CITY OF SANTA CRUZ
Water Department

Water Commission Agenda
Regular Meeting
7:00 p.m. – Monday, March 2, 2015
Council Chambers
809 Center Street, Santa Cruz

Agenda

Call to Order

Roll Call

Presentation *Organized groups may make presentations to the Water Commission. Presentations that require more than three minutes should be scheduled in advance with Water Department staff.*

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 1-38)

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 Items Affecting Water ☆ (accept info) (Page 1)
2. Approve the February 2, 2015 Water Commission Minutes ☆ (Pages 2-8)
3. Future Items Calendar ☆ (accept info) (Page 9)
4. Correspondence from R. Longinotti dated 2.17.15 ☆ (accept info) (Pages 10-13)
5. City Council Item on the February 24, 2015 Agenda : Contract Amendment No. 1/Task Order 3, Stratus Consulting –Multidisciplinary Work Effort: Economics, Policy, Environmental Sciences, Natural Resources - Budget Adjustment ☆ (accept info) (Pages 14-38)

Items Removed from the Consent Agenda

General Business (Pages 39-45)

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.

1. Major Projects Update 2015 (WT)☆ (Pages 39-45)

   Recommendation: Receive Information.

Subcommittee/Advisory Body Oral Reports No items.

1. WSAC Update (Oral Report)

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

1. Monthly Status of Water Supply (to be distributed at meeting)

Adjournment The next meeting of the Water Commission will be a Joint Study Session with City Council and is scheduled on March 3, 2015 at 7:30 p.m. in Council Chambers. The next regular meeting of the Water Commission is scheduled for April 6, 2015 at 7:00 p.m. in Council Chambers.

☆Denotes written materials included in packet

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.

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 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 arrangement can be made. The Cal-Relay system number: 1-800-735-2922.

WATER COMMISSION REPORT

DATE: February 24, 2015

TO: Water Commission

FROM: Rosemary Menard
Water Director

SUBJECT: City Council Items Affecting Water

City Council Meeting of February 10, 2015:

No items.

City Council Meeting of February 24, 2015:

Contract Amendment No. 1, Stratus Consulting – Multidisciplinary Work Effort: Economics, Policy, Environmental Sciences, Natural Resources (WT)

Motion authorizing the City Manager to execute Contract Amendment No. 1/Task Order 3 in the amount of $751,000 with Stratus Consulting Inc. (Denver, CO), in a form approved by the City Attorney, for professional services for necessary work related to water supply planning including: evaluating the potential impacts of climate change on current and future water supply and demand; conducting risk assessment of water system vulnerabilities; evaluating the feasibility of groundwater recharge in local aquifers; developing and evaluating water supply and demand management alternatives and portfolios to be considered as potential strategies for improving the reliability of Santa Cruz's water system; supporting the development of an updated Urban Water Management Plan through the development of a new econometric demand forecasting model; and, providing ongoing technical support services to the Water Supply Advisory Committee.

Resolution transferring funds and amending the FY 2015 Water Department Budget in the amount of $751,000 for Stratus Consulting Change Order No. 1.

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Water Commission
DRAFT
7:00 p.m. – Monday, February 2, 2015
Council Chambers
809 Center Street, Santa Cruz

Minutes of a Water Commission Meeting

Call to Order –Chair D. Baskin called the meeting to order at 7:01 p.m. in the City Council Chambers.

Roll Call

Present:	D. Baskin, G. Mead, D. Schwarm, D. Stearns, W. Wadlow, and L. Wilshusen.
Absent:	A. Schiffrin (with notification)
Staff:	R. Menard, Water Director; H. Luckenbach, Deputy Director/Engineering Manager; T. Goddard Administrative Services Manager; N. Dennis Principal Management Analyst; G. Rudometkin, Administrative Assistant III.
Others:	Approximately 33 members of the public.

Presentation –There were no presentations.

Statements of Disqualification –There were no statements of disqualification.

Oral Communications –There were no oral communications.

Announcements –There were no announcements.

Consent Agenda

1. City Council Items Affecting Water
2. Approve the December 1, 2014 Water Commission Minutes

Commissioner L. Wilshusen moved the Consent Agenda. Commissioner G. Mead seconded.
VOICE VOTE: MOTION CARRIED

AYES:	D. Baskin, G. Mead, D. Schwarm, D. Stearns, W. Wadlow, and L. Wilshusen.
NOES:	None
ABSENT:	A. Schiffrin
ABSTAINED:	D. Baskin due to absence from the December 1, 2014 meeting.

General Business

1. Water Demand Offset Presentation

R. Menard, Water Director introduced consultant S. Gaur, of Raftelis Consulting who provided the presentation and responded to Commission questions.

Commission Feedback:

- A system development charge is the cost for new development to join the system of Santa Cruz and benefit from the assets that the rate payers have been contributing to and the funds that we have available. You can think of it as there being two components of this fee, one is the system development charge which is a onetime capital charge to pay but this fee might not be viewed as paying for the water molecules. As used in other communities, a water demand offset program is a mechanism to make sure that growth in demand for water is offset and so it doesn't contribute to the need for additional infrastructure. Most of the information gathered on water demand offset fees came from utility websites and the consultant noted that relatively little information is available about these programs.
- The system development charges are something we are required to do by statute, is that correct? Response: The City is not required to establish system development charges but allowed to.
- Is there a regulatory framework for the demand offset program? Response: Yes, there is a regulatory framework that tells you the limits and boundaries and how you might calculate them. There isn't a framework for water demand offset fees.
- Why wasn't Soquel Creek used as one of the case studies? Response: Staff believed Commissioners would have some familiarity with the Soquel Creek program and wanted to provide additional examples

R. Menard introduced J. Rebagliati, Director of Planning and Community Development and B. Lipscomb, Director of Economic Development.

- Discussed the general plan which serves as the constitution for conservation, land use and development for the City of Santa Cruz and it is the primary tool that directs management, growth and preservation in our community. The general plan is comprehensive, it looks at all the things that the City does; it is required to be consistent and internally consistent. It covers a broad base of land use, development, conservation, public safety, mobility, economic development, etc. When the City makes a decision on virtually anything it does staff looks to the general plan to make sure there is consistency.
- J. Rebagliati worked in two jurisdictions that had Water Demand Offset programs one in Monterey County and the other in the City of Capitola, she expressed that, in her view if the City pursues such a program, it is very important that the City work carefully to develop the programs and policies to avoid unintended consequences that can occur. Some of the challenges that were brought to the other jurisdictions that she is aware of related to the cost of the program that was seen as prohibitive to some development. Another challenge was the changing cost and rules of the program, in both cases the programs changed periodically both in how they were administered and in the cost; that is difficult for

development, it often involved a lot of up-front planning and analysis which made it more difficult if the rules and costs are changing.

- If a water demand offset program were limited to nonresidential development only, we would only be addressing approximately 20% of the future problem. So are we asking 20% of the problem to address the cost for the 100% of the development?
- Santa Cruz is essentially built out; there aren't many opportunities for new investments on a substantial level. Does the City really want to place a financial burden on the few remaining development opportunities that are priorities for the City in terms of its housing, transportation and economic development goals?
- The bottom line from an economic development perspective is that a program such as the one presented this evening will definitely make development more costly and will likely be a deterrent to the type of development we are trying to encourage in Santa Cruz. If it becomes more challenging to develop in Santa Cruz it would contribute to making Santa Cruz becomes less competitive relative to some of our surrounding communities.
- While the concept of water neutral development is desirable, implementation in Santa Cruz may not be the return on investment that the City anticipates. We need to proceed cautiously considering all the impacts that implementing a program like this will have in Santa Cruz.

Commission Feedback:

- Additional fees make Santa Cruz less competitive than other cities.
- When the cost of new projects is increased, does that result in increasing the value of existing housing because of the replacement cost of housing; is that going to make our community more unaffordable even to the existing housing?
- Until we know what we are going to do for supply augmentation and the cost of it, it is hard for us to evaluate the extent of the need for a fee like this since people are going to be required to do the system development charge in any event.

Public Comment:

- R. Longinotti – reminded us that the concept that growth pays growth is an old concept. Rename water demand offset to a buy in fee. Suggested that the Commission invite Ron Duncan from Soquel Creek to come and speak at a future meeting.
- M. Primack – "this isn't exact math but if you raise the cost for new development by $10,000, it raises my homes value by $20,000. Growth pays for growth is the doctrine of an elitist community."
- M. Ranch – is in favor of water demand offset because it encourages builders to build buildings that are more efficient.
- D. Speltz – water neutral response to growth resonates with public officials across the United States. Quoting a LAFCO Policy -"In cases where a basin is over drafted or existing services are not sustainable a boundary change proposal may be approved if there will be a net decrease in impacts on water resources." This policy makes sense for Santa Cruz since our existing water use is not sustainable for both fish and people.

- J. Chipanny – Strongly supports the demand water offset fee. Concerned that large 3-4 bedroom homes have been taking over her neighborhood of 1 bedroom cottages. The demand water offset fee would allow growth to pay for the true cost of growth.
- J. Todd – in support of water demand offset. Made the point that water saved is energy saved.
- B. Solick – A Soquel Creek water district resident and proud to say that because their water neutral growth program is working well.
- C. Keutman –Believes this program is going to drive up the cost of housing for everyone, discourage growth and recommends proceeding carefully for economic impact.
- M. Thompson –Water conserving policies for building are coming from Sacramento, there is no need to pile it on new development, new development pays for a lot more than connection fees it pays for fire hydrants and infrastructure improvements. Reminded us that Santa Cruz is a mature city, and is approximately 95% built out.
- M. Mesiti-Miller – Believes this topic is in need of careful study. It impacts social justice; when the equity goes up in the housing market it will increase commuting for people trying to find affordable housing thus, increasing our carbon footprint. In regards to Julianna's list of new business possibilities, we don't want to deter great projects like the human genome project. Fairness factor, we are all here and we created the problem, why are asking the new people to pay for our poor planning.
- B. Tysseling – Looking at this from a larger context, Santa Cruz is the least affordable to second least affordable in the nation, land values are set by Silicon Valley, the jobs in Santa Cruz don't pay as much as those in Silicon Valley. How are we actually going to make it affordable to live in Santa Cruz, it's not by increasing the cost and adding additional fees.
- A. Jaffee – Santa Cruz water shortages have been often and have been due to supply and not to do with growth. People are struggling with how to make it here, everyone should have an opportunity to succeed; additional fees are not the solution.
- O. Lollard –Soquel Creek's water demand offset program is successful but also consider that last year issued they issued 10 meters, so it is a non-issue. Why would we do this, what is really the goal?
- P. Nelson – The Water Supply Advisory Committee should be evaluating this very proposal, before this is a recommendation to City Council you should defer to the Water Supply Advisory Committee who has been studying this.
- J. Meccas – Believes this item will raise cost for new development and remodeling. Continued on to share that increased use isn't being acknowledged and that he would rather see a tiered water system.

Commission Feedback:

- This item was agendized tonight for information and discussion because there is no way that it is ripe for decision. We heard not only questions that were posed but a lot of concerns expressed in the public comments as well. The Director's

recommendation was to hear comments from the Commission, City staff and the public, so that the item can be worked on and be considered at a future joint meeting because this is a big policy issue.

- This is both effective and costly but there are unintended consequences. How will we pay for water reliability?
- We have had our consultant Bill Maddaus say while we want a vibrant conservation plan that conservation is not going to get us there in terms of dealing with our supply problem. If conservation isn't going to get us there, in terms of solving the problem then why do we incentivize conservation in excess ways? It is one thing to say that we have a community value; it is another thing to put our money into it if it is not going to get us where we need to go.
- It is important to determine how we are going to deal with our supply problem and what the portfolio supply options that deal with that are going to be because that is going to drive the administration of the conservation program.

