CITY OF SANTA CRUZ
City Hall
809 Center Street
Santa Cruz, California 95060

Water Department

WATER COMMISSION

Regular Meeting

October 01, 2018

7:00 P.M. GENERAL BUSINESS AND MATTERS OF PUBLIC INTEREST, COUNCIL CHAMBERS

*Denotes written materials included in packet.

The City of Santa Cruz does not discriminate against persons with disabilities. Out of consideration for people with chemical sensitivities, please attend the meeting fragrance free. Upon request, the agenda can be provided in a format to accommodate special needs. Additionally, if you wish to attend this public meeting and will require assistance such as an interpreter for American Sign Language, Spanish, or other special equipment, please call Water Administration at 831-420-5200 at least five days in advance so that arrangements can be made. The Cal-Relay system number: 1-800-735-2922.

APPEALS: Any person who believes that a final action of this advisory body has been taken in error may appeal that decision to the City Council. Appeals must be in writing, setting forth the nature of the action and the basis upon which the action is considered to be in error, and addressed to the City Council in care of the City Clerk.

Other - Appeals must be received by the City Clerk within ten (10) calendar days following the date of the action from which such appeal is being taken. An appeal must be accompanied by a fifty dollar ($50) filing fee.

Call to Order

Roll Call

Statements of Disqualification - Section 607 of the City Charter states that ...All members present at any meeting must vote unless disqualified, in which case the disqualification shall be publicly declared and a record thereof made.The City of Santa Cruz has adopted a Conflict of Interest Code, and Section 8 of that Code states that no person shall make or participate in a governmental decision which he or she knows or has reason to know will have a reasonably foreseeable material financial effect distinguishable from its effect on the public generally.

Oral Communications - No action shall be taken on this item.

Announcements - No action shall be taken on this item.

Consent Agenda (Pages 1.1-3.10)Items on the consent agenda are considered to be routine in nature and will be acted upon in one motion. Specific items may be removed by members of the advisory body or public for separate consideration and discussion. Routine items that will be found on the consent agenda are City Council Items Affecting Water, Water Commission Minutes, Information Items, Documents for Future Meetings, and Items initiated by members for Future Agendas. If one of these categories is not listed on the Consent Agenda then those items are not available for action.

1. City Council Actions Affecting the Water Department (Pages 1.1-1.2)

   Accept the City Council actions affecting the Water Department.

2. Water Commission Minutes from August 27, 2018 (Pages 2.1-2.9)

   Approve the August 27, 2018 Water Commission Minutes.

3. Update on Stage 1 Water Shortage Alert (Pages 3.1-3.10)

   Receive information regarding water conditions and Stage 1 Water Shortage Alert.

Items Removed from the Consent Agenda

General Business (Pages 4.1-6.4) Any document related to an agenda item for the General Business of this meeting distributed to the Water Commission less than 72 hours before this meeting is available for inspection at the Water Administration Office, 212 Locust Street, Suite A, Santa Cruz, California. These documents will also be available for review at the Water Commission meeting with the display copy at the rear of the Council Chambers.

4. Quarterly WSAS Update (Pages 4.1-4.18)

   Receive information on the status and progress of the Water Supply Augmentation Strategy.

5. Aquifer Storage and Recovery: Summary of Phase 1 Findings and Discussion of Phase 2 (Pages 5.1-5.2)

   Receive information on the status and findings from Phase 1 of the Aquifer Storage and Recovery study and discuss the work plan for Phase 2.

6. Final Reports: Recycled Water Feasibility Planning Study and Desalination Feasibility Update Review, and Update on Alternatives Decision Making Process (Pages 6.1-6.4)

Receive information on the findings and recommendations of the Recycled Water Feasibility Planning Study and the Desalination Feasibility Update Review; support staff's recommendation to prioritize recycled water as the Element 3 alternative.

Subcommittee/Advisory Body Oral Reports - No action shall be taken on this item.

Director's Oral Report - No action shall be taken on this item.

Informational Items from the Public

Adjournment

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WATER COMMISSION
INFORMATION REPORT

DATE: 9/26/2018

AGENDA OF: October 1, 2018

TO: Water Commission

FROM: Rosemary Menard, Water Director

SUBJECT: City Council Actions Affecting the Water Department

RECOMMENDATION: Accept the City Council actions affecting the Water Department.

BACKGROUND/DISCUSSION:

August 28, 2018

Resolution Amending the City of Santa Cruz Personnel Complement and Classification and Compensation Plans for the Following Departments: Planning and Community Development, Public Works, Water, City Manager, Economic Development and Finance Departments (HR)

Resolution No. NS-29,434 **was adopted** amending the Classification and Compensation Plans and the FY 2019 Budget Personnel Complement for various classification and position changes in six City departments.

University Tank No. 5 Replacement Project – Maintenance Tank – Contract with Anderson Pacific Engineering Inc. Notice of Completion (WT)

Motion **carried** to accept the work of Anderson Pacific Engineering Construction, Inc. (Santa Clara, CA) as complete per the plans and specifications and authorize the filing of a Notice of Completion for the U5 Maintenance Tank.

September 11, 2018

GHWTP Tube Settlers Replacement Project – Approval of Plans & Specs & Authorization to Advertise Bids & Award Contract (WT)

Motion **carried** to approve the plans, specifications and contract documents for the Graham Hill Water Treatment Plant Tube Settlers Replacement Project, and authorize staff to advertise for bids and award the contract in a form approved by the City Attorney. The City Manager is

hereby authorized and directed to execute the contract as authorized by Resolution No. NS-27,563.

September 25, 2018

River Street Water Main Replacement - Notice of Completion (WT)

Motion **carried** to accept the work of Anderson Pacific Engineering Construction, Inc. (Santa Clara, CA) as complete per the plans and specifications and authorizing the filing of a Notice of Completion for the River Street Water Main Replacement.

Bay Street Reservoir Replacement Project – Phase 4 Landscaping - Notice of Completion (WT)

Motion **carried** to accept the work of Bortolussi and Watkin, Inc., (San Rafael, CA) as complete per the plans and specifications and authorizing the filing of a Notice of Completion for the Bay Street Reservoir Replacement Project – Phase 4 Landscaping.

PROPOSED MOTION: Motion to accept the City Council actions affecting the Water Department.

ATTACHMENTS: None.

Water Commission
7:00 p.m. – August 27, 2018
Council Chambers
809 Center Street, Santa Cruz

Water Department

Summary of a Water Commission Meeting

Call to Order: 7:00 PM

Roll Call

Present: L. Wilshusen (Chair), D. Engfer (Vice-Chair), D. Baskin J. Mekis, A. Schiffrin, D. Schwarm, W. Wadlow

Absent: None

Staff: R. Menard, Water Director; J. Becker, Finance Manager; C. Coburn, Deputy Director/ Operations Manager; K. Crossley, Senior Civil Engineer; T. Goddard, Conservation Manager; S. Easley Perez, Associate Planner II; J. Buttz, HDR, Inc.; K. Fitzgerald, Administrative Assistant III

Others: 14 members of the public.

Presentation: None.

Statement of Disqualification: None.

Oral Communications: Scott McGilvray spoke as a member of the public.

Announcements: None

Consent Agenda

1. City Council Items Affecting Water
2. Water Commission Minutes from June 4, 2018

What are the terms of the Environmental Protection Agency (EPA) Water Infrastructure Finance and Innovation Act (WIFIA) loan referenced on page 1.2?

- The WIFIA loan is a subsidized loan for up to 49% of the total cost of a project; in this case, the facility rehabilitation and replacements at the Graham Hill Water Treatment Plant (GHWTP). The range of the subsidy level is potentially 2%-3%.

Is the 10237 Newell Creek Rd property on page 1.3 the same as the property that is referenced in the report within Item 5 of the Water Commission packet?

- Yes.

Commissioner Schiffrin moved the amended Consent Agenda. Commissioner Baskin seconded.

VOICE VOTE: MOTION CARRIED
AYES: All
NOES: None

ABSTAIN: L. Wilshusen due to absence

Items moved from the Consent Agenda

3. Informational Items from the Public

The letter protesting the Accessory Dwelling Unit (ADU) Sewer Connection Fee and the ADU Water Development Fee was questioned by Commissioners; however, due to litigation, the Water Department was unable to comment per legal advisement.

A Commissioner suggested that Water Department staff should implement a process to respond to any correspondence received from the public that are included as agenda items for the Water Commission.

Commissioner Schiffrin moved the staff recommendation on this Item. Commissioner Baskin seconded.

VOICE VOTE: MOTION CARRIED
AYES: All
NOES: None
ABSTAIN: None

General Business

4. Water Transfer Pilot Project with Soquel Creek Water District: Water Quality Assessment Results and Status Update

Ms. Menard introduced Mr. Kevin Crossley, Senior Engineer with the Water Department and Ms. Emily Tummons, PhD from Black & Veatch, for the presentation on status of the water quality evaluation focused on surface water and groundwater compatibility that has been completed in preparation for a pilot water transfer project with Soquel Creek Water District (the District). The presentation reviewed the testing process looking at the potential for corrosion or other negative consequences such as colored water to occur in the District's distribution system or property side plumbing if Santa Cruz's surface water is used to provide service to the District's customers.

What is the source of the water that was used for the bench scale tests? In addition, what source will the water being transferred to the District come from?

- The water that was used for testing came directly from the GHWTP, post treatment. The blend of water treated routinely varies based on source availability and quality considerations, and this variability was taken into account in the bench scale testing to accurately represent the quality of water that can be expected when it is transferred to the District.

How much of the cost of this study is allocated to the City?

- The cost was divided equally between the City and the District.

Why is it necessary for the City to modify its Water Rights for the San Lorenzo River if the water going to the District is supposedly coming from North Coast sources?

- For the pilot water transfer program, the agreement and the CEQA process completed for the agreement specified that the water would come from North Coast sources, which have pre-1914 water rights, and no restrictions on (or definitions of) place of use. The 1-million gallons per day volume of wate[2.2]r up to 100 days proposed in the pilot water

transfer agreement comes specifically from an assessment of the volume of water dependably produced by Liddell Springs during the winter season.

To demonstrate to the State Water Resources Control Board that the volume of water that is transferred does not exceed the amount of water being produced from North Coast sources, the Water Department submits an annual report with monthly production records for each source.

Having a constraint of 1-million gallons per day is fine for a pilot program, but retaining such a constraint over a long-term implementation is not really desirable. Opening up the Place of Use for the City's San Lorenzo River rights is a simple way of removing the constraint and provides the City with the opportunity to explore and implement, if feasible, conjunctive use projects for surface and groundwater resources in mid and north Santa Cruz County.

How does the rate for water that will be sent to the District compare to the rate that City customers are charged for water?

- The rate of $1,000 per million gallons sent was established for the purposes of initiating the pilot program agreement. This rate will be revised if/when transfers become a regular part of the City's operation.

Can the City provide a report on the aesthetic changes of the water during the bench scale testing?

- The results of bench scale testing are not ideal for measuring the aesthetic appearance of water as they would be during a Pipe Loop study. During the bench scale testing, the color and turbidity levels of the water within the coupon jars were measured and no noticeable difference was observed. Although not observed during the testing, there is still a possibility that water aesthetic changes may occur during the pilot program.

Will there be a noticeable difference in the hardness of the water?

- There may be very minor changes noticed by consumers, similar to what is experienced when the source alternates between groundwater and surface water for the City's customers served by the Beltz wells. Another potential aesthetic change that could be noticeable is the chlorine residual due to the fact that the City produces water with a higher average chlorine residual than the District. This is typical for surface water versus groundwater systems.

Is there a correlation between turbidity and pH level? What determines the pH of the City's water?

- No. The study showed no correlation between turbidity and pH level. The City's treatment process doesn't typically include a pH adjustment, so the pH of treated water is basically driven by the pH of the source water or source water blend. The typical range is pH 7.1 to 7.3. The one exception is when the City switches from regular alum as a flocculent to an acidified alum product that helps us treat water when the turbidity in raw water is high. When we do this, the finished water typically has a lower pH level. Another factor that can influence pH levels is the blend of sources. For example, the average pH of the water that comes from the Tait Wells is about 6.8 and can lower the overall pH of the water that is leaving the treatment plant.

Is water that has a pH level higher than 7.8 not considered transferrable?

- During the study, one of the conditions examined was increasing the pH of the City's water to reduce leaching of metals. The **2.3** ults of these analyses showed that there were

small spikes in metal levels in the water when the pH of the City's water was adjusted to 7.8. Therefore the recommendation is not to move forward with a treatment to elevate or increase pH at the intertie between the City and the District.

What does it mean when the City has to "flush the system"?

- Flushing is a process that maintains water distribution systems by ridding pipes of residual sediments with a high-velocity water flow. The flushed water is pushed through the end of a section of grid pipes typically through a hydrant or blow off at the end of a street. Flushing needs to be performed before switching to another source in order to avoid potential adverse reactions between the settled sediment and the new sourced water. Flushing does not affect the availability of water to consumers.

Why is there a need for an additional CEQA review, per the staff report on page 4.2?

