County of Santa Cruz

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PLANNING DEPARTMENT
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(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
ALVIN D. JAMES, DIRECTOR

September 14, 1999

AGENDA: September **21, 1999**

Board of Supervisors
County of Santa Cruz
701 Ocean Street
Santa Cruz, CA 95060

PROGRESS REPORT ON SOQUEL CREEK WATER DISTRICT ISSUES

Members of the Board:

On May 19, 1998, your Board accepted a progress report on Soquel Creek Water District (District) issues. That progress report introduced your Board to the District's Public Advisory Committee (PAC), to several key position papers, the 1997-98 Urban Water Management Plan update, a statement on the District's Water Conservation Analysis, and a beginning look at declines in baseflow to Soquel Creek. Additional progress reports have been deferred until today's agenda wherein the District is submitting a report outlining water resource management activities recommended by their PAC and a discussion of how to work with County staff to achieve mutual goals. The District's Board of Directors approved submittal of the accompanying status report at their regularly scheduled meeting on September 7, 1999.

The status report submitted by the District includes the following three sections: 1) A memo from Laura Brown providing a "Status Report on Soquel-Aptos Groundwater Basin Management; 2) The Fall 1998 and Summer 1999 newsletters; and 3) A June 1999 Summary Report from Montgomery Watson Engineers on the District's Integrated Resources Plan. The three sections provide a comprehensive assessment of Soquel Creek Water District Issues. The Memo provides a good overview of District Basin Management Activities. The latter section of the status report contains the PAC findings and recommendations.

A review of the PAC's findings would suggest that recent (1996) pumping levels need to be reduced by approximately 610 acre-feet per year (afy) to alleviate undesirable conditions. Additional pumping reductions for wells within the Aromas formation may also need to be considered in the future. Estimated future water needs incorporate conservation savings of 650 afy . After accounting for current and projected demand, factoring in potential savings from an aggressive conservation program, and addressing a minimum level of pumping reduction to correct overdraft and avoid undesirable impacts, it was determined that the District needs to augment its current supply by approximately 1,200 to 2,000 afy by the year 2030.
Conservation plays a large role in the PAC's recommendations. Nine conservation best management practices (BMP's) from the California Urban Water Conservation Council are recommended for

implementation. The BMP's relate to water audits of large residential, landscape and commercial/industrial water users; incentives for irrigation system upgrades; promoting water efficient landscapes; and expanding existing toilet and shower-head replacement programs.

Your Board's attention should be directed to the subheading in the latter section on Additional Conservation Recommendations of the PAC (pgl-4) where criteria are established to define groundwater conditions that constitute a shortage emergency. The PAC established triggers to identify factors and an equivalent response for either a first level conservation emergency or a second level supply emergency. The present situation includes up to a 15 percent supply shortage, or overdrafting and a threat to future water supply or water quality. This constitutes a first level conservation emergency. Given this scenario, the District is advised to consider conditional or limited will serve letters, moratoriums on new water hook-ups, and to request the County to consider both a moratorium on new wells in the aquifer and monitoring and metering all wells within the aquifer.

Other sections your Board's may wish to review include the Water Needs Assessment (pgl-7) and the Water Supply Options (pgl-9). The Water Needs Assessment was presented briefly above. Water Supply Options included pursuing the off-stream diversion option and future regional participation in desalination and recycled water options if the City of Santa Cruz or another agency decides to implement either option.

County water resource staff would like to present the following additional comments and observations for your Board:

1) Information in this status report largely pertains to information generated in the mid-County area. Soquel Creek Water District is, however, initiating movements toward collaborative water resource management in the South County as well. Your Board should be aware that on September 7, 1999, the Soquel Creek Water District Board of Directors approved scheduling a joint meeting with Central Water District and Pajaro Valley Water Management Agency to review groundwater management activities; and

2) The District's Board of Directors held their first public forum on September 8, 1999 to receive comments on the PAC's Integrated Resources Plan prior to taking any actions to implement the recommendations contained within that document. A subsequent Board workshop has been scheduled for September 28,1999 to discuss the Plan and public comments. Public testimony at the September 8, 1999 forum largely called for action to implement a moratorium and to solve the undesirable groundwater conditions by accelerating conservation programs.

   Moratoria are temporary responses intended to serve only until such time that some future alternative solution rectifies the problem conditions. A moratorium, by definition, is not a problem solution in and of itself. Your Board should be aware that although conservation is a wise water resource management program, conservation alone does not help remedy or improve location specific pumping depressions or gradient reversals. Therefore, in addition to conservation measures, a broader set of management prescriptions including supply augmentation needs to be pursued concurrently.

   The public discussion regarding the need for a moratorium is not exclusive to the Soquel Creek Water District. The Scotts Valley Water District is presently in a moratorium and the San Lorenzo Valley Water District has on three occasions held discussion to consider a moratorium in their southern service area near Scotts Valley. As your Board can see from this report, many of these issues are better understood in the context of countywide water issues. To this end, staff would like to

incorporate any additional progress reports into a comprehensive staff report on water resources management.

It is therefore RECOMMENDED that your Board:

1. Accept and tile this progress report on Soquel Creek Water District issues; and

2. Direct staff to continue to monitor and support Soquel Creek Water District water resource planning and management activities; and

3. Direct staff to incorporate any additional progress reports into a comprehensive, countywide staff report on Water Resources Management.

Sincerely,

ALVIN D. JAMES
Planning Director

RECOMMENDED

SUSAN A. MAURIELLO
County Administrative Officer

cc: Soquel Creek Water District

ADJ/Blc/SCWD08

Attachments

SOQUEL CREEK
WATER DISTRICT

5180 SOQUEL DR.
P.O. BOX 158
SOQUEL, CA 95073-0158
TEL 831-475-8500 / 831-688-2288
FAX 831-475-4291

September 7, 1999

Board of Supervisors
County of Santa Cruz
701 Ocean Street
Santa Cruz, CA 95060

Subject: Transmittal of Status Report on Soquel-Aptos Groundwater Basin Management

Dear Members of the Board:

Enclosed is information in response to your expressed interest in keeping abreast of water management issues and actions in the mid-County area. As you know, our District has been very involved in long-range water supply planning for several years. We hope that the materials provided will assist you in understanding the issues and options for reliable water supply in the Soquel-Aptos Groundwater Basin and the public involvement process utilized by the District.

The District looks forward to cooperatively working with the County towards achieving consistent groundwater management within our respective jurisdictions.

Sincerely,
SOQUEL CREEK WATER DISTRICT

Daniel F. Kriege, President
Board of Directors

DFK:LDB:jjy
Enclosures

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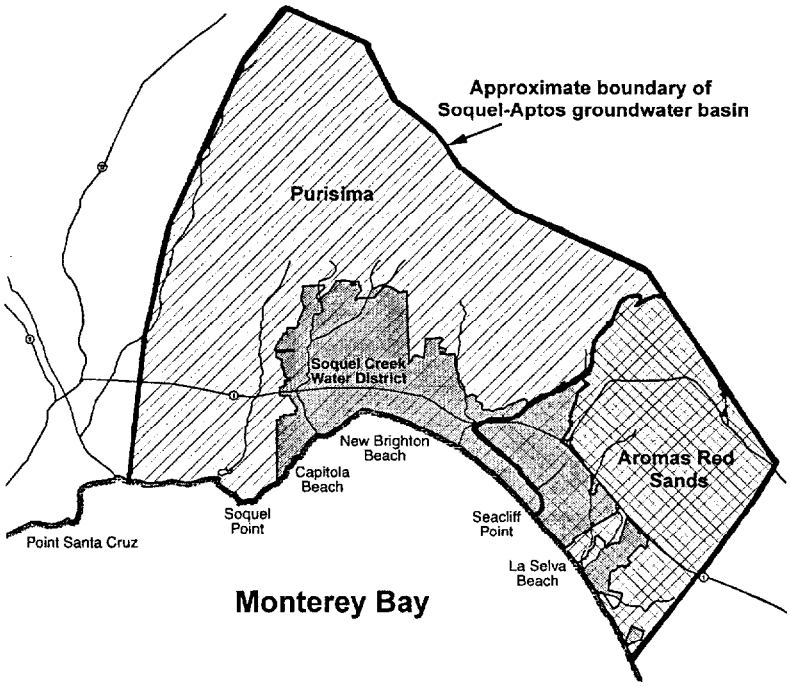
September 7, 1999

MEMO TO THE SANTA CRUZ COUNTY BOARD OF SUPERVISORS

Subject: Status Report on Soquel-Aptos Groundwater Basin Management

BACKGROUND

The aquifer system for the area known as the Soquel-Aptos groundwater basin is comprised of two geologic formations: the consolidated Purisima Formation, which underlies-the entire Soquel Creek Water District and is developed by the District for water supply in the western two-thirds of its service area; and the unconsolidated Aromas Red Sands, which underlies the eastern third of the Soquel Creek Water District and is developed for water supply by the District in that portion of its service area. Soquel Creek Water District began a substantial groundwater management effort in 1982 by installing coastal monitoring wells along the entire length of its service area in order to provide early detection of indicators of susceptibility to saltwater intrusion.



Since late 1993, the District's hydrological reports have noted depressed coastal groundwater levels in the central portion of the District between New Brighton Beach and Aptos Creek. Groundwater levels in this portion of the Purisima aquifer have remained near historic lows and continuously below sea level. While coastal monitoring wells in this area have not yet shown any sign of saltwater intrusion, these conditions must be addressed by restoring groundwater levels to above sea level. The District has developed a groundwater flow model to quantify the aquifer yield. The model indicates that current overdraft in the Purisima Formation is approximately 600 acre feet per year (AFY).

In the Aromas Red Sands aquifer, there is a naturally occurring saltwater wedge in the area of Seascape and La Selva Beach. Since 1992, there has been a progressive degradation of coastal groundwater quality in this area, suggesting that the wedge is moving inland. These conditions, which have not yet impacted any of the District's water supply wells, have occurred despite relatively high groundwater levels. The sustainable yield of the portion of the Aromas Red Sands in the Soquel-Aptos Groundwater Basin is difficult to quantify due to the following: 1) very little historical analysis of the Aromas Red Sands yield within the Soquel-Aptos area; 2) the small total Aromas Red Sands pumpage in the Soquel-Aptos area; 3) the large extension of the Aromas Red Sands into the Pajaro Valley; and 4) the observation of landward migration of seawater intrusion in this portion of the aquifer despite positive coastal water levels.

