park #2	
Winterize Your Irrigation System Workshop #1	
Winterize Your Irrigation System Workshop #2	
Winterize Your Irrigation System Workshop #3	
Winterize Your Irrigation System Workshop #4	
Total	100

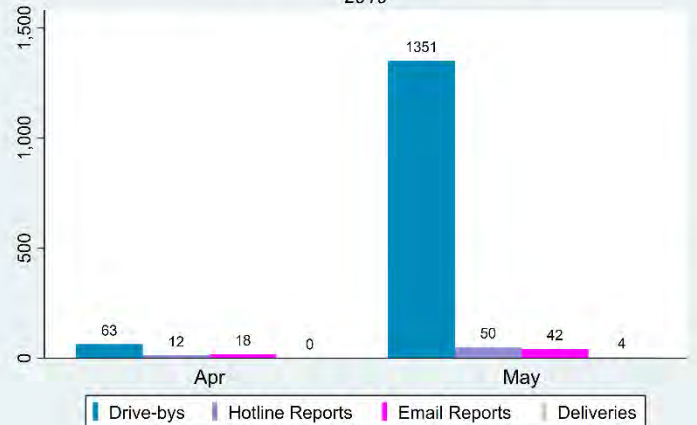
*NEW WORKSHOP FOR 2019

Water Watcher Contact Initiation
2019



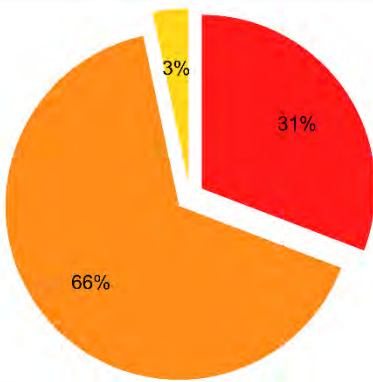
Drive Bys Email Reports Hotline Reports Deliveries

Water Watcher Contact Initiation
2019



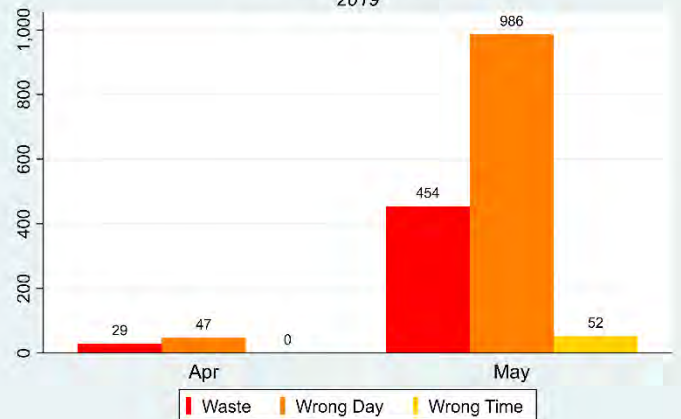
Drive-bys Hotline Reports Email Reports Deliveries

Water Violations Observed
2019



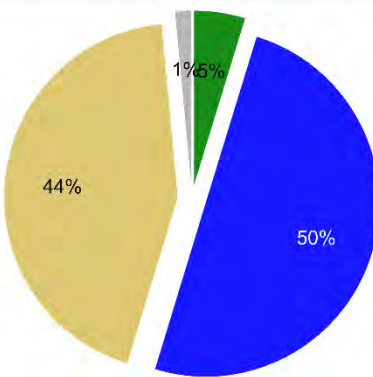
Waste Wrong Day Wrong Time

Water Violations Observed
2019



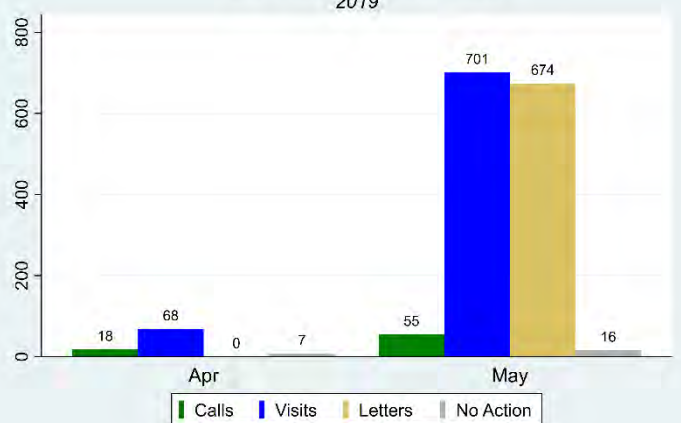
Waste Wrong Day Wrong Time

Water Watcher Actions Taken
2019



Calls Visits Letters No Action

Water Watcher Actions Taken
2019



Calls Visits Letters No Action



TMWA Board Meeting

Wednesday, June 19, 2019

Press Clippings

May 17, 2019 – June 12, 2019



TMWA Fleish Spill Structure Reconstruction

Opening the floodgates for ‘produced water’

By [Kevin Robinson Avila / Journal Staff Writer](#)

Monday, May 20th, 2019 at 12:02am



A new state law on reuse of wastewater from oil and gas operations is expected to spark major investment by companies that should help reduce the use of fresh water in their operations. This large pond is part of Solaris Water Midstream water recycling operations in the Permian Basin of southeastern New Mexico and West Texas. The treated wastewater is reused in fracturing operations. (Courtesy of Solaris Midstream)

Copyright © 2019 Albuquerque Journal

Marvin Nash is gushing with enthusiasm about the prospect of irrigating New Mexico’s arid lands with oil and gas wastewater.

His Wyoming-based startup, Encore Green Environmental, is pursuing a pilot project to clean up effluent waste from booming industry operations in southeastern New Mexico and then spray it over desert areas to increase vegetation for ranching and erosion control.

Verdi Elementary To Hook Up to TMWA Water

May 21, 2019 ThisIsReno

Verdi Elementary School's water well, which is being treated for high arsenic levels, will no longer be necessary when the school gets connected to the Truckee Meadows Water Authority's system.

The state Division of Environmental Protection today announced up to \$500,000 from a revolving loan fund for the hookup.

"The [school district] wants to extend a TMWA water main to the [school] and abandon the existing well and arsenic treatment system," according to a state report. "The project will have a beneficial effect by ensuring the school receives water that is safe to drink."

The state did not provide a construction timeline but did indicate that comments could be submitted by the public to NDEP.

"The project is listed on Nevada's Year 2020 Drinking Water Priority List," said Dominique Etchegoyhen, deputy director for the Nevada Department of Conservation and Natural Resources. "No wetlands, floodplains, agricultural lands, or significant fish or wildlife species or habitats are affected by the project."

On The Web

<https://ndep.nv.gov/posts>

ASK JOE ON FACEBOOK:**Joe Hart KRN**

May 22 at 11:13 AM ·

Ask Joe: the Nevada Attorney General's Office has ruled the Washoe County School Board did not violate the Open Meeting Law when the superintendent agreed to launch an outside investigation into a personnel matter during the public comment period of a board meeting on March 12th. Even though state law says no action is to be taken during public comment, the AG's office says the actions of the superintendent are not subject to the Open Meeting Law. The OML pertains to the school board as a public body and the board did not vote on this issue. It's an interesting question that some of you brought up and School Board President Katy Simon Holland even raised the question at the time as to whether the action should have been taken during the public comment period. But again there was no violation as the school board itself did not deliberate over this or vote on it. I hope that helps to clear up any confusion. Thanks to the Nevada Attorney General's Office for looking into it and providing the legal clarification!

ThisisReno AG: School District Did Not Violate Open Meeting Law

May 22, 2019 Bob Conrad

Superintendent Traci Davis and Board President Katy Simon Holland. Image: Ty O'Neil.

The Washoe County School District's Board of Trustees faced two open meeting law complaints for a mid-March meeting. ThisisReno and Joe Hart of KRNK separately filed complaints against the district after school Superintendent Traci Davis and Chief General Counsel Neil Rombardo interrupted public comment at the March 12 meeting to authorize an investigation into ongoing complaints at the district.

Board President Katy Simon Holland at the time questioned Davis' and Rombardo's discussion. Area Superintendent Lauren Ford demanded that the district investigate complaints allegedly made about her.

Davis and Rombardo, in what some claimed was an orchestrated maneuver, stopped public comment to discuss the matter.

"I'm a little concerned about our discussion of the matter, and counsel I will defer to you," Simon Holland said.

"It's not a vote of the board," Rombardo replied. "This is a decision of the superintendent."

"But it's being discussed in our meeting, and it's not on the agenda," Simon Holland said.

"Well, the open meeting law controls what the board may vote on," Rombardo retorted. "[The open meeting law] specifically says that we can comment on public comment; we just can't take action. We're not asking the board to take action. The superintendent's asking me to take action."

The Attorney General's Office agreed.

"Actions by the District Superintendent are not subject to the [open meeting law] as the District Superintendent is not a public body," wrote Chief Deputy Attorney General Rosalie Bordelove. "Additionally, the Board did not take a motion on the matter and did not entertain a vote regarding the matter."

Lake Tahoe shows stunning improvement in water clarity over past year

Scientists say Tahoe's visibility jumped 10 feet from 2017 to 2018, end of drought cited



(Getty Images)

Emerald Bay, Lake Tahoe, California.

By **PAUL ROGERS** | progers@bayareanewsgroup.com | Bay Area News Group

PUBLISHED: May 23, 2019 at 12:34 pm | UPDATED: May 24, 2019 at 4:26 am

Good news, just in time for Memorial Day Weekend: The clarity of the famed, cobalt-blue waters of Lake Tahoe improved dramatically last year, with visibility increasing 10 feet from the year before, a study released Thursday by scientists at UC Davis found.

The jump is the largest annual improvement in 50 years, since measurements at the iconic Sierra Nevada lake began in 1968.

On average in 2018, the study found, a 10-inch white disk lowered from a research boat was visible 70.9 feet below the water's surface. A year before, the disk could be seen only up to 60.4 feet, the lowest visibility level ever recorded.

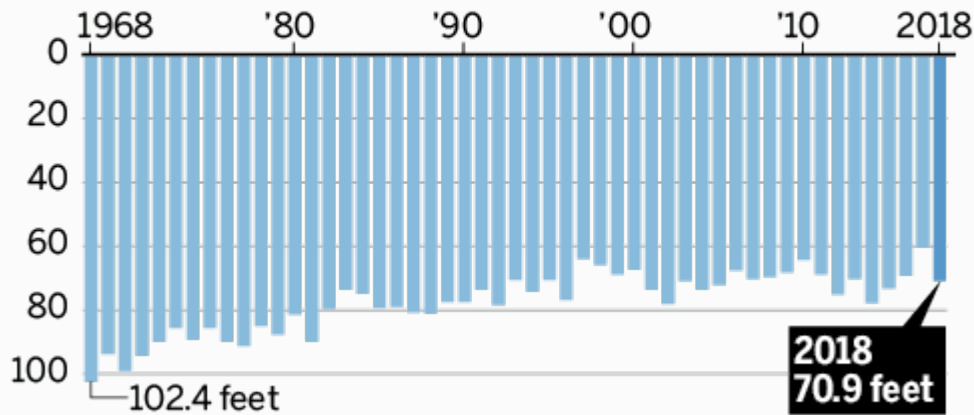
The reason for the huge loss of clarity in 2017, scientists said Thursday, was that heavy rains in the winter of 2016-17 washed massive amounts of sand and mud that had built up during California's five-year drought into the lake. In fact, more sediment washed into the lake in 2017 than the previous five years combined. The big drop-off in the lake's clarity alarmed environmental groups, tourism leaders and many Tahoe lovers.

