



# CITY OF SANTA BARBARA

## COUNCIL AGENDA REPORT

**AGENDA DATE:** March 22, 2016

**TO:** Mayor and Councilmembers

**FROM:** Public Works Department, Water Resources Division

**SUBJECT:** Subsurface Desalination Intake Initial Screening Analysis And Potable Reuse Feasibility Study Status Report Update

### **RECOMMENDATION:**

That Council receive an update on the status of the Subsurface Desalination Intake Initial Screening Analysis and Potable Reuse Feasibility Study.

### **DISCUSSION:**

At its meeting of September 23, 2014, Council directed staff to explore options for converting the existing offshore intake, which is sized and permitted to provide sufficient water for a 10,000 acre feet per year desalination plant, to a subsurface intake (SSI) for the desalination plant, and evaluate opportunities for potable reuse as an alternative to desalination.

On January 30, 2015, the Regional Water Quality Control Board (RWQCB) adopted an amendment to the City's El Estero Wastewater Treatment Plant National Pollutant Discharge Elimination System Permit (NPDES Permit) that incorporated Council's direction to staff and added two milestones: submit a Feasibility Study Work Plan to the RWQCB by August 31, 2015, and report the findings of the Feasibility Study to the RWQCB at a public meeting, no later than June 30, 2017.

On May 5, 2015, Council approved a contract with Carollo Engineers, Inc. (Carollo), in the not-to-exceed amount of \$343,925 to develop the Work Plan. The Work Plan was developed with input from the public and a Technical Advisory Panel and included a public hearing in early August. The Plan included initial screening criteria to evaluate the technical feasibility of the different alternatives and assign them to one of three categories; infeasible, potentially feasible (but does not meet study goals), or potentially feasible (alternative shall be considered further in this study). The Plan was submitted to the RWQCB in August 2015, and accepted in a letter dated October 20, 2015, from RWQCB staff.

On September 22, 2015, Council approved a professional services contract amendment with Carollo in the not-to-exceed amount of \$672,042 to provide a Desalination Subsurface Intake Initial Screening Analysis and a Potable Reuse Feasibility Study.

In accordance with the approved Work Plan, SSI alternatives are first to be evaluated for technical feasibility (i.e., "initial screening criteria"), that include the following:

- Geotechnical Hazards
- Hydrogeologic Factors
- Benthic Topography
- Oceanographic Factors
- Presence of Sensitive Habitats
- Design and Construction Constraints

Pursuant to the RWQCB approved Work Plan, only those options that are determined to be technically feasible as a result of this initial screening will be carried forward for further analysis. Once an option meets screening criteria, it will be considered under the social, environmental and economic factors.

The SSI Feasibility Study, Technical Memorandum No. 3, Basis Of Design and Initial Screening Draft by Carollo (TM No. 3) has been completed and is posted at the following website, along with a significant amount of other information concerning SSIs and potable reuse: <http://www.nwri-usa.org/santa-barbara-panel.htm>. Please note that the initial screening examined six SSI alternatives and, based on the criteria set forth in the RWQCB approved Work Plan, each alternative was determined to be either "not feasible" or "potentially feasible, but doesn't meet the study's objectives". The three main reasons the alternatives were excluded from further study were the result of one or more of the following criteria: impacts to sensitive habitat areas, design and construction constraints, and seismic hazard/oceanographic factors. Please see the "Initial Screening Results" for additional details (Attachment).

In accordance with the Work Plan, on January 27, 2016, a public workshop was conducted by the National Water Research Institute who convened a Technical Advisory Panel (TAP) to receive comments on TM No. 3. The public comments were considered for incorporation into the screening analysis, as appropriate. The TAP reviewed work products (i.e., Work Plan, technical memos, reports, etc.) associated with the SSI initial screening. They also considered public comments, responses, and findings from other completed or ongoing similar efforts to develop the most informed recommendations, which can be found on the previously listed NWRI website.

While none of the SSI alternatives met the study's objectives, the information developed as part of this work will provide insight into the City's future water supply planning efforts. City staff anticipates updating the Long Term Water Supply Plan when the

pending environmental decisions and reliable yield of Lake Cachuma are finalized. A significant decrease in the available yield of Lake Cachuma is anticipated as a result of siltation, climate change, and mitigation flows for Steelhead Trout. As a result, the City will need to consider alternative supply options that may include potable reuse and desalination production outside of drought conditions. Based on the identified needs for desalination in the future, the information gathered during the SSI screening alternative analysis can be revised with a more specific water supply objective.

It is anticipated that a Potable Reuse Feasibility Initial Screening Study will be completed in Summer 2016. It will include a summary of regulatory and permit requirements and an initial screening review of the technical feasibility for potable reuse project alternative concepts. This information will be reviewed by the TAP with public comment.