In 1996, Soquel Creek Water District and Central Water District jointly adopted a groundwater management plan for the Soquel-Aptos area under the provisions of State law (AB 3030.) This action established the Water Districts' groundwater management authority within the jurisdictions of these two agencies.

A significant percentage of pumping within the Soquel-Aptos Groundwater Basin is attributable to a large number of private wells. (Within Soquel Creek Water District's boundaries, there are approximately 240 non-District wells.) The District prepared a consumption analysis of total annual pumping within the basin that was reviewed by County Environmental Health Staff. Since only municipal wells are metered, water use estimates based on land use were applied to the private and mutual water company wells. The **preliminary findings** of this study are summarized below:

PRIVATE WELL CONSUMPTION ANALYSIS (as of 12/31/98)
SUBJECT TO REVISION BASED ON ADDITIONAL STUDY

	PURISIMA		
	ANNUAL PUMPAGE (ACRE FT/YR)	*PERCENTOF TOTAL PUMPAGE (%)*	*NUMBER OF WELLS*
PRIVATE WELLS	1,450	21%	1,030
MUTUALS (excluding Central Water)	330	5%	14
CENTRAL	490	7%	2
CITY OF SANTA CRUZ	790	12%	3
SOQUEL CREEK WATER DISTRICT	3,780	55%	11
TOTAL	6,840		1,060

	AROMAS		
	ANNUAL PUMPAGE (ACRE FT/YR)	*PERCENT OF TOTAL PUMPAGE (%)*	*NUMBER OF WELLS*
PRIVATE WELLS	3,370	57%	297
MUTUALS (excluding Central Water)	280	5%	20
CENTRAL	130	2%	2
CITY OF SANTA CRUZ	0	0%	0
SOQUEL CREEK WATER DISTRICT	2,100	36%	6
TOTAL	5,880		325

INTEGRATED RESOURCES PLAN (IRP)

Soquel Creek Water District is well aware of the complexities, difficulties and controversy involved with water supply issues. In response to the symptoms of declining groundwater levels within the District, it was decided to bring together a representative group of stakeholders to advise the District on future water supply planning. A Public Advisory Committee (PAC) of approximately twenty individuals representing homeowners, business associations, other governmental agencies, environmental groups and private well owners was formed in October 1997. The purpose of the PAC was to have diverse interest group input prior to significant actions being taken by the District with regard to augmenting water supply.

The PAC was given access to the District's technical experts and, through a facilitated process, prepared an Integrated Resources Plan to serve as a blueprint for the District's Board of Directors in considering actions to be taken to address water supply issues. This is the first time such a public involvement process for water supply planning has been undertaken within Santa Cruz County. The process took over 17 months and 60 hours of full PAC meetings, not including many hours in subcommittees and meeting preparation. The PAC presented a comprehensive Integrated Resources Plan to the District's Board of Directors in July 1999. (The County Clerk has been given a copy of this report.) An excerpt of the PAC's findings and recommendations is attached. Two special reports summarizing the Integrated Resources Planning process and the PAC's findings and recommendations were sent to all District customers (copies attached.) The District's Board of Directors will be holding a public forum on September 8, 1999 to receive comments on the PAC's Integrated Resources Plan prior to taking any actions to implement the recommendations contained therein.

Findings and Conservation

In brief the PAC made the following findings based on the District's technical studies:

- There is currently an overdraft of approximately 600 AFY in the Purisima Formation and, until there is better understanding of the situation in the portion of the Aromas Red Sands within the Soquel-Aptos Groundwater Basin, no additional groundwater development should occur in that area;

- Future water demands to the year 2030, or area build out (calculated using estimates developed in conjunction with County and City of Capitola planning staffs), identify the need for approximately 2,000 additional acre feet per year of water or 37% to meet demand.

- Approximately 2,600 AFY will be needed to both address the current overdraft and meet projected demand.

- The PAC spent considerable time evaluating conservation programs that could reduce water demand and recommends implementation of a comprehensive and aggressive conservation program. The PAC recommended conservation measures are projected to result in estimated water savings for the District of approximately *650* AFY by the year 2030.

- The PAC concluded that the proposed conservation measures alone cannot stabilize the basin to provide the necessary protection against saltwater intrusion and a supplemental source of supply needs to be developed.

Supplemental Supply Options and Recommendations

The PAC evaluated eight supplemental supply options to be used in conjunction with the detailed conservation recommendations. The criteria used to evaluate each option included economic feasibility, availability and reliability of supply, environmental quality, implementation risk and uncertainty, water quality, operational flexibility, ability to meet future needs (projected at ≅ 2,000 AFY) and public safety. The options and rationale for the recommendations are briefly addressed below. *This summary is intended as a highlight and not a* ***full*** *representation of all the issues considered by the PAC.* For more complete information, please refer to the "Evaluation and Recommendations" section of the Integrated Resources Plan and the meeting notes documenting the discussions about each project.

The following three options were eliminated from consideration for the reasons given:

- **Surface Water from the City of Santa Cruz –** The City does not currently have sufficient supply to meet its own future projected demands.

- **Reservoir at Olympia Quarry** – The quarry is not available for another 10 years. The storage that the quarry could provide is insufficient to meet the City of Santa Cruz's future demand projections; therefore there would be no surplus supply and storage available for Soquel Creek Water District. To pursue this option as a District only project would require construction of a tremendously long pipeline.

- **Recharge Enhancement with Precipitation –** Based on existing Santa Cruz County hydrogeologic information, the areas designated effective for surface recharge within the Soquel-Aptos basin are very limited, making this an infeasible supplemental supply option.

The PAC's supplemental supply recommendation is summarized below:

- **Off-stream Diversion and Groundwater Injection –** This was selected as the preferred project using the evaluation criteria. The PAC recommends the District pursue this project with certain caveats, which are specified in the description contained in the supplementary materials included with this report. It was agreed that this project could be implemented more quickly than desalination, thus meeting near term options and at a more favorable cost. Since the surface supply would only be available during times of high creek flow, it is not as reliable as desalination but appears to be capable of satisfactorily meeting future supply needs, although it would not have the flexibility of accommodating a higher level of demand or meeting regional needs. The project would benefit recovery of the groundwater basin both through reduced pumping in the winter months and artificial recharge.

- **Desalination** – The cost for desalination was estimated to be approximately 47% more than surface water from an off-stream diversion. The permitting process for desalination projects is complex, requiring extensive permits and approvals by local, state and federal agencies. Special concerns are expected because of the proximity to the Monterey Bay National Marine Sanctuary. Due to the difficulty in obtaining permits and approvals for the intake and discharge facilities, it was determined that this supply option cannot be implemented in time to meet near term needs. The PAC recommends that Soquel Creek Water District consider participating in the development of a regional desalination supply, if, in the future, the District's Board determines it is necessary, possibly working with the City of Santa Cruz to locate the plant site proximate to the existing ocean outfall.

- **Recycled Water** – The PAC considered three uses for recycled water: 1) non-potable irrigation use; 2) aquifer injection; and 3) coastal barrier. Using recycled water for groundwater injection was eliminated due to the density of production wells in the basin and the requirement to retain a 2,000-foot distance and one-year retention to prevent contamination of potable water supplies. The PAC agreed that the biggest obstacles facing the use of recycled water include convincing private well owners (the largest irrigation users) to switch to recycled water, and the uncertainty associated with the partnership needed with the City of Santa Cruz to allow the construction of treatment and related conveyance facilities at their wastewater

treatment plant. The PAC's recommendation is for the District to consider participating in the development of a recycled water supply, if another agency, such as the City of Santa Cruz, implements this supply option. The PAC encouraged the District and the County to consider dual water system installations for new developments of major non-potable water users (e.g. parks, playing fields and major industrial projects.)

- **On-Stream Reservoir (Glenwood) –** This project was determined to be immediately infeasible due to the environmental impact, public perception and permitting issues; however, the PAC felt that Soquel Creek Water District, Scotts Valley Water District and the County should cooperatively support retaining the Glenwood Reservoir option for the distant future should the need for an additional project arise.

- **Imported Supply** – The PAC did not find direct import of supply to be a feasible option for Soquel Creek Water District; however, they recommended that the District work with the County and the Pajaro Valley Water Management Agency to evaluate and maximize the potential indirect increase in the amount of water available in the District's portion of the Aromas Red Sands aquifer. This increase could result from the importation of water to the Pajaro Valley, other supply projects, or a decrease of pumping in the Pajaro Basin.

Other Recommendations

The final report of the PAC also contains recommendations beyond long term water supply planning. Given the current groundwater levels, the PAC recommended that the District consider short-term emergency actions in order to protect the groundwater basin. These include establishing conditions that clearly define the groundwater conditions that constitute a shortage emergency and consider adding to the actions taken under the various levels of supply shortage. The PAC also recommended that all of the agencies having water use jurisdiction within the groundwater basin (which includes the County) initiate discussions to establish similar water emergency and long-term conservation measures.

Summer/Fall flows (known as baseflows) of Soquel Creek were also of significant concern to members of the PAC. Soquel Creek Water District has formed a Soquel Creek Baseflow Working Group comprised of representatives from the County, City of Capitola, Resource Conservation District and Coastal Watershed Council with technical assistance provided by the District's surface and ground water hydrologists. This group has discussed cooperative data collection, monitoring and management efforts to maintain and/or restore baseflows in Soquel Creek. The PAC recommends continuing and possibly expanding this group.

NEXT STEPS

Soquel Creek Water District is very pleased with the extraordinary contribution the PAC made to assist the District in moving forward with implementation of water supply planning actions. Over the next several months, the District's Board of Directors will be giving careful consideration to the recommendations made by the PAC as well as the feedback received from the public since the IRP document was released. A number of the PAC's conservation recommendations have already been approved and are being implemented. The Board will be evaluating both the short-term and long-term recommendations, having further technical investigations conducted as necessary, and taking actions it deems appropriate within the procedural requirements of State law.