"A lot of people last year were looking at the decline and saying, 'It's not working, Tahoe is not getting better,' " said Geoffrey Schladow, a professor of engineering at UC Davis and director of the Tahoe Environmental Research Center. "Many of us were saying it

CLEAR IMPROVEMENT

The clarity of Lake Tahoe's water improved by a stunning 10 feet over the past year.

Average water clarity depth, in feet

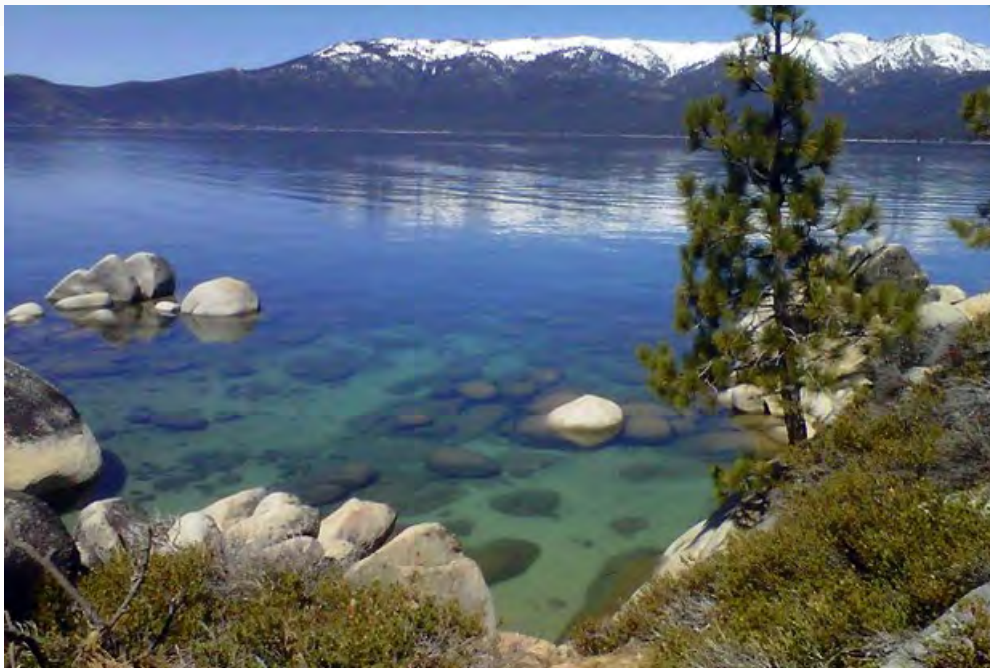


Source: UC Davis Tahoe Environmental Research Center

BAY AREA NEWS GROUP

was a really extreme year in 2017. It was a massive end to a massive drought. There was a lot of new material coming into the lake and lots of new erosion. Now the lake has returned to being even better than it was. It's good news."

In 2018, after a relatively mild winter, not as much sediment washed in, returning the lake to a more normal pattern, he said.



Lake Tahoe near Incline Village, Nevada on April 12, 2012. (AP Photo/Scott Sonner)
Lake Tahoe's recovery is measured in decades, not years. Overall, the lake still has a long way to go to recover the level of clarity it had half a century ago. In 1968, [Tahoe's visibility was 102.4 feet](#).

After steady development that began in the 1920s and accelerated in the 1950s, Tahoe's waters started getting murkier because of erosion from construction, fertilizer from golf courses, and loss of wetlands that filter pollutants and other human disruptions.

Over the past 20 years, the state, federal and local governments have spent hundreds of millions of dollars restoring wetlands, tightening building rules and making other changes to try and stop the 1,645-foot deep lake — America's second-deepest, behind Crater Lake — from becoming a muddy green mess of algae and silt.

That work, highlighted around the United States in the "Keep Tahoe Blue" bumper stickers, has shown slow but steady progress.

The five-year average in lake visibility — widely considered an indicator of the Lake Tahoe basin's environmental health — is now 70.3 feet, an increase of almost a foot from the previous five-year average.

This winter has been wet, with the Sierra Nevada snowpack currently at 148 percent of its historic average. Does that mean the lake's clarity will drop in 2019?

"It possibly will go down," Schladow said. "But it's the long term-trend that matters. A lot of the investments at Tahoe have been made to stopping fine particles from urban, built-up areas from entering the lake."

Thursday's news drew cheers from environmentalists.

"We are thrilled," said Darcie Goodman Collins, CEO of the League to Save Lake Tahoe. "These results encourage us to continue restoring critical habitat and improving our urban areas to keep pollution from entering our lake."



Lake Tahoe's visibility improved by 10 feet from 2017 to 2018, scientists said Tuesday May 23, 2019. (Photo: UC Davis, Brant Allen)

Lake Tahoe is a key tourist attraction, with roughly 3 million people visiting each year. It's also a natural wonder. If the Empire State Building were submerged in Lake Tahoe, the top of its spire would still be below 200 feet of water.

Despite the good news Thursday about the lake's improving clarity, Tahoe still faces significant challenges. One of the most troubling is that the lake's waters are steadily warming as the Earth's climate continues to heat up.

In 2017, the average surface temperature at Lake Tahoe was 53.3 degrees Fahrenheit, up from 50.3 in 1968.

Scientists say the warming water probably will result in more algae growth, silt from drying soils, invasive species and fire risk in the forests around the alpine landmark.

“Research shows Lake Tahoe and other inland water bodies are warming faster than the oceans and atmosphere,” said Joanne Marchetta, executive director of the Tahoe Regional Planning Agency, a government agency established in the Nixon administration to regulate land use around the lake.

“So it’s imperative we continue to invest in the lake’s restoration to combat new and emerging threats.”

One promising way to offset the future visibility loss from climate change might be by removing a tiny species of shrimp from the lake.

Generations ago, fisheries managers introduced an invasive species of shrimp, called Mysis, into Lake Tahoe and other Western lakes as a way to fatten up trout and other fish

for recreational fishermen. But those shrimp ravenously ate a beneficial, native type of zooplankton, called Daphnia.

The plankton eat algae. Fewer plankton mean more algae. Researchers from UC Davis found that from 2011 to 2016, when the population of the half-inch shrimp declined in Emerald Bay for reasons they still don’t fully understand, clarity increased dramatically in that part of Lake Tahoe as the plankton numbers rebounded.

Now, UC-Davis scientists are using sensitive sonar equipment to find where the shrimp are concentrated in the lake. They designed a special trawl net and have been removing them by essentially fishing for them. The studies are continuing. But so far, they suggest that removing from 50 to 70 percent of the shrimp allows the helpful plankton to return. The experiment holds “tremendous potential” for restoring lake clarity in future years, the researchers [wrote in a report last year.](#)

“Climate change can get depressing at times if you don’t have any hopeful leads,” said Schladow. “For us, this is one.”

Sheridan City Council Votes To Remove Fluoride From Water Supply

By CATHERINE WHEELER • MAY 21, 2019

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Credit Pixabay

The water supply in and around Sheridan no longer contains added fluoride after the city council voted to remove it.

Sheridan's city council voted to stop fluoridating the area water supply after the results of a survey sent out to city water customers revealed that most of the respondents wanted fluoride gone.

About 34 percent of surveys were returned, and over half said they didn't want fluoride added to the water.

State and [federal health officials](#), however, support fluoridated water for health reasons. It cost the city around \$1,700 to stop pumping and to dispose of the fluoride. Sheridan City Councilman Aaron Linden said this has been a divisive topic in the area for years.

"It's been a point of conversation around this community since 2015, but it's been really been brought to the forefront for almost a year at this point in time now," Linden said. Linden said he wanted residents to ultimately make the decision about whether to continue adding fluoride or remove it.

"There's pros and cons to either side I guess on either side. But what ended up happening at the end of the day was the people they finally got their say into whether it was going to be in the water system," he said.

The community started adding fluoride to the water in 2015 for health reasons. The Centers for Disease Control estimates that 75 percent of the communities in the U.S. have fluoridated water.

Linden said the equipment used to pump fluoride will be repurposed and the council is considering how to use the funds set aside for fluoridation.

From smart meters to smart cities

May 27, 2019



Czech telecommunications company České Radiokomunikace (ČRa) seeks to use LoRa technology for IoT deployments

With the expansion of urbanisation, countries all over the world are developing ambitious technology driven large-scale smart cities that are fully monitored and controlled. This is done through unified platforms that incorporate smart electricity, water and gas meters, smart street lighting, smart waste management and smart parking among other IoT applications.

The success of such smart cities requires seamless integration between the different parts of the puzzle including unified billing mechanisms and the incorporation of robust, reliable and secure communication infrastructure.

This article was originally published in [Smart Energy International 2-2019](#).

Read the [full digimag here](#) or [subscribe to receive a print copy here](#).

In today's modern distribution sector, utilities for electricity, water and gas mostly have complete autonomy allowing them to explore unique and interesting communication technologies and integration techniques that are largely un-standardised matching their current needs and expectations.

However, once the inevitable transformation to smart cities happens in search of greater efficiency, lower operational expenditure and higher quality services for citizens, these utilities will feel like islands that are unable to mesh together. In order to avoid this pitfall key stakeholders including governmental regulators, utilities, system integrators and solution providers must have the foresight to realise that strategic investment in future-proof smart

metering technology is an integral part of establishing successful smart cities: acting as the catalyst for transformation that will help resolve interoperability issues and ensure that today's deployed technology stands the test of time.

The leap from smart meters to smart cities requires a multi-layered approach that starts with the incorporation of smart water and smart gas meters together with the electricity meters. This raises the bar for project developers and solution providers to plant the seeds for seamless future integration between these currently independent solutions regardless of whether the infrastructure is ready today or not. To do so, we need to start by ensuring that all electricity, water and gas metering products are DLMS compliant, thereby guaranteeing that the foundation upon which the solution is built is solid. This means the incorporation of smart electricity, water and gas meters onto a unified platform would be a smooth process.

The second layer to consider is the type of communication itself because it isn't simply enough to unify the smart metering foundation through DLMS but to also explore issues such as lack of necessary integration of communication standards across smart cities. Using broad terminology such as IoT opens the door for proprietary or vendor-specific technologies to creep in, hampering the integration process. Therefore, it is imperative for our stakeholders to seamlessly build a hybrid wired and wireless communication infrastructure that allows for the inclusion of international open protocols and universally adopted key enablers of smart grids. This includes PRIME PLC, TCP-IP for wired fibre optic networks, RF, NB-IoT and 3G-4G if cost-effective (one-size fits all doesn't work). To do this might seem impossible given the variety and the fact that communication technology is constantly evolving.

What might work today will likely not be applicable or feasible for tomorrow's smart grid, so we need to introduce a simple RS-485 interface onto our electricity, water and gas meters that allows any open standard communication technology to be utilised, thereby future-proofing smart metering solutions.