Commissioner L. Wilshusen moved that Commission send this item back to staff for further work and bring it back at a future meeting. Commissioner G. Mead seconded.
VOICE VOTE: MOTION CARRIED

AYES:	D. Baskin, G. Mead, D. Schwarm, D. Stearns, W. Wadlow, and L. Wilshusen.
NOES:	None
ABSENT:	A. Schiffrin

Discussion:

- Useful next step would be larger research policy analysis, contextualizing it in both water supply planning work but also in terms of the larger City goals. Then write up a product that goes through both the Water and Planning commission as a joint communique to the Council and the Water Supply Advisory Committee as a decision as to whether it should move forward.
- A number of comments were made in support and some raising concern with the concept of growth paying for growth, when you do the research for the informational paper it is not necessarily the case that demand offset fees are the only approach for growth to pay for growth there are other options that you are aware of.

2. Initial Water Supply Outlook
   T. Goddard, Administrative Services Manager and Associate Civil Engineer K. Crossley provided report and responded to Commission questions.

Commission Feedback:

- Driest January on record.
- What is a Tolling Agreement? Response: A Tolling Agreement is a legal term that describes an agreement by the parties to hold certain actions in abeyance while other things are going on. In this case, there was a time limit for CA Fish & Game needed to take action against the City for not complying with their regulations and we entered into an agreement with them to hold that regulatory

action in abeyance while we worked on the habitat conservation plan. There is no prejudice they are retaining the right to come after us later.

- What is the timeline to go forward if it is decided that it is necessary to go back to restrictions? Will you need a similar amount of time as you did last year to staff up or have you kept those employees around or have access to them? Response – No, we shouldn't need the same amount of time as the stage 3 restriction systems have been developed and can be re-established fairly readily.

3. Election of Officers

Chair D. Baskin opened the floor for nominations for Chair.

Commissioner W. Wadlow nominated D. Baskin.

Commissioner L. Wilshusen moved to close nominations and by acclamation elect Commissioner D. Baskin as Water Commission Chair for 2015. Commissioner G. Mead seconded.
VOICE VOTE: MOTION CARRIED
AYES: D. Baskin, G. Mead, D. Schwarm, D. Stearns, W. Wadlow, and L. Wilshusen.
NOES: None
ABSENT: A. Schiffrin

Commissioner D. Baskin opened the floor for nominations for Water Commission Vice-chair.

Commissioner L. Wilshusen nominated W. Wadlow for Vice-Chair. Commissioner G. Mead moved to close nominations and by acclamation elect Commissioner W. Wadlow as Water Commission Vice-chair for 2015.

VOICE VOTE: MOTION CARRIED
AYES: D. Baskin, G. Mead, A. Schiffrin, D. Schwarm, D. Stearns, W. Wadlow, and L. Wilshusen.
NOES: None.
ABSENT: A. Schiffrin

Subcommittee/Advisory Body Oral Reports No items.

1. WSAC Update
   - We are set to come back next week with the report from the IRP.
   - We spent about 10 months learning to think and talk about water, such as the criteria you would utilize to determine if a water supply was a good one and understand the terminology of the field.
   - We are now entering the next phase where we define the baseline, look at what the demand is, then look at what our supply is and what gap might be. In later

meetings we will look at what the portfolio of options might be to help us meet that gap.
- We are still refining the criteria that we are using for measuring all of these supply options so that it actually aligns with the data we are going to get from our technical staff.

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

- The Water Supply Advisory Committee report that went to City Council 1/27/15 is a report on the first phase of the Water Supply Advisory Committee's work and includes previous packet materials, handouts, attachments and is a good comprehensive review of the work that was done in that phase. This document is available at http://www.santacruzwatersupply.com/report-first-phase-wsacs-work-recon-report
- Completed the Modeling and Forecasting Working Group series. Topics that were covered were hydrology, hydrologic modeling, fish flows, ground water issues, the tool for demand forecasting, Maddaus water management demand modeling, and demonstration of the confluence model. You can find all of the presentations on for the Modeling and Forecasting Working Group at the following address: http://www.cityofsantacruz.com/departments/water/modeling-and-forecasting-work-group
- The Modeling and Forecasting Working Group gave people the opportunity to look inside these models to see how they work and understand what the inputs & outputs are.

Commission Feedback:
- Request for a future agenda item - the status of the Water Departments bank account. Response - Next meeting you will get the CIP and parade of projects, we will make sure when we do the budget presentation that we fold that information into it.
- Request for a future agenda item - list of items for a future agendas, even if they aren't attached to what month they might occur to help us keep track of the items coming to us in the future.

Adjournment **Meeting adjourned at 9:59pm.** The next meeting of the Water Commission is scheduled for March 2, 2015 at 7:00 p.m. in Council Chambers.

Respectfully submitted,

Gloria Rudometkin

Digitally signed by Gloria Rudometkin
DN: cn=Gloria Rudometkin, o=City of Santa Cruz, ou=Water, email=grudometkin@cityofsantacruz.com, c=US
Date: 2014.02.10 09:12:05 -08'00'

Staff

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WATER COMMISSION REPORT

DATE: March 2, 2015

TO: Water Commission

FROM: Water Director

SUBJECT: Water Commission Meeting Schedule and Upcoming Agenda Items (Subject to Change)

April 6, 2015
- Martha Lennihan - Water Rights 101 Presentation
- Revised Water Supply Outlook

May 4, 2015
- Operating Budget Overview
- Update Water Shortage Contingency Ordinance
- Water Commission action/recommendation on devised SDC

Unscheduled Items
- Water Rates Workshop

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Strategy #1:
Price Water to Encourage Conservation

A basic principle of *conservation pricing* is to charge for water based on how much water is used. The more you use, the more you pay. Although this seems like common sense, there are water utilities in California today that charge a fixed rate for each customer--- no matter how much water the customer uses. The advantage of fixed charges for the utility is a predictable and dependable revenue stream.

The City of Santa Cruz uses a hybrid billing system, charging both a fixed rate and charge for volume of water used. The fixed rate is the same for all customers of that class, (e.g., single family residential customers with a 5/8inch meter).

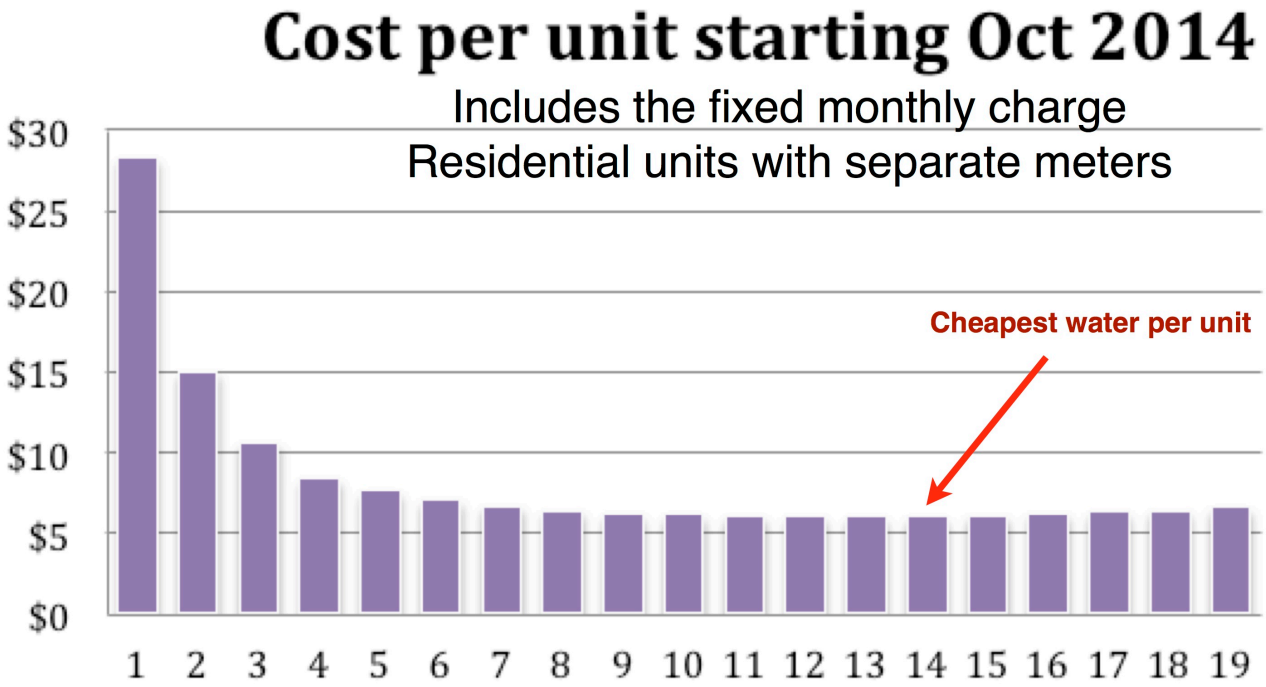
To further increase the incentive to conserve, the City's charges single-family residential customers a base rate for the lowest volume of water used, and higher rates for higher levels of water used. This is called tiered pricing. Table 1 below shows the tiered price structure for single family customers within the City limits. Customers outside the City pay rates that are 27% higher.

Table 1: Current Single-Family Residential Monthly Rates (includes apts with separate meters)

Block	Category	Units	Rate
1	Essential needs	1-4	$1.73
2	Average indoor needs	5-9	$4.40
3	Average outdoor needs	10-14	$5.66
4	High use	15-18	$7.76
5	Inefficient or excessive use	over 18	$9.67

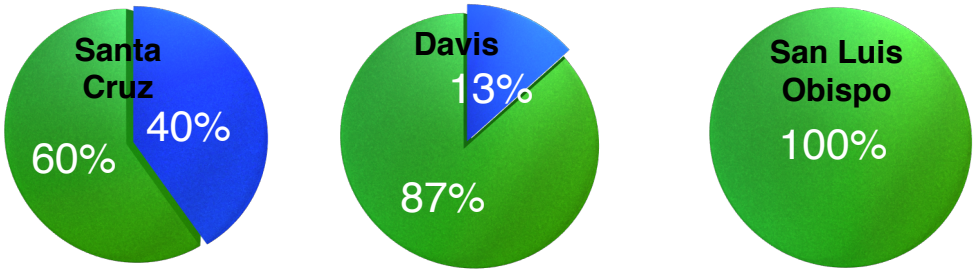
All customer groups that are not single family residential pay for water at the Block 2 rate. This includes businesses, apartment buildings with a single meter, dedicated landscape accounts, golf courses, etc.

Although the City's tiered rate structure for single family units provides a price incentive to conserve water, the fixed charge on a customer's bill does the opposite. As the graph below shows, when the fixed charge is averaged in with the volume charge, customers who use low or moderate amounts of water pay more per unit of water than customers who use more water.



Solutions

There are many ways that Santa Cruz could eliminate the price penalty for conservation. They all involve shifting more of the Water Department's revenue from the fixed charge towards volume pricing. That shift will put the City back into compliance with the California Urban Water Conservation Council's *Best Management Practice* (BMP) which states that revenue from fixed charges make up no more than 30% of a water agency's monthly revenue. Although the City committed to this BMP in its General Plan, it has been out of compliance for the last several years. In September, 2014 the temporary drought surcharge was placed on the fixed charge, making the City further out of compliance. The chart below shows that Santa Cruz proportion of revenue from fixed charge before the drought surcharge was enacted was 40%.



The effect of any of one of the following reforms would be to encourage conservation and make the price of water more equitable for customers who use low and moderate amounts. There is probably considerable overlap between customers who use low amounts of water and customers whose income is lower. Thus conservation pricing coincidently makes our community more affordable.

Recommendation:

1**. Water budgets for *all* landscape accounts. Higher price tiers for exceeding the water budget.** The City has issued water budgets for *large* landscape accounts. Other communities, e.g. Irvine Ranch Water District, have water budgets for *all* landscape accounts. For water budgets to work effectively, there must be a price signal for exceeding the water budget. As part of the drought Stage 3 Curtailment, Santa Cruz has a price penalty for landscapes that exceed the budget. The City needs to implement water budgets with price signals in normal years.

2. **Price landscape water at Block 3 rates.** Currently single-family residential customers pay Block 3 prices for "average outdoor needs", while golf courses and dedicated landscape accounts pay Block 2 rates for landscape water. Charging the Block 3 rate for all landscape accounts would encourage conservation during the dry season---when we need it the most. The reform would also improve the City's compliance with Proposition 218, which prohibits one class of users from subsidizing another class of users.

3. **Tiered pricing for other customer classes** besides single family residential.