The District also continues to proactively manage the groundwater basin through regular updates on the status of the basin based on analysis of the District's monitoring data and by continuing to pursue redistribution of pumping away from the coastal depressed areas. The most recent basin status report indicates that there has been some improvement in both the Purisima and Aromas Red Sands portions of the groundwater basin since the mid-1990's. These improvements appear to be attributable to a combination of stabilized pumping, proactive management of District pumping (particularly in the Purisima Formation) and above-average precipitation in recent years. This news should not be interpreted as alleviating the need to pursue the long-term supply planning as indicated in the PAC's findings.

Since any supplemental supply project will require years to complete environmental review, final design, permitting, financing and construction, the District is also actively pursuing further measures to redistribute pumping. Two specific projects are being evaluated: winter supply from the City of Santa Cruz's Beltz Wells and developing a new District well on Suncatcher Ct. in Soquel. There are numerous issues to resolve with both of these projects.

REQUEST TO COUNTY

Successful groundwater management within the Soquel-Aptos basin will require cooperation between all of the agencies with water use jurisdiction, including the County. The Board of Directors of Soquel Creek Water District requests the Board of Supervisors to allow continued County Staff work on the private well analysis within the basin and participation in the Interagency Water Resources Working Group and the Soquel Creek Baseflow Working Group. The two working groups can serve as the means for developing specific policy recommendations or cooperative actions that can then be communicated to the Boards by our respective Staffs.

By Laura D. Brown

Laura D. Brown
General Manager

What's IRP?
Fall 1998
At the Soquel Creek Water District

Planning for our future

The Soquel Creek Water District serves more than 45,000 customers in Capitola, Aptos, La Selva Beach, Seacliff, Rio Del Mar, Seascape, and Soquel.

One hundred percent of the District's water supply is groundwater from two aquifers, the Purisima and the Aromas Red Sands. Recently, symptoms of decline have appeared in both, indicating that sustainable levels of pumping have been exceeded, thereby increasing the potential for saltwater intrusion.

If these symptoms are not corrected, the District could find itself in a water supply shortage necessitating the need to enact strict mandatory water rationing measures. These measures could include water use allocations for all District customers, moratoriums on new connections, and restrictions on the amount of water for landscaping and recreational connections.

The District is actively seeking acceptable solutions to protect the groundwater basin and continue to meet the community's needs for the long-term.

The Public Advisory Committee

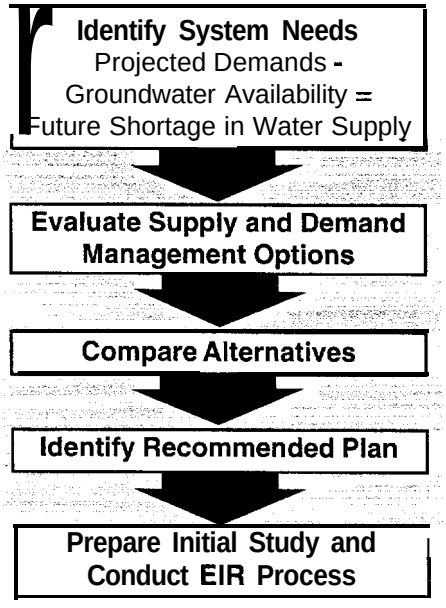
Reliable long-term water supply is important to everyone who lives or works in our District's service area; and successful water supply planning calls for solutions that balance the many considerations in a way that is acceptable to our community. That is why active public participation is important.

This is the District's objective in forming a Public Advisory Committee (PAC). The PAC is composed of individuals who represent homeowners and business associations, environmental groups, government agencies, and private well owners within the District's service area. The PAC reviews information and makes recommendations to the District's Board of Directors about each element of the Integrated Resources Plan using facilitated decision making.

This IRP Special Report provides a summary of the issues and findings to date.

The Integrated Resources Planning process

In our efforts to plan for the future, the District has initiated a decision making-process for determining our water supply need and selecting the best alternative(s) to meet that need. This process is known as Integrated Resources Planning (IRP).



A special report on water supply planning

Public Advisory Committee members

Dennis Baldwin
California Department of Fish and Game
Jan Beautz
County Board of Supervisors
Laura Brown
Soquel Creek Water District
Rich Casale
Natural Resources Conservation Service
Ron Castle
Rio Del Mar Homeowners Association
Karen Christensen ***(Alternate)***
Natural Resources Conservation Service.
Mark Deming
County Planning Department
Jeff Eckles
Aptos Chamber of Commerce
Robert Galway ***(Alternate)***
Rio Del Mar Homeowners Association
Peter Hubback
Capitola Chamber of Commerce
Rick Jones
City of Capitola Planning Commission
Pat McCormick
LAFCO
Barbara McGee
Seacliff Homeowners Association
Donna Meyers
Coastal Watershed Council
Cliff Nichols
Cabrillo College
Richard Nutter
Soquel Property Owner
Dave Reetz ***(Alternate)***
County Board of Supervisors
Judy Parsons
Save Soquel
John Ricker
Santa Cruz County Environmental Health Services
Guy Sanchez ***(Alternate)***
Seacliff Homeowners Association
Jim Smith
Mar Vista Water Corporation
Carl Sprague
Pot Belly Beach Club
Katherine Sweet ***(Alternate)***
Save Soquel
Clarke Wales
Central Water District
Lee Walters
Stockton Beach Grill

Technical Advisory Committee members (TAC)

Randall Hanson, USGS
Carl Hauge, *State Department of Water Resources*
Bruce Laclergue, *County Hydrologist*
Andy Fisher, *UCSC, Earth Sciences*
Martin Feeney, *Private Hydrologist*

Technical Consultants

Montgomery Watson
Luhdorff & Scalmanini
Linsley, Kraeger, and Associates
Don Alley and Associates
Entrix

Understanding our groundwater basin

Contrary to common belief that groundwater collects in underground lakes or flows in underground rivers, the fact is that groundwater is simply the subsurface water that fully saturates spaces between grains of sand or pores and cracks in soils and rocks. This groundwater is replenished (recharged) by precipitation, but the rate of recharge is not significantly affected by drought or above normal rainfall.

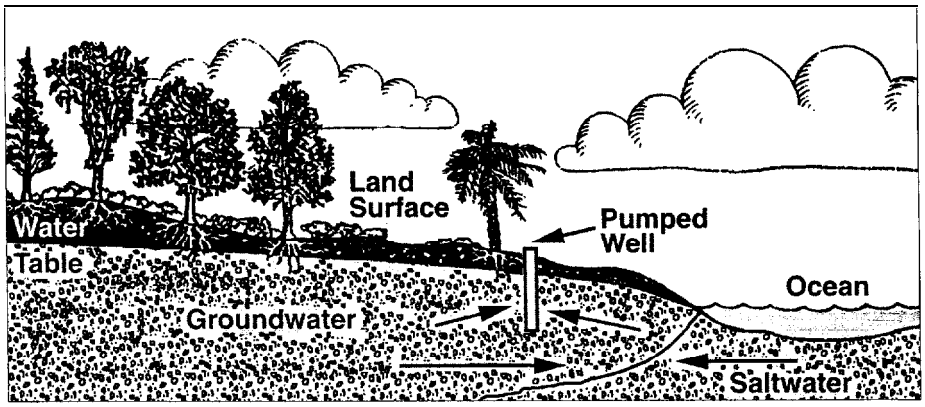
Only about 20 percent of the rain that falls in the 40.2 square mile Soquel/Aptos watershed area ends up as groundwater. The rest flows overland into streams, is absorbed by plants or evaporates.

Recharging the aquifer depths where the District's pumping occurs is a slow process because groundwater moves slowly. The recharge process can take up to seven years in the deepest aquifer layers.

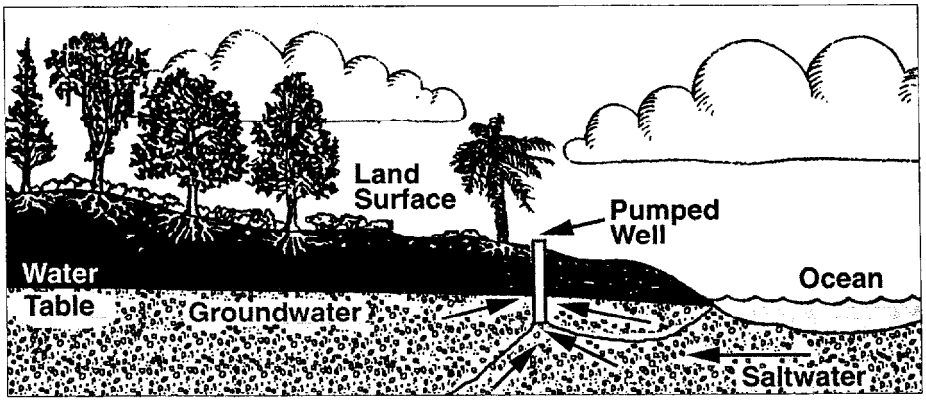
Groundwater flows horizontally through the aquifers to Monterey Bay. This flow creates a kind of wall against the saltwater that exists beneath the ocean floor. Should the groundwater flow go below a certain level, saltwater would eventually contaminate our groundwater supply, making a portion of the aquifer unusable. That is called saltwater intrusion, and it is a very difficult and expensive condition to reverse.

The illustrations below demonstrate what happens when saltwater intrusion occurs.

Normal conditions



Saltwater Intrusion



A special report on water supply planning

How much groundwater is available?

We know from monitoring of coastal groundwater levels that the current volume of pumping cannot be safely sustained; however, the amount of groundwater that can be developed from the aquifers without causing saltwater intrusion has not been quantified.

It is impossible to precisely determine groundwater basin yield. The best available tool for quantifying and simulating groundwater conditions is a numerical groundwater flow model developed using specialized computer software.

The District is in the process of developing such a model, and has formed a technical advisory committee (TAC) of impartial experts to oversee and critique the groundwater model through its development to the final product.

An important factor in establishing the yield of the groundwater basin is determining the locations and amounts of non-District pumping. There are over 1,300 wells pumping water from the Soquel/Aptos groundwater basin in addition to the District's wells. Actual pumping records are not available for most of the non-District wells. Data on these wells and estimates of the annual amount of water pumped by each has been developed and will be included in the groundwater model.