- The original CEQA evaluation was done based on a specified volume of 100 million gallons from November 1st to end of April 30th. That time frame and amount of water were determined by removing Laguna from the North Coast sources, due to the larger fish flow requirements, and examining how much water would be leftover to maintain an ongoing accounting balance during that period. The 1-MGD produced by Liddell was chosen for the Pilot Program because it was a definable amount that would not interfere with water rights. An additional CEQA evaluation is needed in order to transfer more than 100 million gallons of water. After the Pilot Project has been run and if conditions are favorable and the District and the City decide to move forward with larger volumes, the CEQA document would need to be revised.

Are there other approvals that the City and/or the District must obtain in order to begin the Pilot Program this winter?

- From the City's perspective, there are no additional approvals required. For the District, an operating permit amendment approved by the State Division of Drinking Water is required. To address that issue, Ms. Menard introduced Taj Dufour, Engineering Manager for Soquel Creek Water District to elaborate. Mr. Dufour indicated that the District must amend its water supply permit with the Division of Drinking Water (DDW) by adding City water as a source of supply. In addition, there will be additional distribution system monitoring required.

What is the time frame covered by the Pilot Water Transfer Agreement?

- The original agreement was for a program that could last over a five year period, given that conditions within the agreement are met. A longer term agreement can be negotiated if the parties are interested in pursuing a water transfer program as a part of long term supplemental supply.

Will the results of the first year of the pilot program will be sufficient in determining if it should continue for additional years?

- That decision cannot be made until more information becomes available, most likely after the first year of the program and will depend on multiple factors such as rainfall, which cannot be predicted or known at this time.

Will there be public outreach materials that will be released jointly between the City and the District?

- That topic has not been fully fleshed out at this point, but it will be worked on in the coming weeks. In any case, District customers who will receive transferred water will receive notification by the District.

Can the Department and or Black & Veatch clarify why the water samples on page 11 of the presentation of the Black & Veatch Bench Scale testing report appear discolored?

- Some of the coupon jars had red or orange colored tape on the back in order to identify each water sample, thus making the water within the jars appear discolored.

Can water that is produced outside the November through April timeframe be transferable, even though that was the only timeframe where the water sampling took place?

- The water quality analyses were adjusted and synthesized to meet the pH, chlorine residuals and other parameters that are set by the typical water quality experienced during the winter months. However, it is not expected that conditions would be dramatically different in other months of the year, should water be available to transfer.

When is staff expecting to see reactions or results on the groundwater levels of the wells receiving transferred water that serve the District?

- When the wells are rested, there is an immediate though not dramatic response in groundwater levels. More information on groundwater levels will be available at the October 1st Water Commission meeting where Staff will be presenting the initial phases of in-lieu only groundwater modeling at the Santa Margarita Basin and the Mid County Basin.

What is the status of the Operational Plan for sharing the water?

- It is currently in a draft stage and is being reviewed by City and District staff.

What is the status of the City's efforts to amend its water rights?

- The City expects a Notice of Preparation (NOP) on the water rights amendments to be issued sometime in October 2018. Following the public comment period and public input meetings, a draft Environmental Impact Report (EIR) will be developed and issued for public review and comment, likely in the winter 2018-2019. Once a final EIR is ready and the City Council has certified it, the State Water Resources Control Board will take up the change petitions and process them. Our conversations with State Board members and staff indicate that processing these changes could be expedited due to the inclusion of fish flows in the change petitions and the fact that the City has worked with state and federal fishery agencies to resolve potential issues in advance of submitting the change petitions.

Are there new infrastructure requirements that are involved in implementing the pilot water transfer project?

- No.

What is the maximum amount of water that can be taken from the North Coast sources, assuming normal rainfall and the success of the Pilot Program?

- The amount of water that can reliably be produced from North Coast sources for possible transfers is highly variable based on weather conditions. Various modeling efforts both for system operation and groundwater management will help us understand this variability and the implications for potential future water transfers.

Is City Council approval required to implement the next step of the Pilot Program agreement?

- No, no further City Council approval is required.

A member of the public questioned why the particular zone in the District service area was selected to receive transferred water.

- The area was selected because the District has valves that can be used to isolate this part of the service area without disrupting service to other parts of their service area.

A member of the public commented on the difference between the cost of water provided for the pilot water transfer project and the rates being charged to North Coast Ag customers.

A member of the public commented on the successful regional cooperation efforts of the City and the District.

Commissioner Schiffrin proposed a motion to have staff submit a consent agenda item notifying City Council of the results of the water quality testing work and the planned next steps of the pilot water transfer project, and for staff to provide a copy of the existing Pilot Program agreement between the City and the District to the Water Commission for further discussion and possible development of recommendations for its amendment should a long-term water transfer arrangement be proposed. Chair Wilshusen seconded the motion for discussion.

Several Commissioners commented that it was not necessary to provide the City Council with additional information.

VOICE VOTE:	MOTION DENIED
AYES:	J. Mekis, A. Schiffrin, L. Wilshusen
NOES:	D. Baskin, D. Schwarm, D. Engfer, W. Wadlow
ABSTAIN:	None

Commissioner Baskin moved to accept the information on the results of Phase 1 Bench Scale Testing. Commissioner Wadlow seconded.

VOICE VOTE:	MOTION CARRIED
AYES:	All
NOES:	None
ABSTAIN:	None

5. Santa Cruz Water Program Update

Ms. Menard introduced Mr. Crossley and Mr. John Buttz from HDR, Inc. for a presentation on the update of the Santa Cruz Water Program. The presentation provided an overview of the progress of the work performed to date and the many processes and procedures that the City is now using to support the implementation of the Capital Investment Plan (CIP).

What is the "SRF (State Revolving Loan Funding) closeout" listed under Post-Construction on the diagram on page 5.11?

The SRF closeout process will only apply if a particular project received funding from SRF loans. Opportunities for alternate funding (to market rate water revenue bonds) for capital projects from sources such as the SRF, which is a low-interest loan funding source, as well as grants, are being actively explored and pursued. Including a provision for identifying potential alternate sources of funding early on in a project's development ensures that funding program requirements and timelines can be built into the project's development.

In the Staffing Plan on page 5.38, does the total employee count decrease over the life of a project or has it been disbursed over multiple y**2.6**s?

- The configuration of staffing changes over the life of the Program due to the changing nature of the work. The front end of the Program is heavily focused on project planning and design work as well as environmental review and permitting. As projects evolve through their lives, however, staffing needs change to those focused more on construction management which typically requires fewer staff resources than planning and design phases.

Does the staffing plan include a blend of City employees and HDR, Inc. employees?

- Yes, both sets of staff are included in the total number of needed employees.

What does "Validated" mean in terms of the context on page 5.18?

- Validated means that a comprehensive analysis was conducted on each project budget. Across all projects a consistent approach was taken to assign certain percentages of the total cost to construction cost and soft cost, and to include a robust contingency to cover unknown cost, which is a prudent practice for early project budgeting.

A Commissioner suggested that staff include a footnote to show that the term "Validated" does not indicate that an exact cost is known.

Can the City provide results or findings, such as improvements or cost savings, that were discovered as a result of the Value Engineering workshops that were conducted for the Concrete Tanks and Newell Creek Inlet-Outlet CIP projects?

- Both sessions identified value engineering alternatives for overall project scope, project components, construction techniques, and implementation/sequencing of construction. Staff working on both projects will continue to evaluate the costs/benefits to the various alternatives and ultimately decide whether any the value engineering alternatives provide enough benefit to be incorporated into the project. Incorporating value engineering ideas can often result in some re-design, or schedule slippage, therefore the benefits of the value engineering change must clearly outweigh the cost.

Is there a general approach to managing risks and specific responsibilities between the City and HDR staff? Mr. Crossley and Mr. Buttz with HDR responded to this question.

- The current approach to managing risk between HDR and the City is twofold:
    - First: The City has developed a professional service agreement that is tailored for program management services, rather than using the boiler-plate standard professional agreement that most consultants operate on. In addition to the modified professional service agreement, very detailed scopes of work are developed to be as specific and detailed about what services and deliverables HDR is providing or producing over the annual work plan period.
    - Second: The City has hired a program advisor, Capital Program Management Services. LLC. The program advisor assists staff in a number of ways including conducting regular assessments of HDR's performance, and compliance with the written contract.
    - Regarding responsibilities, both the Master Service Agreement, Service Orders, and other program documentation, such as the staff resources analysis in the program management plan, speak to the roles and responsibilities, whether they are consultant or City program staff. Ultimately the City retains final decision making authority over issues that involve cost or schedule,

Are any additional proprietary products or software being utilized as discussed in the beginning stages of the contract?

- As part of the implementation of the Santa Cruz Water Program, the City is implementing several software packages for scheduling and document management, none of which are proprietary. One example is Microsoft SharePoint.

Regarding discussions about possible treatment plant changes at GHWTP, are there additional requirements needed at GHWTP in order to implement a recycled water project?

- It is highly unlikely that the advanced treatment process for recycled water would be constructed at the GHWTP but rather would take place at the Waste Water Treatment Plant.

Are the funds that are being committed to HDR embedded within the budget for CIP?

- Yes, the funds are built into the CIP.

Can staff clarify why design and construction phases are scheduled for projects that are currently "Studies" or "Assessments", as shown on the chart on page 5.19?

Staff anticipates that projects currently in the study or assessment phase will advance to design and construction and the schedule reflects this. This allows staff to anticipate and prepare for the workload that will occur.

Commissioners commented positively on the efforts by staff's use of program management approach to accomplish its long-term water supply and security goals.

Does the City plan to spend approximately $380 million dollars over the next ten years to implement the CIP?

- Yes, that is the approximate amount that will need to be spent.

Does HDR have the capability to reduce and or accurately price the risk associated with each project?

- Yes, HDR does have the expertise to assist with the City with effective risk management on its projects. Several risk management workshops were led by HDR to develop a program risk register, and a HDR risk expert helped staff develop a project level risk register for the Newell Creek Dam Inlet/Outlet project. Risk management is an ongoing process, and as of yet, none of the risks or mitigation strategies have been monetized.

Subcommittee/Advisory Body Oral Reports

6. Santa Cruz Mid-County Groundwater Agency

- Commissioner Baskin commented that a combined meeting between the Mid County Groundwater Agency Board and the Groundwater Sustainability Plan Advisory Committee (GSP Advisory Committee) was held on July 19th. The combined groups received a presentation about the supplemental supply projects that are being explored to address the threat of seawater intrusion or vulnerability to periodic droughts and that could affect the Mid-County Groundwater Basin. The GSP Advisory Committee also met on August 22nd and discussed groundwater modeling for managing the basin.

7. Santa Margarita Groundwater Agency

- Commissioner Engfer commented that the Agency has changed the state's classification from low priority to medium priority for being over drafted and that the Agency is still in

the beginning phases of organization. Ms. Menard also reported that a meeting took place on August 23rd and the Santa Margarita Groundwater Agency Board received a presentation about the Scotts Valley water system which covered, among other topics, projections for population growth that could affect water use in the basin over time, and the concerns occurring within the Scotts Valley community.

Director's Oral Report:

Ms. Menard provided Commissioners with copies of the Department's response letter to the District's Pure Water Soquel draft EIR and also indicated that she will be away during the next Water Commission meeting in October.

Adjournment Meeting adjourned at 9:56 PM.

Respectfully submitted,

Katy Fitzgerald
Staff

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WATER COMMISSION
INFORMATION REPORT

DATE: 9/26/2018

AGENDA OF: October 1, 2018

TO: Water Commission

FROM: Toby Goddard, Water Conservation Manager

SUBJECT: Update on Stage 1 Water Shortage Alert

RECOMMENDATION: Receive information regarding water conditions and Stage 1 Water Shortage Alert.

BACKGROUND: On April 10, 2018, City Council adopted a resolution declaring a Stage 1 Water Shortage Alert due to another year of below average rainfall and runoff. Water restrictions went into effect May 1 and are scheduled to expire October 31, 2018. The goal this year was to maintain system water use during the dry season at the same low level as in 2017 and thereby preserve water storage in Loch Lomond Reservoir in case of a subsequent dry year.

DISCUSSION: On the supply side, water conditions this summer have been somewhat better than predicted in late March. Late season storm activity increased and extended flows in the San Lorenzo River, and led to an upgrade in the water year classification for WY 2018 in May to Dry from Critically Dry. Still, cumulative runoff in the river for the year registered approximately one-third of the long-term average. Daily flows in the river have been low since the beginning of July. In fact, all of Santa Cruz County, since early July, has been classified by U.S. Drought Monitor as abnormally dry.

On the demand side, average daily demand was close to the expected level projected for the month of May. Beginning in June though, daily demands fell lower than projected levels by between 0.2 and 0.4 mgd. It turns out that this effect was caused mainly by the Pasatiempo Golf Club beginning to use its recycled water system to irrigate the golf course for the first time this year. At the current low rate of water use, annual production for 2018 is expected to amount to 2.5-2.6 billion gallons, similar to the level experienced over the last four years.

The combination of increased supply and decreased system demand this year meant that operators did not have to draw on Loch Lomond Reservoir as much as anticipated. The reservoir was forecast to drop to about 75 percent of capacity by the end of September and 70 percent by the end of October. It currently stands at close to 90 percent of capacity. This means the system will have good carryover storage to work with in the event 2019 remains dry.

It should be noted that since May 1, 2018, the system has been operated under a short-term agreement with the California Department of Fish and Wildlife that called for, among other things, the City to continuously bypass a flow of 8.0 cubic feet per second (cfs) on the San Lorenzo River at the Tait street diversion all season long. Despite the challenge of dry conditions and relatively low flows, treatment plant operators demonstrated that they could successfully meet this strict bypass limit, in addition to the releases set on the north coast streams, and still maintain good reservoir storage. Low seasonal demand and having Tait Wells operational again both helped.