Other important factors to consider where smart cities are concerned include the importance of using highly reliable, costeffective, ubiquitous, secure and robust wired communication (if applicable) as the backbone for our hybrid communication network. Capitalising on the superior fibre optic network coverage that is commonly available in any smart city project by

linking vendor solution onto it should also be undertaken. Reputable associations and alliances of utilities, meter vendors, technology providers and international consultants naturally have a critical role to play in this key area helping to shape the future of smart cities everywhere.

They must work closely to define unified open standards for wired and wireless communication (some technologies such as those related to radio frequency (RF) remain largely un-standardised despite their utilisation on a very wide scale, foreshadowing their withdrawal in the smart cities of tomorrow).

Another important piece of the puzzle for the effective deployment of a smart cities platform is the smooth integration between the different application layers (HES, MDMS, IoT, etc...) using internationally recognised open protocols such as multispeak, culminating in the offering of flexible unified service portals, mobile apps, point-of-sale, ATMs – through which citizens would be able to handle all of their collective billing needs.

This approach was adopted to great effect by El Sewedy EMG in smart electricity metering projects across the MEA region including Egypt (63,000 meters), Ghana (200,000 meters), and Lebanon (470,000 meters). In these projects a simple yet effective methodology was implemented that relies on DLMS compliant meters with hybrid open international standard communication technologies. For example, the flexibility offered by cutting-edge wired PRIME PLC v1.4 technology in the CENELEC and FCC bands made it possible to overcome a multitude of challenges (chief among them being the high noise and attenuation levels) hampering remote communication in Egypt's first large-scale smart meter deployment.

These installed metering solutions will in the near future seamlessly integrate with the smart water and gas meters and become a part of the smart cities platform once mandated by the respective governments in each country.

As part of its smart city initiatives, El Sewedy EMG is also meticulously developing multi-layered communication infrastructure solutions and taking strides to address the needs of smart cities. This includes the launch of a DLMS-compliant unified electricity, water and gas metering solution utilising reliable and future-proof wired RS-485 communication for the new administrative capital and smart cities project in Egypt. This is being done in conjunction with

the implementation of different proof-of-concepts utilising NB-IoT across the globe. Together with its partners at the PRIME Alliance, the company has also started working on standardising key communication technologies and hopes to announce some of this initiative's key activities and achievements over the coming months. SEI

About the company

El Sewedy Electrometer Group is one of the leading providers of end-to-end electricity, water and gas smart metering solutions and services, with facilities operating worldwide and a broad range of versatile smart solutions and products tailored to manage utilities better.

California Attorney General Warns EPA: State Oversight Is Required by Law Under the Clean Water Act

Last Updated: Monday, 27 May 2019 05:53

Published: Monday, 27 May 2019 05:53



May 27, 2019 - SACRAMENTO – California Attorney General Xavier Becerra, as part of a coalition of 16 states and four state environmental agencies, last Friday filed a comment letter warning the U.S. Environmental Protection Agency (EPA) that any attempt to roll back state oversight of federal projects under Section 401 of the Clean Water Act (CWA) would be unlawful. The letter responds to the EPA's request for recommendations to revise existing guidance and regulations implementing Section 401. The statute preserves states' authority to protect the quality of the waters within their borders. The EPA's invitation begins the implementation of President Trump's April 2019 Executive Order issued to undermine state authority recognized under the CWA.

"This rushed process is yet another reckless attempt by the Trump Administration to weaken Clean Water Act protections for the nation's waters," said Attorney General Becerra. "California has an inherent right under the Clean Water Act to evaluate whether projects meet our water quality standards and to impose conditions on federal projects to protect our water resources. We won't sit by quietly while the Trump Administration tries to rob us of our rights and degrade water quality for our people simply to benefit polluting industries."

The CWA reflects Congress' policy to "recognize, preserve, and protect the primary responsibilities and rights of states to prevent, reduce, and eliminate pollution" of waters within their borders. Under Section 401 of the CWA, a project requiring federal approval that may result in discharges into the waters of the United States must obtain the state's certification that the project meets state water quality standards and other appropriate state law requirements. This certification process includes adequately assessing the water quality impacts of proposed federal actions and imposing necessary conditions to remedy these impacts. States argue that there is no need for the proposed revisions to the statute, and that neither President Trump's Executive Order nor the EPA's guidance or policies can undermine the CWA.

In the comment letter, the coalition objects to any efforts to abbreviate the time-frame for states to complete the Section 401 water quality certification process and ensure compliance with state water quality standards.

Furthermore, the group opposes any attempt to restrict the scope of states' review and oversight of projects under Section 401. The EPA's request for recommendations on future revisions to the existing Section 401 guidance and regulations is simply a step towards restricting state oversight. The comment period comes ahead of the agency's revised guidance, which the Executive Order requires to be published just 17 days after the comment period ends. The speed of this process, and the EPA's failure to disclose its proposed revisions ahead of the comment period, points to a process with a predetermined outcome. In the letter, the state attorneys general suggest that rather than make unnecessary changes to Section 401 guidance and regulations following a sham process, the EPA should simply continue applying its existing guidance and regulations.

▪ **A water portfolio planning report card for California**

▪ Posted on [May 26, 2019](#) by [jaylund](#)

by Jay Lund



Kern Water Bank conjunctive use with waterbird benefits

Governor Newsom recently called for a state portfolio of actions to manage water under rapidly changing climate and other conditions. This post reviews the state of water portfolio planning in California today.

In this complex changing world, major problems are rarely solved with a single solution or a single problem-solver. Portfolio-based planning and management tries to do many things in an organized and coordinated way, often with friends to collectively improve water management, reduce costs, and improve environmental conditions overall. This sounds idealistic, but with hard work this approach has been tremendously successful when earnestly applied.

The most common portfolio plans are financial. We feel safer if retirement funds have a diverse portfolio of different stocks, bonds, real estate and other investments, as well as social security and pension payments and an ability to manage expenses. Government finance similarly is more stable if supported by a range of taxes and fees and some discipline and ability to reduce expenses. Energy systems also usually involve a diverse portfolio of power stations connected by a flexible transmission network, along with pricing and efforts to manage energy demands and rules for managing shortages and outages. Good portfolios provide a foundation for flexibility and help hedge against uncertainties.

California's most advanced water management portfolios are by local and regional urban water suppliers seeking to diversify supplies and manage demands, often in cooperation with neighbors. The [Sacramento Water Forum](#), and efforts of [EBMUD](#), [MWDSC](#), [SCVWD](#), [CCWD](#), [SDWA](#), [Orange County](#), the [Inland Empire](#) and [other areas](#) show local and regional water agencies adapting to changes in conditions in California with great success using portfolio management. These efforts almost always involve cooperation with outside agencies.

The safety of drinking water systems relies on a portfolio approach known as “[multiple barriers](#).” Regulating harmful substances, source water protection, water treatment, disinfection, and public health monitoring and responses provide multiple layers of actions and institutions to reduce drinking water contamination and waterborne disease outbreaks.

Local agricultural water suppliers also employ portfolio approaches. These cases are less well-funded, but usually include effective efforts to conjunctively manage surface water and groundwater supplies, in cooperation with farmers and often in cooperation with outside agencies. [YCWA](#), [YCFCWCD](#), [KCWA](#), and other agencies have been leaders.

For [floods, portfolio approaches](#) also have become common, led by federal policy, with a mix of “structural” and “non-structural” approaches advocated to reduce the frequency of flooding and reshape human activities to suffer less when flooding occurs. California benefits from a mix of flood warning, evacuation, floodplain management, flood bypass, levee, and reservoir operation activities and preparations at federal, state, and local levels.

Even in ecosystem management, portfolio approaches have been developed to help restore and maintain waterfowl in California, and North America, involving a range of institutions and a diverse and substantially coordinated set of adaptable management actions. In California this includes the [Central Valley Joint Venture](#), which has been a foundation for broader relative successes for waterfowl.

California’s recent droughts and floods show the success of portfolio approaches. The extreme events from 2012-2017 were more easily managed and caused less damage when agencies had developed effective portfolio water management approaches. [The areas hardest hit lacked preparation](#) based on portfolio planning. These results are illustrated by the overall portfolio water management scorecard below.

Portfolio Report Card for Water Management California:

Problem	Grade	Explanation
Urban water	A-	Mostly great success, illustrated by recent drought. Still room for further improvement and opportunities to benefit from expanded collaborations. Prop. 218 might limit cooperation.
Agricultural water	B-	Good successes, but more difficult future. Opportunities to benefit from expanded collaborations with urban, flood, rural drinking water, and ecosystem interests.

Rural drinking water	D+	Band-aid approaches to a more systemic problem. Problem is relatively cheap to address, but wickedly hard to effectively organize and fund.
Floods	C+	Good history of portfolio development and use, but lacks steady funding and attention outside of emergency management. Still room for improvement. Small communities remain problematic.
Ecosystems	D	Generally absent or poor development or use of portfolio or other active management approaches. Poor development and integration of science. Waterfowl management is the most advanced and successful.
Groundwater	C	Improving over time, but far to go, particularly for water quality. Worsening water quality in agricultural areas is a major challenge. SGMA brings major opportunities. State needs a common technical groundwater program.
Delta	C	Slow improvements. Stewardship Council plan is a potential foundation, but efforts to integrate efforts across agencies are slow to develop; meanwhile ecosystems decline and water demands rise.
Regional integration	C+	Steadily improving in urban regions, with room for improvement. Rural regions will be challenged much more by SGMA, which also can help structure opportunities.
Interagency integration	D+	Largely absent among state agencies, isolated to a few examples. Some excellent isolated programs, poorly integrated into agency and interagency efforts. Disintegration disrupts developing a common understanding of problems and potential solutions.

The Governor is right to call for more and better use of portfolio management in California water. The general portfolio approach has shown great value and effectiveness, but also has several challenges.

Three barriers hinder development of effective portfolio management:

Intellectually, people who would be involved in portfolio approaches must sufficiently understand and be willing to deal with the greater complexity and flexibility of portfolio management.

Organizationally, portfolio management requires organizing more people in more complex ways. Organizing people is never easy. Organizational issues include a host of legal, funding, coordination, personnel, and sociology issues.

Politically, those involved must be sufficiently unafraid of a portfolio approach. Challenges arise because most portfolio approaches require more entanglements and risks with outsiders for cooperative activities, such as conjunctive use, water trading, or economies of scale from regional facilities and activities.

It is remarkable how successful and widespread portfolio water management has already become despite these barriers. Not surprisingly, portfolio management often takes time to develop and requires some motivating need and pragmatism.

Portfolio management has still greater and growing potential. Improving portfolio management will be motivated and challenged by a more rapidly changing climate, growing collapses of native ecosystems, ending groundwater overdraft under SGMA, changes in Delta and storage infrastructure and environmental management (new flow regulations and/or voluntary agreements), and the need for cooperation to sustain economic prosperity at reasonable costs for agricultural and urban water users.