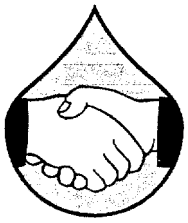
What can we do? Taking a look at our options

The Public Advisory Committee (PAC) is considering various water supply alternatives in the Integrated Resources Planning (IRP) process. Each alternative will be compared using the same set of criteria such as: the ability to meet demand; costs, both capital and ongoing; operational considerations; environmental impacts; and ease of implementation. A description of each follows:

Conservation/Demand Management

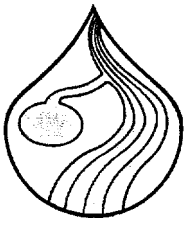
A conservation program analysis was developed to evaluate the potential water savings from an expanded conservation effort. Conservation measures that have quantifiable savings projections and other conservation/demand management options such as community outreach programs, incentive/rebate programs, partnerships with other agencies, and price incentives, are being evaluated and considered for implementation by the District.

Surface water from the City of Santa Cruz



The City of Santa Cruz currently has surface water supply available during non-drought years that could be treated and transported through a delivery pipeline to the District. The treated water could then be integrated directly into the District's distribution system and/or used to recharge the District's aquifer for storage and later withdrawal. The District would have an agreement with the City to either purchase the water or possibly deliver groundwater to the City during drought years in exchange.

Off -Stream Diversion and Storage

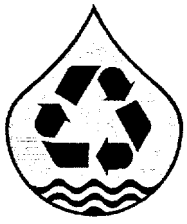


The proposed off-stream diversion and storage project would divert water from Soquel Creek during periods of high flow (winter runoff period and wet years) but maintain a prescribed level in the creek. After treatment, the potable water could be conveyed to the distribution system and/or used to recharge the aquifer for storage and later withdrawal.

Desalination

The desalination process treats seawater to meet potable water quality. The treated water could be delivered directly to the distribution system and/or used to recharge the aquifer for storage and later withdrawal.

Recycled Water

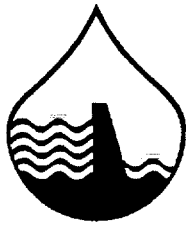


The recycled water supply alternative involves constructing a separate conveyance pipeline for treated wastewater from the nearest plant in the City of Santa Cruz to the District to be used for landscape irrigation and/or recharging the aquifer.

Transfer/Purchase of water from outside agency

This project alternative could involve a direct transfer or purchase from a Central Valley Project contractor or water rights holder outside the area. The District would first need to identify a willing seller and negotiate a water supply quantity and a purchase price with the seller. After delivery and treatment, the water could be integrated directly into the distribution system and/or used to recharge the aquifer for storage and later withdrawal.

On-Stream (Glenwood) Reservoir



The proposed Glenwood Project is located on the west fork of Soquel Creek in the Glenwood Basin. The project would require the construction of a dam on the west fork of Soquel Creek. The reservoir capacity would be approximately 5800 acre-ft. After treatment, the water could be delivered directly into the distribution system and/or used to recharge the aquifer for storage and later withdrawal.

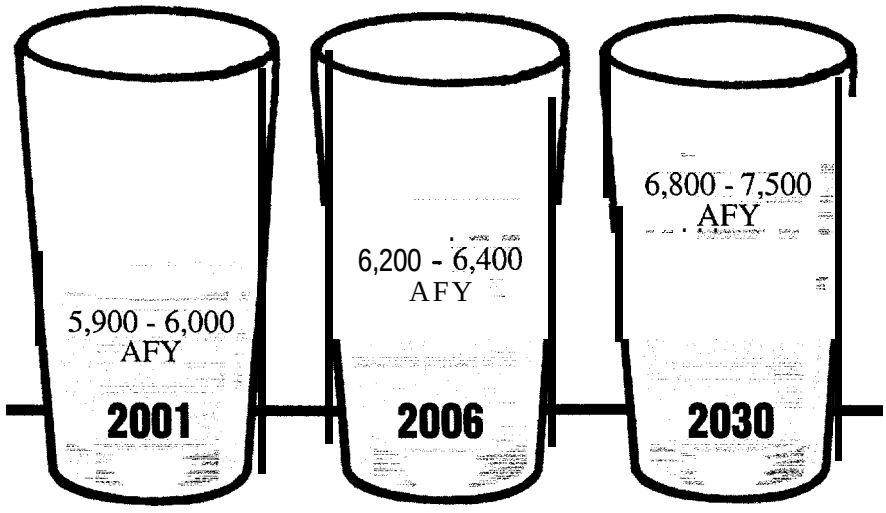
Projected future water needs

The graphic below shows the projected increased water demands being used in the IRP. Quantities are expressed in acre-feet per year (AFY). One acre-foot is equal to 325,828 gallons or enough water to cover a football field one-foot deep. Current demand equals 5,480 AFY.*

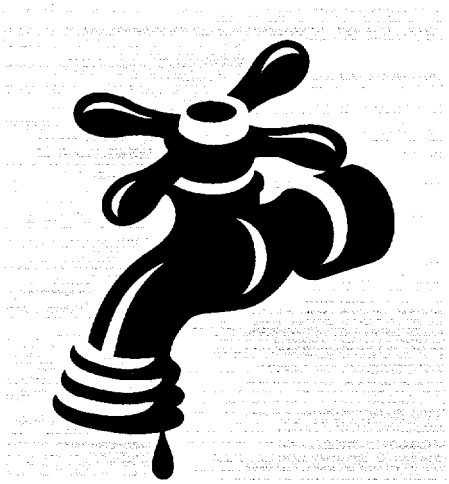
2001 Projected year when currently vacant lands inside the Urban Service Line (USL) are developed.

2006 Projected year when vacant lands outside the USL, but within the District's sphere of influence, are developed.

2030 Projected year for area at buildout, reflecting increased density/ infill based on the lowest growth rate used by planners.



*Because of signs of degradation of the groundwater basin, it is presumed that this level of pumping cannot be maintained over the long-term.



Determining future water needs . .

The methodology used to arrive at future w'ater demands within the Soquel Creek Water District. combined four main elements: the boundaries of the study area; land use data (developed in consultation with the County and City of Capitola Planning Department)! population growth rates; and water use factors (the expected water needs based on land use and/or population).

This methodology is a departure from the often-used approach to water demand projections of applying per capita water use factors to population growth rates without benefit of actual land use data.

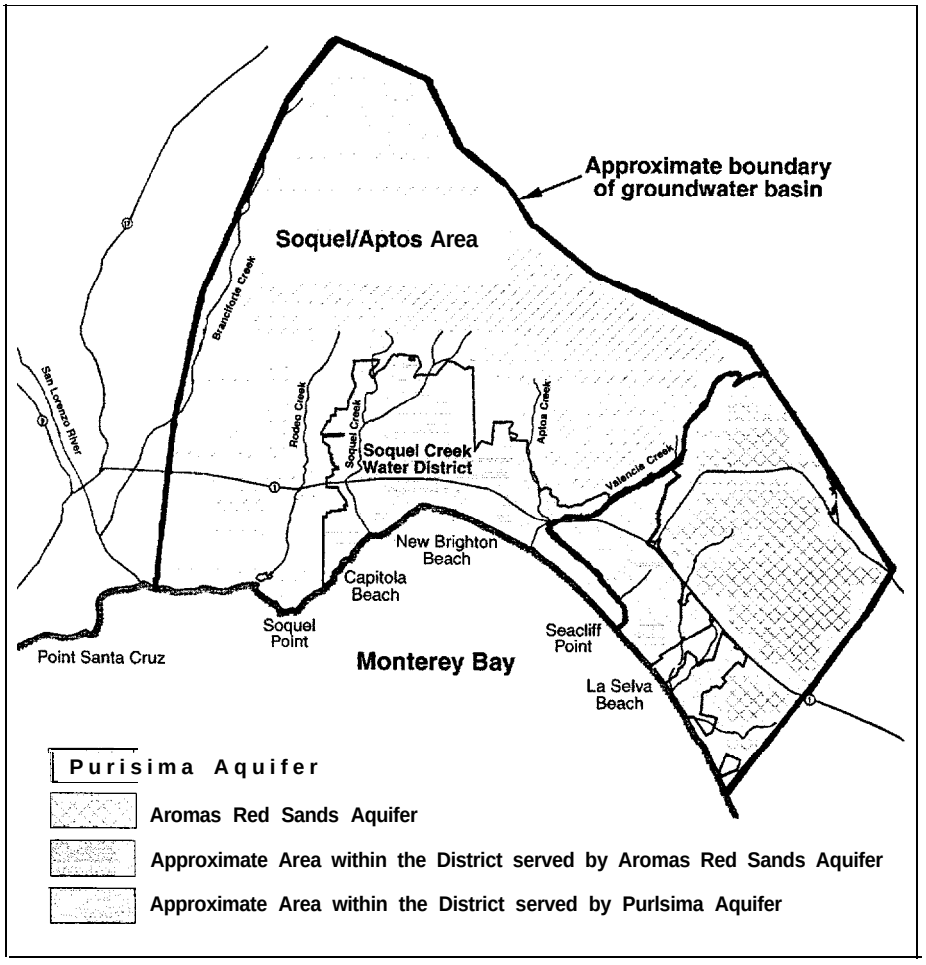
What's on Tap is an in-house publication for the customers of the Soquel Creek Water District. It provides an update on major projects, water quality concerns, conservation activities, and other District issues.

A special report on water supply planning

The concern for our groundwater aquifers

The Soquel-Aptos area's groundwater comes from two separate aquifers underlying the District, the Purisima Formation and the Aromas Red Sands. The Purisima Formation is developed by the District for water supply in the western two-thirds of its service area. The Aromas Red Sands is developed for water supply by the District in the eastern portion of its service area. These two aquifers represent the District's sole supply of water.

Two conditions of concern are: 1) depressed coastal groundwater levels in the Purisima Formation, suggesting the potential for degradation of water quality by saltwater intrusion; and 2) some apparent landward movement of the fresh-saltwater groundwater interface in the Aromas Red Sands.



Purisima Aquifer

There is sufficient evidence to conclude that the Purisima aquifer is degrading and actions need to be taken to restore the stability of the aquifer as well as provide additional water to meet future growth.

Since late 1993, the District's hydrological reports have noted depressed coastal water levels in the central portion of the District between New Brighton Beach and Aptos Creek. Groundwater levels in this portion of the Purisima aquifer have remained near historic lows and continuously below sea level.