The table and charts Attachments 1-4 show monthly water production and reservoir targets for 2018, daily and monthly water demand, and projected versus actual reservoir storage.

In terms of the Stage 1 Water restrictions, a temporary water conservation representative was hired in June to patrol the service area, enforce water waste prohibitions, and perform education and outreach about the restrictions. Early morning patrols, along with reports received from coworkers and from the public via email or the Leak Line generated about 300 individual enforcement cases to date, most of which involved excess water running to waste from an irrigation system, or related leaks and breaks. The vast majority of these cases were resolved through communications with the responsible customer; only five cases of repeated violations translated to penalties being applied to the customer's utility bill.

In early August, staff made the effort to reach out to area restaurants and survey them about the impact of the restriction – serving drinking water only on request – on their operation, and to offer materials to help with this restriction. A brief report on the findings of this effort is included as Attachment 5.

ATTACHMENTS:

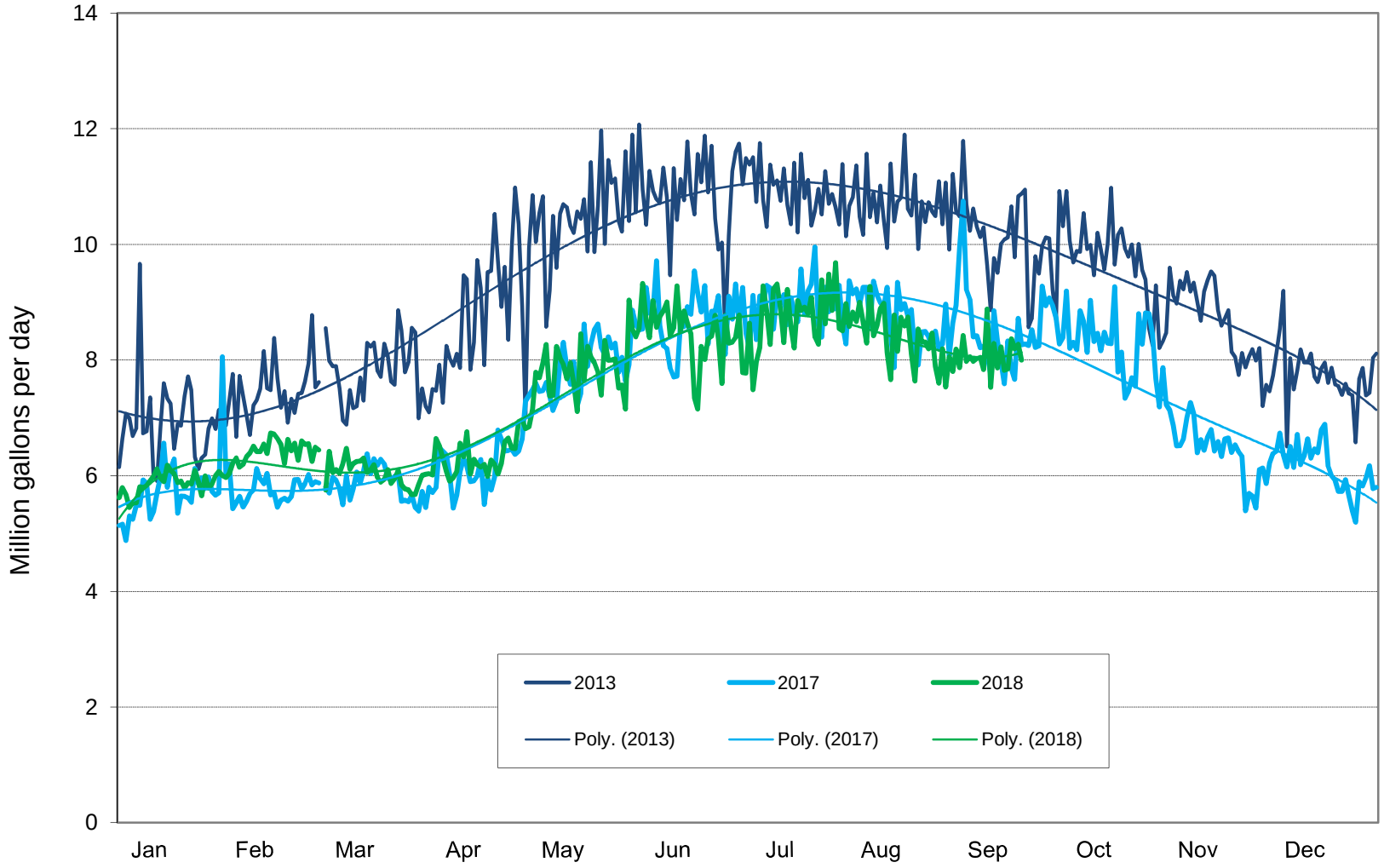
1. 2018 Monthly Water Production and Reservoir Targets
2. Gross Daily Water Consumption
3. Projected System Water Demand (mgd)
4. Projected Reservoir Drawdown
5. 2018 Mid-Season Restaurant Report

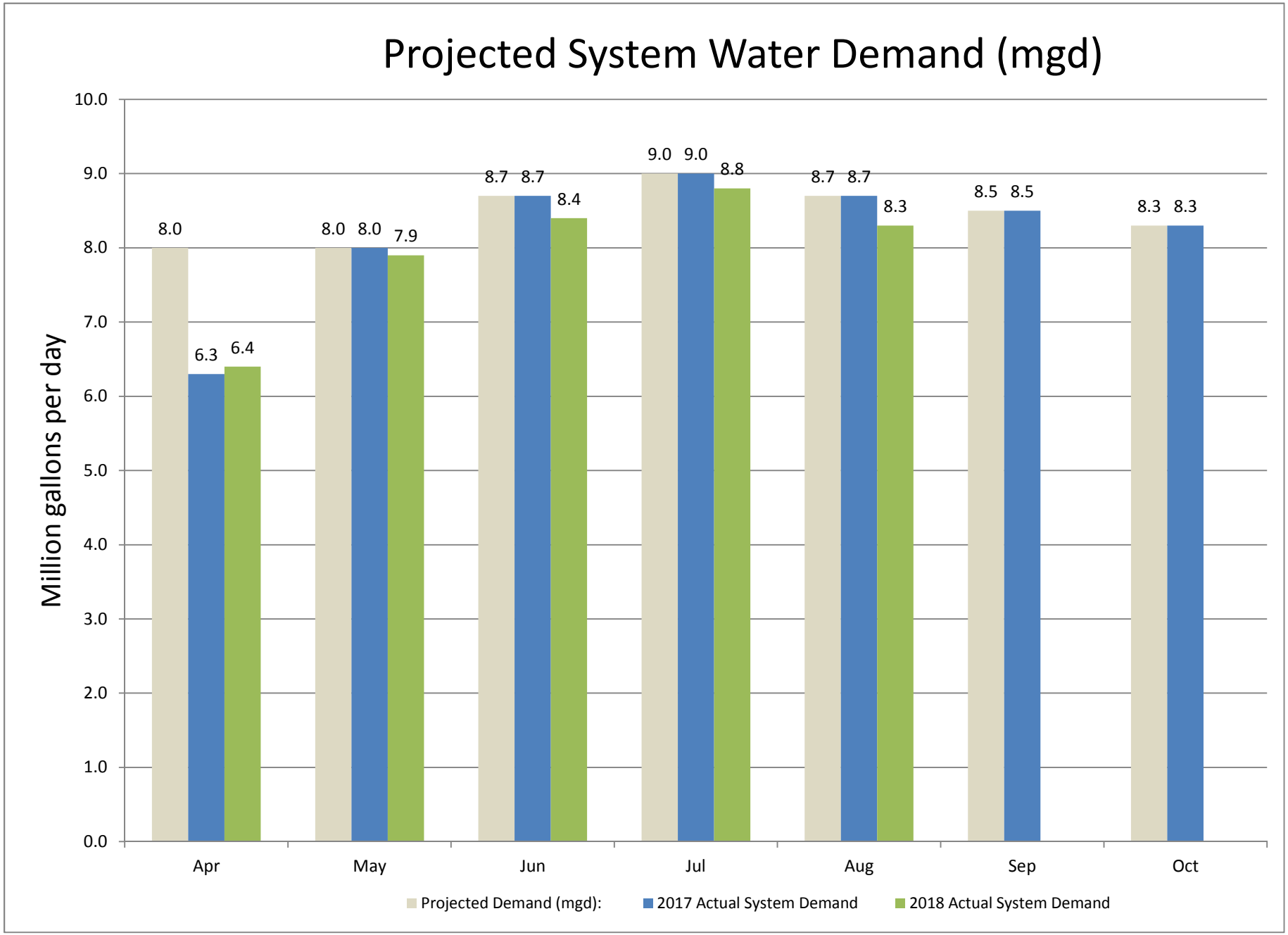
City of Santa Cruz
2018 Monthly Water Production and Reservoir Targets

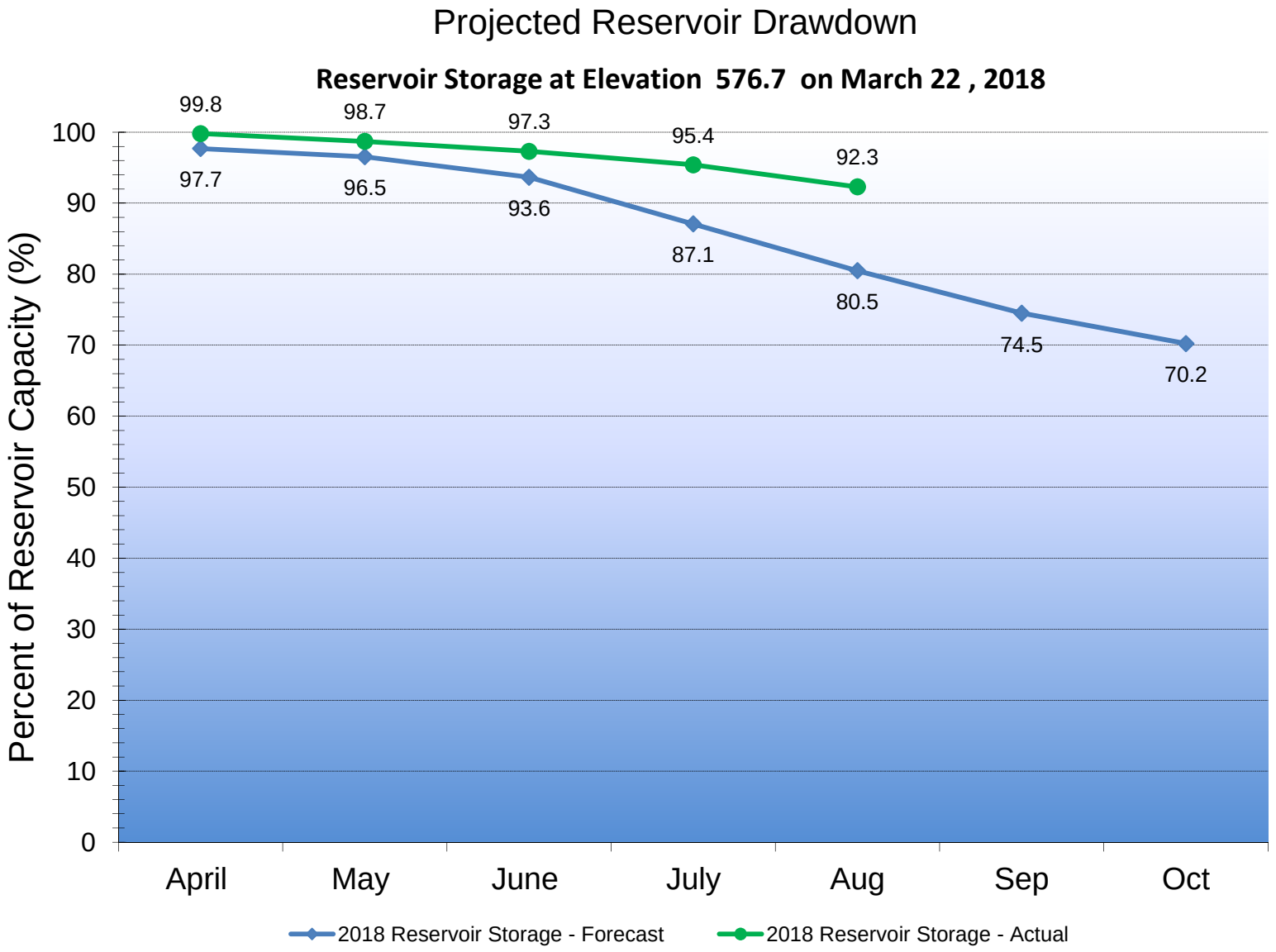
Metric:	May	Jun	Jul	Aug	Sept	Oct
Monthly Water Production (million gallons)						
Target (equal to 2017 production)	**248**	**261**	**279**	**270**	**255**	**257**
Actual	**246**	**254**	**270**	**259**		
Average Daily Water Production (mgd)						
Target	**8.0**	**8.7**	**9.0**	**8.7**	**8.5**	**8.3**
Actual	**7.9**	**8.4**	**8.8**	**8.3**		
Reduction in Water Use						
Baseline Water Production, 2013 (mg)	**328**	**325**	**338**	**332**	**301**	**300**
Volume Reduction (mg)	**-82**	**-70**	**-68**	**-73**		
Percent reduction (%)	**-25%**	**-22%**	**-20%**	**-22%**		
Reservoir Storage (million gallons)						
Target	**2,732**	**2,650**	**2,464**	**2,278**	**2,109**	**1,987**
Actual	**2,794**	**2,753**	**2,700**	**2,613**		
Difference	**+62**	**+103**	**+236**	**+335**		
Reservoir Storage (% of capacity)						
Target	**96.5**	**93.6**	**87.1**	**80.5**	**74.5**	**70.2**
Actual	**98.7**	**97.3**	**95.4**	**92.3**		
Difference	**+2.2**	**+3.7**	**+8.3**	**+11.8**		