Moreover, portfolio management has still greater importance in helping balance and integrate management for multiple benefits. This is nicely hinted-at by the State's co-equal goals for the Delta Plan's elements. As single-purpose management becomes more effective, it ultimately struggles with management for other objectives. As such, California's portfolio water management must grow beyond narrow objectives and into a greater and less adversarial balancing across objectives. Organizing state, local, and regional activities to achieve such balancing and integration might be the biggest challenge.

Further Readings

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<http://www.centralvalleyjointventure.org/partnership/what-is-the-cvjv>

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[Jay Lund](#) is a Professor of Civil and Environmental Engineering at the University of California, Davis where he is also Director for the Center for Watershed Sciences. He has always liked the idea of optimizing portfolios (perhaps a little too much).

California's Growing Demand for Recycled Water Has Ripple Effects

HENRY MCCANN, CAITRIN CHAPPELLE MAY 28, 2019

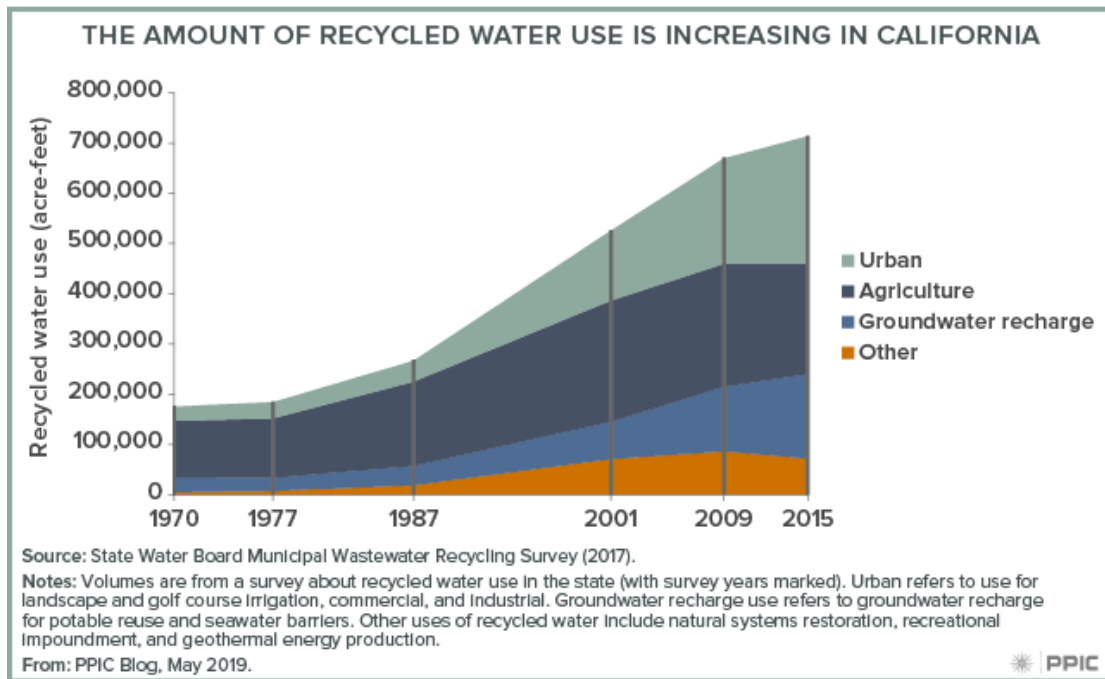


Wastewater agencies produce highly treated water that is increasingly being reused as a water supply. While it's still only a small portion of overall water use, the use of recycled water has nearly tripled since the 1980s—and is continuing to rise as water agencies seek to meet the demands of a growing population and improve the resilience of their water supplies.

Recycled water production is closely related to water use and wastewater management. It also directly influences flows for ecosystems and downstream water users in some watersheds. As its use expands, weighing the trade-offs involved will help avoid conflict. Meeting current and future demands requires careful consideration of several issues, including the impact of water use on wastewater management, changing types of demand for recycled water, and the needs of ecosystems and downstream users.

Recycled water production is affected by reductions in water use. In other words, recycled water is not completely “drought proof.” The drought of 2012–16 provides a clear example of this. The rapid reduction of urban indoor water use in this period resulted in a reduced quantity and quality of wastewater for most of the state's wastewater agencies. In a [survey conducted by the PPIC Water Policy Center](#), just over 40% of wastewater agencies that recycle wastewater reported that their ability to produce recycled water was impaired during the drought. The long-term efficiency of water use and related declines in wastewater quality may also affect recycled water production in the future. For example, as households become more water-efficient, the wastewater they discharge to sewers can have higher concentrations of salts, which are not removed in most treatment processes. Saltier water may not be suitable for outdoor irrigation of golf courses or lawns—common uses of recycled water. If this issue grows in severity, agencies may be forced to incorporate desalination into wastewater treatment, which is likely to add cost and complexity.

Demand for recycled water is growing and changing. Recycled water is increasingly being used in urban areas for public landscape irrigation, golf courses, industrial cooling, and groundwater recharge. Replenishing sources of drinking water is the biggest growth opportunity for water recyclers. New state rules allowing replenishment of groundwater and surface water storage with recycled water—and eventually the [direct connection of recycled water to drinking water infrastructure](#)—will create opportunities for recyclers to cost-effectively meet growing demands well into the future. This will require close coordination between water suppliers and wastewater agencies. Some wastewater agencies will also need to increase their treatment capacity to meet the higher water quality standards required for potable reuse.



Expanding use of recycled water may reduce flows of treated wastewater in rivers, streams, and estuaries. Treated wastewater is an important water source for some ecosystems and downstream water users. Watersheds where wastewater makes up a significant amount of the flow that supports ecosystems and downstream users are especially vulnerable to conflict. For example, a proposal to increase the use of recycled water in Coachella Valley would decrease flows to the already shrinking and vulnerable [Salton Sea](#). Managing recycled water so that it avoids harm to ecosystems and downstream users will require additional collaboration and thoughtful planning.

Closer coordination between wastewater agencies and water suppliers can help minimize impacts from changing patterns of water use on wastewater quantity and quality. Regional planning can also help agencies make smart recycled-water investments that take advantage of opportunities to more directly replenish drinking water supplies. New projects should be based on a careful consideration of local demands and costs, and also how well the investment fits into the overall regional supply of water for both human and environmental uses. Taking such steps now can help water managers in this growing sector make the most of this once-maligned resource.

License to Pump

May 29, 2019 | Water in the West | News

By

Michelle Horton

Dashboard pump.jpg



New web portal examines, compares and explains the permitting process of groundwater pumping across seven U.S. states.

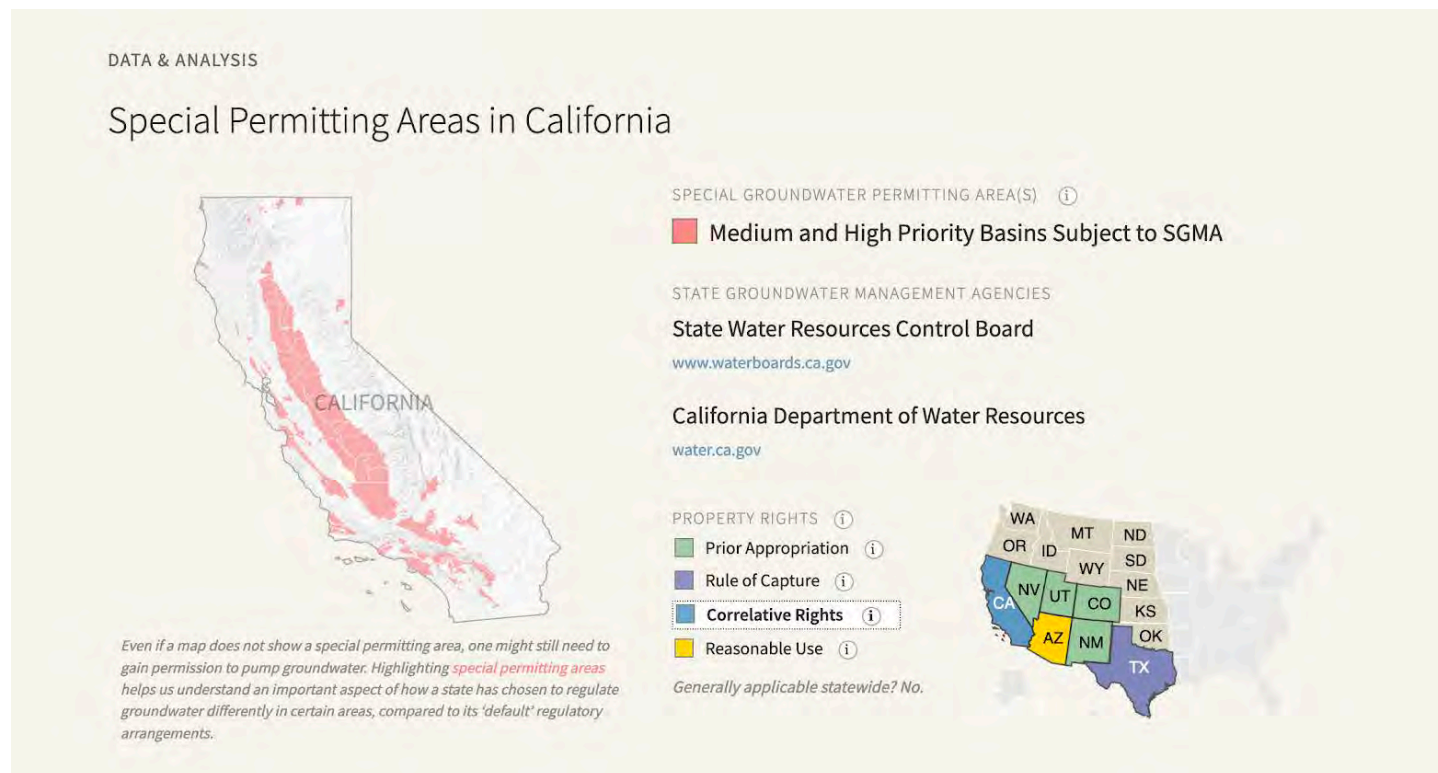
Overpumping groundwater poses a major threat to the availability of a critical resource, especially in the arid lands of the Southwestern United States. States across the region have sought to deal with this issue through a wide variety of regulations and permitting processes. A [new dashboard tool](#), created by affiliates from [Stanford's Water in the West program](#), compares groundwater withdrawal permitting – a common tool used by resource managers to limit groundwater pumping – to help plan for a more sustainable future.

“Western states have adopted a wide range of approaches towards regulating groundwater pumping, but information about these approaches are not always shared across the region. Our goal is to help parties in different states learn from what is happening elsewhere. This is particularly important in California, where local agencies are working to implement the Sustainable Groundwater Management Act,” said [Leon Szeptycki](#), executive director of Water in the West and a dashboard contributor.

Groundwater, a major source of drinking water, makes up roughly 25 percent of total available fresh water across the U.S., however drier states with less surface-water supply use it more heavily than other regions. Water users in these areas often pump groundwater at a rate exceeding the recharge from rainfall, irrigation and streamflow, leading to a condition called overdraft. Overdraft can lead to negative consequences including seawater intrusion, water contamination, lowering of the water table and land subsidence.