4. Increase the price signal by **making the tier steps steeper**. (Increase the price increment for each tier.)

5. **Implement tiers in the fixed charge.** A customer's monthly fixed charge could be based on that customer's highest month of usage during the previous year. This would allow capture of revenue from vacation homes. It would also encourage conservation during the peak season, as customers would have motivation to qualify for a lower tier.

6. **The marginal cost of new water supplies (or new conservation investments) should be charged to the highest tiers**, since low water users are not driving the need for new water supplies. An article published by the American Water Works Association[1] states:

> "When excess water consumption is priced to capture the costs associated with overuse, the rates more closely respect each customers' proportionality requirement by ensuring that those customers who stay within reasonable use of water don't pay for costs generated by those whose use is excessive."

Revenue Reliability

The principle disincentive for water utilities to adopt more robust conservation pricing is the tradeoff in revenue reliability. With fixed rates, water utilities can reliably predict their revenue. Viewed from the utility perspective, conservation pricing can work *too well*, with customers responding to price signals by reducing water use more than expected. In that case water agencies need to cover their expenses by returning to their governing bodies with requests for further rate increases.

Conservation pricing can be accomplished along with revenue reliability by including a price buffer in case demand reduction exceeds utility estimates.

[1] Hildebrand et al, "Water conservation made legal: Water budgets and California law"

If in spite of the buffer the feared scenario occurs, and revenue from water use is lower than needed---and the Water Dept. needs to request a rate increase--- it would be advantageous for customers to understand and support their city's revenue structure. Water rates that rely more heavily on volume charges rather than fixed charges are more popular with customers. In June 2014, City of Davis voters overturned a new water rate structure due in part to the unpopularity of the high fixed charges. As a result, the Davis City Council adopted a rate structure that reduces revenue from fixed charges to 13% of monthly revenue.

Environmental and Community Impact

The benefit of all demand reduction measures is their ability to eliminate or reduce the need for new water supply projects (and their environmental and financial impacts). The Draft Desal EIR estimated that the cost of desalinated water for Santa Cruz is $10,750 per million gallons. This a very large amount compared to the cost of our existing water production, which the Water Department reports is $500 per million gallons.

CITY COUNCIL
AGENDA REPORT

DATE: 2/18/2015

AGENDA OF: 2/24/2015

DEPARTMENT: Water

SUBJECT: Contract Amendment No. 1/Task Order 3, Stratus Consulting – Multidisciplinary Work Effort: Economics, Policy, Environmental Sciences, Natural Resources - Budget Adjustment (WT)

RECOMMENDATION: Motion authorizing the City Manager to execute Contract Amendment No. 1/Task Order 3 in the amount of $751,000 with Stratus Consulting Inc. (Denver, CO), in a form approved by the City Attorney, for professional services for necessary work related to water supply planning including: evaluating the potential impacts of climate change on current and future water supply and demand; conducting risk assessment of water system vulnerabilities; evaluating the feasibility of groundwater recharge in local aquifers; developing and evaluating water supply and demand management alternatives and portfolios to be considered as potential strategies for improving the reliability of Santa Cruz's water system; supporting the development of an updated Urban Water Management Plan through the development of a new econometric demand forecasting model; and, providing ongoing technical support services to the Water Supply Advisory Committee.

Resolution transferring funds and amending the FY 2015 Water Department Budget in the amount of $751,000 for Stratus Consulting Change Order No. 1.

BACKGROUND: A cornerstone of the Water Department's work is water supply planning and demand management. Because of changing conditions, these two ongoing efforts are revisited regularly. Examples of changing conditions may include water supply shortages such as those caused by periodic drought conditions; the economic circumstances of a community; implementation of enhanced water saving fixtures and/or conservation policies; and changing environmental and regulatory requirements.

Between the mid 1990s and 2005, the Water Department was in a process later referred to as Integrated Water Planning. This process resulted in the Integrated Water Plan (IWP) as well as a program-level Environmental Impact Report (EIR) on the IWP. Between 2005 and 2013 the Water Department was implementing the then-Council direction to investigate the feasibility of a seawater desalination plant as a supplemental source of water for the community, the origin of which was the IWP. Throughout and supporting these phases, the Water Department produced and contracted for a significant volume of necessary technical work. These technical work products are in continual need of updating to respond to changing conditions, such as described above.

The project-level draft EIR for the seawater desalination project was released for public comment in May 2013. A significant volume of written and oral comments were received during this process and in October 2013, in response to the growing public discussion over the future of the community's water supply, the City Council directed staff to explore all feasible solutions with the city/community prior to making critically important decisions on future water supplies. At its October 8, 2013 meeting, the City Council provided valuable input and a set of principles for a process to engage the community in the water supply discussion, and the issues that needed to be better understood in the community. It was this meeting that led to the development of the Water Supply Advisory Committee; perhaps more importantly, it prioritized work elements such as:

• Completion of the Habitat Conservation Plan for the North Coast Streams,
• Completion of the Water Conservation Master Plan,
• Evaluation of current and future water supplies and demands, and
• Evaluation of economic impact (if any) that would occur in the event of significant multi-year drought.

See Attachment 1, City Council Item on Future Actions – Water Supply for Drought, October 8, 2013.

The Water Supply Advisory Committee (WSAC) was formed in early 2014 for the purpose of analyzing and formulating recommendations for the City Council regarding water supply options. With a charge that included many of the Council's principles, the members of the WSAC responded to a need for external technical assistance by requesting that City Council approve a contract for Stratus Consulting Inc. (Stratus). City Council approved Stratus's contract in July 2014 for $350,000 to support the WSAC effort. The scope of work was divided into three fairly broad phases to capture the known and unknown course the WSAC process may take.

• Phase 1: Reconnaissance and Review of Existing Information
• Phase 2: Identifying and Characterizing the Potential Water Shortage Problem
• Phase 3: Identifying and Evaluating Potential Solutions

DISCUSSION: The Water Department strives to inform the WSAC, respond to City Council principles, and, significantly, complete work elements in the most efficient manner possible. Ongoing work of the Water Department that is required, even without the WSAC efforts, includes the following:

• Completion of the Habitat Conservation Plan,
• Preparation of the 2015 Urban Water Management Plan,
• Evaluation of water supply alternatives,
• Formulation of econometric demand model,
• Completion and implementation of the Long Term Water Conservation Master Plan, and
• Regional work with the Integrated Regional Water Management group.

Completing these longstanding work items necessitates a substantial body of technical products ranging from engineering, analysis, modeling and forecasting of topics from the effects of climate change on current and future water supply, to groundwater recharge, to risk assessment of water system vulnerabilities, to water supply and demand management strategies, to

econometric demand forecasting. The volume of products and specialization required to produce them surpass the capacity and expertise of Water Department staff. Similar to the past 30 years of water supply planning effort, contracting for services is a necessary step for completion.

In its project planning early this year, the Water Department considered the elements listed above and it became apparent that in addition to informing water supply planning and demand management for the department, the projects would significantly and beneficially inform the work of the WSAC. In fact, for the WSAC to fulfill its charge from the City Council to broadly explore water supply options and develop recommendations, it requires virtually all of the technical and analytical work needed to support the usual water system and water resources planning and management activities that are an ongoing part of any water utility's business. Moreover, with an October 2015 sunset date, the WSAC has need for a timely production of this information.

Accordingly, a situation presented itself where the Water Department and the WSAC, in following the City Council principles and charge, are both in need of an overlapping set of technical work. Attachment 2 illustrates the alignment between the work of the Department, the WSAC areas of interest, and the City Council principles.

Given the dovetailing of technical demands, a solution that efficiently and quickly meets those needs was identified. That solution entails charging the Stratus Team with an expanded scope of work to support the Water Department and the WSAC. As the Council is aware, the Stratus contract was awarded in 2014 after significant due diligence and scrutiny from the WSAC, Council and Water Department staff. Stratus was selected for its comprehensive expertise and ability to be responsive to emerging needs of the WSAC and Water Department. The Stratus Team has been in place for several months and has successfully assimilated to the City and earned the confidence of Water Department staff and the WSAC.

For the Council's consideration, staff and the Stratus Team developed Contract Amendment No. 1/Task Order 3 to maximize the utility of the work products by the Stratus Team across all of these areas. (Attachment 3, Contract Amendment No. 1/Task Order 3.)

Contract Amendment No. 1/Task Order 3 will substantially inform ongoing efforts in the Water Department efforts and implement the WSAC technical work plan through October 2015 while following the Council's principles.

The Stratus Team estimates that an additional $751,000 will be needed to fund the broad range of subject matter experts to complete the work items described above. The work items are necessary to the Water Department and would have been completed in the near term. Due to the dual use for the WSAC, the work is condensed and accelerated to occur in the next several months with a corresponding consolidation of cost that otherwise would have been spread across a few fiscal years.

FISCAL IMPACT: No fiscal impact. Existing appropriations within the Water Department FY 2015 budget will be transferred to projects c701402/Water Supply Reliability and c701403/Water Supply Reliability – SDC.

Prepared by:	Submitted by:	Approved by:
Heidi Luckenbach	Rosemary Menard	Martin Bernal
Deputy Director/Engineering Manager	Water Director	City Manager

ATTACHMENTS:
Attachment 1 City Council Item on Future Actions – Water Supply for Drought, October 8, 2013
Attachment 2 Water Department Workload Cross Reference
Attachment 3 Contract Amendment No. 1/Task Order No. 3
Attachment 4 Budget Adjustment

To: Mayor and Councilmembers
From: Councilmember Lane
Re: Water Supply Agenda Item on October 8, 2013

There seems to be in general concurrence on the need to do something new and different as the City addresses its water supply issues... and concurrence on the need to have a better community process for the examination of water issues. I want to thank Mayor Bryant and City Manager Bernal for bringing the idea of a "re-set" forward.

As I'm sure is the case with many others in the community, I have some specific ideas about how the City could proceed and I am prepared to offer those ideas at our meeting today. However, I think it could serve us well to achieve clarity on our underlying principles before devising the details of the roadmap that will be needed in the context of our re-set.

Below are my suggestions for those principles and I very much welcome hearing others' suggestions, too.

Principles

Achieve clarity on the arithmetic of our water situation and water needs.
Let's sharpen our understanding of the quantity of our supply now and what that quantity will look like in the future. And let's sharpen our understanding of how much water we will need to sustain a healthy community.

Provide more clarity as to what the impacts will be if we implement modest supply increase measures plus a new successful conservation program and then a serious drought occurs.
This is related to the arithmetic question... after we calculate how much water we will have with new measures in place that protect fish habitat and maximize the top feasible supply opportunities (other than desalination) how short will we be in a serious drought. How will that shortfall affect our community?

Achieve an understanding of the seriousness of the salt water intrusion problem for the City system.
It is well (!) understood how serious the salt water intrusion situation is for the Soquel Creek District. However, the City of Santa Cruz system relies on the same aquifer for water and it becomes a fairly significant source for us in very dry years. What would the impact be if Santa Cruz were not able to fully utilize our wells in that aquifer?

Ensure that many alternative ideas and proposals will be considered or reconsidered.
While there are many other issues at play in our water discussion and debate, it seems the crux of that debate is a lack of confidence on the part of many in the community that alternatives to desalination have not been adequately explored. We must revisit those potential alternatives and determine 1) their viability and feasibility, 2) the quantity of water each can provide, and 3) the cost associated with each alternative.

Make sure we are getting the most from our conservation effort.
Adopt a new conservation program soon and demonstrate how much the community is able to save year in and year out.

Acknowledge the seriousness of the critique of desalination and examine that critique thoroughly.
This does not mean accept as fact each individual criticism but it does require ensuring a process the carefully considers each item.

Examine the issue of how much our water supply needs are driven by growth and development.
This is another element of our arithmetic problem that needs sharper numbers. How much do we need absent any growth in demand from new development? How much more water do we need, if any, to meet housing and economic development requirements.

Create and implement community and city government processes that will move quickly on all fronts to allow the community to make an informed decision on our water supply approach in the year 2016.
The City has been expending significant funds on this water supply issue over many years

Act carefully in relation to Soquel Creek Water District recognizing the challenging situation they are in.
The City did not embark on the desalination exploration process alone and we need to take Soquel Creek's needs and concerns seriously as we make our decisions.