While coastal monitoring wells in this area have not yet shown any sign of saltwater intrusion, these conditions must be addressed. This will require stabilizing and restoring the aquifer to healthy conditions. Although the quantity of water needed to reach this goal has not yet been established, a numerical groundwater computer model is being developed to enable these calculations to be made. (See separate article: *How much groundwater is available?*)

The Aromas Red Sands Aquifer

Beneath the fresh groundwater of the Aromas Red Sands Aquifer, there is a wedge-shaped body of saltwater in the area of Seascape and La Selva Beach. This *saltwater wedge* is believed to be a naturally occurring condition.

For many years, the District's monitoring program detected no change in the saltwater wedge. However, since 1992, there has been a progressive degradation of coastal groundwater quality (increasing concentration of total dissolved solids and chloride) in this area, suggesting that the saltwater wedge is moving inland. None of the District's water supply wells have been impacted yet.

What we're doing now - Interim measures

1. Redistributing pumping

The District has taken steps to reduce pumping in those coastal areas where groundwater levels are below sea level. Pumping is being shifted to the western portion of the District where higher groundwater levels exist in order to reduce pumping in areas of concern.

2. Evaluating water use policies

The District has policies in place to prohibit wasting water and requiring water efficient landscaping on new development other than single-family residential lots. The District is researching expanding those policies.

3. Conservation

The District has increased its conservation and community information efforts. New programs include residential ultra-low-flow toilet replacements, commercial/industrial fixture rebates, customized use reduction for large customers, grants for public water-wise gardens, and free informational publications and low-flow showerheads.

4. Coordination with other agencies

The District is coordinating with the County and other water agencies to address issues of mutual concern and develop supportive programs.

What's next? Completion of the IRP and the next steps

We know that current conditions and future demand projections indicate that supply alternatives must be developed to reduce pumping of the groundwater basin.

Evaluating supply and demand management options

The PAC is now studying the alternatives and focussing on possible solutions for the District to address water supply needs within the next eight years. Programs and projects will be thoroughly investigated and evaluated to determine whether they are feasible and satisfy the District's water supply needs.

Identify recommended plan

A resource strategy will then be developed. The ultimate strategy may be a hybrid of several options in order to provide a balanced solution. That strategy will be recommended to the District's Board of Directors and may also include recommendations for recharging the aquifer, enhancing stream baseflow of Soquel Creek, and regional programs.

Environmental review and permitting process

Completion of the IRP is only the first step in water supply planning. Before any new supply project can be built, it must meet California Environmental Quality Act (CEQA) requirements and have permits approved by various state and federal regulatory agencies.

SOQUEL CREEK WATER DISTRICT
5180 Soquel Drive
P.O.Box 158
Soquel, CA 95073-0158

A special report on water supply planning

What's ON TAP
Summer 1999
At the Soquel Creek Water District

Integrated Resources Plan

Every drop counts...

Public **Advisory** Committee presents their findings and recommendations

The Soquel Creek Water District serves more than 45,000 customers through approximately 13,400 active services in Capitola, Aptos, La Selva Beach, Seacliff, Rio Del Mar, Seascape, and Soquel.

One hundred percent of the District's water supply is groundwater from two aquifers, the Purisima and the Aromas Red Sands. Recently, symptoms of decline have appeared in both, indicating that sustainable levels of pumping have been exceeded, thereby increasing the potential for saltwater intrusion.

In October 1997, the District formed a Public Advisory Committee (PAC), representing a broad cross-section of interest groups.

The objective of the PAC was to evaluate the District's water supply situation and projected future needs for the next 30 years, and to develop an Integrated Resources Plan (IRP) for meeting those needs. Technical assistance and facilitation was provided to the PAC by a number of consultants.

By consensus, the PAC has prepared the Integrated Resources Plan and has concluded that current demands on the groundwater basin cannot be sustained and that both a comprehensive conservation program and development of a supplemental source of supply is needed.

This *Special Report* contains a summary of the PAC's findings and recommendations.

Every voice matters

District schedules public forum to discuss IRP

Reliable long-term water supply is important to everyone who lives or works in our District's service area; and successful water supply planning calls for solutions that balance the many considerations in a' way that is acceotable to our community. Active public oarticioation'is important..

In order to receive your input and answer questions, the District has scheduled a Public Forum to discuss the findings and recommendations of the Integrated Resources Plan.* All District customers are encouraged to attend or send us your comments.

What: Public Forum to discuss Integrated Resources Plan
Where: Sesnon House, Cabrillo College Campus
6500 Soquel Drive, Soquel
When: Wednesday, September 8, 1999, 7 PM to 10 PM

***The complete Integrated Resources Plan is available for review at the District office and at local public libraries.**

A special report on water supply planning

The Public Advisory Committee

The Public Advisory Committee was composed of individuals who represent homeowners and business associations, environmental groups, government agencies, and private well owners within the District's service area.

Aptos Chamber of Commerce
Jeff Eckles
Cabrillo College
Cliff Nichols
California Department of Fish and Game
Dennis Baldwin
Capitola Chamber of Commerce
Peter Hubback
Central Water District
Clark Wales
City of Capitola Planning Commission
Rick Jones
Coastal Watershed Council
Donna Meyers
County Board of Supet-visors
Jan Beautz, DaveRietz (Alternate)
County Planning Department
Mark Deming
LAFCO
Pat McCormick
Mar Vista Water Corporation
Jim Smith
Natural Resources Conservation District
Rich Casale
Pot Bely Beach Club
CarlSprague
Rio Del Mar Homeowners Association
Ron Castle, Robert Galway (Alternate)
Santa Cruz County Environmental Health Services
John Richer
Santa Cruz County Resouce Conservation District
Karen Christensen
Save Soquel
Judy Parsons, Katherine Sweet (Alternate)
Seacliff Homeowners Association
Barbara McGee, Guy Sanchez (Alternate)
Soquel Creek Water District
Laura Brown
Soquel Property Owner
Richard Nutter
Stockton Beach Grill
Lee Walters

Technical Advisory Committee (TAC)

Randall Hanson, USGS
Carl Hauge, *State Department of Water Resources*
Bruce Laclergue, *County Water Resources Manager*
Andy Fisher, *UCSC, Earth Sciences*
Martin Feeney, *Private Hydrologist*

looking at the big picture

PAC's Integrated Resources Plan established goals

From October 1997 to June 1999, PAC members worked together using a collaborative decision-making process to accomplish the following specific goals:

1. Understand and decide whether a saltwater intrusion problem is imminent in the groundwater basin utilized by the Soquel Creek Water District;

2. Develop a common assessment of long-term water needs and water demand management alternatives for the area served by the District;

3. Consider water use and management issues throughout the watersheds and groundwater aquifers that are utilized by the District;

4. Decide whether a supplemental water supply is needed;

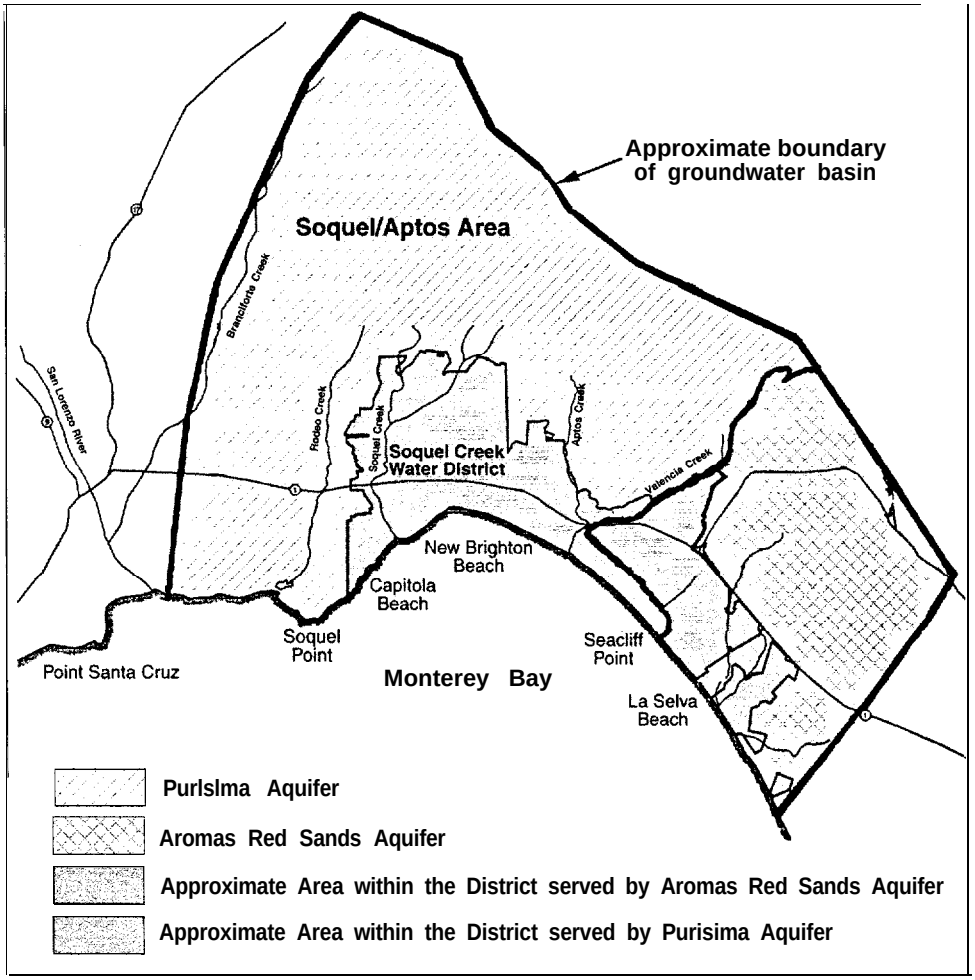
5. Develop criteria including environmental, social, and economic elements to equally evaluate all water supply alternatives, including conservation, and

6. Use the evaluation criteria to recommend a water supply plan to meet projected demands.

Why the concern for our groundwater aquifers?

The Soquel-Aptos area's groundwater comes from two separate aquifers underlying the District, the Purisima Formation and the Aromas Red Sands. The Purisima Formation is developed by the District for water supply in the western two-thirds of its service area. The Aromas Red Sands is developed for water supply by the District in the eastern portion of its service area. These two aquifers currently represent the District's sole supply of water.