Unlike surface water, groundwater has not been regulated in California historically. Traditionally, a right to withdraw groundwater was established by pumping the water and using it. The 2014 [Sustainable Groundwater Management Act](#) requires sustainable management of groundwater basins, empowering local agencies with regulation of groundwater extraction if necessary. California was the last of the Southwestern states (including Arizona, Colorado, Nevada, New Mexico, Texas and Utah) to create a statewide framework for groundwater management.

“Our goal was to clearly lay out the varying policies and practices of these Southwestern states, [highlight the geographic areas](#) in which they held sway, and enable [side-by-side comparisons](#) across a number of different parameters. Some things are just best done visually, even in nuanced fields like the law,” said Geoff McGhee, dashboard co-creator and former creative director at the [Bill Lane Center for the American West](#).



License to Pump webpage examining the special permitting areas within California.

To better understand the bigger picture of water withdrawal for each of the states, the team pulled together special permitting information from areas needing more intensive controls

on groundwater withdrawals. They examined various aspects of permitting, such as the criteria a user must meet to obtain a permit, exemptions, required metering and penalties for violations.

“We did systematic searches of state legislation and regulations to find common themes and striking differences,” said [Rebecca Nelson](#), a non-resident fellow at Water in the West and senior lecturer at the Melbourne Law School, University of Melbourne, Australia.

This information provides a baseline for resource managers introducing groundwater permitting and for identifying jurisdictions facing similar legal challenges.

“The dashboard sets out a menu of key components for California agencies looking to introduce a permitting regime for the first time, and shows just how widespread and indispensable this approach has become to groundwater managers across the Southwest,” Nelson said.

The dashboard is largely based on two recent studies authored by dashboard co-creators [Debra Perrone](#), a non-resident fellow at Water in the West and an assistant professor at the University of California, Santa Barbara Environmental Studies Program and Rebecca Nelson: [The Role of Permitting Regimes in Western United States Groundwater Management](#); and [Comparing Local Groundwater Withdrawal Permitting Laws in the Southwest and California](#).

This work was generously funded by Cody Smith.

Workshops scheduled to assist Newland Project water rights owners to verify mapping results

Submitted by Carson Now Reader on Thu, 05/30/2019 - 2:06pm

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Department of Conservation and Natural Resources

CARSON CITY — The Nevada Department of Conservation and Natural Resources' Division of Water Resources has completed revisions to Phases 1 through 5 of the Newlands Project Water Rights Mapping Project.

Workshops are scheduled to assist water rights owners to review the mapping of their water rights for correctness. If owners feel their water rights are incorrectly represented, a Request for Revision form and supporting documentation may be submitted to NDWR no later than September 30, 2019.

Newlands Project Water Rights Mapping results and forms to request a revision are available for review at <http://water.nv.gov>, located under the Programs listings.

Revised Phases 1-5

Workshop Location and Dates:

Fernley City Hall, Community Room

595 Silver Lace Blvd.

Fernley, Nevada 89408

August 26 – 1:00 pm – 7:00 pm

August 27 – 1:00 pm – 7:00 pm

August 28 – 9:00 am – 3:00 pm

August 29 – 9:00 am – 3:00 pm

Churchill County Commission, Room136

155 N. Taylor Street, Suite 110

Fallon, Nevada 89406

September 9 – 1:00 pm – 7:00 pm

September 10 – 1:00 pm – 7:00 pm

September 11 – 9:00 am – 3:00 pm

September 12 – 9:00 am – 3:00 pm

For additional Newlands Project Water Rights Mapping Project assistance, water rights owners may call NWDR at 775-684-2800 and ask for Newlands Mapping Project assistance.

Sierra snowpack is 202 percent of average for this time of year

By **Amy Graff**, SFGATE

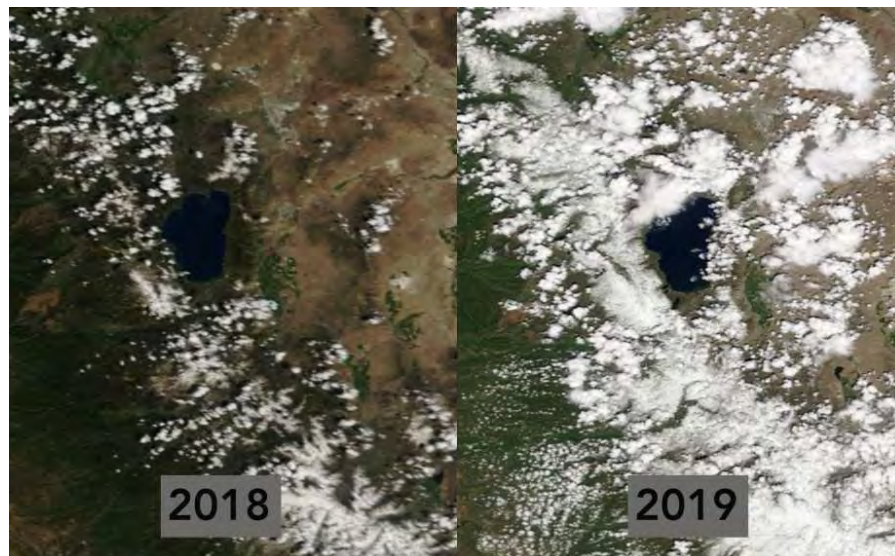
Updated 3:27 pm PDT, Friday, May 31, 2019



Photo: Tom Stienstra, Tom Stienstra / The Chronicle

Ice out at Craggs Lake, elevation 7,440 feet, on Meeks Creek Trail in northern Desolation Wilderness above Lake Tahoe, now passable with a few snowfields

Ice out at Craggs Lake, elevation 7,440 feet, on Meeks Creek Trail in northern Desolation Wilderness above Lake Tahoe, now passable with a few snowfields



NASA satellite imagery shows the difference between the Sierra snowpack in 2018 when snow levels were below average and in 2019 when they were above average. In the left image from May 29, 2018, the snowpack was at 6 percent of average and in the right image from May 29, 2019, the snowpack was 202 percent of normal.

A nonstop parade of storms barreled across the Sierra Nevada in winter. Then, spring hit and winter weather persisted with unseasonably cold systems piling up snow all the way through Memorial Day weekend.

The marathon stretch of unsettled weather means the reservoirs are brimming, the rivers are rushing, the waterfalls are spectacular, and people are still skiing in fresh powder in Tahoe.

But perhaps the most noteworthy outcome is a remarkably gargantuan snowpack blanketing the mountain range straddling California and Nevada. Right now, it's even bigger than the 2017 snowpack that pulled the state out of a five-year drought. As of May 30, the snowpack measured 202 percent of average, according to the California Department of Water Resources which compiles data from about 100 stations across the range. At this time last year, it measured 6 percent of average, making this year's 33 times bigger than last year. In 2017, the snowpack measured 190 percent of average.

State officials consider the most important snowpack measurement to be the one taken around April 1 because that's when the sun is at its highest point, temperatures warm, and storm activity subsides.

"That's basically the measurement we look at because that's when the snowpack usually peaks," said Idamis Del Valle, a forecaster with the National Weather Service. "And then after that the sun's highest position in the sky contributes to rapid melting. This year, that didn't happen and we had late season snow."

This year's April 1 reading put the snowpack at 176 percent of average, making it the fifth-largest on that date, with records going back to 1950.

"I'd say it's not normal," said Chris Orrock, a spokesperson for the California Department of Water Resources. "But it's good for California."

The Sierra snowpack is one of California's most important water sources, with its spring and summer runoff feeding rivers and reservoirs, watering crops, filling bathtubs and water glasses. Mountain snowpack provides about 30 percent of the yearly fresh water supply for California. Orrock says this year's massive snowpack will help with the water supply and also outdoor recreation.

"The good news is there will be plenty of water for fishing, boating, white-water rafting, even skiing, all that stuff."

In the Tahoe Basin, Squaw Valley has seen its third-snowiest season going back to 1970 and the resort plans to stay open until at least July 5. In May alone, the resort recorded 37 inches on the upper mountain above 8,200 feet.

Three feet is impressive for May in California, but it's not the resort's highest-ever May total. "In 2011, we received 56 inches in May," says Squaw spokesperson Alex Spsychalsky. "That came at the tail end of our snowiest season on record, 2010-2011, when we received a season snowfall total of 810 inches."

This year, the resort has recorded 719 inches since the start of the season. To the south in the Central Sierra, Mammoth has also been pummeled with snow and will be running lifts through early July and possibly beyond.

ALSO: \$5 lift tickets: A crazy bargain comes to Tahoe resort

But while the snowpack has benefits, it also presents serious dangers. California officials are preparing for flooding, especially in the more flood-prone and narrow San Joaquin watershed, where rivers such as the Merced that runs through Yosemite swelled in 2017.

"That's where we're mostly concerned about, but there's always concern everywhere," says Orrock. "If you get abnormal warm rain and with these reservoirs being so full, we have to be ready for everything. Each reservoir has their manual and if they have so much water coming in, they have to let so much water out."

And while we may be worrying about the state having too much water this summer, Orrock says soon we could be back in a situation where there's not enough. "Let's look at the past 10 years and we had the historic drought from 2011 to 2016, and then we had 2107 that was a historic precipitation year, but the snow pack wasn't as much as this year," he said. "Climate change has led to changes. There's such variability in California's climate now, we go from one extreme to another. "It's not if the next drought is going to come, it's when."

Global Smart Water Meters Market 2019 Segments Analysis: Companies Sensus, Siemens, Kamstrup, Itron, Diehl Stiftung & Co. KG

[Laura Tate](#) — June 4, 2019



Productive insights into **Global Smart Water Meters Market** considering growth prospects, profit potential, and revenue outcomes

The **Global Smart Water Meters Market Research Report 2019** is highly focused on upcoming occurrences in the global [Smart Water Meters](#) industry that tends to exhibit both positive and negative impacts on the market. The report also studies historical and current events in the market and provides valuable forecast estimations to help a Smart Water Meters business owner and company to determine the futuristic status of the market and perform accordingly.

The global Smart Water Meters market has been brewing with commendable growth momentum from recent decades, and it is likely to perform more vigorously in the forecast period. According to the financial assessment of the market considering the last five years, the market holds the potential to become one of the most profit-making businesses that substantially contribute to the global revenue generation and boost the international trade system. The Smart Water Meters market growth is being fueled by technological advancements.

[Request Sample Copy of Global Smart Water Meters Market Report](#)

Intact evaluation of Smart Water Meters companies and competitive landscape illuminating all requisite factors.

- Sensus
- Siemens
- Kamstrup
- Itron
- Diehl Stiftung & Co. KG
- Elster (Honeywell)

The Smart Water Meters types, applications, regions, technology, and end-users are the leading segments of the global Smart Water Meters market which are highly essential to be studied while exploring the market at a minute level. Thus, the report facilitates a reader with profound segmentation analysis which helps to bifurcate target consumer base considering their needs and anticipations. The analysis is equally important to all Smart Water Meters companies regardless of their capacity and financial outcome, it helps them to improve their planning and provide better product/services that appeal to customers.

Obtain complete insights into the Global Smart Water Meters Market Study

The report further sheds light on robust contenders performing in the Smart Water Meters market, which primarily strives to fulfill overall demand for the Smart Water Meters at both national and international level. It includes expansive analysis based on the company's production process, product cost, value chain, pricing structure, raw material sources, import-export activities, and global reach.