Gross Daily Water Consumption

2018 and 2017 compared to 2013



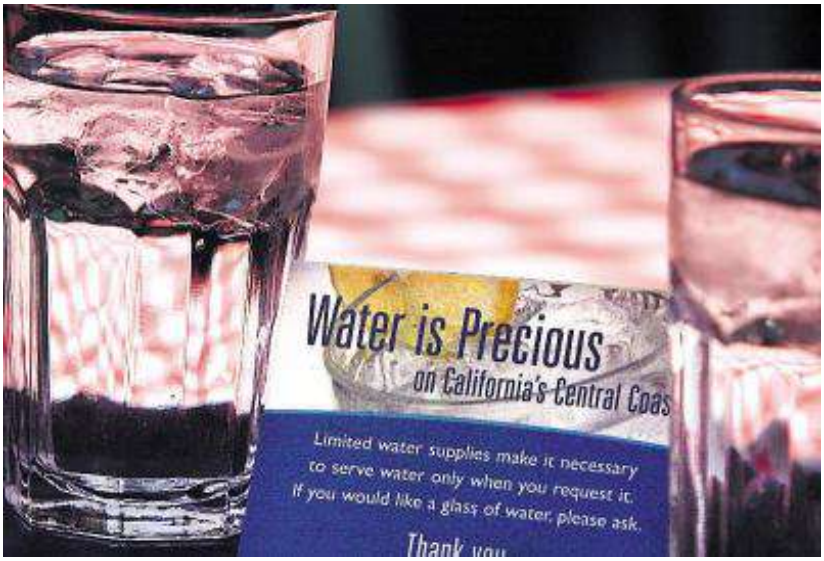

Projected System Water Demand (mgd)
Million gallons per day
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
8.0
6.3
6.4
8.0
8.0
7.9
8.7
8.7
8.4
9.0
9.0
8.8
8.7
8.7
8.3
8.5
8.5
8.3
8.3
Apr
May
Jun
Jul
Aug
Sep
Oct
Projected Demand (mgd):
2017 Actual System Demand
2018 Actual System Demand


Projected Reservoir Drawdown
Reservoir Storage at Elevation 576.7 on March 22 , 2018
Percent of Reservoir Capacity (%)
100
90
80
70
60
50
40
30
20
10
0
99.8
98.7
97.3
95.4
92.3
97.7
96.5
93.6
87.1
80.5
74.5
70.2
April
May
June
July
Aug
Sep
Oct
2018 Reservoir Storage - Forecast
2018 Reservoir Storage - Actual

2018 Mid-Season Restaurant Report

Introduction

The City of Santa Cruz is currently in a Stage 1 Water Shortage Alert as of May 1, 2018. One of the restrictions in place during this Stage is the requirement that restaurants serve water only upon request. A survey was taken of 79 restaurants in the City's service area to determine how restaurants and customers have responded to this restriction and if it is commonly understood and practiced among these restaurants. The results will determine if it would be beneficial to remove this restriction from Stage 1 and reserve it for higher Stages, or if it would be unnecessary to remove it. Upon analysis of the results it is recommended that the drinking water restriction remain in the Stage 1 Water Shortage Alert.



Background

On April 10, 2018 the Santa Cruz City Council adopted a resolution declaring a Stage 1 Water Shortage alert starting on May 1, 2018 and ending October 31, 2018 (attachment 1). This declaration was a result of below normal rainfall and runoff, and changes to water supply operations. The goal of declaring a Stage 1 Water Shortage Alert was to keep water use at the same level as last year, allowing the City to preserve the Loch Lomond Reservoir for future dry years. According to Chapter 16.01.070 of the Santa Cruz Municipal Code, a Stage 1 Water Shortage Alert requires:

- No landscape watering between 10 am and 5 pm
- All hoses must be equipped with a shut-off nozzle
- No washing down hard or paved surfaces
- Residential swimming pools may not be initially filled, or drained and refilled
- Restaurants and commercial food service establishments may serve drinking water only upon request
- Hotels and motels offer patrons the option to forego daily laundering of towels, sheets, and linens

In April of this year before the start of the Stage 1 Water Shortage Alert a letter was sent to all restaurants in the City's water service area (Appendix A). This letter was used to inform restaurants of the upcoming mandatory restrictions and offered free table cards to those who wanted them. For those who could not be reached by letter a phone call was made to inform the restaurant of the mandatory restriction as well as offer them free table cards. Half way through the Stage 1 Alert restaurants were visited in person to ask if restaurants are meeting the mandatory restriction. The purpose of this survey is to determine the level of compliance for this restriction, as surveys in previous restriction years have yielded mixed results with compliance varying from site to site. This survey could also be used to determine if it would be appropriate to remove from the restriction from Stage 1 and reserve it for higher Water Shortage Alert stages.

Method

A list of 104 restaurants was compiled from the list made earlier this year of both in-city and out-of-city restaurants. The list of in-city restaurants was compiled from the City's business license database. A list of out-of-city restaurants was compiled from the sanitation district database. From August 3 to August 19, 2018 restaurants were visited in person and asked several questions regarding their water serving policies. These questions included:

- Is restaurant aware of 2018 water restriction that requires water to only be served upon request?
- Is restaurant practicing this?
- Does restaurant want new/more table cards? If so, how many?
- Has restaurant received any comments, feedback, or questions from customers regarding this policy?
- Name and position of person representing restaurant.

Some restaurants could not be visited during the day, or did not have the time to speak with a Water Conservation Representative. For these cases the restaurants were called and asked the questions over the phone. For those who could not be contacted over the phone a form letter similar to the first letter sent in April will be mailed to these restaurants. While data will not be received from these restaurants for use in this study, the letter serves to still inform and remind restaurants that the City is still in a Stage 1 Water Shortage Alert.

Results

Of the 104 restaurants on the list, 79 restaurants, 76%, answered the questions. Thirteen of the restaurants were only open for dinner and could not be visited in person or reached by phone during regular business hours. Twelve of the restaurants did not have the time to talk in person or over the phone during their hours of operation. The following numbers and percentages are produced from the 79 restaurants that were able to answer the questions, and answers regarding compliance were self-reported by restaurants. Results of the survey show that the majority of restaurants are aware of and practicing the water serving restriction outlined in the ordinance.

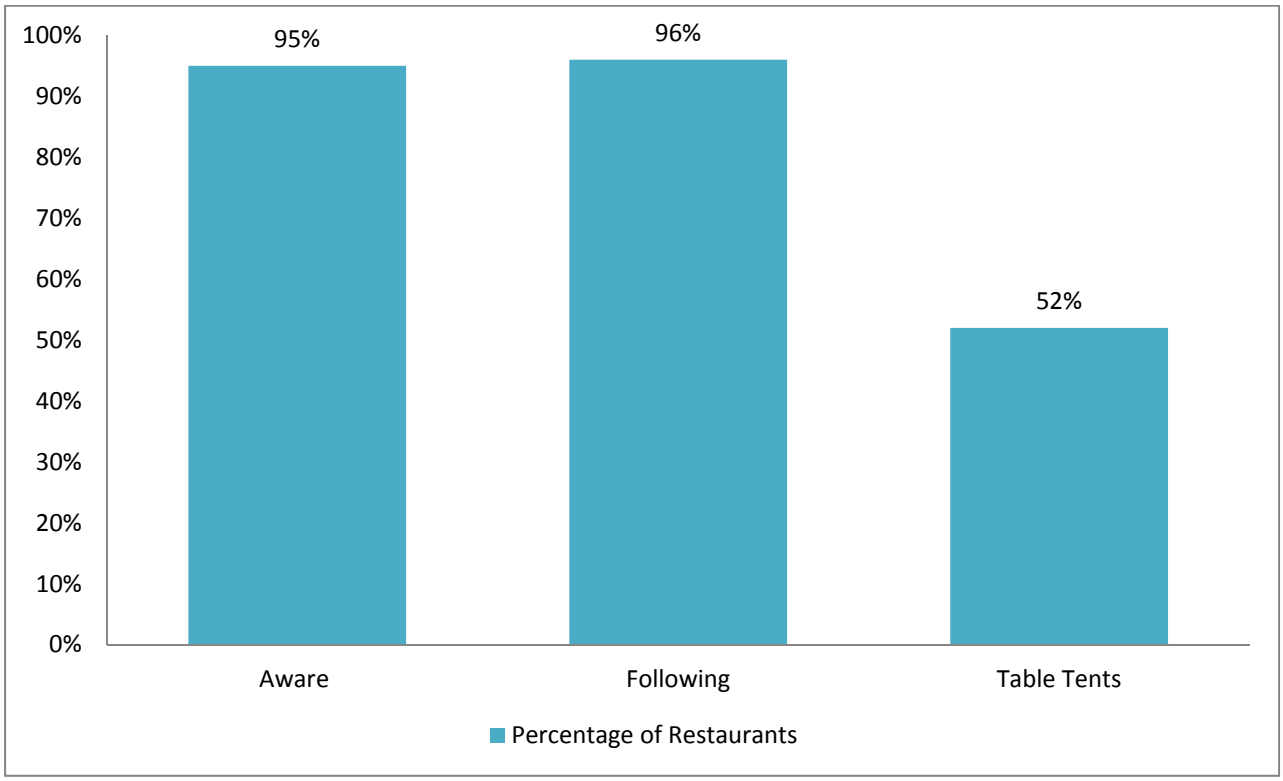


Figure 1: Percentage of restaurants aware of restrictions, following restrictions, and asking for more table tents.

Out of the 79 restaurants spoken with 75 were aware that they could not serve water unless upon request according to the Stage 1 Water Shortage Alert. 76 restaurants claimed to be serving water upon request only. When asked if they would like more table cards, or would like to start using table cards, 41 said

yes. A total of 1,469 table cards were given out to restaurants as a result of including this question in the survey. Finally, restaurants were asked if they had received questions or feedback from customers regarding the water serving restriction. Of the 79 restaurants surveyed 60 restaurants reported no feedback from customers. Fifteen of the surveyed restaurants reported negative feedback from customers, and four restaurants reported positive feedback from customers.

