

Planning for Our Water Future

Integrated Water Plan Update

Spring/Summer 2011

www.scwd2desal.org



Overdrafted Groundwater Basin: SqCWD's Water Supply at Risk

For many years, groundwater levels in the Soquel Creek Water District (SqCWD) have been dropping and remain too low to protect against seawater intrusion. Despite extensive conservation efforts by customers, the groundwater basin is in a state of overdraft because more water is being pumped out annually than is naturally recharged through rainfall. The groundwater basin is the SqCWD's only source of water.

Overdraft of the groundwater basin is not sustainable and early signs of seawater intrusion are present in the La Selva Beach area and low groundwater levels are affecting SqCWD wells in the Aptos/Seacliff area. Seawater intrusion occurs when groundwater levels drop so low that wells become contaminated with seawater. This condition can be irreversible and can result in either abandoning wells or requiring costly treatment. In order to manage its groundwater basin, SqCWD needs a supplemental water supply to meet customers' needs and raise groundwater levels to prevent seawater intrusion. The main challenges we face include:

• Water Supply Shortage:

The groundwater basin that supplies SqCWD and other local pumpers is overdrafted and coastal groundwater levels are too low to protect against seawater intrusion.

• Seawater Contamination:

Contamination of seawater into the freshwater aquifer will make the groundwater unusable. A freshwater barrier is needed to keep seawater intrusion from occurring.

Seawater intrusion is almost impossible to reverse and remediate. When it is possible, remediation takes a lot of time and money.

• **Climate Change:** There is a potential for more intense storms with greater runoff and less soaking into the aquifers, more frequent/intense droughts and rising sea levels.

• **Water Quality:** Naturally occurring hexavalent chromium is generally present throughout the Aromas Red Sands Aquifer, which currently provides more than one-third of the SqCWD water supply and is the primary source of water for the service area from Rio Del Mar to La Selva Beach. The State is expected to establish a drinking water standard that could require the addition of expensive treatment facilities or abandoning impacted wells.

Groundwater Usage is Unsustainable

In order to assure a reliable water supply, SqCWD's two-fold approach includes developing a sufficient supplemental supply to:

- 1) Restore protective groundwater levels by limiting groundwater pumping. This could be as much as 45 percent (675 million gallons/year) less than current pumping and may take 10 years or more before the basin recovers. Protective groundwater levels are the minimum needed to prevent seawater contamination as identified by the District's hydrologist.
- 2) Maintain protective groundwater levels for the long-term. Hydrologists predict that after the basin has recovered, groundwater pumping must be restricted by at least a quarter million gallons per year less than current use. Conservation alone will likely not save enough, and there will be an ongoing need to supplement our groundwater sources.

IRP Ensures Reliable Water Supply

Despite above average rainfall this year, the state of California faces a long-term water shortage crisis and our coastal community is no different. Even with our customers' commitment to conservation, local water supplies are insufficient to respond to drought conditions, long-term water supply needs and overdrafted groundwater basins. Continually withdrawing more than the sustainable yield of our coastal aquifers will result in seawater intrusion that will contaminate our groundwater resources.

To supplement our existing supplies and ensure a sustainable and reliable, high-quality drinking water supply, Soquel Creek Water District (SqCWD) and the City of Santa Cruz Water Department (SCWD) have joined together to evaluate seawater desalination as a supplemental water resource to diversify their water portfolios. Because both agencies share the same initials, this joint venture is referred to as **scwd²**.

The proposed desalination plant is consistent with the SqCWD's Integrated Resources Plan (IRP), a flexible, phased approach for providing a reliable supply of water, preserving coastal aquifers from seawater intrusion, and protecting public health and safety. The IRP's preferred alternative identified maximizing conservation and further evaluation of a regional seawater desalination project with the City of Santa Cruz that

can be used in conjunction with groundwater resources. The IRP includes the following components:

- Conservation and Curtailment — Continue conservation and drought management programs to reduce water demand and increase water-use efficiency.
- Supplemental Supply — Develop a regional desalination plant with the City of Santa Cruz to meet additional water needs.
- Recycled Water — Develop site-specific recycled water supplies for non-potable irrigation use.
- Groundwater Management — Continue monitoring and assessment of coastal groundwater quality and levels; redistribute groundwater pumping to alleviate the potential for seawater intrusion; and support aquifer recharge protection and enhancement.