Additionally, the report provides details based on their financial status comprising terms such as sales volume, revenue outcome, product price, growth rate, maintenance cost, capital investment, cash flow, and other financial ratios. The report also offers a comprehensive acumen for a competitor's business planning, which typically includes recent product launches, acquisitions, mergers, ventures, partnerships, banding, and promotional activities.

Ultimately, the report enriches Smart Water Meters market players, companies, or officials with a shrewd acuity that certainly helps them in making crucial decisions and forming effective business stratagem that can steer the player to become the most influential Smart Water Meters company worldwide.

Get in touch with us, we would be happy to resolve your queries report version upgrade/customization and offer additional intelligent counsel to bolster your market conception. Contact us through sales@marketresearchexplore.com

Smart Water Meter Market- Water Depletion Concerns has Fueled the Demand

June 3, 2019

3 Min Read



The market is described by the nearness of all around differentiated worldwide, territorial, and nearby water meter makers and has all the earmarks of being profoundly divided. Nonetheless, the territorial or nearby sellers command the market in a few creating nations. The help from the legislatures of different nations over the globe towards the selection of keen meters for water administration will help in the development of the merchants in this marketplace. To upgrade income shares and enhance their market positions, a few organizations have begun receiving acquisitions and association methodologies and are additionally concentrating on presenting powerful items. Significant sellers are additionally focusing on making joint endeavors, MOUs, and acquisitions, which will enable them to pick up an aggressive edge over their rivals. Elster Group GmbH, Azbil Kimmon Co., Ltd., B Meter, Itron Inc., Master Meter, Inc., Kamstrup A/S, Sensus (Xylem Inc.), LLC., Plata Meter Co., Ltd, G. Gioanola S.R.L., Aichi Tokei Denki Co., Mueller Systems, NINGBO WATER METER CO., LTD, Diehl Stiftung & Co. KG, Badger Meter, Inc., Arad Group, Neptune Technology Group Inc., Ltd, Apator SA, Fedrel Meter, Maddalena Spa, ZENNER International GmbH & Co. KG, and . Jiaying Easton Electronic Instruments Co., Ltd. are among of the important firms dominating the water meter market worldwide.

According to Transparency Market Research (TMR), the [global water meter market](#) is anticipated to witness a robust growth in coming years owing to a steady CAGR of 4.5%. The worldwide water meter market was evaluated to be worth US\$ 3.5 bn in 2015 and is relied upon to achieve a worth of US\$ 5.2 bn before the finish of 2024. Asia Pacific is required to lead the worldwide market all through 2016 to 2024. The enhancing foundation in the district and a solid nearness of a few water meter makers are relied upon to keep Asia Pacific local market at the front line. In view of use, the private portion held the prevailing offer in the worldwide market in year 2015. The report recommends that the private portion will keep on leading as family units will keep on being key clients of water meters amid the figure time frame.

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Water Depletion Concerns has fueled the Demand for Water Meters in the Market

Water utilities have indicated unmistakable fascination in embracing water meters as these gadgets have developed throughout the years to help customers and specialist co-ops to comprehend the measure of water utilization. The exactness of this hardware has improved charging strategies and enabled utilities to dissect water utilization and its wastage. Throughout the years, a few sorts of water meters have picked up a market share in the worldwide market inferable from their significance in monitoring water, vitality, and lessening the use on water bills. The undeniable actuality about draining water assets have raised worries about measures to diminish water utilization and wastage over the globe.

Government Activities for Water Conservation to Play Vital Role in Overall Demand

Governments are in this manner taking activities for the same through bringing issues to light and introducing water meters to examine the required measure of water for different purposes, its wastage assuming any, and techniques for safeguard it. A few buyers over the globe are likewise settling on water meters as they help in enhancing the bill, consequently sparing vitality and assets. The consistent incorporation of smart innovations has prompted the presentation of keen water meters, which has expanded the take-up of these items in the course of recent years.

Sky Vision Soars Over The Truckee River West of Reno, NV

by Brian Kulpa

Tuesday, June 4th 2019

[*Link to video: Truckee River NV CA Line*](#)

Watch News 4-Fox 11's Sky Vision Drone Team soar over the Truckee River West of Reno, NV as temperatures rise and snow melts.

News 4-Fox 11 operates Sky Vision in partnership with Reno-Tahoe Auto Group.

1. Keeping Green During Drought

Keeping Green During Drought

June 06, 2019 | Water in the West | News

By Karly Chin



A new study analyzes patterns of urban irrigation and vegetation health during extreme drought. Its findings could inform urban water conservation and water infrastructure development under climate pressures.

The grass is not always greener if you water it, a new study finds. A recently published [Stanford-led paper](#) couples water-use and remote sensing data to examine the effectiveness of irrigation on urban green space during periods of climate-induced drought. Their findings provide important insights for efficient water conservation management as droughts become more frequent and severe due to a changing climate.

Limiting outdoor water use is a key component of managing water scarcity. However, maintaining green space – a societal norm in many urban areas – offers a variety of benefits, such as recreation and aesthetic value along with auxiliary benefits such as stormwater retention and management. As a result, preserving vegetation while conserving water is a major challenge. As droughts become more frequent and severe due to a changing climate, deciding on the optimal allocation of limited water resources within a city becomes even more important.

“To make more effective water infrastructure decisions, we need an improved understanding of how outdoor water use patterns, vegetation greenness and climate impacts interact,” said [Newsha Ajami](#), study senior author and director of Urban Water Policy at [Stanford’s Water in the West program](#).

Stanford researchers teamed up with Andrew Marx, associate professor at the Spatial Sciences Institute of the University of Southern California Dornsife College of Letters, Arts and Sciences to analyze water use and remote sensing data for nonresidential properties in Redwood City, California before and during the state’s 2012-2016 drought. They coupled high-resolution satellite imagery of parcels with water use data from irrigation “smart meters” tracking only outdoor usage. Their analysis focused on commercial, industrial and

institutional customers irrigating with recycled or potable water. The two water types are governed by different water use policies, and only potable water customers are subject to mandatory water use restrictions.

“Because we had customers with two water types, managed under different restrictions and policy regimes, but facing the same drought conditions, we could evaluate how vegetation vigor evolved under different levels of irrigation but also conservation,” said lead author [Kim Quesnel](#), a Ph.D. candidate in [civil and environmental engineering](#) at Stanford.

The team found that despite differing policy and pricing regulations, potable and recycled water use followed similar trends, although potable users conserved more water overall. Water customers decreased their usage as the drought progressed regardless of their water type, with the most substantial decreases occurring after the summer of 2014 when mandatory outdoor watering restrictions went into effect.

Hot and dry temperatures greatly influenced parcel greenness, which was lowest during the height of the drought in 2014, even before implementation of water restrictions, but rebounded after the drought, despite decreased water use. Vegetation health decreased from 2012 to 2014, while irrigation rates did not change substantially, suggesting that under extreme climatic stress, even with consistent irrigation, vegetation may not be able to thrive. The greenness started recovering despite continued conservation even after restrictions were lifted in 2016, due to decreasing severity of the drought with increased precipitation and decreased temperatures.

“These findings are relevant for arid and semi-arid communities in the U.S. and around the world. As droughts become more frequent and severe due to climate change, we should be rethinking urban landscapes,” Quesnel said.

The study offers valuable insight on urban water use patterns, showing that vegetation may not be able to withstand the most severe drought periods regardless of sustained irrigation rates. As more cities consider diversifying their water portfolios and incorporate recycled water, understanding where and how recycled water will be used most efficiently is key to guiding conservation efforts.

“Currently, these decisions are not well coordinated and informed. Through this approach we hope to shed some light on how environmental stress such as extreme droughts and their long-term impacts on water use patterns need to be more actively incorporated in our infrastructure investment process and water use allocation,” said Ajami.

The authors note that solutions such as shifting to climate-appropriate landscaping, creating more shaded areas, implementing drip irrigation and nighttime watering are helpful water management practices. However, recognizing the limits of irrigation during drought will prove critical in guiding efficient water policy and urban planning in the coming years.



Photo credit: Doc Searls.

Truckee looks for funding of aquatic invasive species program at Donner Lake

Environment | June 7, 2019

Hannah Jones hjones@sierrasun.com

Truckee is working on funding for Donner Lake's aquatic invasive species program after losing grant funding this year.

"Our program in Truckee was 100 percent funded by the grant," said Truckee Police Chief Robert Leftwich. "I don't think the grant funding is the appropriate path forward."

In the past the program has been funded by three separate grants, one from the **Truckee River Fund** and two from the Division of Boating and Waterways. All three grants expired in December last year.

"This is the first year our program is unfunded," said Deverie Acuff, support services manager for Truckee.

Inspection stations can cost between \$90,000 to \$145,000 depending on the number of boats that are inspected each year. To get through this season the Tahoe Regional Planning Agency has agreed to help cover the costs this summer. Acuff said nothing will change for boaters this summer.

"We had all intentions of applying for another grant in 2018," said Acuff who added that the grants did not become available last year. The grant opening was pushed to April of this year with funds unavailable until October, after boating season is over. This year the division of boating and waterways also separated the grant into two parts.

The first grant is available to agencies looking to update their prevention plan with the second being an actual operations grant. To get the operations grant Truckee must first update their outdated prevention plan.

Donner Lake has three boat launch sites, two of which are privately owned by the Tahoe Donner Marina and Donner Lake Homeowners Association. When staff isn't present those sites are closed. The public boat launch, however is always open despite a staff presence. During off season there is no one monitoring the boat launch, Acuff said.

"There's no one there monitoring that lake so people can go on and off as they please. That's what these programs are working towards," she said. "A closed access to make sure we know who is going on and off the lake and ensuring they've all been inspected."

"The threat of the quagga and zebra mussels is not going away anytime soon," said Leftwich. "We are at the lower end of that risk scale but that doesn't mean we need to be complacent."

Moving forward Leftwich said they are looking to find a funding source not reliant on grants.

"Although things are stabilized for this boating season, we are still optimistic but concerned about what the following year has to bring with the financial implications," he said.

Hannah Jones is a reporter for the Sierra Sun. She can be reached at 530-550-2652 or hjones@sierrasun.com.

Jury Selected for Class Action Lawsuit by Lemmon Valley Residents Against City of Reno

Several residents in Lemmon Valley near Swan Lake are suing the City of Reno for damages to their property from flooding in 2017. Monday lawyers on both sides chose 10 jurors to hear the case, and opening statements will start at 8:30 a.m. on Tuesday.

Monday, June 10th 2019, 7:18 PM PDT by Brandon Fuhs

Updated:

Monday, June 10th 2019, 7:40 PM PDT

[Play Video](#)

Several residents in Lemmon Valley near Swan Lake are suing the City of Reno for damages to their property from flooding in 2017. Monday lawyers on both sides chose 10 jurors to hear the case, and opening statements will start at 8:30 a.m. on Tuesday.

The lawsuit alleges the City of Reno ignored a study conducted in 2007, that details the potential of flooding at existing homes is more development was built in the area. It also alleges the City of Reno pumped water from Silver Lake to Swan Lake, and pumped effluent from their Sewage Plant even after flooding occurred in early 2017.