Once a set of principles is established by the Council based on the input we've received from the community, I recommend that we direct staff to return with a more detailed plan or roadmap based on those principles.

The EIR question

Because the issue of the continuing with the EIR on the desal project is such a point of contention, I suggest we include the following in our action this evening:

1) Do not allocate any additional City funds for work on the EIR at this time
2) Ask staff to come back with a range of choices for our approach on the EIR including (but not limited to) the possibility that community EIR comments be responded to but that a complete or final EIR not be prepared for presentation to the City Council. This would come back at the same time as staff presents the overall re-set plan.
3) Request that the Soquel Creek Water District formally convey their wishes for next steps in relation to the EIR, recognizing that they have shared equally in the costs of the EIR up till now and are partners with the city in addressing regional water needs.

I believe it is important that we not make any new commitments on the EIR until we make similar commitments to the other elements of our exploration and community decision-making. By not proceeding with any new funding commitments for the EIR at this time, we indicate that we are truly in a re-set that puts consideration of alternatives on an equal footing with consideration of desalination.

presented at 10/8/13 meeting

Ideas for the new roadmap

Based on the principles I shared earlier, I have drafted some ideas for inclusion in our roadmap. I am not presenting these for specific consideration today. I simply want to contribute to a discussion of what our roadmap ought to look like. I offer them to the Council and the community for comment as we give direction to staff.

During the next 30 months:

1) Complete an agreement with regulators on the Habitat Conservation Plan for north coast streams. (After 10 years of wrangling, we need to do whatever it takes to nail this down within one year.)

2) Complete work with the countywide consortium looking at water transfers, make a commitment to an agreement that is mutually beneficial to Santa Cruz Water and our neighboring agencies, and then determine how much water would be available to the Santa Cruz system during a multi-year drought when a transfer agreement is implemented.

3) Complete work and adopt a new water conservation program. Begin implementation with substantial funding for incentives.

4) Adopt new water rates that encourage even more conservation without being punitive... and develop an estimate as to how much conservation will occur with these new rates (based on experience in similar communities that have adopted these.)

5a) Once the conservation plan is adopted and implementation is underway; and once the water supply reduction for habitat conservation is defined; and once water transfer supply amount is defined... establish a new estimate for overall City water supply and establish likely curtailment amounts that would be required in a serious drought. Utilizing that data and the existing drought curtailment plan, establish a month to month and customer by customer target for water use. For at least one year, include that target amount on a monthly basis in customer bills to compare with actual use. This billing information will be accompanied by new information and incentives for customer adoption of conservation measures.

5b) At the same time, using the same set of new information, produce an economic impact report (utilizing a public process similar to an EIR process) showing what economic impact (if any) would occur in the event of significant multi-year drought.

6) Establish a blue ribbon committee to oversee the work in item 5 (above). This panel will review the outcomes of items 1, 2, 3 and 4 (above) and determine what numbers shall be used in water supply and water conservation projections moving forward. Membership: (at minimum) Councilmembers, Water commissioners, Desal Alternatives advocates, business community.

7) Revise our current water neutral development program to make it project based... but ensure that the offsets required do not unfairly burden new development. (The offset fee should pay for concrete savings that offset all new demand but should not require offsets significantly beyond the amount demanded of the project.)

8) Give direction to the Water Commission to work on the following:
a) continue development of the new water conservation program,
b) continue work toward a recommendation to the council on changes to rate structure, and
c) (this would be a new assignment) study and report on the top three alternative (alternative to SCWD2 Desal) sources of water supply for both feasibility and cost. These alternatives would be in addition to the ideas outlined above (conservation and water transfers), which will already be underway. Use a community input process to select which three will be studied. (Among the possibilities: a large wastewater recycling project; new wells at UCSC; a new storage facility in an abandoned quarry; buying water from another source such a larger regional desalination project that is not owned or operated by the City.)

9) Approve sufficient funding and staffing and expert consultant costs to accomplish all of these items.

Attachment 2, Water Department Workload Cross Reverence

			Elements of Work							
Subset of City Council Principles	**Consultant(s)**	**WSAC**	**UWMP**	**HCP**	**LTCMP**	**Ground-water**	**Recycled Water**	**Climate Change**	**Water Rights**	**IRWM**
Achieve clarity on the arithmetic of our water situation and water needs. Let's sharpen our understanding of the quantity of our supply now and what that quantity will look like in the future. And let's sharpen our understanding of how much water we will need to sustain a healthy community.	Stratus Consulting Gary Fiske	X	X	X	X			X	X	
Provide more clarity as to what the impacts will be if we implement modest supply increase measures plus a new successful conservation program and then a serious drought occurs. This is related to the arithmetic question... after we calculate how much water we will have with new measures in place that protect fish habitat and maximize the top feasible supply opportunities (other than desalination) how short will we be in a serious drought. How will that shortfall affect our community?	Stratus Consulting Maddaus Water Management M-Cubed (David Mitchell) Rosenblum Environmental Engr	X	X	X						X
Achieve an understanding of the seriousness of the salt water intrusion problem for the City system. It is well (!) understood how serious the salt water intrusion situation is for the Soquel Creek District. However, the City of Santa Cruz system relies on the same aquifer for water and it becomes a fairly significant source for us in very dry years. What would the impact be if Santa Cruz were not able to fully utilize our wells in that aquifer?	Stratus Consulting Pueblo Water Resources Inc.	X	X			X	X	X		X
Ensure that many alternative ideas and proposals will be considered or reconsidered. While there are many other issues at play in our water discussion and debate, it seems the crux of that debate is a lack of confidence on the part of many in the community that alternatives to desalination have not been adequately explored. We must revisit those potential alternatives and determine 1) their viability and feasibility, 2) the quantity of water each can provide, and 3) the cost associated with each alternative.	Stratus Consulting Brown and Caldwell Pueblo Water Resources Inc	X	X		X	X	X	X	X	X
Make sure we are getting the most from our conservation effort. Adopt a new conservation program soon and demonstrate how much the community is able to save year in and year out.	Stratus Consulting Maddaus Water Management M-Cubed (David Mitchell)	X	X		X					
Examine the issue of how much our water supply needs are driven by growth and development. This is another element of our arithmetic problem that needs sharper numbers. How much do we need absent any growth in demand from new development? How much more water do we need, if any, to meet housing and economic development requirements.	Stratus Consulting Brown and Caldwell M-Cubed (David Mitchell)	X	X		X					X

WSAC – Water Supply Advisory Committee
UWMP – Urban Water Management Plan
HCP – Habitat Conservation Plan
LTWCMP – Long Term Water Conservation Master Plan
IRWM – Integrated Regional Water Management

CONTRACT AMENDMENT No. 1/Task Order No. 3

That certain Agreement dated July 16, 2014 between the City of Santa Cruz (City) and Stratus Consulting Inc., hereinafter called "Consultant" for Professional Services for Water Supply Reliability – Multidisciplinary Work Effort: Economics, Policy. Environmental Sciences, Natural Resources, be amended as follows. The terms of this Contract Amendment apply to all Consultant's duties and tasks under the Professional Services Agreement. All other terms and conditions of the original Agreement shall remain in effect.

Section 1, Scope of Work
Amend the original scope of work as per the attached Contract Amendment No. 1/Task Order No. 3 Scope of Work.

Section 2, Fees and Payment
Amend the current budget as per the attached budget estimate.

Technical Review by:

Heidi R. Luckenbach 2/11/15
Heidi R. Luckenbach, P.E. Date
Deputy Water Director/Engineering Manager

Approved As To Form:

2-18-15
John G. Barisone Date
City Attorney

Department Approval by:

By _____ Dated _____
Rosemary Menard, Water Director

Stratus Consulting Inc.

By _____ Dated _____
Robert S. Raucher, PhD

CITY OF SANTA CRUZ

By _____ Dated _____
Martin Bernal, City Manager

Stratus Consulting Inc
Contract Amendment No. 1; Task Order No. 3
Scope of Work
02/24/15

Original Contract Dated: July 16, 2014

Contract Amendment No. 1/Task Order No. 3, describes a series of tasks to be completed for the City of Santa Cruz as an addition to and extension of the original contract, Task Order No. 1 and Task Order No. 2. All Task Orders (TO) are issued under the contract dated July 16, 2014 between Stratus Consulting and the City of Santa Cruz (City). The original contract was set up as three broad phases as follows.

- Contract Phase 1: Reconnaissance and Review of Existing Information
- Contract Phase 2: Identifying and Characterizing the Potential Water Shortage Problem
- Contract Phase 3: Identifying and Evaluating Potential Solutions (Alternatives)

Task Order 1 focused on work under Phase 1; Task Order No. 2 allowed the Stratus Team to develop a technical work plan within all three phases, form the required technical team, and refine scopes of work; and Contract Amendment No. 1/Task Order No. 3 will fund implementation of the technical work plan. The following outlines specific work efforts, within each Phase, under Contract Amendment No. 1, Task Order No. 3.

Contract Phase 1: Reconnaissance and Review of Existing Information

TO 1 defined three tasks within Phase 1. (See attached Budget Estimate.) Expansion of Phase 1 under TO 2 and TO 3 is as follows:

Task 1.1(a): Continued and Expanded Subcontractor Recruitment, Contractual and Task Order Development, and Oversight (expansion of Task 1.1 from TO 1)

In accordance with the September 17, 2014 memo to the WSAC titled "Work Plan Development Update, and Subcontractor Recruitment and Preliminary Assignments," and subsequent materials shared and discussed with the WSAC, Stratus Consulting will continue to recruit, contractually engage, and work with the subconsultant team to provide the Committee with the types of analyses and information with which they can assess the potential water supply shortage (Phase 2) and evaluate the potentially relevant Alternatives and Management Actions (Phase 3). These work scope areas span a range of topics and tap into an associated array of technical specialties. Below (under the Contract Phase 3 description), abbreviated synopses of several technical work areas have been identified as being directly relevant to the Committee's ability to conduct informed deliberations. Specific timetables and work scopes will be developed in concert with the relevant technical experts. These are likely to start with initial investigations that will articulate a focused and well-defined set of technical next steps for possible follow-on work to further support Phase 2.

Table 1 provides a summary of the subconsultants that have been put forward for WSAC review, along with their credentials, and for whom WSAC has approved subcontracting. At this time,

this established team, together with the Committee, the Independent Review Panel, and City staff, appears sufficient to address relevant work scope items.

Note that the City has existing separate contractual agreements with several of the subcontractors (Fiske, Hagar, Chartrand, Lennihan, Maddaus, and Skaggs), and may opt to access these consultants through those other mechanisms (rather than under this contract agreement).