Subsequently, in spring 2017, draft SSI and Potable Reuse Feasibility Studies should be available for a public workshop and TAP review, followed by a presentation to Council and the RWQCB by June 2017. The information from these studies will be useful in identifying additional water supply opportunities. Alternatives that provide less than the possible 10,000 AFY production capacity from the City's desalination facility will be considered when staff embarks on an effort to update the City's 2011 Long Term Water Supply Plan.

This item was presented to the Water Commission on March 17, 2016.

**ATTACHMENT:** SSI Initial Screening Results

**PREPARED BY:** Joshua Haggmark, Water Resources Manager/RLR/mh

**SUBMITTED BY:** Rebecca J. Bjork, Public Works Director

**APPROVED BY:** City Administrator's Office

# Initial screening results

Initial Screening Criteria	Vertical Beach Wells	Onshore Infiltration Gallery	Radial Collector Wells	Slant Wells	Subsurface Infiltration Galleries	HDD Wells
<b>Geotechnical Hazards</b>						
<b>1 Seismic Hazard</b>						
a. Project facilities would cross a known fault line, or be exposed to a seismic hazard that could otherwise not be protected from loss by design	PF	PF	PF	PF	NF	PF
<b>Hydrogeologic Factors</b>						
<b>2 Impact on existing freshwater aquifers, local water supplies, or existing water users</b>						
a. Volume of groundwater in storage is reduced due to subsurface intake pumping, impacting drought supply & requiring additional desalination to make up for loss of groundwater.	PF	PF	PF	PF	PF	PF
b. Operation of subsurface intake causes salt water intrusion into groundwater aquifers.	PF	PF	PF	PF	PF	PF
<b>3 Impact to sensitive habitats such as marshlands, drainage areas, etc.</b>						
a. Operation of subsurface intake drains surface water from sensitive habitat areas or adversely changes water quality.	NF	NF	NF	NF	PF	PF
<b>4 Insufficient length of beach available for replacing full yield derived from existing open ocean intake.</b>						
a. Small individual facility yield, large number of facilities required, & minimum spacing between facilities requires more shoreline than is available.	PF*	PF*	PF*	PF*	PF	PF
<b>Benthic Topography</b>						
<b>5 Land type makes intake construction infeasible.</b>						
a. Depth to bedrock too shallow (i.e., less than 40-feet deep); rocky coastline; cliffs	PF	PF	PF	PF	PF	PF
<b>Oceanographic Factors</b>						
<b>6 Erosion, sediment deposition, sea level rise, or tsunami hazards.</b>						
a. Oceanographic hazards make aspects of the project infrastructure vulnerable in a way that cannot be protected &/or would prevent the City from being able to receive funding or insurance for this concept.	PF	PF (4)	PF	PF	NF	PF
<b>Notes:</b>						
(1) NF = Not Feasible						
(2) PF = Potentially Feasible						
(3) PF* = Potentially Feasible, but does not meet current study goals						
(4) Potentially feasible at Leadbetter & West Beach only. Sediment transport conditions at East Beach make the implementation of an onshore infiltration gallery infeasible (refer to Section 3.4.2).						

# Initial screening results (continued)

Initial Screening Criteria	Vertical Beach Wells	Onshore Infiltration Gallery	Radial Collector Wells	Slant Wells	Subsurface Infiltration Galleries	HDD Wells
<b>Presence of Sensitive Habitats</b>						
<b>7 Proximity to marine protected areas</b>						
a. Location would require construction within a marine protected area.	PF	PF	PF	PF	PF	PF
<b>Design &amp; Construction Constraints</b>						
<b>8 Adequate capacity</b>						
a. Subsurface material lacks adequate transmissivity to meet target yield of at least 15,898 gpm (i.e., build-out intake capacity necessary to produce 10,000 AFY).	NF	NF	NF	NF	PF	PF
<b>9 Lack of adequate linear beach front for technical feasibility</b>						
a. Length of beachfront available is not sufficient for construction of the required number of wells of all or portion of intake to meet target yield.	NF	NF	NF	NF	PF	PF
<b>10 Lack of adequate land for required on-shore facilities</b>						
a. Surface area needed for on-shore footprint (i.e., pump house) of an intake unit is greater than the available onshore area.	PF	PF	PF	PF	PF	PF
b. Requires condemnation of property for new on-shore intake pumping facilities.	PF	PF	PF	PF	PF	PF
<b>11 Lack of adequate land for required on-shore construction staging</b>						
a. The amount of land available to stage construction does not meet need.	PF	PF	PF	PF	PF	PF
<b>12 Precedent for subsurface intake technology</b>						
a. Intake technology has not been used before in a similar seawater or fresh water application at a similar scale.	PF	PF	PF	PF	PF	NF
<b>Passes Initial Screening? Yes (Y) or No (N)</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>
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