Two conditions of concern are: 1) depressed coastal groundwater levels in the Purisima Formation, suggesting the potential for degradation of water quality by saltwater intrusion; and 2) some apparent landward movement of the fresh-saltwater groundwater interface in the Aromas Red Sands.



Purisima Aquifer

There is sufficient evidence to conclude that the Purisima aquifer is degrading and actions need to be taken to restore the stability of the aquifer as well as provide additional water to meet future growth.

Since late 1993, the District's hydrological reports have noted depressed coastal water levels in the central portion of the District between New Brighton Beach and Aptos Creek. Groundwater levels in this portion of the Purisima aquifer have remained near historic lows and continuously below sea level. While coastal monitoring wells in this area have not yet shown any sign of saltwater intrusion, these conditions must be addressed. This will require stabilizing and restoring the aquifer to healthy conditions. The estimated quantity of water needed to reach this goal is approximately 600 acre feet per year. An acre foot equals 325,829 gallons.

Aromas Red Sands Aquifer

Beneath the fresh groundwater of the Aromas Red Sands Aquifer, there is a wedge-shaped body of saltwater in the area of Seascape and La Selva Beach. This saltwater wedge is believed to be a naturally occurring condition.

For many years, the District's monitoring program detected no change in the saltwater wedge. However, since 1992, there has been a progressive degradation of coastal groundwater quality (increasing concentration of total dissolved solids and chloride) in this area, suggesting that the saltwater wedge is moving inland. None of the District's water supply wells have been impacted yet.

Conservation, one piece of the puzzle

Making every drop count is an important piece of the Integrated Resources Plan. Through conservation programs, it is projected that the District could ultimately reduce water demand by 650 acre feet a year over the next 30 years. (One acre foot of water equals 325,829 gallons.)

To determine the potential water savings that could be gained from an expanded conservation effort, a conservation program analysis was developed by the consulting firm of Montgomery Watson.

Using the list of best water management practices (BMP's) established by the California Urban Water Conservation Council (CUWCC), Montgomery Watson evaluated each program to determine quantifiable savings projections.

PAC members also identified a wide range of other conservation/demand management options. These were also evaluated and considered for implementation by the District.

It is the PAC's recommendation that the District expand upon its existing conservation program and consider implementing the additional programs and incentives summarized here.

long-term conservation program

Water Audit Programs

The PAC recommends the District develop indoor/outdoor water audit programs for District customers including:

- Residential
- Large Landscape
- Commercial/Industrial/Public

Expanded Rebate Programs

The PAC recommends the District enhance and expand rebate (credit) programs for:

- Ultra-low flow toilets
- Horizontal axis clothes washers
- Landscape replacement and irrigation system upgrades.
- Low-flow showerheads

Educational Programs

The PAC recommends the District establish programs to educate private well owners, schools, and District customers on the need to conserve.

Incentive Programs

The PAC recommends the District implement incentive programs such as conservation pricing, financial incentives, and free conservation products.

Coordination with other agencies

It is recommended that the District take steps to clearly communicate with the County and City of Capitola regarding the District's estimated current and projected ability to adequately supply water for new development.

Short-term conservation measures

Emergency Measures

Given the current groundwater levels, the PAC is recommending the District consider short-term emergency actions in order to protect the groundwater basin. These actions include:

- Establishing criteria that clearly define the groundwater conditions that constitute a shortage emergency and modifying the provisions of the District's Drought Contingency Plan to add to the actions considered under the various levels of supply shortage.
- Initiating discussions with other agencies having water use jurisdiction within the groundwater basin to establish similar water emergency and long-term conservation measures.

A special report on water supply planning

Determining our water needs

To determine the District's water supply needs, both the amount of safe groundwater supply and future water demands were projected.

The amount of available groundwater was calculated by reducing current pumping by the amount required to stabilize and restore the aquifer to healthy conditions.

Future demand projections were estimated for three levels of area development. First, 2001 or when currently vacant lands inside the Urban Service Line (USL) are developed. Second, 2006 or when vacant lands outside the USL, but within the District's sphere of influence, are developed. And third, 2030 or when the area is at buildout. The estimates used for all three levels reflect increased density/infill based on the lowest growth rate used by land use planners.

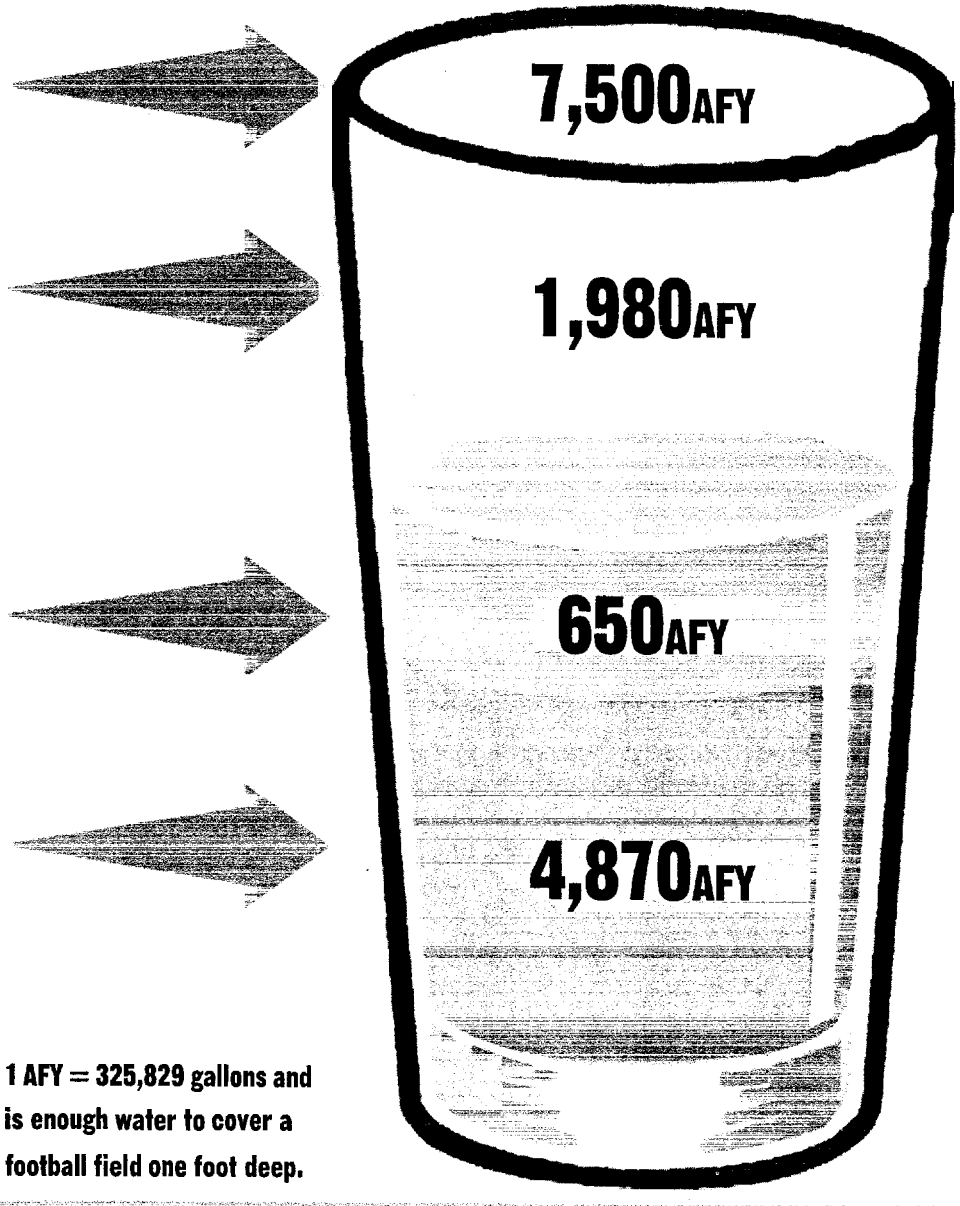
What will it take to fill up the glass?

Future Demand
What will it take to fill the glass? By about year 2030, the District will need to supply approximately 6,800 to 7,500 acre feet a year to' meet the projected demands.

Additional Water Needed
Approximate amount of additional water needed in order to meet future demands. (See recommended supply projects)

Conservation
The conservation measures recommended by the PAC are expected to result in an estimated water savings of approximately 650 acre feet a year by the year 2030.

Available Groundwater Supply
The District currently pumps about 5,480 acre feet of water per year. This needs to be reduced by approximately 610 acre feet a year to overcome the existing overdraft and eliminate the potential for saltwater intrusion. The ongoing District's groundwater supply is, therefore, estimated at 4,870 acre feet a year.



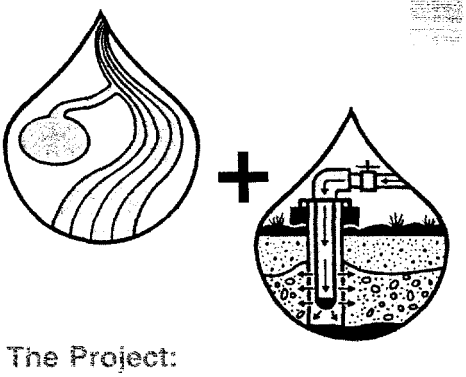
1 AFY = 325,829 gallons and is enough water to cover a football field one foot deep.

PAC recommended supply projects

The Public Advisory Committee identified and considered various water supply options in the IRP process. The list of water supply options was then narrowed down by the PAC to three supply options: desalination: off-stream diversion; and recycled water.

Each option was evaluated using the same set of criteria that included economic feasibility, availability and reliability of supply, environmental quality, implementation risk and uncertainty, water quality, operational flexibility, ability to meet future needs, and public safety.

Off-Stream **Diversion** and Groundwater **Injection**



The Project:

The proposed off-stream diversion project would be located off Soquel San Jose Road approximately two miles north of Soquel Drive.

Some water would be diverted from Soquel Creek during periods of high flow (winter runoff period in wet years). The preliminary project concept is construction and operation of a surface water intake in the stream bank to divert water from Soquel Creek to a raw water reservoir. A pump station would deliver the stored water to a treatment plant on site. After treatment, the potable water would be conveyed to customers. Surplus water from the diversion would be injected into the aquifer for storage and later withdrawal. Injection would be done by reversing the operation of existing production wells.