Table 1. Summary of sub-consultants approved to be added to the contract

Subcontractor	Individual(s)	Specialties
Andy Fisher (UC Santa Cruz)	Andy Fisher	**Hydrogeologist**; currently doing north county passive recharge and has done Monterey County active recharge work and will likely sit on a review committee for the groundwater model work being done by the City and Soquel Creek Water District
Balance Hydrologics	Shawn Chartrand	**Hydrologist/Geomorphologist**; Water balance modeling, streamflows
Brown & Caldwell	William K. Faisst Charles W. Joyce Jenny Gain James "Butch" Matthews	**Engineers**; Resource management, water management, regulations, water quality, economics, civil engineering; Designed 1990 upgrade to WWTF.
David Abbot	David Abbot	**Hydrogeologist**; groundwater supply, yield and watershed studies, aquifer storage
Ebin Moser + Skaggs, LLP	Sean Skaggs	**Attorney**; current HCP attorney, Fishery Endangered Species Act (HCP = Habitat Conservation Plan)
Gary Fiske and Associates, Inc.	Gary Fiske	**Engineer**; Water resource planning, *Confluence*® water resource planning model
George Tchobanoglous (UC Davis)	George Tchobanoglous	**Civil engineer**; specializing in innovative water and wastewater treatment systems
Hagar Environmental Science	Jeff Hagar	**Biologist**; Fisheries, resource management, water quality
HydroMetrics	Derrik Williams	**Hydrogeologist**; resource management, hydrogeology, water quality; history with Soquel Creek Water District and the state of the shared basin.
Lennihan Law	Martha H. Lennihan	**Attorney**; Water rights, regulations

Maddaus Water Management	Bill Maddaus Lisa Maddaus Michelle Maddaus	**Engineers;** Water resource planning
Luhdorff & Scalmanini	Vicki Kretsinger Grabert	**Hydrologist**; groundwater quality, environmental regulations, groundwater resource assessment
M-Cubed	David Mitchell	**Economist**; Resource management, water management, economics
Pueblo Water Resources	Michael Burke Martin Feeney Robert Marks Stephen Tanner	**Hydrogeologists/Engineer;** worked recently with City on Beltz 12 and Tait Street well projects, and in Monterrey County on ASR
Rose Env. Engineering	John Rosenblum	**Civil engineer**, specializing in industrial water and energy efficiency; evaluating the regional impacts of water efficiency measures on energy use and greenhouse gas emissions
Trussell Technologies	R. Shane Trussell R. Rhodes Trussell	**Engineers**; water quality, sanitary engineering, civil engineering, water reuse, desalination and filtration

To enable technical support from the relevant members of the full technical consultant team, this expansion of Task 1.1 authorizes Stratus to establish TOs with this approved subconsultant list; Stratus is currently working on the following team members, in concert with several Tasks, including Task 3.1 (described under Contract Phase 3):

1. Brown and Caldwell (BC): to provide engineering and related technical insights (especially regarding cost, technical feasibility, and potential yields) for a subset of Alternatives to be addressed by WSAC in Recon within the Multi-Criteria Decision Support (MCDS) model being developed by the WSAC Facilitation team. For WSAC Phase 2, under TO 3, BC will continue to evaluate supply-side Alternatives (see Task 3.2), providing WSAC with essential information with which to consider which supply options to recommend.

2. Maddaus Water Management (MWM): to provide professional technical insights (especially regarding cost, technical feasibility, and potential water savings/yields) for a subset of demand management Alternatives to be addressed by WSAC in Recon within the Multi-Criteria Decision Support (MCDS) model being developed by the WSAC Facilitation team. For WSAC Phase 2, under TO 3, MWM will evaluate the water savings, costs, distribution of costs across customers and the City, and other relevant factors associated with demand-side management Alternatives to be considered by WSAC (see Task 2.2). Alternatives to be considered will include ways to shave peak month water demands, and Program C from the draft water conservation master plan,

among others.

3. Rosenblum Environmental Engineering (REE): to provide professional technical insights (especially regarding cost, technical feasibility, and potential water savings/yields) for a subset of demand management Alternatives to be addressed by WSAC in Recon within the Multi-Criteria Decision Support (MCDS) model being developed by the WSAC Facilitation team. For WSAC Phase 2, under TO 3, REE will examine water conservation as may be attained through moving beyond existing building codes, and may also be tasked to examine other Alternatives in terms of potential water savings and/or energy requirements.

4. David Mitchell (M-Cubed) for his efforts under Task 1.2 to scope out demand forecasting, evaluating impacts of the current drought, and drafting a work scope for developing an econometric demand forecasting model for the City of Santa Cruz Water Department (SCWD) (the latter to establish the basis for a portion of the work to be executed under Task 2.2). For WSAC Phase 2, under TO 3, M-Cubed is being tasked with developing an econometric demand forecasting model that will provide much more accurate and useful demand projections than prior methods applied for the City (see Task 2.2). This work will be instrumental for developing the UWMP 2015 update mandated by the state, as well as informing WSAC deliberations.

5. Pueblo Water Resources (PWR): to provide hydro-geologic insights and analysis for WSAC Phase 2 (under TO 3) regarding several groundwater issues relevant to WSAC deliberations and City water supply and storage management. PWR will examine issues related to the suitability of regional aquifer systems for aquifer storage and retrieval (ASR), as a reservoir for recycled water under potential indirect potable reuse (IPR) Alternatives, and the potential yields, costs and reliability of possible future wells along the North Coast or elsewhere (see Task 3.5).

Additional TOs for subconsultants are likely to be developed and issued, to meet continuing and emerging needs for WSAC-related activities and to help meet other City obligations and needs.

Task 1.2(a): Expanded Effort related to Curtailment Impacts (expansion of Task 1.2 under TO 1)

Stratus Consulting, along with David Mitchell and SCWD staff, will continue to assess the economic and related impacts of the on-going drought and related curtailments on key portions of the Santa Cruz business community. This includes developing, conducting, and summarizing the results of roundtable discussions with key representatives of the community's landscape and nursery, golf, and hospitality sectors. Also included is development of a survey that the Chamber of Commerce has circulated to its members, to help assess the impact of the current drought and related curtailments on the regional economy. Additional related work on this topic, to be addressed under TO 3, is described under Task 2.3.

Task 1.2(b): Expanded Effort related to Climate Change and its Impacts and Implications for Santa Cruz Water Issues (expansion of Tasks 1.2 under TO 1)

Stratus Consulting is continuing to develop, review, and advise the technical team and WSAC on climate change (CC) projections and related scenarios. Among the application of these efforts will be assessing the impact of streamflows by integrating the CC results through the hydrologic stream-flow model (developed and run by Balance Hydrologics) and the water supply yield *Confluence® Model* (developed and run by Gary Fiske).

This CC-focused effort will include examining the range of CMIP3 and CMIP5 Climate Change Models (GCMs) used by the Intergovernmental Panel on Climate Change (IPCC), to help assess which GCMs are most suitable to reflect the range of plausible CC impacts (e.g., precipitation) for California. This also includes downloading, analyzing, and properly interpreting "downscaled" output from these GCMs, targeted for the cells associated with the SCWD-relevant watersheds. TO 3-related activities related to this line of inquiry are described under Tasks 2.1 and 2.2

Task 1.3(a): Enrichment Series for WSAC (expansion of TO 1 Task 1.3)

In response to requests by WSAC members for more background, and to better ensure the Committee has the depth and breadth of expertise necessary to make well informed technical recommendations to the City, the Stratus Team will develop and deliver a series of "enrichment activities" in a form that can dovetail with other Committee activities. The enrichment activities will focus on developing the Committee's pragmatic knowledge base concerning water supply planning. Some of the topics that are being considered for the Enrichment Series under TO 3 include:

a. Water and regional economic vitality (David Mitchell)
b. Conservation/Demand management (Maddaus)
c. History of Water Treatment Technology, and where we are headed (membranes, UV and Ozone today, and whether Forward Osmosis likely to be viable in the near future) – perhaps presented by Rhodes Trussell)
d. Water Reuse (potable and nonpotable) – Water Quality, Regulatory Development, and Public Health Perspectives (Trussell or Tchobanoglous)
e. Energy requirements and carbon footprints (Rosenblum)
f. Potentially others – numerous topics and associated presenters have been identified by WSAC and the Technical team, as summarized in a memorandum circulated as part of the February WSAC packet.

Stratus will work with the SCWD and WSAC to identify timeframes and formats for the enrichment activities. Up to 6 or more enrichment presentations may be provided.

Contract Phase 2: Identifying and Characterizing the Potential Water Shortage Problem

While three tasks were described in Contract Phase 2 under TO 1, no work was authorized. Initial planning and scoping work on these tasks has been developed under TO 2. Under TO 3, this analytic work will be fully developed to assist WSAC to better assess the community's water challenges (problem definition) and, thus, better evaluate the Alternatives available to help address the problem.

Task 2.1: Updating Information on Current and Future Water Supply

This Task addresses issues related to the current water supply portfolio for SCWD, and what yields might be expected over coming years and decades due to a variety of relevant factors. These factors include, but are not limited to, variability under current climate (including extended multi-year drought periods, such as observed from the Paleo-climate data for periods in predating the 20th century); changes in precipitation and temperature under relevant climate change scenarios reflecting a plausible range of future outcomes; instream flow requirements associated with fishery-related Habitat Conservation Plan (HCP) mandates or other initiatives; the complex interaction of climate and fishery flow considerations; and the vulnerability and water quality/quantity implications of sea level rise, saltwater intrusion, and other climate- and non-climate factors that may impact future supply yields.

Scenario Development and Scenario Planning: Portions of the work under this task are an extension of Task 1.2(b), and includes "Scenario Development" in which Stratus will continue to work with the Committee to develop scenarios that represent large future uncertainties driven by external forces (such as climate- and seismic risks). The objective of this aspect of the task is to refine the future scenarios to three or possibly four. Each scenario will be articulated in a short written narrative that captures the significant driving force for water supply and demand in each plausible future. Scenario development and scenario planning exercises are a key component of WSAC activities in WSAC Phase 3, and will be developed under TO 3.

Climate Change (CC) Impacts: As noted above, a key aspect of this effort will focus on how CC will impact Santa Cruz's water future. Some aspects to be considered under this task are bulleted below.

- What impact will the range of projected changes in the levels and patterns of future precipitation and temperature have on supply? Demands? Water Quality?

As presented to the WSAC in past meetings and related written materials, climate change is likely to have a range of potentially significant impacts on Santa Cruz and its water future. In concert with developing relevant future "Scenarios" to help guide evaluations of future supplies and demands, Stratus has been developing a range of temperature and precipitation projections based on the latest IPCC and the Department of Water Resources (DWR) endorsed models and methods (e.g., as circulated in written materials prior to the July meetings, and as presented during those meetings). Under TO 3, Stratus will continue the process of working with Shawn Chartrand (Balance Hydrologics) and Gary Fiske (Gary Fiske and Associates) in conducting investigations of: (1) how projected climate changes can be integrated into the hydrologic instream flow model, and then (2) how those flow results can be integrated into the Confluence model to project water system performance (e.g., surface water yields and associated projections of system reliability).

- Sea Level Rise and Climate-Related Extreme Events – Developing a Preliminary Vulnerability Assessment

Climate change and climate variability has numerous pathways through which it may impose risks to Santa Cruz's water resources, related infrastructure, and the community as a whole. Sea level rise (and storm surge), extreme precipitation events, drought, and wildfire are among the

possible climate-related events to which the system will be vulnerable to water quality degradation, inundation, and other adverse impacts. A preliminary assessment of such vulnerabilities has been explored by the Water Department, and Stratus will work with the Department, under TO 3, to convey these risks within a "risk profile matrix" To help WSAC consider the broad range of system risks as it evaluates the merits of possible future water supply and demand management Alternatives.

Fisheries: Flow Requirements and Impacts on Yields:

- What will HCP requirements entail for surface water yields? How does Climate Change potentially interface with HCP instream flow requirements and impact yields?

In concert with the Habitat Conservation Plan (HCP), the City is already working with Jeff Hagar and Shawn Chartrand to evaluate how fish flow requirements translate into instream flows and hence (via Gary Fiske and the *Confluence* model), into water system yields and performance. As noted above, under TO 2 and TO 3, Stratus Consulting will continue working with these subject area experts to help factor climate change impacts into these calculations. The coupling of potential climate change impacts with HCP-driven fishery flow requirements is an essential component of examining Santa Cruz's water future under various scenarios.

Task 2.2: Updating Information on Future Water Demand, and Associated Gaps between future supply and demand.

- How far can Santa Cruz go in reducing demands, what will that cost, and who bears those costs?

Amongst the principles stated in the Committee's charge is that "conservation is a cornerstone of our water profile and should be maximized." The SCWD has been working with Maddaus Water Management to develop a Long Term Water Conservation Master Plan. This plan will provide direction to the City for maximizing water conservation efforts.

A supplemental effort to the on-going Maddaus work with the Water Department is required to provide WSAC with a broader understanding of what levels of aggregate (and disaggregated) water demand may be feasible, which in turn raises questions such as what additional conservation and water use efficiency measures are available, what they will cost, who will bear those costs, and what they are likely to attain in terms of water use reductions.

Under TO 3, MWM is being tasked to focus on an Alternative for managing seasonal peak demand, as peak season demands appear to be particularly relevant to the Committee's deliberations (as summer season demands are what drive the "gap" observed between supply and demand in drought years). Maddaus Water Management is being tasked to identify various conservation approaches (voluntary and mandatory, across sectors and customer classes) and evaluate the potential water savings, costs, and other relavnt considerations for these options and associated implications.