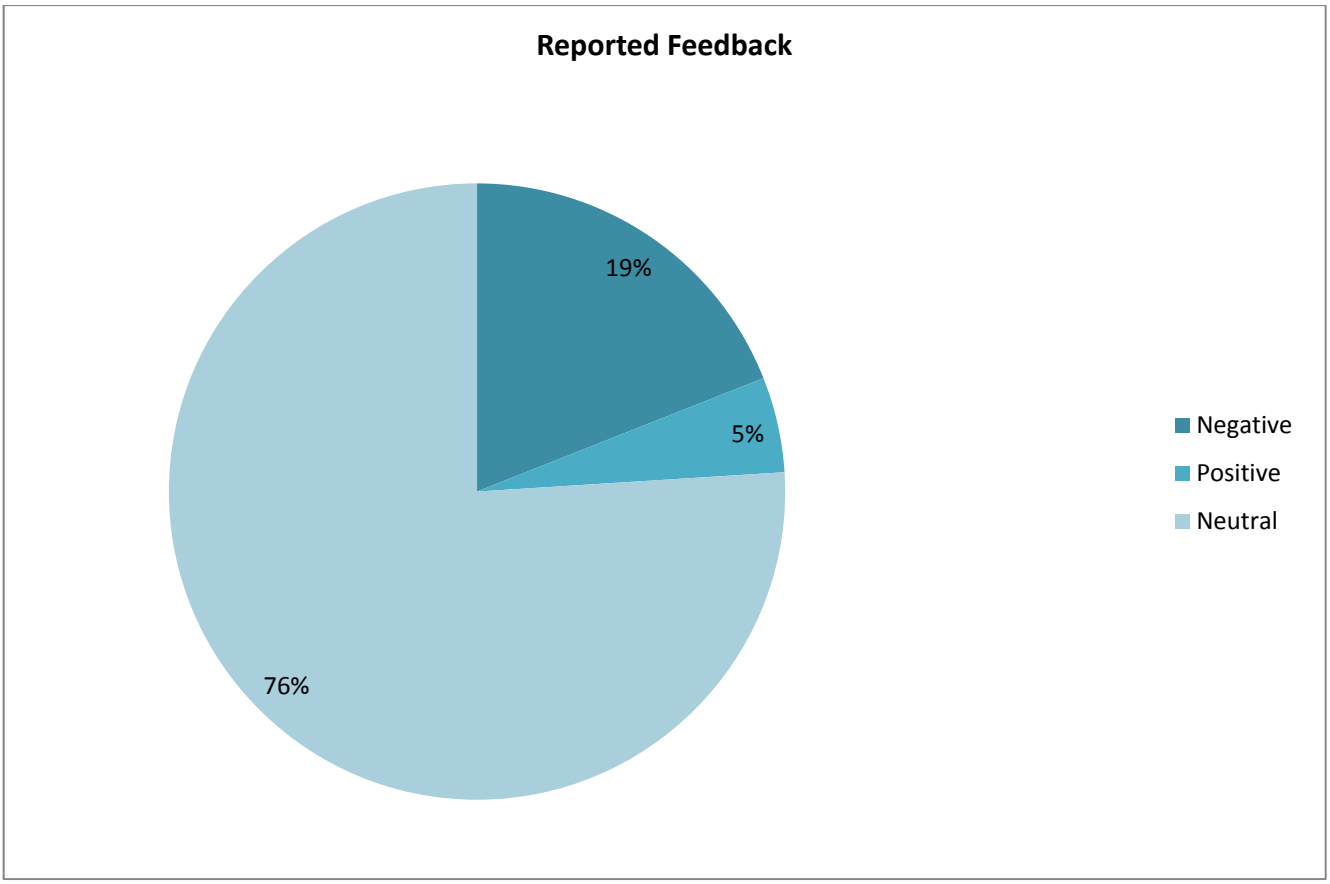


Figure 2: Reported feedback from surveyed restaurants

Those restaurants who experienced negative feedback expressed that it often came from non-local and seasonal customers who were not familiar or understanding of the water serving policy. The few that reported positive feedback stated that customers appreciated that water was only served on request, and one restaurant reported being thanked by a customer. Additionally, many of the restaurants that received no feedback from customers stated that local and regular customers are accustomed to this water serving policy. There were several outliers in this survey. One restaurant claimed that it was fully aware of the restriction and used table tents, but served water to all customers before it was requested. He explained that he is the only waiter and it saved him time to bring water automatically. Two restaurants stated that customers considered it bad service to not bring water automatically. Lastly, four restaurants claimed to be unaware of the restrictions.

Discussion

The results of the survey show that a large majority of restaurants are aware of and following the drinking water serving restriction. Through speaking with restaurant owners, managers, and staff they provided significant qualitative data that helped to explain this trend. As mentioned earlier, many of the restaurants stated that most customers were accustomed to this policy. This is understandable since the city has been in restrictions for six of the past ten. Restaurants also reported that they had printed this water serving policy directly into their menus. Many of the restaurants who chose not to use table cards chose to do so because of the printed notice in their menus. Finally, the restaurants that experienced the most negative comments from customers seemed to be high end restaurants, where water is expected to be brought without request and at restaurants with a customer base consisting mainly of out of town visitors and tourists. From the discussions with restaurant owners,

managers, and staff, it was apparent that local customers expected this restriction while out of town customers, who were not familiar with this restriction, did not understand or expect it.

It is important to note that the lack of feedback from restaurants that only open for dinner could have impacted the results. Thirteen restaurants that open only for dinner were not included in the results. Restaurants that open for dinner are usually higher end restaurants where it is more common to serve water to all customers without request. It is possible that these thirteen restaurants could have had more or different feedback from customers regarding the water serving policy due to the level of service that is expected of them. It is important to address this factor in the analysis of the survey results.

Conclusion and Recommendation

Based on the results of the survey it can be concluded that removing the drinking water serving restriction from the Stage 1 Water Shortage Alert detailed in Chapter 16.01.070 of the Santa Cruz Municipal Code is not necessary at this time. Currently, the majority of restaurants are aware of and practicing this restriction and feedback from customers is minimal and largely seasonal. Many restaurants have been practicing this for years as a result of being in water restrictions for the past six out of ten, and restaurants have also taken the extra effort to print this policy in their menus to practice year round regardless of restrictions. It can also be concluded that if the drinking water serving restriction were removed from the Stage 1 Water Shortage Alert that many restaurants would be unaffected or minimally affected.

WATER COMMISSION
INFORMATION REPORT

DATE: September 26, 2018

AGENDA OF October 1, 2018

TO: Water Commission

FROM: Heidi Luckenbach, Deputy Director/Engineering Manager

SUBJECT: Water Supply Augmentation Strategy, Quarterly Work Plan Update

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RECOMMENDATION: Receive information regarding the status of the various components of the Water Supply Augmentation Strategy and provide feedback.

BACKGROUND: As per the Final Agreements and Recommendations of the Water Supply Advisory Committee (WSAC), the Water Commission shall receive quarterly updates on the status of the various elements of the recommended plan. This is the eleventh quarterly update. Elements of the Water Supply Augmentation Strategy (WSAS) include In Lieu water transfers with neighboring agencies, Aquifer Storage and Recovery, Recycled Water, and Seawater Desalination. Demand management, via implementation of the Long Term Water Conservation Master Plan, is foundational to the WSAS.

Also included in this quarterly report are updates on other studies and projects that have or may have a nexus with the WSAS work. These are included in the section at the end of this report under "Other."

DISCUSSION: Progress and status of the various WSAS-related work is described in detail below as well as that of other projects related to but not specifically articulated in the WSAS.

Demand Management

Status of Measures in the Water Conservation Plan

No. 1 System Water Loss Reduction. Over the last three months, Water Conservation staff completed the 2017 distribution system water audit, had the audit validated by an outside expert and submitted it to the state. A summary of the results is included in Attachment 1. We also received a report on results of the June 2018 acoustic leak detection survey, which covered another 100 miles of the distribution system. The survey found no audible leakage on the City's water main pipelines and just one inconsequential hydrant leak (Attachment 2).

No. 2 Advanced Metering Infrastructure (AMI). Work on AMI is currently proceeding on two tracks: 1) a business case study, and 2) an irrigation meter pilot project. It is a joint effort between Customer Service, Meter Shop, Administration, Engineering, and Water Conservation.

AMI Business Case Study. The AMI Business Case is moving forward successfully and on schedule. The project is divided into three distinct tasks and will ultimately culminate in a final report that summarizes all tasks. Task 1 consisted of the assessment of current inventory and prior work. The assessment consisted of the consultant Jacobs Engineers (Jacobs) submitting a request for information (RFI) to staff to determine the current state of metering at the department with the goal of developing a meter registry as well as an understanding of what has been done to date in regards to AMI & AMR (Automatic Meter Reading). Task 1 has been completed and staff has reviewed and provided feedback on the Task 1 technical memorandum. Task 2 consisted of an evaluation of the needs and requirements of department with regards to a new AMI system. This task included a series of interviews conducted by Jacobs with each section of the department that is potentially affected by the AMI system. The interviews were designed to assess the needs of the department and identify business process changes that will need to take place with AMI implementation. Additionally, Task 2 involved an evaluation of the existing available AMI technologies and which technology may best suit the department based on the results of the interviews. Task 2 has been completed and staff has reviewed and provided feedback on the Task 2 technical memorandum. Task 3 is the business case evaluation. This task involves Jacobs using their business case model to quantify the benefits and costs of a new AMI system and explore the return on investment. The model will evaluate only so-called "hard benefits," those that can be quantified such as reduced field visits/truck rolls, labor savings, etc. The final report will also include a discussion about "soft-benefits" which are those benefits that can't easily be quantified, such as improved customer satisfaction.

Staff met with Jacobs this September for a workshop on Task 3 in which the preliminary results of the model were presented. The purposes of the workshop were to provide feedback on the model inputs and make sure everyone agreed on the inputs and assumptions. As a result of the feedback given, Jacobs will now update the model and begin working on the Task 3 technical memorandum. The next step for staff will be to review the Task 3 memo and provide input. Jacobs will incorporate all feedback given for each of the three memos in order to produce their final report. It is expected that the Task 3 memo will be received by mid-October and then the final report by mid-November.

AMI Irrigation Meter Pilot Project. The AMI Irrigation Meter Pilot Project with Badger meter is also moving forward successfully. The pilot consists of an evaluation of the deployment, integration, and customer response to the Badger Meter AMI technology. The pilot involved cellular AMI units being installed on irrigation meters throughout the service area, monitoring water consumption and leak detection using the Badger utility software, and also opening up the Badger customer software portal to a select group of customers within the pilot. The evaluation of the pilot will consist of the following items:

1. Ease of installation
2. Reliability and accuracy of reads from the AMI end-points

3. IT integration with city customer service and billing systems
4. Customer engagement with the Beacon web portal
5. Overall effectiveness of the technology for water efficiency, leak detection, and leak alerts
6. Staff utilization and ease of use with the Badger Beacon software

As part of item #4, customer engagement, a customer survey was developed and was sent out recently. This survey is designed to gauge customers within the treatment group in the pilot as to their satisfaction with the AMI customer portal, as well as other overall question about satisfaction with the services provided by the water utility. It is expected that the pilot evaluation period will conclude at the end of September. A final report is expected by the end of the year. The results of the pilot evaluation will not be directly used in the AMI business case project. However, the results will be useful if and when the overall AMI project moves into the procurement and then implementation phases.

No. 4 General Public information. Most of the outreach performed by Water Conservation over the last three months involved water restrictions and water waste enforcement, including a radio piece broadcast on KAZU, the local NPR affiliate. (See separate information report in this agenda packet). Staff recently participated with other local utilities by building a demonstration garden and staffing a booth at the County fair.

No. 5 Home Water Use Reports. The City reached agreement and signed a contract with WaterSmart Software in August and has been actively working with staff from the City's Information Technology department on providing them with key program inputs. These include account information, consumption history, rebate program participation data, as well as setting up an ongoing (weekly) data transfer processes. Some key steps before launching the program are finalizing initial customer letters, approving customer messages, creating a customer portal for registration, and staff training. The program is being designed to target the top 25 percent of single residential customers (almost 5,000). Another 3,000 single family customers will serve as a randomized control group to measure the effects of the home water use reports by recipients. The program is on track to be launched in December. However, the program was envisioned to target water use primarily during the peak season period and so a decision about when exactly to introduce it to the public is yet to be determined.

No 25. Large Landscape Survey and Water Budgets. Staff worked with the Parks Department to have professional water audits conducted at 6 more park sites this summer. Included were Frederick Street, Ocean View, Westlake, University Terrace, Laurel Park (Louden Nelson) and landscaping around City Hall. A comprehensive report for each site was prepared and reviewed with parks personnel. Site maps for all 373 large landscape sites in the Waterfluence program have been upgraded to a new Google Earth Viewer, replacing static maps in .pdf format. In the process, some adjustments to landscape area measurement and plant type have been made.

Also worth noting in this past quarter is a recent report produced by the California Department of Water Resources that summarizes the authorities, requirements, and schedules contained in two new water conservation bills (SB 606 and AB 1668) recently signed into law. These laws establish a new foundation for long-term improvements in water conservation and drought planning. Along with other urban water suppliers, staff has been poring over this report to better

understand the new standards and reporting requirements, which begin as soon as next year and ramp up through 2027. The report, Making Water Conservation a California Way of Life is currently undergoing public review.

In Lieu Water Transfers (Winter Water Strategy)

- Consultant: Black & Veatch
- Contract Signed: August 2017
- Project Partners: Soquel Creek Water District (SqCWD)
- Engaged Stakeholders: None at this time.
- Original Contract Amount: $668,000 (While Council approved the entire contract scope and budget, a purchase order was opened in the amount to cover Phase 1 only, $180,220.)
- Contract Amendment No. 1: $7,500, 10/2/2017 for additional water testing.
- Amount Spent: $187,720
- Amount Remaining: $57,789
- Status: On schedule.

The scope of this study is to examine the compatibility of the City's surface water with SqCWD's distribution system and customer plumbing for the purposes of further understanding the opportunities and limitations with providing SqCWD water from the City's surface water sources. As reported previously, the study is organized in two phases: Phase 1, Bench Top Analysis and Phase 2 Pipe Loop Study. Bench top testing was completed in June 2018. Staff and Black and Veatch presented study results and recommendations at the August 27, 2018 Water Commission Meeting. The key findings and recommendations of the bench top study were:

- Additional corrosion control measures such as increasing pH of City water is not necessary or beneficial
- Metals release (lead, copper, iron, manganese) is not a concern in the District's system
- Further analysis, like Phase 2 (full pipe loop study) is not necessary
- Proceed forward with pilot study to introduce City surface water into District water system, when conditions permit.

There are three major steps left to complete before water transfers can begin. First, the District must finalize a distribution system monitoring plan. Enhanced distribution system water quality monitoring prior to beginning the transfers will confirm the findings of bench top study results and demonstrate that no unanticipated or adverse water quality conditions are created. Once this monitoring plan is reviewed the State Division of Drinking Water will start the necessary permit amendment with the District. Second, the City and District are working to finalize an intertie operations plan which will describe the routine operations between the two water systems. Third, the District will notify customers of the pending change in source water. Staff from both agencies is targeting the beginning of November 2018 to complete these final steps.
SqCWD is sharing equally in contract costs. The City began invoicing SqCWD in March for their share of this study and will continue to do so quarterly.

Aquifer Storage and Recovery (ASR) (Winter Water Strategy) - Phase I Work

- Consultant: Pueblo Water Resources (PWR)
- Contract Signed: February 2016
- Project Partners: None at this time.
- Engaged Stakeholders: SqCWD, County of Santa Cruz, Scotts Valley Water District, San Lorenzo Valley Water District
- Original Contract Amount: $446,370
- Contract Amendment No. 1: $377,615
- Contract Amendment No. 2: see below
- Amount Spent: $589,740
- Amount Remaining: $235,245
- Status: Delayed approximately 9 months.