Conservation and groundwater management will continue to be extremely important components of the IRP; however, even with increased conservation, a supplemental supply is needed to recover the overdrafted aquifers and maintain groundwater pumping within sustainable levels. Desalination would provide a weather-independent and drought-proof water source to meet customers' water needs and make the groundwater basin more sustainable.



Our Water Future

Dear Water Customer,

Our community has a complex water supply problem. It includes the overdraft of freshwater aquifers, the threat of seawater intrusion into wells, the likelihood of severe droughts and the probability that regulators will reduce our water supply from surface streams to protect endangered fish species. We must continue to evaluate the threats and risks to our environment, our households and our local economy — and evaluate potential remedies to our water supply problems.

Critics question whether our community should build a desalination plant to meet our water needs. We believe the community should be allowed to consider the latest information and the potential for desalination to meet our water supply challenges.

The **scwd²** Task Force, formed by the Santa Cruz City Council and the Soquel Creek Water District Board of Directors, is working diligently to examine a variety of issues related to the proposed desalination plant, including: energy usage; the cost to ratepayers; the impacts to the marine environment; the quality of desalinated water; and the overall question of whether desalination is the best approach. A full Environmental Impact Report is currently evaluating many of these issues, and this report, along with public comments, will assist the entire community in understanding them.

Elected representatives and citizens who voluntarily served on local commissions have spent years thoroughly examining and considering many alternatives. Those citizens sat through dozens of public meetings with countless hours of public testimony to decide that desalination was a reasonable and necessary approach to explore. We do not believe desalination alone is a panacea for our water supply problems — rather it could serve as a safety net in our water supply portfolio. Our Integrated Water Plans identified desalination as part of a careful process of exploring new water sources while moving ahead with vigorous conservation measures and preparations for significant restrictions during drought periods. We believe the community is best served if we continue with a thorough examination of all the facts and issues revealed through a rigorous environmental review process and then make an informed decision.

Dan Kriege,

Board Member,
Soquel Creek Water District
Member of the **scwd²** Task Force

Don Lane

Vice Mayor of Santa Cruz
Member of the **scwd²** Task Force

What if We Do Nothing?

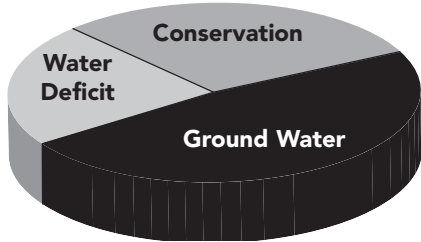
If Soquel Creek Water District (SqCWD) were to take no action to develop a supplemental water supply, these consequences could occur:

- The continued overdraft of the groundwater basin would lower groundwater levels and increase the risk of seawater contamination of SqCWD's production wells.
- Reduced pumping to the level needed to recover the groundwater basin would result in water restrictions for customers that could create hardships for residents and local businesses.
- Restrictions on year-round water use for existing customers and a moratorium on new or expanded services could be imposed.
- Reduced water sales due to restrictions would cause rates to increase in order to meet the fixed costs of delivery and maintenance of the water system.

Water Conservation Continues to Play Key Role in Water Supply Solution

Water conservation is not a new concept in Santa Cruz County. It's a way of life for our residents and businesses — like recycling, keeping our beaches clean, and preserving our parks and open space. For years, customers in the Soquel Creek Water District (SqCWD) and City of Santa Cruz (SCWD) have been actively and measurably conserving water.

Water conservation is the cornerstone of the SqCWD and SCWD diver-



Soquel Creek Water District relies solely on groundwater to meet its water needs. In order for the overdrafted groundwater basin to recharge, a supplemental water supply is needed.

sified water portfolios. It's a matter of pride that, on average, our customers use far less water than most California residents and businesses. But doing a good job of conserving our existing water resources doesn't eliminate the need for new water supplies. The bottom line is we can't sustain the local economy, environmental values, quality of life, and health and safety without supplementing our surface and ground water resources.