The trial is expected to last about two and a half weeks. The prosecution did not comment, noting the judge was clear he did not want lawyers holding press conferences after every day.

City Attorney Karl Hall, leading the defense, did not comment further than saying they successfully chose a jury today.

Legislature | Water & Land

Legislation to set aside water passes through Nevada Legislature with bipartisan, unanimous support

By [Daniel Rothberg](#)



June 5th, 2019 - 2:00am

Railroad Valley, one of the basins where a small percentage of water will be set aside by Senate Bill 140, on Monday, Feb. 2, 2018. (Jeff Scheid/The Nevada Independent)

Legislation to set aside water passes through Nevada Legislature with bipartisan, unanimous support
June 5th, 2019 - 2:00am

They say water is for fighting over, but one bill sitting on Gov. Steve Sisolak's desk proves that's not always true. In fact, [Senate Bill 140](#) would make fighting over some water impossible.

If it's signed into law, the bipartisan bill, sponsored by Eureka Sen. Pete Goicoechea, would prevent water users from making claims on billions of gallons of water previously available to develop.

More than half of the state's 256 groundwater basins are out of balance, a common problem throughout the West and across the globe. Attributable in part to outdated hydrology and early policies to settle the West, [regulators often issued](#) more rights to use water than there is water that can be used sustainably. In many cases, aquifers that were overstressed by groundwater pumping declined, leading to conflicts among water users, drying up springs and disrupting ecosystems.

The imbalance is known as over-appropriation. And the legislation, which passed unanimously in both houses, aims to prevent it from happening in the future by creating a buffer in aquifers throughout the state.

Most of Nevada's groundwater is already used by towns, ranchers, businesses, miners and other water users. But there are some basins where water is still available to claim by filing for water rights with the state engineer, Nevada's top water regulator. To protect against future over-pumping, the bill would require the state to set aside 10 percent of available water in those basins.

In practice, the change will be largely symbolic. According to Acting State Engineer Tim Wilson, the bill will prevent the appropriation of about 30,000 acre-feet of water, roughly the amount of water it would take to fill 23,000 football fields with a foot of water, a fraction of the state's total supply. Still, the bill drew support from varied water users who framed it as a prudent approach in a region where regulators have a history of allocating more, not less, water.

"This is definitely a step in the right direction," said Laurel Saito, the Nevada Water Program Director for The Nature Conservancy, which testified in favor of the bill. "It doesn't solve everything, but it's a step in the right direction. And I think that's what we can build on."

Setting aside water for the future or protecting it for the environment is uncommon in the West but not unprecedented, according to Rebecca Nelson, a non-resident fellow at the Stanford's Water in the West program who recently published a [report on groundwater policy in the Southwest](#).

In an email, Nelson wrote that Montana allows for a "state water reservation" to keep water in streams as a benefit to the public. North Dakota and Utah also have codes that allow them to reserve some water. But the practice, she said, is more common outside of the U.S., especially in Australia.

"Reservations of groundwater in Australia can be much more than Nevada's 10 percent," wrote Nelson, who is also a senior lecturer at the University of Melbourne's law school.

Although several conservation groups supported the legislation, business interests like the Nevada Farm Bureau also rallied behind the bill.

Doug Busselman, the bureau's executive vice president, said the provision would offer existing water users more security. More allocations can create more opportunities for conflict and over-appropriation, which could lead to newer water users, sometimes businesses, having their rights curtailed.

"Taking a conservative approach gives us a lot more of a solid ground to work on," he said.

An original version of the bill had allowed water users to tap into the reserved water during emergencies, such as severe drought. In that case, the water would have been allocated as a temporary right. That provision was taken out of the bill after the state engineer expressed concerns about how it would be implemented. Nelson wrote that allowing for the temporary use of reserved water, at least in the case of Australia, often removed environment protections at the exact time when ecosystems needed that protection most.

During an interview last week, Goicoechea noted that the legislation wasn't a cure-all for the state's groundwater issues, but he said it was a positive start.

"It's not a ton of water," Goicoechea said. "But at least it is a reservation. And I think it will prevent some of these basins from becoming over-appropriated."

And in a Legislature where water policy often triggers heated debates and impassioned testimony from water users that can stretch on for hours, Saito argued that the legislation has helped start a productive conversation.

"I found it really encouraging," Saito said of the wide-ranging support for the bill among lawmakers and water users. "That makes me hopeful for discussions about these issues in the future. Hopefully it's an example of where there can be these overlapping interests and ways where we can resolve or come up with solutions for challenging water issues in the state."

Update: This story was updated at 2:11 p.m. on June 5, 2019 to indicate that Rebecca Nelson is a non-resident fellow at Stanford's Water in the West program, not the Stanford Woods Institute for the Environment.

INDY FAST FACTS

Pete Goicoechea

Office: State senator, District 19

Party: Republican

In current office: 2012-present

Birth year: 1949

Job: Rancher

Education:

Utah State University

Other public offices held:

Assemblyman, 2002-2012

Top Donors:

Newmont Mining \$5,000

Nevada Realtors PAC \$4,000

Southwest Gas \$2,500



INDY FAST FACTS Steve Sisolak

Job: Nevada Governor

Party: Democrat

In current office: 2019-present

Birthdate: December 26, 1953

Education:

University of Wisconsin—Milwaukee (B.S.)

University of Nevada, Las Vegas (M.B.A.)

Other public offices held:

Clark County Commissioner (2009-2019)

*Commission Chairman (2013-2019)

Nevada System of Higher Education Regent (1999-2009)

Total donations: \$9,647,261 (1/12/11-6/7/18)

Top donors:

MGM Resorts International \$174,359

Station Casinos/Zuffa: \$90,000

Las Vegas Sands \$75,000

Fidelity National \$61,600

Marnell Companies LLC \$55,000



State and local governments seeking climate change 'solutions' have plenty of options

By Craig K. Chandler
Tuesday, June 11, 2019



A March 2019 [five-part series](#) addressed actions individual people can take to reduce their carbon footprint on the road, in and around their homes, and in their diets.

That series raised the obvious question of whether individual actions on their own can be adequate to help society confront the climate challenges we all face. The answer is decidedly 'No': Societal actions globally also are essential. That's the focus of this companion two-part series.

This post focuses on actions all levels of government can take in this effort. A second part of this series will address actions only the federal government can take. After that, the author plans to address a range of private sector (manufacturing, agriculture, services) actions needed to help prevent the most devastating impacts of climate change.

The following list of governmental actions, based on science and common sense, is by no means exhaustive. They are straightforward, with some already being implemented, and they could be scaled up.

All levels of government

Use best green technologies and practices for procurement and infrastructure upgrades.

All levels of government can take steps to reduce their enormous carbon footprint. For example, in the U.S., the federal government is the single biggest consumer of energy, with 360,000 buildings, 650,000 vehicles, and \$445 billion spent annually on goods and services. The Texas state government has more than 30,000 vehicles and more than 28 million square feet of office, warehouse, and parking facilities. And the City of Los Angeles has approximately 11,000 vehicles and pieces of equipment.

Taxpayers, of course, will have to be supportive when government leaders want to retrofit old government buildings to make them more energy efficient or upgrade vehicle fleets to more fuel-efficient, but initially more costly models.

National, state, and local governments collectively have huge purchasing power. This power can be used to create or strengthen markets for renewable energy and green technologies. Christian Parenti, an investigative journalist and contributing editor for *The Nation* magazine, has written that a single action – replacing U.S. Postal Service gas-powered delivery trucks with all-electric trucks – would bring down the price of sustainable transportation: “The USPS is a perfect place to start, as most of its vehicles travel in loops of less than 20 miles each day and always park in the same garage (at night, when the demand for and price of electricity is at its lowest).”

All government employees, when undergoing job orientation, could be encouraged to look for ways to do their job in the least carbon-intensive way possible. Many might be able to minimize driving and flying while still accomplishing objectives of their positions.

More funding for land or conservation easements

A conservation easement is a voluntary legal agreement between a landowner and a land trust (a qualified private land conservation organization) or government agency. It permanently limits uses of the land in order to protect its conservation value. Landowners retain many of their rights, including the right to own and use the land, sell it, or pass it on to heirs.

An easement’s purposes might include any of the following:

- Maintain and improve water quality;
- Perpetuate and foster the growth of healthy forest;
- Maintain and improve wildlife habitat and migration corridors;
- Protect scenic vistas visible from roads and other public areas; or
- Ensure that lands are managed so that they are always available for sustainable agriculture and forestry.

Conservation easements typically forbid or substantially constrain subdivision and other real estate development.

More on this.

State government

Boost funding for enforcement of highway speed limits

The federal government can mandate a maximum speed limit, but it is state and local police that enforce speed limits. Increased funding for enforcement would result in higher compliance, and therefore lower greenhouse gas emissions.

Drop unreasonable barriers to solar power development

Public service commissions in some states are allowing electric utilities to impose a surcharge on residential customers with rooftop solar PV systems.

Other states have prohibited non-utilities from selling solar-generated power directly to consumers. Allowing such sales could be a powerful incentive for businesses to install solar panels atop commercial building and parking lots. Electric utilities see roof-top solar as a threat to their bottom line, but there are counter arguments to that perspective.

More on this.

Boost public support for agricultural experiment station research

State funding for agricultural research has generally leveled off or declined since the early 1990s, and the public agricultural experiment station system has had to rely increasingly on corporate funding for support. This trend has generated concern that public research programs will become more focused on the needs of private industry – at the expense of broader interests that include small farmers, consumers, and environmental protection.

Use rebates to support energy efficiency and conservation and use of renewable energy sources

Rebates could help lower the cost of replacing old toilets and HVAC systems. (See energy.gov/savings for rebates available in your state.)

Local government**Construct and maintain more walkways, bike lanes, bike parking spaces**

If we want people to consider walking or biking to work, shopping, and so on, then they must have access to safe, enjoyable, and well-maintained sidewalks and protected bicycle lanes and parking facilities.

Require composting by large food waste generators (e.g. arenas, stadiums, restaurants, schools, and food manufacturers, wholesalers, and retailers)

This step can reduce the amount of organic matter going to landfills or being incinerated. Landfilled food waste results in the creation of methane; incinerating that waste lowers incinerator efficiency because of the high water content of food waste.

The finished compost created from food and yard waste could be used by local farmers to enrich their soil, thus allowing organic matter and valuable nutrient elements, such as nitrogen, potassium, and phosphorus, to be recycled.

Provide incentives to help counter urban sprawl

Infill development (i.e., new construction on vacant or underused lots in established neighborhoods or business districts) can have many benefits, but often only with local government encouragement or assistance.

Benefits of infill development include:

- Making better use of urban land, while reducing consumption of forest and agricultural land;
- Increasing access of people to jobs and vice versa;
- Reducing time, money, energy, and air pollution associated with commuting and other uses of single-occupant automobiles; and
- Making better use of existing infrastructure and lowering cost of public services, such as transit, sidewalks, water and sewer, schools, and public safety.

Strengthen urban forests

An urban forest consists of the vegetation within a city, town, or suburb – including the trees, shrubs, grasses (and other groundcovers) along roads and in yards and parks.