Pueblo is currently under contract for Phase 1 of a potentially three phase evaluation process.

- Phase 1 – Paper study/modeling/siting study
- Phase 2 – Pilot study
- Phase 3 – Full Scale Implementation

Task 1.1 Existing Well Screening
This task is substantially completed with no new report.

Task 1.2 Site Specific Injection Capacity Analyses
This task is substantially completed with no new report.

Task 1.3 Geochemical Interaction Analysis
This task is substantially completed with no new report.

Task 1.4 Pilot ASR Testing Program Development
After completing groundwater modeling of initial scenarios in the Mid-County Groundwater Basin (MCGB), PWR and City staff have been working towards finalizing the ASR Pilot Test Work Plan for Beltz 12. A DRAFT version of the work plan was submitted to the California State Water Resources Control Board Division of Drinking Water (DDW); after incorporating DDW's comments, the Beltz 12 ASR Pilot Test Work Plan has been recently finalized. In addition, shortly after finalizing the piloting work plan for Beltz 12 and to comply with CEQA, a Notice of Exemption was filed with both the County of Santa Cruz and the State of California Office of Planning and Research.

Although modeling of initial scenarios in the Santa Margarita Groundwater Basin (SMGB) is complete, a work plan for pilot testing in this basin has not been prepared due to on-going issues associated with identifying and acquiring access to a test location property. Staff has recently engaged the Land Trust of Santa Cruz County about potentially installing a test well and monitoring wells on Land Trust owned property within the Santa Margarita Groundwater Basin. If one of the sites is determined to be technically suitable for ASR testing and negotiations between the City and the Land Trust are successful, a piloting work plan for a test well will be developed.

Task 1.5.1 Well Siting Study
No new to report; however, it may be worth reiterating that, while the initial identification of sites has been completed, this work is an iterative task that relies on the two groundwater models and ultimately the ASR piloting results to finalize the recommendation for ASR well locations. While several sites have been identified (9 potential sites in the SMGB and up to 17 sites in the MCGB), these initial sites are a first approximation of technically suitable sites that would allow for the formulation of the various groundwater modeling scenarios. In all likelihood, there may also be additional potential sites available in other areas within each groundwater basin.

Task 1.5.2 Groundwater Modeling Coordination
An update for this task and the results from initial modeling scenarios will be presented by Pueblo Water Resources as part of another item on the agenda.

Issue(s) and Next Steps
As discussed previously, an important and complicated topic related to the ASR study continues to be the ongoing discussion around projections for future climate conditions. Although there is an interest in synchronizing the climate change modeling efforts, particularly in attempting to implement the climate change scenario used as part of the HCP process into groundwater modeling efforts, there may be an issue related to compatibility since the goals of each model may be different: one is used to forecast future conditions in a surface water system, while the other is used to determine when a groundwater basin might be sustainable and whether or not it complies with the requirement of the Sustainable Groundwater Management Act. Due to the complexity of this issue and the length of time required to resolve open questions, a contract amendment (Contract Amendment No. 2) to PWR's original contract is currently being developed. Also, as part of Contract Amendment No. 2, PWR will prepare an Executive Summary Technical Memorandum that summarizes key findings to date. This Summary Technical Memorandum will include the various Phase 1 task memos as appendices and will summarize the major and key findings from each. The total budgeted amount for Contract Amendment No. 2 will be $35,000.

Identifying a pilot-testing location in the Santa Margarita Groundwater Basin continues to be a challenge. Although several wells were identified in the Task 1.1 (Existing Well Screening) that were suitable for piloting purposes, these are existing municipal production wells that are relied upon by the owner to meet their own system demands. However, as mentioned above, staff has recently engaged the Land Trust of Santa Cruz County about potentially piloting ASR in one of their properties within the SMGB.

After finalizing the work plan for piloting ASR at Beltz 12, PWR and the City engaged in contract negotiations for Phase 2 of the ASR evaluation process. An item will go before City Council on October 9th authorizing execution of a Professional Services Agreement with PWR in the amount of $458,085 to conduct pilot testing of ASR at Beltz 12 as part of Phase 2 of the ASR evaluation process.

Advanced Treated Recycled Water
Regional Recycled Water Facilities Planning Study (RWFPS) Status

- Consultant: Kennedy/Jenks Consultants
- Contract Signed: February 2016
- Project Partners: Water and Public Works Departments, State Water Resources Control Board (SWRCB)
- Engaged Stakeholders: City Parks and Recreation Department, County of Santa Cruz – Water Resources Division, Santa Cruz County Sanitation District, Scotts Valley Water District, Soquel Creek Water District, University of California Santa Cruz
- Original Contract Amount: $486,000
- Contract Amendment No. 1: $26,357
- Contract Amendment No. 2: $74,951
- Funding: State of California $75,000*; City Public Works, $35,000; Water, remainder
- Amount Spent: $556,641
- Amount Remaining: $30,667
- Schedule: On Schedule, Final Report received June 2018

*The State accepted the report as final in late July and staff has prepared and submitted a payment request.

Next Steps
This study is complete. The contract with Kennedy/Jenks Consultants will remain open for the completion of a final task – update of the regulations with regards to surface water augmentation. These regulations were finalized as the RWFPS report was being finalized and staff believes it will be useful to have updated information reflected in decision making.

Additional details regarding next steps are covered under a separate item on this agenda.

Desalinated Water
- Consultant: DUDEK
- Contract Signed: May 2017
- Project Partners: NA
- Engaged Stakeholders: None at this time.
- Original Contract Amount: $139,669
- Amount Spent: $113,678
- Amount Remaining: $25,990
- Schedule: On schedule. Final report received August 2018.

This study is complete. Additional details regarding next steps are covered under a separate item on the agenda.

Other

Source Water Monitoring

- Consultant: Trussell Technologies
- Contract Signed: November 2016
- Project Partners: NA
- Engaged Stakeholders: None at this time
- 2017 Contract Amount: $98,924. Amount remaining: $0
- 2018 Contract Amount: $80,002. Amount remaining: $46,288
- Schedule: Currently on schedule.

Through the Source Water Monitoring project, the City strives to learn more about water quality in the San Lorenzo River, especially during high-flow, winter months. This understanding could facilitate the treatment of more water during the winter, increasing the feasibility of an in-lieu water transfer project.

Trussell Technologies is under contract to conduct source water monitoring, data management and analysis for water year 2017 and 2018. Water year 2017 final report was delivered in February 2018. Monitoring for water year 2018 is nearing completion; Trussell is drafting the report with a final version that incorporates staff's comments, anticipated in January 2019. Staff will continue with this program for water year 2019.

Santa Cruz Water Rights Project

In May 2018 the City entered in to an agreement with Analytical Environmental Services (AES) for the purpose of assisting the City of Santa Cruz with the preparation of environmental documentation and related materials to complete the California Environmental Quality Act (CEQA) compliance process for the Santa Cruz Water Rights project. The Proposed Project addresses key issues needed to improve the City's water system flexibility while enhancing stream flows for local anadromous fisheries. The Proposed Project involves modification of existing City water rights to increase the flexibility of the water system by improving City ability to utilize surface water within existing allocations. Staff has been working with AES to develop the Project Description and Notice of Preparation. Additional information will be provided at the meeting regarding this item.

Outreach and Communication

Our Water, Our Future progress reports were distributed by email following Water Commission meetings.

FISCAL IMPACT: None.

ATTACHMENT(S):
Attachment 1: Summary of Results of the 2016 & 2017 Distribution System Water Audit
Attachment 2: 2018 Leak Detection Final Report

Attachment 1

Summary of Results of the 2016 & 2017 Distribution System Water Audit

Line #	Item	2016	2017
1	Water Supplied (treated water entering the distribution system)	2,557 mg	2,658 mg
2	Authorized Consumption[1] (metered water consumption & other authorized uses)	2,330 mg	2,438 mg
3	Water Losses (Line 1 – Line 2)	227 mg	220 mg
3a	Apparent losses (metering inaccuracies)	51 mg	65 mg
3b	Real losses (leakage in mains and service connections)	176 mg	155 mg
4	$ Value of apparent losses[2]	$406,707	$837,463
5	$ Value of real losses[3]	$108,070	$88,279
6	Total $ value of losses	$514,777	$925,742

[1] Authorized consumption includes other authorized uses and is thus different from the consumption value described on P.5

[2] Apparent losses was valued at $9.66/CCF (volumetric revenues for the calendar year/sales in CCF = Average $/CCF sold) or $12,900 per mg in 2017.

[3] Real water losses valued at variable production cost of current water supplies was $570 per million gallons in 2017.

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City of Santa Cruz:

2018 Leak Detection Final Report

July 2018

Water Systems Optimization

Contents

Executive Summary

In June of 2018, the City of Santa Cruz partnered with Water Systems Optimization (WSO) to conduct proactive, comprehensive distribution system leak detection on 100 miles of main pipe. This 100-mile survey followed a previous 100-mile survey conducted in 2016. As a result, a total of 200 miles of main pipe have been sounded to date, accounting for 74% of Santa Cruz's 272 miles of distribution main pipe.

A WSO leak detection technician listened to almost all accessible infrastructure and fittings, including customer meters, fire hydrants, blow-off valves, and backflow preventers, to ensure that all acoustically-detectable leaks on the survey route were identified. A handful of appurtenances were not sounded due to accessibility and safety challenges. When leak noise was heard, WSO recorded initial leak characteristics in a leak report form for Santa Cruz staff to verify when convenient.

In total, four potential distribution-side leaks were identified. Upon investigation, two leaks were determined to be on the customer side of the meter. One minor hydrant leak was traced to a hydrant sealing problem, and another suspected hydrant leak was attributed to ambient sound, rather than actual leak noise (see Table 1).

Table 1: Leak detection survey results

Infrastructure Type	Suspected Leaks	Confirmed Distribution Leaks	Confirmed Customer Leaks
Main	0	0	0
Service	0	0	0
Meter	2	0	2
Blow-Off	0	0	0
Valve	0	0	0
Hydrant	2	1	0
Other	0	0	0
Total	**4**	**1**	**2**

This survey effort corroborated the water audit's estimate of minimal volumes of leakage. Furthermore, the infrequency of leaks discovered through the survey, particularly the absence of main line leaks, indicates a well-managed system in good condition.

Background and Goals

Leakage Management

The City of Santa Cruz water department maintains distribution efficiency by tracking volumes of water loss; proactively engaging with infrastructure, instrumentation, and system data; and intervening against excessive water loss when appropriate and cost-effective. Santa Cruz monitors water loss with an annual, level 1 validated American Water Works Association (AWWA) water audit. Field studies like proactive leak detection and customer meter testing are used to confirm water audit results.

Santa Cruz predominantly depends on surface water for supply and does not currently have any non-emergency interconnections with neighboring agencies to enable consistent imported water supply. As a result, Santa Cruz cannot tolerate significant distribution losses that would inflate supply needs without serving customer demand. To ensure minimal distribution losses, Santa Cruz intends to continue proactive leak detection surveying in 2019 to complete an initial survey of the entire system.

The first 100-mile survey was conducted in 2016. In 2018, another 100 miles were surveyed, bringing the total distance surveyed to 200 miles. An additional 72 miles of distribution system main pipe remain to be surveyed in a future effort.

Goals

Through leak detection in 2018, Santa Cruz and Water Systems Optimization (WSO) aimed to:

1. Acoustically survey 100 miles of the distribution system to identify leaks
2. Compare leakage detected in the field to analytic estimates of leakage

Survey Route

The original 2016 survey accomplished 100 miles of leak detection in three transects in Santa Cruz's distribution area. The transects captured a range of infrastructure, pressure dynamics, and soil conditions to provide a snapshot of leakage distributed across the system.

The 2018 survey continued the transect approach by shifting the transects eastward to produce three news transects parallel to the 2016 transects. The survey transects are illustrated in Figure 1 on the following page.