Both agencies rely solely on local water supplies (surface water from streams and rivers and groundwater) and do not receive any state or imported water. With local water supplies severely limited during drought conditions, new regulations to maintain stream flows that will protect fish, and the perilous threat of seawater intrusion due to the overdrafted groundwater basins, we are committed to managing our precious water resources wisely and efficiently.

SqCWD's groundwater aquifers are overdrafted, meaning more water is being extracted than is replenished through recharge. Despite excellent customer response to conservation programs, coastal groundwater levels are not appreciably recovering and remain too low to protect against seawater intrusion. Once seawater contaminates a coastal aquifer, it is virtually impossible to reverse. Relying on conservation alone to achieve sustainable groundwater pumping is not feasible.

Nonetheless, continued and expanded conservation efforts are a critical piece to help solve the water supply shortage — and they save energy. Both agencies will continue to evaluate and implement new water saving programs and encourage the use of more water-efficient technologies and devices that will stretch our existing water supplies and reduce the amount of supplemental supply that is required.

What are the Benefits of the Proposed Desalination Plant?

- Provides the Soquel Creek Water District and City of Santa Cruz with a secure, flexible, and reliable supplemental water supply.
- Diversifies water supply portfolios, in conjunction with water conservation and restrictions during droughts, to best manage the sustainability of existing surface and groundwater resources.
- Protects groundwater aquifers from seawater intrusion by reducing groundwater pumping from wells.
- Protects endangered fish species by maintaining adequate stream flows and reducing the amount of surface water used.
- Safe and proven technology that provides high-quality drinking water that is compatible with existing water supplies.

FAQs — Frequently Asked Questions

Q: Are there any successful desalination projects currently in operation?

A: Desalination is a proven and reliable technology that is used in over 120 countries worldwide including Australia, Japan, China, Saudi Arabia, Greece, Spain, and the United States. It is also often used on islands (such as the Caribbean and our nearby Catalina Island), naval vessels, and cruise ships. Locally, Moss Landing Power Plant, Monterey Bay Aquarium and the City of Sand City operate desalination facilities.

Q: Why is the Santa Barbara desalination facility not in operation?

A: The primary reason that Santa Barbara's desalination facility, which was constructed in the early 1990's, is not in operation is due to their subsequent connection to the State Water Project. That project can deliver up to 3,000 acre-feet-per year of water. Even though the desalination facility was in operation for just a short time, it still serves as an insurance policy. City officials know the facility remains in their long-term water portfolio for emergency purposes such as an extended drought. While imported water was a viable option for Santa Barbara to use in lieu of desalination, this option is not an alternative for the City of Santa Cruz or Soquel Creek Water District. The infrastructure to import any water from outside the Santa Cruz area does not currently exist and would be very expensive to build. In addition, given the current condition of water supplies in the State Water Project and the issues facing the Sacramento-San Joaquin Delta, it is extremely unlikely that any of that water would become available for importation to Santa Cruz.

Q: Is desalinated water actually safe?

A: Desalination is a safe and proven technology. scwd² operated a pilot facility in 2008-2009 that tested the reverse osmosis technology for desalinating ocean water from the Monterey Bay. The facility was able to meet and exceed all state and federal drinking water

standards and clearly demonstrated that it can provide a clean and reliable source of drinking water.

Q: Will the Soquel Creek Water District and the City of Santa Cruz be updating supply and demand figures that were used in previous planning documents?

A: Yes, the District and City are updating information on water demands, supply reliability, water conservation measures, and water shortage contingency planning as part of the updates to the Urban Water Management Plans and the environmental review process for the proposed desalination project. This information will be incorporated into the Draft Environmental Impact Report (EIR) that is being developed for the proposed scwd² Regional Seawater Desalination Project and the applicable supporting technical studies.

Q: Is a surface water transfer during winter months between the City of Santa Cruz and Soquel Creek Water District feasible?

A: Santa Cruz is presently unable to transfer surface water to Soquel, but opportunities such as this are being investigated by the water agencies. Challenges with this option include lengthy water right amendments, potential impacts to endangered fish species, and the annual variability that cannot guarantee a sufficient supply year-in and year-out. John Ricker, Water Resources Division Director for Santa Cruz County, who is overseeing this study, acknowledges that "the possibility of a water exchange is not a near-term solution in the water supply shortage faced by the City and District and is not considered an alternative to developing a new reliable and flexible supplemental supply."