The PAC's recommendation:

Pursue the Off-Stream Diversion Project to offset winter demands and recharge the aquifer contingent upon the following:

- Determine that there is capacity within the aquifer to absorb the amount of water available for injection without losing water to the ocean. Determine the aquifer response when water is injected/recharged to evaluate the overall benefit to groundwater levels along the coast. Use an independent peer review, Technical Advisory Committee or consultant to verify findings.

- Work with California Department of Fish and Game and other interested entities to understand their issues related to fisheries protection and other stream resources.

- Analyze the environmental impacts, especially related to the biological health of the stream system, and mitigate accordingly.

If the above studies demonstrate to the District Board that the project is feasible and impacts can be addressed, then proceed with the project in the following manner:

- Working with the appropriate agencies, identify possible stream enhancement activities, such as riparian and streambed restoration, erosion control, fish habitat and other environmental enhancement projects.

- Obtain all necessary environmental and other permits and approvals.

- Develop a stream-flow monitoring program that includes baseflow and other types of monitoring as identified by the permitting agencies.

- Develop an interactive Public Information Program regarding all aspects of the project.

- Utilize an open participation process with the neighborhood surrounding the project in developing the facilities design. Pay particular attention to ways of minimizing visual, noise, and other potential impacts to surrounding areas.

Desalination Option

The Project:

The desalination process treats seawater to meet potable water quality. The treated water could be delivered directly to the distribution system and/or used to recharge the aquifer for storage and later withdrawal.

The PAC's recommendation:

Consider participating in the development of a regional desalination supply, if, in the future, the District's Board determines it is necessary. If the District pursues this option, consideration should be given to working with the City of Santa Cruz to locate the plant site proximate to the existing ocean outfall or working with other water agencies that may pursue a desalination project. Track the most up-to-date technologies for more cost-effective treatment options.

Recycled Water Option

The Project:

The recycled water supply alternative involves constructing a seperate conveyance pipeline for treated wastewater to be used for landscape irrigation and/or recharging the aquifer.

The PAC's recommendation

- Consider participating in the development of a recycled water supply for non-potable applications (such as irrigation), if, in the future, the City of Santa Cruz or another agency implements this supply option.

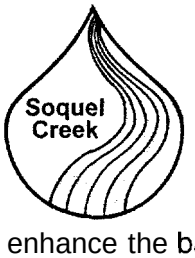
. Identify and encourage the installation of dual water systems in existing and new developments with large turf areas (e.g., playing fields, golf courses) and other major non-potable water uses (e.g., industrial users) for future applications of recycled water.

- Request that the Counties and Cities consider dual water system installations for new developments of major non-potable water users by non-District customers (e.g., Cabrillo College, County parks, major industrial projects, etc.).

Additional PAC recommendations

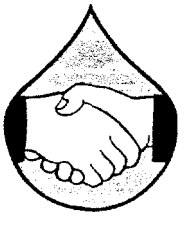
In addition to the three supplemental supply options recommended, the PAC recommends the following:

Summer/Fall Flows of Soquel Creek.



The District should continue to work with other agencies and private interests to protect and enhance the baseflow of Soquel Creek. Efforts should include monitoring groundwater levels along Soquel Creek; developing a watershed management plan; cooperatively working with others to evaluate the adjudication of the Creek; and consideration of a Watermaster.

Coordinate with other agencies



The District should work with the County and the Pajaro Valley Water Management Agency (PVWMA) to evaluate and maximize the potential indirect increase in the amount of water available in the District's portion of the Aromas Red Sands Aquifer. This increase could result from the importation of water, other supply projects to the Pajaro Valley, or a decrease of pumping in the Pajaro Basin.

- Use the updated PVWMA groundwater model to evaluate the effect of groundwater pumping in the Pajaro area (particularly Corralitos) on water levels, gradients, and yields in the Aromas formation in the southern part of the District.

- Evaluate the potential impact on water levels and yields within the District that could result from importation of water and in-lieu recharge in the Pajaro Basin, particularly in the Corralitos area.

- If there are indirect benefits to the District, work with PVWMA to consider changes in the Pajaro Basin Management Plan to maximize benefits to the District in return for District support in proportion to those benefits.

"Additional recommendations"
continued on page 8

How to reach us

If you have questions, comments or would like more information on water issues, please contact us or visit our web site.

TEL: (831) 4758500
FAX: (831) 475-4291
EMAIL: custsetv@scwd.dst.ca.us
MAIL TO: P.O. Box 158
Soquel, CA 95073-0158
WEB SITE: www.scwd.dst.ca.us

Soquei Creek Water District is a non-profit, local government agency with a locally elected Board of Directors. The District provides water supply and water resource management to more than 45,000 customers within a 17-square mile area of mid-Santa Cruz County.

The Board of Directors meet on the first and third Tuesday of each month at 7:00PM at the District's headquarters office at 5180 Soquel Drive. Meetings are open to everyone and comments from the public are heard at each meeting.

"Additional recommendations"
continued from page 7

On-Stream Reservoir.

The proposed Glenwood Reservoir Project is located on the west fork of Soquel Creek in Glenwood Basin. This project would require the construction of a dam on the west fork of the Soquel Creek. The PAC recommends that the District:

- Retain this option for the distant future should the need for an additional project arise.

- Work with the State Water Resources Control Board and Scotts Valley Water District to retain a modified application for a water rights permit on the West Branch of Soquel Creek to not preclude a possible reservoir project at the Glenwood site.

- Seek County support for this application.

- Do not sell land holdings in the Glenwood area.

- Request that the County retain this option as a possible future regional project in the General Plan.

What's ON TAP
At the Soquel Creek Water District

What's on Tap is an in-house publication for the customers of the Soquel Creek Water District. It provides an update on major projects, water quality concerns, conservation activities, and other District issues. Comments and questions should be directed to the editor at the address below.

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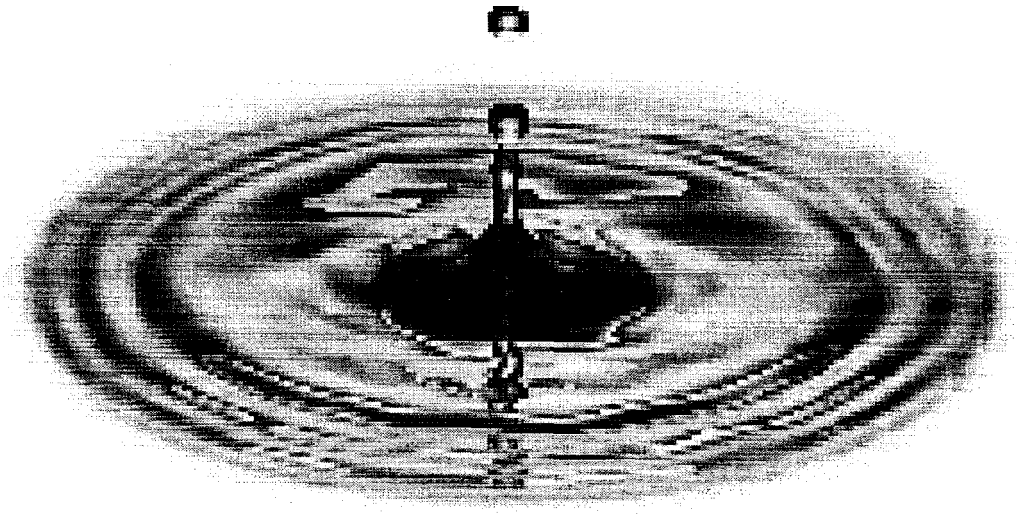
A special report- on water supply planning

Soquel Creek Water District

INTEGRATED RESOURCES PLAN



June1999

MONTGOMERY WATSON

in association with

MOORE IACOFANO GOLTSMAN Incorporated

Section 1
PAC Findings and Recommendations

Background

The Soquel Creek Water District (District) serves more than 45,000 customers through approximately 13,400 active services in Capitola, Aptos, La Selva Beach, Seacliff, Rio Del Mar, Seascape, and Soquel.

One hundred percent of the District's current water supply is groundwater from two aquifers, the Purisima and the Aromas Red Sands. Recently, symptoms of decline have appeared in both, indicating that sustainable levels of pumping have been exceeded, thereby increasing the potential for saltwater intrusion.

In order to plan for a sustainable water supply into the future, the District initiated a decision-making process for determining their water supply need and selecting the best alternative(s) to meet that need. This process is known as Integrated Resources Planning (IRP). The resulting IRP covers a thirty-year period.

Public Advisory Committee

Since reliable long-term water supply is important to everyone who lives or works in the District's service area; and successful water supply planning calls for solutions that balance the many considerations in a way that is acceptable to the community; the District formed a Public Advisory Committee (PAC) to work with consultants and staff on all aspects of the IRP.

The PAC was composed of individuals who represent homeowners and business associations, environmental groups, government agencies, and private well owners within the District's service area.

The PAC used an open, community-based, collaborative discussion and decision-making process throughout its work. Members of the public periodically attended the meetings and provided comments and input to the PAC. PAC members were asked to review technical materials and presentations, attend meetings, raise questions and offer comments, bring information and direction back to their group or constituency, and reach agreement on recommendations to the District.

The PAC conducted its work in two phases. The first phase, begun in October 1997, included six meetings of the entire PAC and six smaller working group meetings to work on detailed tasks. It concluded with the PAC reaching agreement on a number of significant elements of the final recommendation including the following:

- PAC mission statement and ground rules;
- Current and long-term water needs of the District;
- Preliminary work on the status of the groundwater basin, and
- Initial draft of a section on water conservation programs for the District.

At the conclusion of the first phase, the PAC evaluated its progress and the process used to date. Based on this evaluation, the District Board authorized the second phase of the process. The second phase began in November 1998 using slightly revised ground rules, but the same open,

collaborative public process used in Phase I. The PAC met eight times during the second phase as a full group.