Also under TO 3, MWM is being tasked to update its "Program C Recommended" option from the draft Water Conservation Master Plan, so that it can be presented to WSAC as one of the demand side management Alternatives for Committee consideration. This effort will also support the City's efforts to refine and finalize the Water Conservation Master Plan.

- Demand Forecasting: Econometric Demand Modeling

A critical aspect of effective water planning includes developing reliable demand forecasts. For many water utilities across North America, this has emerged as a significant challenge, as past traditional forecasts have often failed to capture the level and persistence of declining per capita demands due economic, technologic and other changes. (This has become a very widespread issue throughout the water supply sector, resulting in over-estimated demands and associated "revenue gaps" and other problems).

Moving forward, demand forecasting using econometric (i.e., advanced statistical) methods enables a much more robust and useful approach to predicting and understanding how demands may change as a result of changes in prices (water rates), incomes, weather, and other relevant factors. Econometric demand forecasting also provides a measure of economic loss associated with different levels of curtailments.

As part of TO 1 and TO 2 efforts, Stratus is has been scoping out such a demand forecasting effort, with David Mitchell (M-Cubed) working in tandem with Stratus Consulting and SCWD. Under TO 3, Mr. Mitchell will lead development of an econometric demand forecasting model for Santa Cruz. This work will be useful for WSAC deliberations and also will be a central component of the City's work in developing the state-mandated 205 revision of the Urban Water Master Plan (UWMP).

Task 2.3: Re-evaluating Curtailment Assumptions and Assessing Curtailment Impacts

In concert with SCWD, Stratus has conducted roundtable discussions with members of the local business community to assess the impact of the current drought and curtailments on enterprise-level water use and business performance. Our focus includes the "green" (e.g., plant nursery, landscaping, golf course) and hospitality (e.g., hotels, eateries) sectors. This effort is also assessing the level and manner in which water use efficiency measures have been implemented, and the degree to which conservation and the water use curtailments have reduced water consumption in some businesses. This is an ongoing activity (initiated under Phase 1), conducted jointly by Stratus, David Mitchell (M-Cubed), and SCWD.

Under TO 3, the Stratus Consulting team, in concert with the SCWD, will continue to assess the impacts of curtailments on key business sectors and local/regional economic vitality. This will include reviewing data gather by the Chamber of Commerce, and other data and studies as needed to assist WSAC in its consideration of the economic impacts of water supply curtailments.

Contract Phase 3: Identifying and Evaluating Potential Solutions (Alternatives)

No tasks were identified or authorized in Contract Phase 3 under TO 1. Initial planning and scoping work on these tasks has been developed under TO 2. Under TO 3, this analytic work will be fully developed to assist WSAC to better assess the community's options (the "Alternatives") for addressing its water challenges. All of the Tasks under Contract Phase 3 are intended to provide WSAC with critical information with which to better evaluate the Alternatives available to help address and shape the City's water future.

Task 3.1: Initial review and characterization of ~12 potential Alternatives for Recon MCDS model exercise; consolidation of full set of alternatives for Real Deal Analysis

This task has several areas of focused activity (and was largely executed as a core part of TO 2, with some aspects to be continued under TO 3):

1) Create summary information for a selected representative subset of the alternatives presented at the Water Supply Convention, along with any other additional options requested by WSAC or SCWD. Information in the summary table will be taken from the write ups prepared by submitters.

2) Develop a list of 12 or fewer Alternatives for review by the Committee at the November meeting and for use in the MCDS model as part of the Recon process. Stratus will ensure that the 12 possible alternatives:

    i) cover a wide range of options,
    ii) are available for discussion in November WSAC meetings, and amended if/as needed and approved by the Committee, and
    iii) can be used by the Committee for MCDS Recon rating between November and December meetings and further explored in the December meeting MCDS process.

3) Identify and suggest for the Committee's consideration, possible collapsing of similar alternatives into a single project. This would include creation of hybrid alternatives and will assist in eliminating duplicates from being carried forward. This work area will also ensure that no gaps occur in the range of alternatives for future consideration. This consolidation of Alternatives is an important element that will be continued under TO 3)

4) Develop, where feasible, *initial and preliminary* information for the approximately 12 Alternatives on two important data points: project yield, and project costs. This information will be developed with Brown and Caldwell. The objective is to provide the format for this information for the November meeting, and then provide *initial and preliminary* information for all of the ~12 Alternatives by early December (to facilitate use of the MCDS model).

5) Develop, where feasible, *initial and preliminary* information for criteria (other than cost and yield) identified by the Committee, for use in the December MCDS process (and as a starting point for the Real Deal assessments). Examples of the kind of data that would be drawn from the proposals, or developed by the technical team include:
    i) for demand management options, targeted water use (peak/off peak, indoor/outdoor, residential/commercial), yield/savings, cost per million gallons (MG), public sector (e.g., utility-borne) costs, private (e.g., customer-borne) costs, lifecycle costs;
    ii) for storage options, volume, yield, source of water, cost per MG, lifecycle costs;
    iii) for new supply options, yield, cost per mg, lifecycle costs;
    iv) for system optimization options, costs, yield.

6) Under TO 3: Continue to consolidate the full set of more than 70 Alternatives provided to the WSAC before, during and following the Water Supply Convention into a manageable yet

comprehensive set of alternatives to be further analyzed during the WSAC Phase 2 (Real Deal). In concert with the Planning subcommittee, the Stratus team – largely entailing engineering experts from Brown and Caldwell -- will evaluate each of the alternatives, combine common themes, and recommend for approval to the WSAC a reduced collection of alternatives.

Task 3.2: Lifecycle Costing and Technical Scoping for Key Alternatives (Water Supply Options)

The Committee will ultimately need to have reasonably accurate estimates of the cost, technical feasibility, scalability, and other key aspects of the various water supply (and demand management) alternatives it wishes to consider. This will be especially relevant as the WSAC moves into the "Real Deal" phase of its deliberations. Under TO 2, Brown and Caldwell was tasked with initiating this exercise in the near term, so that initial findings under Task 3.1 could help guide Recon efforts. Under TO 3, more in-depth, sie-specific, and detailed analysis will be developed so that WSAC can make better informed decisions about which Alternatives it may wish to recommend for further City consideration.

Efforts under TO 3 will include assessments of infrastructure and treatment needs, including pipe/pumping needs, land acquisition, and so forth – as well as permitting costs – as needed to develop preliminary estimates of initial capital outlay (implementation) costs. Operation and maintenance (O&M) costs also need to be characterized, as well as energy and residuals management requirements. Water Department expertise and past reports will help guide and inform this effort. This work also needs to be coordinated with the initial scoping of energy requirements and carbon footprints (Task 3.3, below). Options to explore should include the baseline, water reuse, water exchanges, seawater desal, and others as put forward by the Committee.

Task 3.3: Energy Requirements and Carbon Footprints of Potential Water Options

- Preliminary assessment of energy requirements and carbon footprints for key alternatives

Energy use and the associated carbon footprints of various potential water supply alternatives are a significant concern in Santa Cruz. Each of the possible water-related futures for the City (including the status quo "baseline") has an associated energy requirement and carbon footprint.

Under TO 3, it is anticipated that a preliminary assessment of the energy and carbon footprint implications of key water technologies and management strategies will help guide initial evaluations and focus where more in-depth analysis may be warranted. Stratus will likely work with Brown and Caldwell, and possibly John Rosenblum (REE) to provide a preliminary assessment in which they develop preliminary estimates of energy use and carbon footprints associated with the baseline (including possible water treatment or pumping upgrades as may be required for continued water quality compliance), desal, water reuse, water exchanges, demand management, and other relevant Alternatives. This effort will draw on available past studies and may entail engineering-related support from Trussell Technologies and/or other team members.

- Opportunities for tapping green energy and/or providing meaningful carbon offsets

Extracting, treating, and distributing water inevitably requires a considerable amount of energy consumption. Are there meaningful ways in which the City can minimize its water-related energy use, tap into green energy, and/or provide meaningful carbon offsets? Under TO 3, this may be a topic WSAC wishes to explore, possibly after (or in concert with) the work item defined above. The Stratus Team is in a position to address many if not all of these issues.

Task 3.4: Water Storage (Inter-seasonal and/or Inter-annual) and Groundwater Management

Water storage is a critical and extremely valuable component for managing water supplies where demands and yields tend to vary considerably across seasons, and across years (e.g., summer months when demands tend to be greatest but precipitation and water supply availability tend to be limited). Storage can be accomplished with surface reservoirs (on stream or off stream), or by using aquifer systems for subsurface storage and retrieval.

Developing additional on-stream surface water storage (e.g. a new or expanded reservoir) has not been an institutionally feasible option over the past few decades. The current drought and related water bond passed on the November 2014 ballot may facilitate new surface storage efforts. In addition, several of the Alternatives suggested for the Water Supply Convention centered around developing more surface storage. Hence, some surface water storage investigations is warranted (on stream and/or off-stream). Under TO 3, several variations of possible surface storage will be investigated (in concert with Task 3.2). In addition, work items addressing two other water storage-related alternatives are provided below.

- On-stream (surface) Storage – What if we modify how we operate Loch Lomond?

WSAC discussions have revealed an interest in assessing whether changes in how the existing Loch Lomond reservoir is managed may better align available supplies with demands. This is a line of inquiry that may be investigated under TO 3 through application of the *Confluence* model to explore various alternative Loch-related management strategies (e.g., sensitivity analyses). This also builds upon efforts for providing WSAC with a better understanding of the inner workings of the *Confluence* model (e.g., transparency regarding required inputs, calculating routines, and outputs). One specific investigation regarding the Loch and its management that may be pursued under TO 3 will be to assess how the water system and community fare under current and alternative operating guidelines (e.g., for maintaining minimum storage levels), in a scenario in which there is an extended (e.g., 6- to 8-year) drought. This may be assessed through running this set of conditions through the *Confluence* model.

- Groundwater storage -- Feasibility of Aquifer Storage and Retrieval (ASR)

Aquifer systems can provide extremely valuable settings for storing and retrieving water. This can be a viable and valuable approach where hydrogeologic conditions enable ASR (physical and technical feasibility), and where there are waters periodically available for storage. In Santa Cruz, water for possible ASR storage could be provided by high winter season streamflows, and/or by using highly purified reclaimed water (water reuse). Other sources of water for potential storage may also be available.

Under TO 3, Pueblo Water Resources is being tasked to examine a suite of technical questions for Santa Cruz on whether any of the regionally available aquifer systems is suitable for ASR.

Some of the applicable technical questions include: Is there underground capacity in any of the regionally available aquifer formations to store a useful quantity of water? Is there a reasonable way to place water into those systems (e.g., recharge basins, injection wells)? Can the water placed in these aquifer systems be stored and retrieved (without large losses, or without adverse water rights implications)? Will there be undesirable water quality impacts?

Under TO 3, Stratus, through PWR, and possibly HydroMetrics, is initiating a technical review of the existing knowledge about regional groundwater systems, to provide WSAC with a summary of what is known, and what key unknowns remain, regarding the potential viability of ASR or other approaches to making better and sustainable use of the region's aquifer systems (including possible indirect potable reuse). Our preliminary understanding is that the groundwater systems in the region are complex, and that there is limited definitive knowledge about several key hydro-geologic issues (i.e., the physical ability of any of these systems to provide a reliable setting for storing and retrieving water). The City and Technical team have identified Pueblo Water Resources as best suited to leadthis effort, with review and input from Andy Fisher (as available), and with subsequent review and input from the Independent Review Panel (IRP, notably, Mike Cloud). Input and involvement from other hydrogeologists and regional water experts (e.g., HydroMetrics, John Ricker) may be valuable as well.

- Viability of Developing North Coast Brackish (or other regional) Wells

In our review of "past alternatives" considered in the region, we found that the option of developing brackish groundwater wells along the North Coast had emerged as the most promising alternative in the mid-1990s. However, the planned investigation of that alternative was aborted before test wells could be developed and pilot tested.

Under TO 3, PWR is being tasked to provide an initial review of what is known about the feasibility, potential yields, and potential challenges associated with the possibility of developing this alternative. This will be a modest -level effort initially, until and unless the information assembled provides a reasonable indication that this alternative may indeed be technically and institutionally feasible, and may provide reasonably-sized yields.