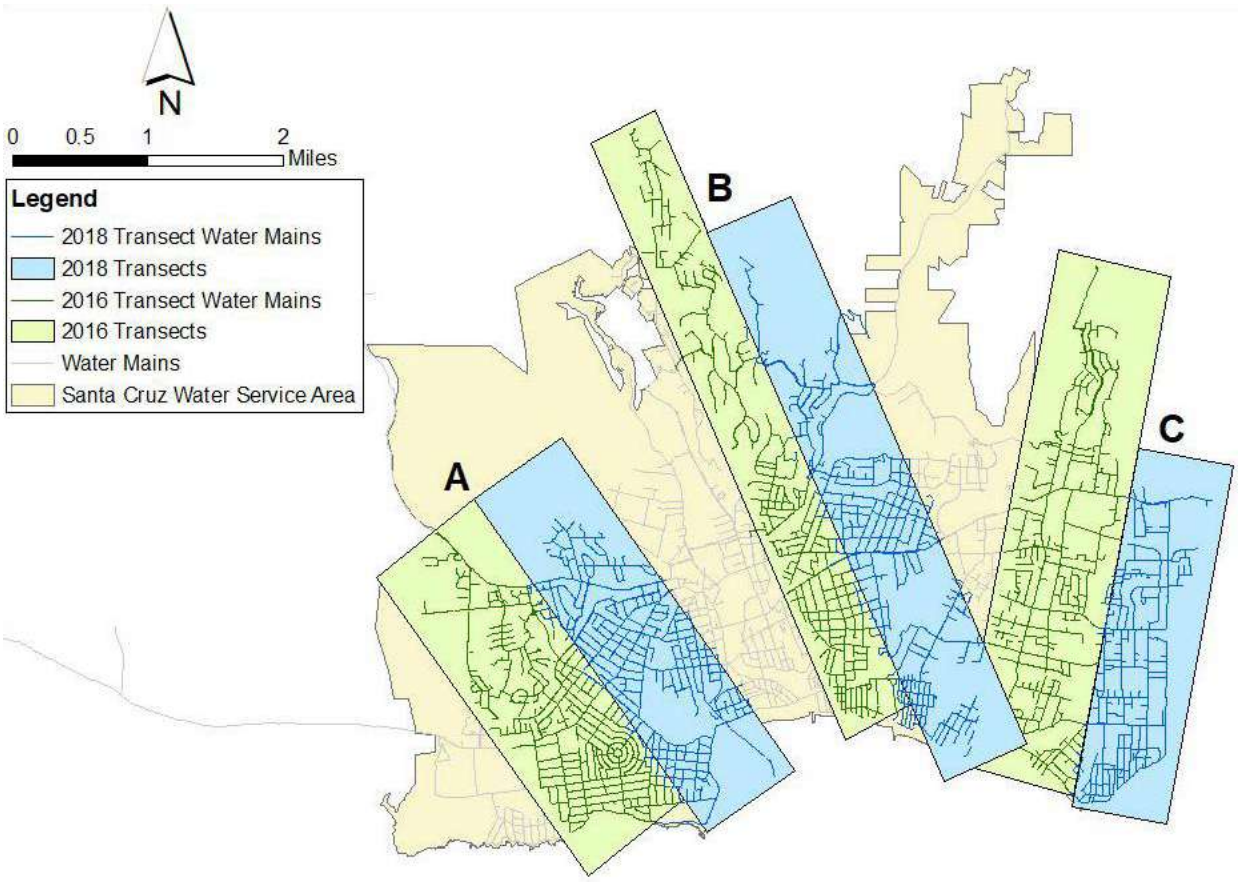

Figure 1: Leak detection transect areas, 2016 and 2018

Leak Detection Survey Methodology

Comprehensive Acoustic Leak Detection

WSO performs comprehensive acoustic leak detection in which a leak detection technician listens to all available fittings on main pipe and service connections. In instances in which infrastructure contact points are far apart, the leak detection technician uses a geophone to sound above buried infrastructure. Then, once a leak sound is detected, the technician uses a listening rod, geophones, and leak noise correlators to pinpoint the leak.

Comprehensive acoustic leak detection is more time intensive than a general survey in which a technician listens only to accessible valves and hydrants. However, a general survey often fails to detect the majority of distribution system leakage, especially in Southern California where the majority of distribution system leakage tends to occur at low flow rates on service connections. As a result, WSO and Santa Cruz elected to perform a comprehensive survey to engage with distribution system leakage.

Figure 2: Sounding rod used in comprehensive acoustic leak detection

Equipment

The leak detection survey was conducted using a Fluid Conservation System (FCS) L-Mic sonic leak detection probe and a FCS ACCUCOR 3000 digital leak noise correlator. WSO made direct contact with all accessible distribution system appurtenances in the areas surveyed, including customer meters, fire hydrants, blow-off valves, and backflow preventers.

Leak Detection and Confirmation Process

To accurately identify leaks and communicate their locations to Santa Cruz staff, WSO employs a systematic protocol for leak detection, confirmation, and tracking (see Figure 3 on the following page).

Leak Flow Rate Estimation

Leak flow rates were estimated for all suspected leaks based on either the leak's appearance (when visible) or the intensity of the noise produced (when buried). Typically, leaks are not audible when flowing at less than 1.0 gallon per minute (gpm). Furthermore, leak noise intensity depends on the severity of the leak, but proximity to the sounding point and pipe material also affect leak noise. Therefore, leak flow rate estimates are approximate.

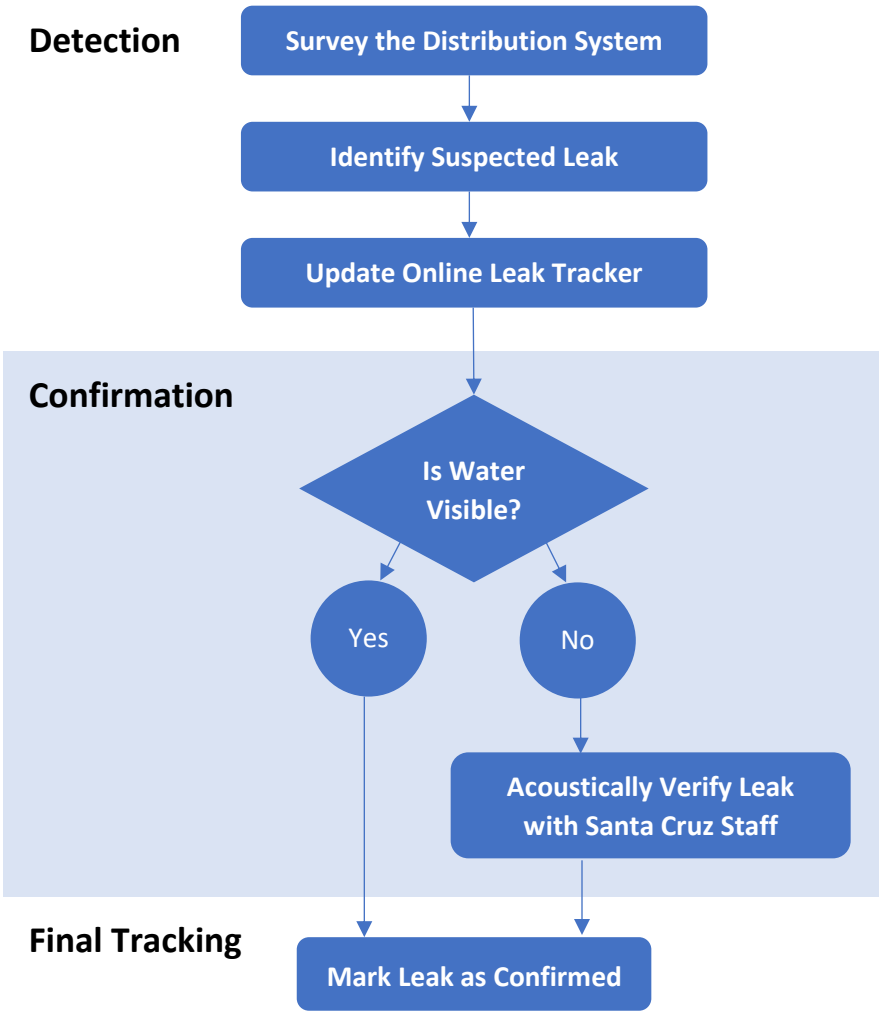

Figure 3: Leak detection, confirmation, and tracking protocol

Results

Leaks Identified

WSO's leak detection specialist identified four potential leaks during the acoustic survey. The cumulative flow rate of suspected leaks was roughly estimated to be 5.16 gpm (see Table 2).

Table 2: Distribution system leaks identified

Infrastructure Type	Suspected Leaks	Suspected Flow Rate (gpm)	Confirmed Distribution Leaks	Confirmed Distribution Flow Rate (gpm)	Confirmed Customer Leaks
Main	0	0	0	0	0
Service	0	0	0	0	0
Meter	2	0.15	0	0	2
Blow-Off	0	0	0	0	0
Valve	0	0	0	0	0
Hydrant	2	5.01	1	0.01	0
Other	0	0	0	0	0
Total	**4**	**5.16**	**1**	**0.01**	**2**

Through the confirmation process, the two meter leaks were pinpointed on the customer side of the meter. One hydrant leak was attributed to a sealing problem. The other hydrant leak was dismissed as ambient noise.

Analysis

Leak Frequency

To date, WSO has surveyed 200 miles of Santa Cruz's distribution system. The 2016 survey identified four meter leaks and two service connection leaks, while the 2018 survey identified one hydrant leak.

Table 3: Distribution system leak frequency

Infrastructure Type	Count of Leaks *2016 and 2018*	Normalized Leak Frequency
Main	0	0.0 leaks / 100 miles of main
Service	2	0.0 leaks / 1,000 service connections
Meter	4	0.0 leaks / 1,000 meters
Blow-Off	0	0.0 leaks / 100 miles of main
Valve	0	0.0 leak / 100 miles of main
Hydrant	1	0.5 leak / 100 miles of main
Other	0	0.0 leaks / 100 miles of main
Total	**7**	

These leak frequencies indicate a well-managed system in good condition. Particularly notable is the absence of main line leaks. Though main pipe is likely subject to modest seeps at joints and fittings, no audible leakage on main pipes was uncovered in the surveyed portion of the system.

Leak Repair Savings

A single, inconsequential hydrant leak was discovered through the 2018 proactive leak detection survey. Repairing this hydrant seep will not result in significant cost savings, though it may prevent more consequential hydrant leakage later.

Proactive leak detection is worthwhile for reasons beyond simple leakage savings. Proactive leak detection confirms system integrity, establishes an efficiency baseline, and corroborates water audit results. To achieve these benefits throughout the system, Santa Cruz intends to finish the remaining survey mileage in upcoming years and continue proactive surveying after that, when deemed necessary.

Summary

In conclusion, Santa Cruz's distribution system experiences minimal volumes of leakage that is detectable with acoustic technologies. This finding is supported by both the water audit and proactive system leak detection results. Additional proactive leak detection will finalize the distribution system's leakage baseline, allow for a full component analysis of real loss, and lay the groundwork necessary to track future leakage changes.

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WATER COMMISSION
INFORMATION REPORT

DATE: September 20, 2018

AGENDA OF October 1, 2018

TO: Water Commission

FROM: Heidi Luckenbach, Deputy Director/Engineering Manager

SUBJECT: Aquifer Storage and Recovery: Summary of Phase 1 Findings and Discussion of Phase 2

RECOMMENDATION: That the Water Commission receive information on the status and findings from Phase 1 of the Aquifer Storage and Recovery (ASR) study and discuss the work plan for Phase 2.

BACKGROUND: The City entered into a Professional Service Agreement with Pueblo Water Resources (PWS) in February 2016 to advance the Aquifer Storage and Recovery (ASR) element of the Water Supply Augmentation Strategy (WSAS) recommended by the Water Supply Advisory Committee (WSAC) in late 2015. The initial ASR implementation plan developed through WSAC and being implemented by staff consists of the following three phases:

Phase 1 – Technical Feasibility Analyses: Detailed technical feasibility investigations including the use of groundwater modeling, completion of site-specific injection capacity and geochemical interaction analyses, and development of a pilot ASR testing program in the Santa Margarita Groundwater Basin (SMGB) and the Mid County Groundwater Basin (MCGB).

Phase 2 – ASR Pilot Testing: Pilot ASR testing and assessment of probable ASR system performance, cost and schedule to complete build-out of the ASR system.

Phase 3 – Project Implementation: Development of full-scale ASR project including construction of ASR system facilities (perhaps incrementally), establishment of ASR project operational parameters, and long-term operation of project to achieve target storage volumes.

Staff has reported out to the Commission on a number of occasions regarding the progress and findings from Phase 1. As Phase 1 winds down, staff has been working with PWS to develop a scope, schedule and budget for Phase 2.

DISCUSSION: City and Consultant staff will present information on the status and findings of the Phase 1 work performed to date. Having spoken with the Commission on several occasions since 2016 about Phase 1, the focus of the presentation will be on the ongoing groundwater modeling work in both the MCGB and the SMGB. The presentation will also introduce the work that will begin as part of Phase 2 pilot program.

The presentation outline is as follows:

- Summary of Phase 1 Technical Feasibility Analyses
- Groundwater Modeling
    - Overview
    - Descriptions of Modeling Scenarios
    - Results for Select Scenarios
    - Interpretation of Findings
        - Aquifer Storage Capacities
        - Hydraulic Losses
        - Sustainable Injection Rates
        - Basin Impacts
    - Next Steps
- WSAC Performance Metrics Update
- Phase 2 Pilot Testing Work Plan

A Professional Service Agreement with PWS is going to City Council on October 9, 2018 for approval of Phase 2 pilot testing in the Mid County Groundwater Basin. Staff continues to develop a pilot testing program for the SMGB.

FISCAL IMPACT: None.

Prepared by:
Heidi Luckenbach
Deputy Director/Engineering Manager

Approved by:
Rosemary Menard
Water Director

ATTACHMENT(S): None

WATER COMMISSION
INFORMATION REPORT

DATE: September 26, 2018

AGENDA OF October 1, 2018

TO: Water Commission

FROM: Heidi Luckenbach, Deputy Director/Engineering Manager

SUBJECT: Final Reports: Recycled Water Feasibility Planning Study and Desalination Feasibility Update Review, and Update on Alternatives Decision Making Process

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RECOMMENDATION: Receive information on findings and recommendations of the Recycled Water Feasibility Planning Study and the Desalination Feasibility Update Review; support staff's recommendation to prioritize Recycled Water as the Element 3 Alternative.