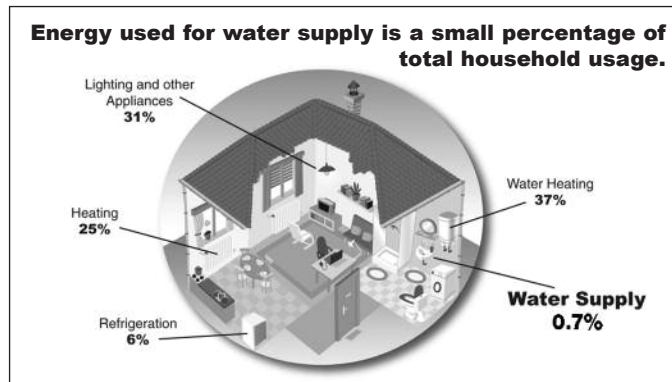
Q: Will the marine life in the Monterey Bay be harmed by pulling in ocean water and pushing out the brine produced in the desalination process?

A: scwd² recently completed technical studies that evaluated the intake effects of bringing ocean water into the desalination plant and mixing the brine with existing treated wastewater effluent that

currently goes to the Bay. Both studies concluded that effects would be minimal based on newer technologies that could be implemented. Technical Working Groups, which included scientists, academics, and regulators, advised and oversaw these complex and detailed studies. To access the technical studies, visit scwd2desal.org.

Q: Does desalination use a lot of energy?

A: The process of desalination does use more energy than traditional water treatments (such as groundwater and surface water), but the amount of energy that would be attributed to water supply would continue to be a very small fraction of the total energy requirements for a typical household. For example, if the energy required to produce and deliver water (desalination and groundwater) during non-drought conditions was divided by the number of households within SqCWD's water service area, it would be less than three percent of the total household energy demands. A white paper on Energy Use is available on our website and provides more information on energy use and comparisons for the proposed project. The graphic below illustrates the breakdown of typical household energy uses.



Q: What type of conservation rebates and incentives are available to Soquel Creek Water District customers?

A: The District currently offers numerous conservation rebates and incentives to its customers that include, but aren't limited to rebates/incentives for high-efficiency and dual-flush toilets, hot water recirculation systems, front-load washers, drip irrigation, smart irrigation controllers, rain catchment, graywater and turf replacement. For a list of incen-

tives and free water-saving devices, visit soquelcreekwater.org/content/rebates.

Q: Will the mixing of desal water with surface water and groundwater cause water quality issues?

A: All new water supplies must be extensively evaluated to ensure they can be 1) treated to all state and federal drinking water standards and 2) don't have unanticipated impacts either on the distribution system or with other water supplies it may be mixed with. scwd² evaluated all required constituents, as well as constituents that are not currently regulated but that may be in the future. For example, trihalomethanes (THMs) is a regulated constituent which forms when organic material in any surface water combines with chlorine during disinfection. scwd² successfully demonstrated that desalinated water could be treated and mixed with surface water and groundwater supplies and comply with regulations related to THMs. As is currently required and performed, the City would continue monitoring programs at treatment facilities and within the distribution system to ensure compliance with water quality standards. For information on the pilot study and water quality testing, visit scwd2desal.org.

Q: What is the estimated cost of the proposed desalination facility?

A: Cost estimates of the proposed project are very preliminary since numerous component alternatives are being evaluated

and no component has exceeded ~30% design. Current estimates, used for planning purposes, of the total project cost is approximately \$115 million, which includes a 30% contingency and an expected range of accuracy of -15% to +30%. The evaluation costs are being equally shared by SqCWD and SCWD; if construction occurs, those costs will be split 41% for SqCWD and 59% SCWD. Total project cost for SqCWD could range from \$40-\$50 million.