- Seawater intrusion and coastal wellfields – how large a risk, and what might be done?

Seawater intrusion into coastal aquifer systems is a concern for City wells, as well as for water systems in neighboring communities (most notably, Soquel Creek Water District). Sea level rise and elevated storm surge from climate change are likely to exacerbate challenges associated with current extraction levels. The City has completed a preliminary assessment of what is known about these vulnerabilities (WSAC August agenda); their implications (e.g., for yields, water quality, and treatment requirements), and potential remedies should be further evaluated (e.g., the potential feasibility of hydrologic barrier wells to recharge coastal aquifers while concurrently managing seawater intrusion). Under TO 3, some additional work may be pusued, depending on direction from WSAC and the availability of project resources. The intent of this potential TO 3 work effort is to gather and articulate what is known, and to define what core questions need to be examined in order to more fully assess the risks and potential remedies.

Task 3.6: Water Recycling

Water reuse is an alternative that may be viable and valuable to consider. There are various forms of reuse, typically characterized as

- Nonpotable reuse (NPR, such as may be used for irrigation or industrial processes)
- Indirect potable reuse (IPR, such as may be implemented through ASR, for example, and which is gaining fairly widespread application throughout California and other locations), and
- Direct potable reuse (DPR, for which the State of California currently is developing enabling regulations – due by 2016).

A series of investigations are warranted for water recycling, as described below.

- How much reclaimed water might be available (potential yield)?

A core question is how much water is available for potential reclamation in Santa Cruz. The answer depends on the volume of wastewater effluent discharged from the wastewater treatment plant (which in turn is driven largely by the volume of indoor water use in the City and the portion of the County where effluent is directed to the wastewater treatment plant). Other potentially important factors may include (1) the volume of effluent discharge that the City needs to meet regulatory requirements (e.g., dilution, flows, which may vary seasonally), (2) the volume of wastewater that may be "scalped" by the county for reuse before the effluent reaches the wastewater facility, and (3) the percentage of product water generated by the "complete advanced treatment" process train deployed for reclaimed water. Under TO 2, BC helped in developing this estimate. Some refinement may be relevant under TO 3.

- Potable Reuse: what are the options, public health implications and perceptions?

Potable reuse is gaining increasing acceptance from the scientific and regulatory community, as well as from the general public (as evident through potable reuse programs in Orange County, San Diego, Santa Clara Valley, Chino Basin, El Paso, Singapore, and elsewhere). Under TO 2, Stratus provided WSAC with an initial overview of the key issues, approaches, and comparative advantages and disadvantages of the various water reuse options (IPR, NPR, as well as DPR).

Under TO 3, this may be supplemented in the form of an "enrichment" presentation (e.g., by Rhodes Trussell or George Tchobanoglous), a short written report (which can be based largely on a White Paper being completed by Bob Raucher and for the WateReuse Research Foundation), developing a "library" of information (reflecting a range of perspectives) that WSAC and the public can review to explore public health and other issues, and (or) a short briefing presentation in a WSAC meeting.

Contract Amendment No. 1/Task Order No. 3
Budget Estimate
(Rev. Feb. 2015)

	Task Order No. 1		Task Order No. 2		CO 1 Task Order No. 3	
	Budget	Duration(wks)	Budget	Duration(wks)	Budget	Duration(wks)
Phase 1 Reconnaissance & Review of Existing Information			$ 60,000	11/1/14 - 2/28/15		
Task 1.1 Project Management & Administration	$ 30,000	7/16/14 - 5/31/15				
Task 1.1(a) Continued/Expanded Subcontractor Recruitment, Contractual & TO Development, & Oversight					$ 35,000	3/1/15 - 10/2/15
Task 1.2 Reconnaissance & Review of Existing Analysis, Reports & Data	$ 30,000	7/16/14 - 5/31/15				
Scoping of Econometric Demand Forecast Modeling	$ 10,000	4				
Scoping for Evaluation of Conservation and Drought related Curtailments	$ 6,000	4			$ 50,000	3/1/15 - 7/31/15
Scoping for Evaluation of Impacts of Climate Change	$ 8,000	4				
Task 1.2(a) Expanded Effort related to Curtailment Impacts						
Task 1.2(b) Expanded Effort related to Climate Change & its Impacts and Implications for Santa Cruz Water Issues						
Task 1.3 Team Support for, and Participation in, Committee and Other Meetings	$ 80,000	7/16/14 - 5/31/15			$ 80,000	3/1/15 - 10/2/15
Task 1.3(a) Enrichment Series for WSAC					$ 75,000	3/1/15 - 10/2/15
Phase 2 Identifying & Characterizing the Potential Water Shortage Problem			$ 46,000	11/1/14 - 2/28/15		
Task 2.1 Updating Information on Current Water Supply					$ 60,000	3/1/15 - 7/31/15
Task 2.2 Updating Information on Future Water Demand					$ 90,000	3/1/15 - 7/31/15
Task 2.3 Re-evaluating Curtailment Assumptions and Assessing Curtailment Impacts					$ 40,000	3/1/15 - 10/2/15
Phase 3 Identifying & Evaluating Potential Solutions			$ 80,000	11/1/14 - 2/28/15		
Task 3.1 Initial Review & characterization of ~12potential Alternatives for Recon MCDS model exercise/consolidation of full set of alternatives for Real Deal Analysis						
Task 3.2 Lifecycle Costing & Technical Scoping for Key Alternatives (Water Supply Options)					$ 180,000	3/1/15 - 8/31/15
Task 3.3 Energy Requirements & Carbon Footprints of Potential Water Options					$ 35,000	3/1/15 - 7/31/15
Task 3.4 Water Storage (Inter-seasonal and/or Inter-annual) & Groundwater Management					$ 80,000	3/1/15 - 7/31/15
Task 3.5 Water Recycling Issues and Options					$ 26,000	3/1/15 - 7/31/15
Total	$164,000		$186,000		$751,000	

City of Santa Cruz
BUDGET ADJUSTMENT REQUEST

PAGE 1 OF 1

⊙Council Approval ..... Resolution No. _____
○Successor Agency ..... Resolution No. _____
○Administrative Approval

⊙Current Fiscal Year
○Prior Fiscal Year

TO: FINANCE DIRECTOR
FROM:

DATE:

ACCOUNT	REVENUE EDEN ACCOUNT TITLE	
	TOTAL REVENUE	0

ACCOUNT	EXPENDITURE EDEN ACCOUNT TITLE	
711-70-91-7153-57302	Water systems	(525,700)
c700305-100-2020-0	Water Supply Project	
715-70-91-7153-57302	Water systems	(225,300)
c700016-100-2020-0	Water Supply Project - SDC	
711-70-91-7153-57302	Water systems	525,700
c701402-100-2020-0	Water Supply Reliability	
715-70-91-7153-57302	Water systems	225,300
c701403-100-2020-0	Water Supply Reliability - SDC	
	TOTAL EXPENDITURE	0

NET: $ 0

Purpose:

Move appropriations from the Water Supply Project (projects c700305 and c700016) to the Water Supply Reliability projects (c701402 and c701403) to cover the cost of the change order to the Stratus Consulting contract for technical and analytical support to the Water Supply Advisory Committee

REQUESTED BY	DEPARTMENT HEAD APPROVAL	ACCOUNTING APPROVAL	FINANCE DIRECTOR APPROVAL	CITY MANAGER APPROVAL
Malissa Kaping	Rosemary Menard	Patty Haymond	Patty Haymond	
02/13/15	02/13/15	02/18/15		

Revised September 2012

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WATER DEPARTMENT
MEMORANDUM

DATE: March 2, 2015

TO: Water Commission

FROM: Heidi Luckenbach, Deputy Water Director/ Engineering Manager

SUBJECT: Review of Draft 3-year Capital Improvement Program and Update on Major Projects

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RECOMMENDATION: Receive Information and provide feedback to staff on the Water Department's Capital Improvement Program for FYs 2016 – 2018.

The Water Department is completing a draft of its proposed Capital Improvement Program (CIP) for fiscal years 2016 – 2018. The attached spreadsheet includes the following elements of the proposed CIP.

- Project by Category – this column includes projects that are recently completed, ongoing, starting during the FY2016-2018 timeframe, or defined but not due to start until after FY2018. Projects are organized by categories including Water Sources, Treatment of Water, Distribution of Water, Facilities and Storage of Water.
- FY 2014 includes amounts spent during that fiscal year.
- FY 2015 includes amounts budgeted for that fiscal year. Remaining budget may or may not be rolled into FY 2016 depending upon the project status and need.
- Individual cells are shaded: tan represents evaluation, green design, blue construction. Annual projects, such as the *Water Main Replacement – City Engineering,* do not include these phases because evaluation/prioritization is ongoing, and design/construction typically overlap.

The Water Department has been working towards a process for scheduling projects for implementation that is more data-driven than the current prioritization methods. The approach taken this year, and will be revisited each year, adds risk optimization to previous prioritization methods. As part of the process Water Department staff met for several half-day sessions to consider two specific dimensions of risk:

- The impact or consequence of a failure or other negative outcome occurring; and
- The probability or likelihood that the failure or other negative consequence will occur.

Each project was reviewed by staff within this added risk-consequence framework; project scopes, schedules and budgets were adjusted occasionally as a result of this additional

consideration. This is an ongoing process that will become more valuable and robust each time it is revisited.

Below are brief summaries of several projects; engineering staff will report on several of the larger projects and be available for questions.

Capital Improvement Project Updates

BSR Reconstruction (c700313, c700027) The Bay Street Reservoir was constructed in 1924 to store raw water from the City's North Coast sources. The facility was later re-purposed as a treated water reservoir, storing and distributing treated water from the Graham Hill Water Treatment Plant. In the mid-1970s, a roof was added to meet the requirements of the Safe Drinking Water Act. By the mid-1990s, the roof structure showed signs of deterioration and an investigation indicated structural problems which ultimately led to a full replacement of the Bay Street Reservoir.

The project has been divided into multiple phases:

Phase 1: Installation of four temporary bolded steel tanks;

Phase 2: Construction of Tank 1 (put into service on October 22, 2013);

Phase 3: Demolition of the 4 temporary tanks and construction of Tank 2 (Tank 2 construction began in January 2014 and will be ready for service by April 2015);

Phase 4: A future phase will include final site treatments including fencing and landscaping as well as evaluation of roof top solar. (The majority of Phase 4 work is included in the project budget; solar evaluation and installation is currently funded through a new project currently titled *Photovoltaic Systems Evaluation and Construction.* This project will likely be ongoing and focus on various facilities; FY 2016 will focus on the Bay Street Tanks.)

Beltz Well #12 (c701003) With variations in the elevation of coastal groundwater levels, some groundwater pumping has been shifted further inland so as to maintain protective groundwater levels in the Western Purisima. The Beltz Well #12 Well and Treatment Plant was completed December 2014 and is operating as expected. No new funds will be allocated towards this project in FY 2016.

San Lorenzo River Diversion and Tait Wells (c709872) The City has operated several wells on Crossing Street referred to as the Tait Wells. Presently only Tait Well No. 1 and 4 are operational. This project includes a condition assessment of the existing diversion and wells including consideration of sanding issues, potential dam replacement, potential use of an infiltration gallery, construction of two new wells (to replace Tait Wells 1 and 3), and rehabilitation of existing Tait Well No. 4. Combined output of these wells will be restored to historic levels of 1 MGD. The design, permits, and property acquisitions will be finalized in FY 2016, and construction of the new wells will occur in FY2017.

North Coast System Rehabilitation Project (c709835) The Santa Cruz Water Department (SCWD) has operated and maintained the 16-mile long North Coast System since the 1880s.

The system relies entirely on rainfall runoff and emergent groundwater to supply the City with approximately 30 percent of its overall water supply. The diversion structures on its four coastal streams (Liddell, Reggiardo, Laguna and Majors creeks) range in age from approximately 90 years to over 130 years. In June 2004, the City undertook the preparation of a program-level Environmental Impact Report (PEIR) for this project which addressed the potential impacts and mitigation measures for the overall system repairs. The PEIR was certified by City Council at a Public Hearing held on November 8, 2005. The rehabilitation work is estimated to require 15 to 20 years to complete. Two sections have been completed which include the alignment along High Street to the Coast Pump Station. Phase three includes a three mile segment along the coast; design is nearing completion, property appraisals for easement acquisitions and permitting are nearly complete; and construction is planned to begin July 2015 and will require two construction seasons to complete. As described in the earlier preliminary design work, there will be three phases remaining.