BACKGROUND: The Water Supply Advisory Committee (WSAC) Final Report on Agreements and Recommendations defines the various elements of the Water Supply Augmentation Strategy (WSAS) to be evaluated, the activities needed as part of the evaluation, and the timeline for reaching decision points and milestones. A significant amount of analytical work has been accomplished in the last three years on all elements of the WSAS work plan. Staff has been developing a work plan for the next three years that includes the continuation of technical analyses (including pilot testing of both in lieu and Aquifer Storage and Recovery), as well as further development of the criteria and guidelines developed by the WSAC against which the technical data will be compared and contrasted.

This report, together with the staff presentation, will update the Commission on the Element 3 supply alternatives under evaluation (recycled water and desalination) and further the discussion on decision making.

DISCUSSION: Two studies have been completed that inform the decision making related to Element 3: the Recycled Water Feasibility Planning Study (RWFPS) was finalized in June 2018, and the Desalination Feasibility Update Review (Desal Update) was completed in August 2018. Both documents can be found on the Department's website at the link provided below.

Recycled Water Feasibility Planning Study (RWFPS): The RWFPS identified, evaluated and prioritized recycled water alternatives that could then be compared with the desalination alternative so that a "preferred" Element 3 could be selected and advanced through preliminary design, environmental review, etc. as per the WSAC Implementation Plan and Timeline. The

two primary objectives of the study were to identify recycled water uses that could reduce or eliminate the water supply gap as identified by the WSAC and, because this was a joint project with the City's Public Works Department that owns and operates the Wastewater Treatment Facility, the study also identified projects that beneficially reuse treated wastewater. This two year study identified a large number of alternatives, and concluded with the following recommendations:

Irrigation Projects

- **Santa Cruz Public Works Department (SCPWD) Title 22 Upgrade Project** – project would meet in-plant demands, develop a bulk water station and serve the near-by La Barranca and Neary Park. Public Works staff is advancing this project.
- **BayCycle Project** – expand the SCPWD Title 22 Upgrade Project to increase production and non-potable reuse to serve UCSC and City customers along the way. This is a longer term project that would require partnerships with end-users in order to be successful.

Groundwater Recharge Projects (GRR)

- **Coordination with Pure Water Soquel** – continue to work closely with Soquel Creek Water District to support the evaluation of the Pure Water Soquel project.
- **Explore GRR at Beltz Wellfield** – to replenish the Santa Cruz Mid-County Groundwater Basin in the Beltz Wellfield area, through a collaborative project with Pure Water Soquel or as an independent City led project.
- **Explore GRR in Santa Margarita Groundwater Basin (SMGB) –** to replenish the SMGB through a potentially regional project with the potential to make the region more resilient in the long term.

The RWFPS showed that the groundwater recharge projects listed above show merit: they are technically feasible, able to meet at least a portion of the water supply gap, provide regional opportunities and may be incrementally expandable. Additional information is needed however to fully understand their potential as part of a water supply solution.

Desalination Feasibility Update Review (Desal Update): The Desal Update was completed in August 2018 and found that a desalination project as described in the update also shows merit: a desalination project could provide up to 3.3 million gallons per day of potable water to meet the WSAC plan goal and fill the water supply gap; it is technically feasible; provides regional opportunities; could be incrementally expanded; etc. The final task of the Desal Update was to consult with agencies with regulatory purview over ocean water desalination to understand the opportunities and limitations of the recently adopted Ocean Plan Amendment (OPA). Following a March 2018 meeting with staff from the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Board (RWQCB), and the California Coastal Commission (CCC), our consultant for this study, Dudek, drafted a "Seawater Desalination Marine Work Plan" describing the work needed to support completion of CEQA and the regulatory permitting process under the new OPA guidance. Dudek received agency feedback in mid-June and subsequently finalized the study.

The primary permitting constraint for the project would be pursuing an open-ocean intake because the OPA requires a subsurface intake unless such an intake is determined not to be

feasible by the RWQCB under the OPA definition of "feasible." The Desal Update reflects this requirement by including options for use of an open-ocean intake only and for a hybrid system where radial collector wells are used with an open-ocean screened intake if the radial collector wells lose production capacity and/or require significant maintenance. Continued consultation with the SWRCB and RWQCB is being recommended by Dudek to discuss the scope of work for the Intake Technical Feasibility Study Update and other studies identified in the Marine Work Plan to determine if, during the scwd2 Desalination Project, sufficient work was completed to demonstrate feasibility, or lack thereof. If the radial collector well option is required to be considered further in detail after completion of the update, substantial additional testing in the marine environment would be required. The OPA requirements will likely have a significant impact on the cost and timeliness of a desalination project.

Update on Decision Making

Staff worked with the Ad-Hoc Committee (appointed by the Water Commission in December 2017) to discuss the decision making process outlined in the WSAC Final Report. The Ad Hoc Committee worked with staff to develop a decision-making framework that would include both the criteria and, perhaps even more importantly, a process for evaluating the various water supply augmentation strategy elements that was clear, transparent, thorough, robust and applicable to single elements as well as portfolios.

Staff was prompted to initiate this effort in part because of the imminent decision around Element 3 of the WSAC Work Plan. Specifically, high level feasibility studies, as needed demonstration testing and conceptual level designs of alternatives would have been completed to a sufficient level to select a preferred Element 3. With this in mind, staff anticipated the need for a rigorous process to make a sound decision for the preferred Element 3 with the assumption that these two water supply strategies would be similar in their ability to meet the WSAC goals and objectives.

However, for the reasons described above, staff is no longer of this opinion; while a decision making process will be required moving forward when looking at other elements of the WSAC work plan, staff believes sufficient information is already available to prioritize work efforts within Element 3, focusing on recycled water alternatives with no additional work being performed on desalination unless the Commission is in disagreement.

The work on recycled water over the next 12 months will identify specific projects and costs that could fill all or a portion of the supply gap. Once this is known, a final decision could be made on Element 3.

At the November meeting staff will bring the recycled water alternatives recommended for additional study over the next 12 months, as well as additional work on the overall alternative's decision making process.

FISCAL IMPACT: None.

PROPOSED MOTION: Motion to support staff's recommendation to prioritized recycled water as the Element 3 alternative.

ATTACHMENT(S):
Attachment 1: Link to Recycled Water Feasibility Planning Study, Final Report (Link will be provided)
Attachment 2: http://www.cityofsantacruz.com/home/showdocument?id=71971

WATER FOR SANTA CRUZ COUNTY

Ms. Rosemary Menard
Santa Cruz Water Director

September 24, 2018

Via email

Dear Rosemary,

In the ongoing discussion and consideration of Santa Cruz transferring water to the SqCWD, three critical questions have consistently been raised pertaining respectively to (1) the amount of water that Santa Cruz has the current legal right to transfer, (2) the extent of risk to its own water security that Santa Cruz would have in doing so, and (3) and what ability Santa Cruz would have to recover water in the future from the Purisima aquifer.

Water for Santa Cruz County has broadened its scope of inquiry to include how Santa Cruz can could retrieve water sent to the Purisima aquifer

1. **Water that Santa Cruz has the current legal right to transfer**

There are several sources of water that Santa Cruz can direct toward helping the Purisima aquifer:

A. North Coast flows: Santa Cruz has estimated 671 million gallons of water sourced from North Coast streams . North coast water has pre-1914 water rights and can be sent to the Purisima at the sole discretion of Santa Cruz . WFSCC looked at the production data and the data show that the city received 539 mg in the average rainfall year of 2016 and 759 mg in the wet year of 2017. Transfer of this water to SqCWD would reduce pumping in the Purisima and aid in its recovery.
B. Santa Cruz pumping: Santa Cruz annually takes 140 million gallons from its Beltz wells for use in the SC district. Santa Cruz could cease pumping from the Beltz wells during the summer, which would increase the recovery of the Purisima aquifer.

Conclusion

Santa Cruz has over 800 million gallons of water under its control that can be used to help the Purisima aquifer recover: 671 mg by sending it through the intertie to SqCWD allowing all wells in the North portion of the aquifer to be rested throughout most of the year, and 140 mg by resting the Beltz wells during the summer.

2. Risk to Santa Cruz water security

Santa Cruz has several sources to replace water that might be directed to Purisima aquifer restoration:

A. Loch Lomond Cushion. A review of the Loch Lomond levels at the end of the dry season reveals that Santa Cruz usually has a supply cushion because there is more water in the Loch than planned for in the April planning document. The average amount over the last 7 years is over 240 million gallons.

Comparison of City of SC Water Plan vs. actual;

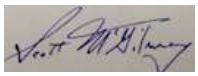
	Loch Lomond Levels. %			
Year	Reservoir level @ April plan	Reservoir level @9/30	9/30 actual Cushion from plan	conversion to millions of gallons
2012	79.3%	92%	12.700%	361,950,000
2013	76.0%	75%	-1.000%	(28,500,000)
2014	50.6%	60%	9.400%	267,900,000
2015	63.3%	72%	8.700%	247,950,000
2016	79.3%	88%	8.700%	247,950,000
2017	87.4%	93%	5.600%	159,600,000
2018	74.5%	90%	0.155	441,750,000
		7 Year Average		242,657,143

B. Felton Diversion right. Santa Cruz has a winter water right to transfer water from the San Lorenzo river to Loch Lomond that totals 900 million gallons. The 18 year average use of that right is 50 million gallons, leaving 850 million gallons available for Loch Lomond refill.

Collectively these two sources can supply Santa Cruz almost 1.1 billion gallons to offset any water redirected to the Purisima aquifer recharge from North Coast sources and the city's own reduction of pumping from the Purisima aquifer.

3. Santa Cruz retrieval of water from the Purisima aquifer

It is important to realize that Santa Cruz already has access to water in the Purisima. Santa Cruz presently has 4 wells in the Purisima aquifer near Pleasure Pt. and another at 41st and Soquel Dr. . The annual pumping capacity of these wells is large: 420 m gallons per year for those at Pleasure Pt. and 180 m gallons for the new well at 41st and Soquel Dr. The total sustainable pumping capacity, if water is available in the aquifer, is over 600 million gallons per year.



WATER FOR SANTA CRUZ COUNTY

Ms. Rosemary Menard
Santa Cruz Water Director

September 24, 2018

Dear Rosemary,

We were delighted to read in the Sentinel that water transfers between Santa Cruz and SqCWD will begin this winter, possibly as early as November. This is consistent with what had previously been expressed as the department's goal and it's heartening to have it publicly confirmed as still on track. Water for Santa Cruz County would like to express our heartfelt appreciation to you, and your team at the Santa Cruz Water Department, for the hard work which has helped to make this historic event possible.

As you know, Water for Santa Cruz County has been studying the dynamic of water reserves and historical flows and has found additional information that we think would support a decision to start transferring water sooner rather than later with your committed pilot project.

Water Availability:
The amount of water currently stored in Loch Lomond is 91% of it's capacity. The Santa Cruz annual water plan, adopted last April projected that Loch Lomond would be at 75.4% at the end of September. That means that Loch Lommond is 15% fuller than the city regarded as prudent and necessary storage going into the 2019 rain year. 15% of Loch Lomond's capacity equates to roughly 450 million gallons, giving the city 450 million gallons of water over and above what had been anticipated and planned for.

Limitations:
As we know, the rate at which the water can be transferred is limited by 3 factors. In November the limiting factor will likely be North coast flow, usually 20 million gallons per month, or less. After the rains commence in earnest North Coast stream flow increases, usually exceeding 50 million gallons per month in the winter. In this condition, the limiting factor is the capacity of the existing intertie between Santa Cruz and SqCWD which is 1.4 million gallons per day which is 40 million gallons per month. The third limiting factor is the demand in SqCWD during the winter months. SqCWD demand exceeds 60 million gallons per month in all months. Therefore reduced winter demand in SqCWD is not a limiting factor in any scenario.

Estimate of Water Transfer Capability for 2019:

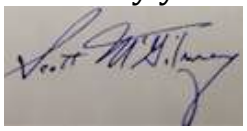
Notwithstanding the 100 million gallon limit for water transfers in the pilot project itself, it nevertheless is worthwhile to see how much water potentially could be transfered within the constraints of the existing current infrastructure during this coming winter if weather conditions co-operate to meet average rainfall amounts. Water for Santa Cruz County has studied the amount of water that could be sent to Purisima aquifer in 2019. The amount of water that could be available could be 260 million gallons if the winter of 2019 is "average". Our analysis below indicates it would be more 2.5 times more than the pilot, lending still more credence to WSAC's finding of the potential value of conjunctive use

Water that can be transferred to Purisima with existing infrastructure and permits

		Units in millions of gallons		
	N. Coast Production, 2016	Intertie capacity (1.4mgd)	SqCWD demand (2017)	Lowest of 3 limiting factors
November	21	42	76.8	21
December	28	43.5	74.9	28
January	33	43.5	73.5	43.5
February	61	39	61.7	39
March	67	43.5	70.6	43.5
April	59	42	73.5	42
May	47	43.5	97	43.5
			Totals	260.5

We appreciate this opportunity to share our analysis.

Sincerely yours,



Scott McGilvray
Water for Santa Cruz County.

Cc: John Ricker Santa Cruz County Water Resources director
Linda Wilshusen chair Santa Cruz Water Commission
Doug Engfer, vice-chair Santa Cruz Water Commission