How the Environmental Review Process Works

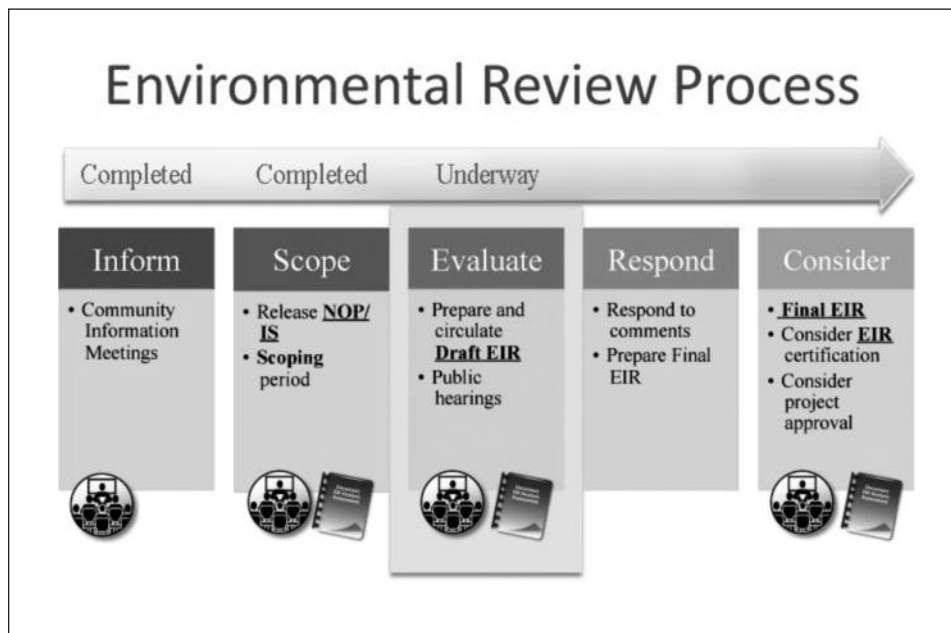
The purpose of the project Environmental Impact Report (EIR) that is currently under way is to identify and evaluate potentially significant effects that the regional desalination project could have on the environment, to identify alternatives to the project, and to indicate how and whether the significant effects can be mitigated or avoided. This will ensure that the governing bodies and permitting agencies

consider any potential environmental impacts when deciding whether to approve a project.

The first step in the EIR process was scoping, which is used to define the issues to be evaluated in the EIR. Release of the Notice of Preparation/Initial Study (NOP/IS) launched the scoping period in November of 2010. The NOP/IS identified the potential environmental effects that will be eval-

uated in the EIR. During the scoping comment period (November 15, 2010 - January 10, 2011) the public provided input on the environmental topics, potential effects, mitigation measures, and range of alternatives to be analyzed in the project EIR. A Scoping Report of all comments received is available on the project website and the next step in the process is preparation of the Draft EIR.

The scwd² agencies are working closely with the project team responsible for preparing the EIR. The project team will continue to seek input at various stages of the environmental review process. The next opportunity for public input will be during the public review of the Draft EIR, which is currently being prepared. The public will have the opportunity to provide formal comments on the Draft EIR during this public review period, anticipated for early winter 2012. The project team will then respond to comments submitted during the public review period in the Final EIR and make any revisions necessary to the EIR. Upon completion of the Final EIR, the City Council and District Board of Directors will consider certification of the EIR and approval of a project.



The Environmental Review Process allows several opportunities for people to provide their input.

Why Desalinated Water is Being Studied

Desalination is a weather-independent source of water because, unlike surface water, it is not affected by droughts, and can be used when existing supplies are extremely limited. During wet years, the desalinated water would be produced in smaller amounts to help restore groundwater levels in the Soquel Creek Water District (SqCWD).

A joint desalination plant is not a "quick-fix solution" to solve our water shortages. Both SqCWD and the City of Santa Cruz (SCWD) have been investigating supplemental water supply options for more than 20 years. Desalination technology has evolved to where it can be a very viable, safe and reliable component of a diversified water supply portfolio.

SqCWD and SCWD have conducted lengthy and exhaustive evaluations of water supply options and potential new water sources. The results were the SqCWD Integrated Resources Plan (IRP, 2006) and City of Santa Cruz's Integrated Water Plan (IWP, 2005).