Main Replacements (c700002, c700003, c700004, m701105, c709833, c700017) The Water Department budgets funds annually to replace existing water mains. These projects are initiated by the Engineering and Distribution Divisions, outside agencies, and customers. Department-initiated projects are established annually through the use of a prioritization matrix developed by the Water Department's Engineering Division. Many factors balancing the risk of failure with the consequence of failure are considered including:

- the need to maintain water system reliability and water quality,
- deliver adequate fire flows,
- improve circulation, and,
- reduce maintenance costs.

Water Main Replacements – Outside Agency projects are budgeted annually to accommodate and partner with outside agency work such as County or City Public Works paving projects and water mains required for new development.

Due to the drought conditions, last year's *Water Main Replacements – City Engineering* project was postponed to conserve the potentially large volumes of flushing water needed to disinfect new water mains. The replacement program will resume this year with a project on Soquel Avenue from Branciforte Avenue to Morrissey Boulevard Street beginning spring 2015.

Beltz Treatment Plant Reclaim Tank Replacement (c701101) The Beltz Treatment Plant Reclaim tank was built in 1971. In 2002, a liner was placed into the tank to mitigate leaking; however, it was determined that a new tank was needed. Bids were received in September 2012 for a new tank and came in 50% higher than the engineer's estimate. The scope of the project was refined and rebid; the project was awarded to Monterey Peninsula Engineering for $159,000. The tank was completed in spring 2014.

GHWTP Filter Rehabilitation and Upgrades (c701303) The Graham Hill Water Treatment Plant (GHWTP) Filter Rehabilitation and Upgrades Project is the first step in the phasing of various process improvements at the plant. The Filter and Rehabilitation Project will improve the overall condition, performance and reliability of the granular media filters. A construction contract was awarded in July 2014; construction of the improvements started in November 2014 and is

expected to be completed in early 2016. No new funds are allocated towards the project in the FY 2016 CIP.

Recoat University Tank 2 (m701202) The University Tank 2 (U2) is a one million gallon welded steel potable water tank that was constructed in 1959. This tank supplies water to the upper west side of the water service area. As a critical component of the system that serves the University, it has been challenging to remove it from service for any significant period of time. However, a new pumping system and a small maintenance tank were installed which allowed the U2 Tank to be taken offline for a detailed inspection and the subsequent rehabilitation project, and will facilitate future maintenance. Bids were received in March 2013 for a new roof and interior/exterior coatings; the project was awarded to Crosno Construction Inc for $982,000. The tank was completed in May 2014.

Rehabilitate Delaveaga Tank (m701304, m701401) The DeLaveaga tank site contains two 1 million gallon riveted steel potable water storage tanks. The tanks were constructed in 1935 and have been periodically repainted since initially being placed into service. The City entered into a maintenance contract in 2008 to provide inspection, maintenance, cleaning and painting upgrades for the tanks but that contract was terminated and the tanks remained offline. A subsequent engineering analysis recommended repainting the tanks and performing roof repairs. Bids were received in November 2012 for new interior/exterior coatings and roof repairs; the project was awarded to Farr Synthetic Coatings. The West tank was completed in November 2013 and a change order issued for the East tank, which was completed in October 2014. Total cost was $1,377,669.

Attachments
Attachment 1 Draft Water Department Capital Improvement Program, FY 2016-2018
Attachment 2 Example Risk Consequence Matrix

Water Department Proposed Capital Improvement Program, Fiscal Years 2016-2018

Projects by Category	Project #	Description	FY2014	Estimated Year-End Exp or Carry over FY2015	Budget new appropriations FY2016	FY2017	FY2018
WATER SOURCES							
Coast Pump Station Rehab	c70xxxx	Replace/Rehab Motor Control Center					
Felton Diversion Evaluation & Updgrade of Dam and Pump Station	c701602	Evaluate existing dam and pumps and rehabilitate as needed. Includes evaluation of subsurface intake(s).			$ 300,000		
Laguna Dam	c7016xx	Evaluate condition of dam and make recommended modifications. Project will follow completion of anadromous HCP.					
Loch Lomond Slide Gates	c700309	Evaluate condition of and repair/replace the five existing slide gates located on the upstream face of the Newell Creek Dam.					
Majors Creek Diversion	c70xxxx	Evaluate condition of dam and make recommended modifications.					$ 300,000
San Lorenzo River Diversion and Tait Wells	c709872	Evaluate condition of dam, intake and wells; construct new wells, and potentially modify dam/intake.	$ 16,566	$ 253,434	$ 300,000	$ 1,600,000	
Water Supply Project	c700305/ c700016	Following the adoption of the Integrated Water Plan, the investigative phase of the desalination project spanned 8 years and funded the SWRO pilot project, intake studies, preliminary design, DEIR and various other studies.	$ 376,005	$ 1,683,735			
Water Supply Reliability	c701402/ c701403	Support the Water Supply Advisory Committee to explore the City of Santa Cruz's water situation and potential supply options.	$ 121,789	$ 1,078,211	$ 500,000		
Subtotal Water Sources			$ 514,360	$ 3,015,380	$ 1,100,000	$ 1,600,000	$ 300,000
TREATMENT OF WATER							
Beltz Monitoring Wells	c701002	Construct inland monitoring well network to monitor groundwater elevations and water quality in the inland portion of the Purisma.	$ 80,900				
Beltz 10	c709830	Replace Beltz Well #7 with new well					
Beltz 11	c700026	Convert existing monitoring well at site of Beltz 7 and 10 to a production well.				$ 70,000	$ 300,000
Beltz 12	c701003	Add groundwater well and wellhead treatment inland to distribute pumping away from the coast.	$ 1,693,864	$ 1,755,427			
Beltz Treatment Plant Reclaim Tank Replacement	c701101	Replace existing tank with steel bolt-up tank	$ 179,763				
Beltz Treatment Plant Rehabilitation	c700020	Ongoing maintenance to maintain reliable operation.					
Concrete Tank Assessment & Rehabilitation	c701501	Evaluate concrete tanks, develop repair/rehab plan, implement plan. Includes $145,000 endowment for MHJB HCP mitigation.		$ 233,320	$ 250,000	$ 2,000,000	
~~WTP Basin & Filter Cover~~	c701601	Covering of the sedimentation basins to reduce debris and sunlight					
WTP Solids Handling	c70xxxx	Evaluate treatment and disposal of solids produced at the GHWTP. Evaluation will occur with project c701501.			$ 250,000	$ 500,000	
WTP Filter Rehabilitation and Upgrades	c701303	First project to the current phasing of improvements at GHWTP. See project "Water Treatment Upgrades."	$ 461,197	$ 4,723,994			
WTP Flocculator/Sedimentation Improvements	c701502	Replace aging paddle wheel flocculators and improve sedimentation processes. Project c701601 combined with this project.			$ 60,000	$ 600,000	$ 6,000,000
WTP Hypochlorite Generation	c701401	Consider replacing existing gas chlorine system to sodium hypochlorite system		$ 75,000			
WTP UV System - Pasatiempo	c701503	Consider upgrading the Pasatiempo pump station with ultra violet disinfection.		$ 40,000			
Water Treatment Upgrades	c700014/ c700025	Upgrades to Graham Hill Water Treatment Plant to enhance water quality, meet new and planned regulations, increase reliability. (Power Mgmt and Filter Rehab are offshoots of this project.)		$ 91,561	$ 200,000		
Subtotal Water Treatment			$2,415,724	$6,919,302	$760,000	$3,170,000	$6,300,000
DISTRIBUTION OF WATER							
~~Inspection of Ocean Street Main~~	~~c7016xx~~						
Water Main Replacements - City Engineering	c700002	Funds are allocated in the CIP each year to replace underground water mains < 10" in diameter.	$ 726,647	$ 742,481	$ 1,000,000	$ 1,000,000	$ 1,000,000
Water Main Replacements - Outside Agency	c700003	Funds are allocated in the CIP each year to replace underground water works to coincide with projects initiated by other agencies.	$ 11,261	$ 374,620	$ 200,000	$ 200,000	$ 200,000
Water Main Replacements - Customer Initiated	c700004	Projects initiated on an as-needed basis to accommodate customer-requested connections to undersized or inadequate mains.		$ 50,000	$ 50,000	$ 50,000	$ 50,000
Water Main Replacements - Distribution	c701507	Funds are allocated in the CIP each year to replace underground water mains (transmission, distribution and service lines) by City forces.		$ 300,000	$ 325,000	$ 325,000	$ 325,000
Gravity Trunk Main Valve Replacement	c701504	Replace isolation valves on trunk main leaving GHWTP		$ 150,000	$ 200,000		
Newell Creek Pipeline Rehabilitation	c701701	Full/partial replacement of the pipeline btw the base of Loch Lomond Reservoir and the GHWTP.				$ 700,000	

				Estimated Year-End Exp or Carry over	Budget new appropriations		
Projects by Category	**Project #**	**Description**	FY2014	FY2015	FY2016	FY2017	FY2018
Newell Creek Dam Inlet/Outlet Pipeline	c70xxxx	Inspect and develop a rehabilitation plan for the inlet/outlet pipe within Newell Creek Dam.			$ 125,000		
North Coast System Rehab	c709835	Replace approximately 16miles of raw water pipeline. Pipelines deliver water from the North Coast sources to the GHWTP and date back to 1889.	$ 242,548	$ 1,267,876	$ 4,235,000	$ 4,000,000	
Service Line Replacements	c700006	Ongoing program to repair, recondition or establish water services to meet customer demand and replace deteriorated services.					
Water Transmission System Improvements (10" and larger)	c709833/ c700017	Funds are allocated in the CIP each year to replace underground water mains (transmission, distribution and service lines).		613,510	500,000	500,000	500,000
Water Services and Meters	c709806	Repair and recondition water services at various locations					
Subtotal Distribution of Water			980,456	3,498,486	6,635,000	6,775,000	2,075,000
FACILITIES							
Advance Metering Infrastructure (AMI)	c70xxxx	Evaluate use of AMI and install as recommended.			50,000	4,000,000	4,000,000
Bunker Roof Project	c701508	Install roof over existing material storage area at the City's Corporation Yard. Evaluate install of solar panels.		200,000	150,000		
Hydroturbines	c700901	Installation of a hydro turbine at the Newell Creek Dam					
Loch Lomond Facilities Improvements	c709837/ c701301	Conduct assessment of current and potential future uses, develop master plan.	4,676	180,324	100,000		
Photovoltaic Systems Evaluation/Construction	c70xxxx	Ongoing project to evaluate, design and construct PV systems on water department facilities. Current project is at the Bay Street Tank Site.			40,000	500,000	
Water Resources Building	c701702	Design and construct a new facility			100,000	1,000,000	
Subtotal Facilities			4,676	380,324	440,000	5,500,000	4,000,000
STORAGE OF WATER							
Bay Street Reservoir Reconstruction	c700313/ c700027	Replace the existing reservoir that has reached the end of its useful life (build ~1926), and to downsize to meet current water quality regulations.	4,855,428	6,782,561			
Recoat University Reservoir No. 4	c701505	Condition assessment and recoating/rehabilitation project		95,000	100,000	75,000	1,300,000
Recoat University Reservoir No. 5	c701506	Condition assessment and recoating/rehabilitation project		110,000	75,000	1,750,000	
Tank Aerators	c70xxxx	Add aerators to various tanks to help with DBPs.					
Steel Tank Recoating	c700024	Inspect, repair and recoat storage tanks.					
Subtotal Storage of Water			4,855,428	6,987,561	175,000	1,825,000	1,300,000
Total Projects			**8,770,643**	**20,801,054**	**9,110,000**	**18,870,000**	**13,975,000**

LEGEND

Evaluation Phase
Design Phase
Construction Phase

Attachment 2

Example Risk Consequence Matrix