The urban forest can benefit a community in many ways. Here are a few:

- Strategically planted trees reduce energy use by shading buildings and pavement in summer and blocking cold winds in winter.
- Tree canopies and roots reduce soil erosion.
- Tree-lined streets encourage people to walk and walk more often and farther.
- Beautifully landscaped parks and other public spaces provide people nearby places to relax and enjoy nature, without having to drive to more distant areas.

[More on this.](#)

Reduce energy use and light pollution without compromising public safety

The International Dark-Sky Association and the Illuminating Engineering Society of North America have developed a template for such an ordinance. This template can be found on IDA's [website](#).

Charge property owners appropriately for leaf/brush pickup

Regular removal of leaves and brush from residential and commercial properties is not considered a best management practice. It is often done to maintain a certain subjective aesthetic. So property owners should be charged the full cost of this service.

By charging a pickup fee, homeowners and other landowners would be discouraged from using such a service — which in most cases is using fossil-fuel burning trucks to transport this waste to landfills or composting sites. This would provide an incentive for landowners to [learn how to recycle this organic matter](#) on their own property.

Restrict use of leaf blowers

Gas-powered leaf blowers emit significant amounts of greenhouse gases. They also create noise and air pollution. The air pollution includes fine particles that can go deep into the lungs and be especially troubling to asthmatics and allergy sufferers.

With less use of leaf blowers, roads and parking areas won't be completely free of very small bits of debris, but there will be less dust and dirt in the air and less movement of this material into parked cars, screen porches, and open windows.

It's important to remind ourselves that we often do things because technology has made them easy to do – not because there is a good reason to do them.

[Resources used by the author](#) to research and write this post.

AUTHOR

Craig K. Chandler is a retired horticulturist and professor at the University of Florida's Gulf Coast Research and Education Center, where he led the university's strawberry breeding program from 1987 until 2010.

Lemmon Valley residents take on Reno in trial accusing city of causing 2017 Swan Lake flood

[Sam Gross](#), **Reno Gazette Journal** Published 6:12 p.m. PT June 11, 2019

The waters in Swan Lake started rising two years ago. Residents there are still worried. Sam Gross and Benjamin Spillman and Anjeanette Damon, Reno Gazette Journal

CONNECTTWEETLINKEDINCOMMENTEMAILMORE

The trial to decide if the city of Reno is liable for the flood damage caused to homes and property along Swan Lake in Lemmon Valley began on Tuesday.

A cadre of Lemmon Valley residents whose homes and property were damaged when Swan Lake flooded in 2017 have filed a class action lawsuit against the city.

On the line is potentially millions in Reno taxpayer dollars if the jury rules in favor of the homeowners.

The suit claims Reno used the property owners' land unjustly and without fair compensation when the city allegedly pumped, diverted or discharged excess stormwater and effluent into the normally dry lakebed during the historic winter of 2016-17, causing many properties to flood.

It also claims the city trespassed on the properties and caused a nuisance.

The root cause of the problem, the suit alleges, is unchecked development in the Lemmon Valley area that has paved over or otherwise eliminated ground that normally would have absorbed rainfall and snowmelt, permanently changing the drainage system surrounding Swan Lake.

Attorneys for the city, in response, argued Reno — like the residents whose homes flooded in 2017 — is the victim of an unforeseen natural disaster that impacted the entire region.

And the homeowners affected by the flooding, Assistant City Attorney Jonathan Shipman argued during opening statements on Tuesday, were living in a known flood-prone area.

Attorneys on both sides made opening arguments on Tuesday and interviewed the first three witnesses, who were called to the stand by the plaintiffs.



Buy Photo

Washoe County sets up some HESCO barriers on the edge of Swan Lake flood waters in Lemmon Valley on Dec. 19, 2017. (Photo: Jason Bean/RGJ)

Those witnesses were David Michael Walls, a Lemmon Valley homeowner whose property was severely damaged in 2017; Sam Hicks, a Truckee Meadows Fire Department battalion chief who served as incident commander during the flood; and Jeff Lytle, the Las Vegas-based former chief of Nevada's highly trained FEMA urban search and rescue team that was deployed to Lemmon Valley in 2017.

A 2018 Reno Gazette Journal investigation [revealed that Reno knew Swan Lake would likely flood](#) and ignored suggestions to build flood mitigation projects alongside new development in Lemmon Valley.

After another record winter in 2018-19 the water in [Swan Lake began to rise again](#), surpassing the high-water mark set during the 2017 floods and re-inundating properties that had previously dried out.



Buy Photo

Washoe County installs temporary inflatable barriers, called Tiger Dams, in front of homes bordering Swan Lake along Shane Way in Lemmon Valley on April 3, 2019. (Photo: Jason Bean/RGJ)

Walls and his wife, Linda, were forced to leave their home of 40-plus years in February 2017 after flooding got so bad they worried they wouldn't be able to escape if it got any higher.

They moved into a neighbor's fifth-wheel trailer up the street, where they've been living since.

Their home, he testified in court on Tuesday, remains uninhabitable. It's still surrounded by 25,000-plus sandbags, has no water or power and the septic system is unusable.

On the stand, he told the jury about watching the rising floodwaters invade the property he's owned since 1977 and inundate his home.

"It kept getting worse and worse ... the dry lake bed was not becoming dry," he said.

Hicks and then Lytle followed Walls on the stand.

Attorneys questioned the two chiefs primarily on the mechanics of the initial response to the flooding.

Hicks led the type-3 incident team in early 2017 charged with searching and securing the inundated properties and also led the installation of the initial Hesco barriers, temporary structures erected to hold back the lake water — which are still in place today.

Lytle and about 40 members of the specialized urban search and rescue team were called in to help with the effort.

New 'Tahoe Beaches' Website Helps Visitors Explore More of Lake Tahoe's Pristine Shoreline

TahoePublicBeaches.org guides visitors and locals to over 40 public beaches in the Tahoe Basin

TAHOE CITY, Calif. (June 4, 2019) - In partnership with eight agencies that manage Lake Tahoe's public beaches, the nonprofit Tahoe Fund has launched a new [website](#) designed to serve as a guide to visitors and locals interested in exploring over 40 beaches that surround the iconic shores of Lake Tahoe. From frequented hotspots to little known hidden gems, the website offers information about how to get to each beach, where to park, hours of operation, what amenities and services are offered if any. The website also details other helpful information beachgoers might be interested in.

"For the most part, when people visit Tahoe, they often frequent the same 5-10 beaches. With the new [Tahoe Public Beaches website](#), our intention is to help educate people about the 40+ public beaches that surround the lake so people can experience more of what Tahoe has to offer," said Amy Berry, Tahoe Fund CEO. "Whether you're looking for dog friendly beaches, places where you can BBQ, rent paddleboards, boats or find shade, TahoePublicBeaches.org was designed to be the singular place to learn what each beach offers and how to get there."

In addition to information about each beach and the facilities available, [TahoePublicBeaches.org](#) offers information about the Lake Tahoe Water Trail, convenient transportation options, and how to take care of Lake Tahoe.

The Tahoe Public Beaches website was developed by the Tahoe Fund and co-funded by the California Tahoe Conservancy through the [Lake Tahoe License Plate Program](#). Eight public agencies collaborated to develop the site, seamlessly integrating public beach information across their organizations to get information to their users. The partners include: California Tahoe Conservancy, California State Parks, City of South Lake Tahoe, Tahoe City Public Utility District, North Tahoe Public Utility District, Nevada Division of State Parks, the U.S. Forest Service, and Tahoe Transportation District.

"Everyone who enjoys the lake should have a Tahoe plate," said Patrick Wright, the Conservancy's Executive Director. "They look cool on your car, show your love for Lake Tahoe, and fund important recreation projects like this new website, which makes it easier for you to find a public beach at Lake Tahoe."

Visitors and Lake Tahoe area residents are encouraged to bookmark the mobile-friendly website and use it to plan their next trip to one of Tahoe's public beaches. Learn more at [TahoePublicBeaches.org](#). Learn more about Lake Tahoe license plates at [tahoeplates.org](#).

About Tahoe Fund

The Tahoe Fund was founded in 2010 to work with the private community to support environmental improvement projects that restore lake clarity, enhance outdoor recreation, promote healthier forests, improve transportation and inspire greater stewardship of the region. Through the generous support of private donors, the Tahoe Fund has leveraged more than \$2 million in private funds to secure more than \$40 million in public funds for more than 30 environmental projects. The projects include new sections of the Lake Tahoe Bikeway, restoration of watersheds, removal of aquatic invasive species, forest health projects, public beach improvements, and stewardship programs. Learn more at [www.tahoefund.org](#).

Missoula approves purchase of smart water meters

by Shannon MacNeil

Monday, May 20th 2019

MISSOULA, Mont. — The city of Missoula just approved an agreement with Northwest Pipe Fittings, Inc.

The agreement is for the city to purchase no more than \$4.25 million in Neptune water meters, software and the Advanced Metering Infrastructure. Billings, Bozeman, and Great Falls have already switched over.

Officials say the smart meters will replace customers' current meters within the next five to six years, at no cost to the customer.

Neptune water meters are said to work faster and be more accurate because they are read every 15 minutes, instead of current meters that are read once a month.

Dennis Bowman with Missoula Water says the change will benefit consumers and the city alike.

"These meters will be able to give access to the customers themselves for conservation reasons, they can look and see how much water they use," explained Bowman. "It would help this facility for analyzing all unaccounted-for water, we'll be able to use the software to see how much water goes into certain systems in real time."

The city will be spending the next year developing the software before installing anything. They will also send out pamphlets to customers explaining how the water meters work.

From: "Westlake, Marci" <mwestlake@tmwa.com>
Date: June 3, 2019 at 4:01:00 PM PDT
To: [REDACTED]
Cc: "info@waterforms.net" <info@waterforms.net>
Subject: FW: New submission from Comments to the Board

Hello Julia,

I am sorry for the inconvenience, due to the growth in the region we had to rearrange some boundaries to make our read cycles more manageable. Unfortunately your account was one of the ones that was restructured. Your account has been noted and will not suffer due to the late payment. Again, I apologize for any inconvenience this may have caused you.

Regards,

Marci Westlake

Customer Service Manager

Truckee Meadows Water Authority

1355 Capital Blvd. | Reno, NV 89502

O: (775) 834-8074

mwestlake@tmwa.com | www.tmwa.com



Subject: New submission from Comments to the Board

Name

Julia [REDACTED]

Email

[REDACTED]

Account Number

[REDACTED]

Comments

I went to pay my bill and found you randomly changed my due date. I find this very unprofessional that I was not notified. I paid my bill on May 6, 2019 thinking I was paid up til June 1, 2019. On May 3, 2019 you had already billed me again and you wanted me to pay on May 24th which didn't show on May 6th. Twice in one month. According to your records I am now late on my payment. Your customer service took the late fee off but I am more concerned I was late on paying my bill because you were negligent in informing me of the change. When I paid my bill on May 6th there should have been some reference to my new bill and my new payment schedule.

Julia [REDACTED]

Our vision is to enhance the quality of life in the Truckee Meadows by delivering exceptional, customer-focused water services.