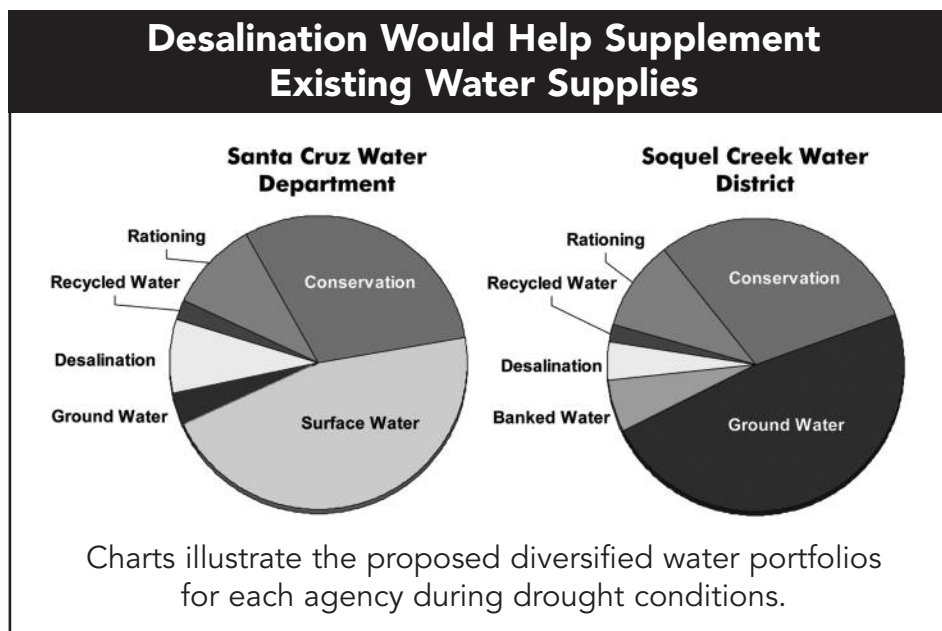
Through those efforts, more than 30 projects were identified, including building one or more new reservoirs, substantial use of recycled water, groundwater recharge, water exchanges, and importing water. After thoroughly

Desalination is a weather-independent source of water ... it is not affected by droughts, and can be used when existing supplies are extremely limited.

evaluating the alternatives, both agencies concluded that a desalination plant was the preferred option for providing a reliable water supply that meets long-term needs while ensuring protection of public health and safety.

The potential environmental impacts of the desalination project proposed by scwd² are currently being studied in a project level Environmental Impact Report (EIR). The EIR will include a variety of studies related to energy, marine impacts and water quality. The EIR must be completed and certified before any decision is made on the project.

Map shows Water Service Area Boundaries



Diversified water portfolios enable us to provide a reliable supply of water during drought, preserve our coastal aquifers from seawater intrusion, and ensure protection of public health and safety.

Minimizing Environmental Impacts

Santa Cruz County residents are passionate about the environment and the community. There are a number of studies and evaluations that have or will be conducted as part of the scwd² Desalination Program to minimize any adverse environmental impacts from the proposed desalination project.

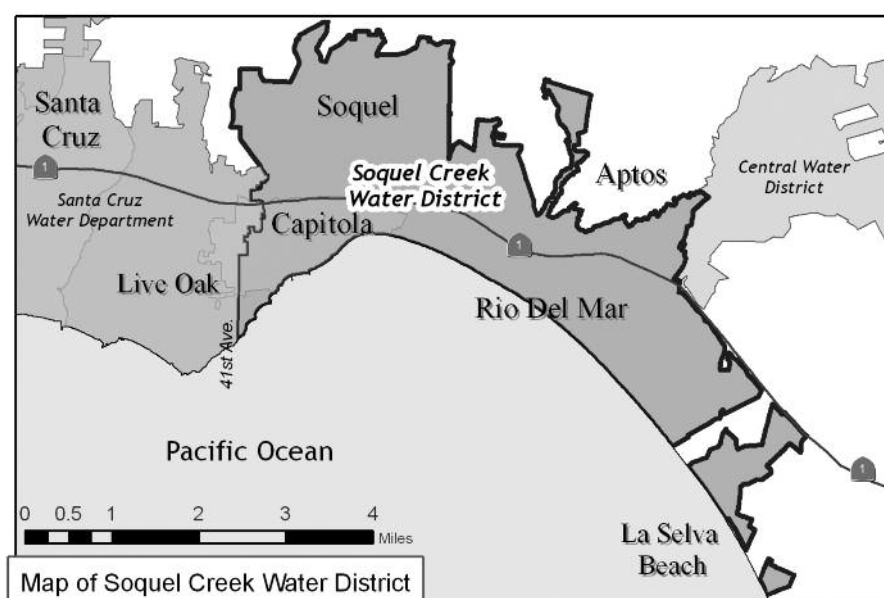
Several technical studies have concluded that:

- The brine (highly saline water that is a byproduct of the desalination process) can be safely disposed of by blending it with the existing treated wastewater that flows to the Monterey Bay.
- A properly designed intake system is capable of bringing seawater to the desalination plant without affecting marine life.
- Overall energy use to provide water to our customers, which includes desalination plus existing water resources, would be equivalent to approximately one to two percent of a household's overall energy demand, much less than the individual energy demands of household heating, refrigeration, lights, and water heaters.
- Desalinated water is a clean and safe water supply that can meet all local, state, and federal drinking water quality standards.

A project-level Environmental Impact Report (EIR) is currently being conducted for the proposed project that will thoroughly evaluate the environmental impacts associated with the project. This study is anticipated to be released in early winter 2012.

A project-level Environmental Impact Report (EIR) is currently being conducted...

scwd² will continue to work with all of the regulatory agencies that oversee potable water resources and the Monterey Bay including, but not limited to, California Department of Public Health, Regional Water Quality Control Board, California Coastal Commission, National Marine Fisheries Service, Monterey Bay National Marine Sanctuary, U.S. Fish and Wildlife Service, and California Department of Fish & Game.





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Overdrafted Groundwater Basin and Threat of Seawater Contamination Create Need for Additional Water Supply

What you need to know about:

- Desalination
- Seawater intrusion
- Potential water quality issues
- Overdrafted groundwater basin
- Soquel Creek Water District's plan for assuring reliable water supply



How to Stay Informed

scwd² is committed to educating the community about the need for a supplemental source of water, and the environmental review process for the proposed desalination project. There will be ample opportunities for public input throughout the project planning and environmental review process. Here are some ways to stay informed:

Web
www.scwd2desal.org
www.soquelcreekwater.org

Email
To receive monthly project updates, send an email to:
melanies@soquelcreekwater.org

Call
(831) 475-8501 x153



www.facebook.com/scwd2news



twitter.com/scwd2news

Esta información está disponible en español.
Por favor llame al (831) 475-8500.

Energy Efficiency and Reducing Greenhouse Gases

There is no question that energy use and greenhouse gas emissions (GHGs) are a major concern regarding desalination. There have been many advances in desalination technologies over the past two decades, which have reduced the energy required to desalt water. Advancements in reverse osmosis materials and energy recovery devices have reduced the energy usage for desalination.

Nonetheless, providing additional water supply with desalination does present energy challenges and that is why scwd² is conducting an Energy Minimization and Greenhouse Gas Reduction Study. This study will ensure that the most advanced and energy-efficient technologies and approaches are identified and incorporated into the proposed project as well as explore renewable energy projects to offset power requirements of the project. As part of this study, the agencies will:

- Calculate the amount of energy required for the proposed project.
- Establish greenhouse gas mitigation goals based on an understanding of regulatory status, future regulatory direction and input from the GHG Technical Working Group.
- Identify options to meet the GHG mitigation goals including making the project carbon neutral.
- Develop a list of potential GHG mitigation projects based on each agency's energy use. Various types of options will be evaluated to understand which actions would best offset GHG emissions associated with the proposed desalination project. These actions may include, but are not necessarily limited to: green energy produc-

ers such as solar, wind, wave and geothermal; power purchase agreements; restoration projects; and salinity gradient power generation.

This comprehensive study will help to ensure the project is developed in a way that minimizes any impacts to the environment while providing a supplemental source of water.



scwd² will be evaluating additional local solar power opportunities similar to this system on the City of Santa Cruz's Graham Hill Water Treatment Plant.

Proposed Project Timeline

2008-2009	Pilot Plant Testing
2010-2012	Desalination Facility Environmental Impact Report Preparation and Certification
2010-2012	Desalination Facility Design
2012-2016	Desalination Facility Construction

Schedule subject to change.