The PAC completed and agreed upon the following products and elements in the second phase:

- Final version of the recommended Water Conservation Program;
- Reviewed the status of the groundwater basin and utilized the information from the groundwater model on the estimated level of overdraft and a preliminary understanding of basin recharge;
- Confirmation of the District's long-term water needs and available supplies;
- Evaluation criteria to assess water supply project alternatives;
- Evaluation and selection of water supply alternatives for further study, and
- Recommended strategy for an Integrated Resources Plan for the District including water supply projects to pursue.

Goals and Objectives

The Mission Statement adopted by the PAC contained the following specific goals:

1. Understand and decide whether a water quality and water supply problem is imminent in the District;
2. Develop a common assessment of long-term water needs and water demand management alternatives for the area served by Soquel Creek Water District;
3. Consider water use and management issues throughout the watersheds and groundwater basins that are utilized by the District;
4. Decide whether a supplemental water supply is needed;
5. Develop criteria including environmental, social, and economic elements to evaluate all water supply alternatives equally and include evaluation of conservation as an alternative, and
6. Use the evaluation criteria to make a recommendation for water supply to meet projected demands.

Water Demand Projections

To determine the District's water supply need, future water demands were projected. Using 1996 as existing conditions, the demand projections were developed to year 2030. The 1996 District pumping was approximately 5,480 AFY. High-end and low-end future demands were estimated for 2001, 2006, 2015, and 2030. At year 2030, the high-end demand projection is 7,500 AFY and the low-end demand projection is 6,800 AFY.

Conservation Measures

A conservation program analysis was developed by Montgomery Watson to evaluate potential water savings from an expanded conservation effort using the list of best water management practices (BMP's) established by the California Urban Water Conservation Council (CUWCC). Each of these programs have established quantifiable savings projections. PAC members also

identified a wide range of other conservation/demand management options. These were also evaluated and considered for implementation by the District. The PAC recommends that the District implement a comprehensive and aggressive conservation program incorporating the various components described below.

Each of the 16 BMP's established by the CUWCC, plus ten variations of these BMP's, were examined for implementation. Based on that analysis, nine are recommended for implementation by the District.

1. **Residential Water Audits.** The top 20 percent of single-family and multi-family home water users (on a gallons-per-account-per-day basis) are offered a free audit that includes indoor water conservation measures and development of an irrigation schedule. The audit needs to be repeated every five years to maintain savings.

2. **Large Landscape Water Audits and Incentives.** Audits to increase the irrigation efficiency of landscapes containing more than three acres of turf would be conducted according to methods developed by the California Department of Water Resources.

3. **Commercial/Industrial/Public Incentives for Irrigation System Upgrades.** This program offers a customized rebate for any device or technique that can be shown to reduce irrigation water use by more than 1,000 hundred cubic feet (CCF)/year per application and to reliably provide those savings for at least five years. The burden of proof for savings and durability of those savings rests with the applicant, however, and acceptance of the proof, for the purpose of setting the rebate level, is at the discretion of the District.

4. **Commercial/Industrial/Public Indoor Water Audits.** This measure targets the top 10 percent of commercial, industrial, and public (government, institutional) water users. Building owners would be contacted and offered a free interior audit together with incentives sufficient to achieve customer implementation of audit findings. Audits would be repeated every five years to maintain or improve the conservation level.

5. **Commercial/Industrial/Public Outdoor Water Audits.** Existing commercial and industrial building owners, with less than three acres of turf and whose buildings have high summer water use, would be offered an irrigation system audit to improve water use efficiency of the existing sprinkler system including establishing the correct watering schedule. Annual conservation reminders would be sent to the targeted businesses/industries, and an offer would be made to repeat the audit after five years.

6. **Residential Water Efficient Landscape and Irrigation System Incentives.** This program offers incentives to single-family and multi-family customers for the installation of water-efficient landscaping and irrigation systems. To qualify, customers must have drip irrigation on plant material, timers or controllers, and soil and rain sensors.

7. **Ultra-Low-Flush Toilet Replacement.** The District would continue and enhance its current toilet replacement program offering rebates to customers who replace their high water-use toilets with 1.6 gallons per flush (gpf) models. This measure would create increased savings in the short term because the low-flow fixtures are installed sooner than the natural

replacement rate. Over the long run, no total increase in savings would occur; however, since the federal Energy Policy Act mandates that only 1.6-gpf toilets can be sold.

8. **Incentives for Commercial/Industrial/Public Toilet Shower Replacement.** Cash rebates would be offered to encourage replacement of existing high water-use toilets and urinal valves in the Commercial/Industrial/Public sectors and low-flow showerheads could be replaced for all Commercial/Industrial/Public customers that have significant numbers of shower-heads (like schools).

9. **Irrigation Advisory Service.** This measure would offer all irrigators advice on when and how much to water based on the calculated irrigation water needed for turf grass, using evapotranspiration (ET) information from a series of local weather stations. ET information could be published daily in the local newspaper.

Additional Conservation Recommendations of the PAC

The following suggested measures expand upon the conservation Best Management Practices, (BMP), and suggest collaborations or partnerships between the District and other organizations that could produce additional water savings.

1. **Communication with County and City Regarding Water Resource Management.** It is recommended that the District take steps to clearly communicate with the County and City regarding the District's estimated current and projected ability to adequately supply water for new development. This will enable planning for future growth, which reflects the District's ability to serve that growth as well as contribute to the broader goal to achieve regional-level coordination for water resource management. Specifically, the PAC recommends the following steps be taken by the District:

   1.1. An annual report should be submitted by the District to the County Planning Department, County Board of Supervisors, and City of Capitola. If the District has entered any of the three shortage levels outlined in Appendix V of the *Soquel Creek Water District 1995-2015 Drought Contingency Plan, the* annual report should include a request to the County to review its growth limits.

   1.2. Set criteria that clearly define the groundwater conditions that constitute a shortage emergency and invoke the provisions of the *Soquel Creek Water District 1995-2015 Drought Contingency Plan* with the following modifications:

   A. First Level: Conservation Emergency.

   Triggers include up to 15 percent supply shortage, or overdrafting and threat to future water supply/quality.

   The District shall hold a public hearing regarding the water supply shortage, shall take action to reduce water use and shall consider the following potential actions:

   a) Conditional or limited will-serve letters to customers;
   b) Moratorium on new water hookups;
   c) Request the County to place a moratorium on new wells within the aquifer;

d) Request the County to monitor and meter all wells within the groundwater basin;
e) Voluntary use reductions outlined in table 5 and in Appendix V of the *Soquel Creek Water District 1995-2015 Drought Contingency Plan;*
f) Mandatory use reductions outlined in Table 5 and in Appendix V of the *Soquel Creek Water District 1995-2015 Drought Contingency Plan;*
g) Particularly in short-term emergency situations, take other appropriate actions to reduce water use.

B. Second Level: Supply Emergency

Triggers include a more than 15 percent supply shortage, and threat to current and future water supply/quality, and evidence of salt water intrusion.

The District shall hold a public hearing regarding the water supply shortage and shall take the following actions:
a) Moratorium on new water hookups;
b) Request the County to declare a moratorium on new well drilling;
c) Mandatory use reductions outlined in Table 5 and in Appendix V of the *Soquel Creek Water District 1995-2015 Drought Contingency Plan;*
d) Particularly in short-term emergency situations, take other appropriate actions to reduce water use.

Legal case history requires that these steps be supported by sound data.

1.3. Declare a groundwater emergency consistent with the provisions of Stage 1 of the District's Drought Contingency Plan (up to 15% shortage), with its associated conservation measures.

1.3.1. Revise the District's Drought Contingency Plan by adding the following measure to Stage 1 -- "Issue conditional will serve letters and clearly communicate to all applicants about the District's projected supply shortage and the necessity of resolution in order to approve additional connections."

1.4. Initiate discussions with other agencies with water use jurisdiction within the aquifers used by the District to establish similar water emergency and conservation measures.

1.5. Encourage regional solutions to water supply/quality problems by forming alliances with other water management agencies.

1.6. Request that the County and City of Capitola, in their future land use planning decisions, not exceed the projected water demands through 2030 (which are based on current General Plans) by not increasing densities, expanding urban services lines or other land use changes that would result in overall increased water demand within the Soquel/Aptos groundwater basin.

1.7. Expand the drought tolerant landscaping requirements with County and City of Capitola input and explore the possibility of working with the other water agencies and the Mayor's Select Committee to create uniform water conservation legislation throughout the County.

1.8. Work with the County of Santa Cruz to quantify non-District pumping within the aquifers.

1.9. Support a countywide water resource monitoring and management program.

1.10. Investigate a countywide assessment to support water monitoring throughout the County of Santa Cruz, to include private wells.

2. **Conservation Pricing.** Pricing methods including multi-tier, "Fair Use Management" or "fee-bates" reward those who conserve and charge those who use substantially above average amounts of water at a greater per unit cost. Establishment of any of these pricing methods should be accompanied by an appeal process allowing the District to hear special cases such as unavoidable high water use to care for sick or elderly residents.

3. **Leak Detection.** The District can develop a priority list of projects for reducing water system loss to achieve 6% and 5% system loss with anticipated costs associated with each level of reduction. Active sonic leak detection for all water lines and connections can be an effective option.

4. **Expanded Rebate Programs.** Expanding programs in their scope, moving up the implementation timelines, and increasing rebates to achieve fuller utilization can make the savings greater. Three options to increase savings include:
   4.1. A new rebate program for front-load laundry washers could save both water (est. 4.5 gppd) and energy and would include a special rebate program for laundromats or laundry facilities in multi-family complexes.
   4.2. Accelerate and increase the participation in the Ultra-Low-Flow Toilet Rebate Program through the mandatory replacement at time of transfer or remodel (exceeding 50% of existing square footage) for all residences and commercial facilities.
   4.3. Provide low-flow showerheads with shutoff valves and hose shutoffs without cost during water audits.

5. **Landscape Incentives.** Drought tolerant landscaping can help address the approximately 50% increase in water consumption during the summer months.
   5.1. Irrigation rebates are an option and could be combined with reasonable mandatory replacement or installation at time of transfer or remodel (exceeding 50% of existing square footage) for all residences and commercial facilities.
   5.2. Drought tolerant landscaping or drought tolerant lawn replacement rebates and technical assistance in selecting plant or lawn variety would encourage and accelerate water savings as well as provide the District with data on participation.

6. **Mandatory Rationing.** Mandatory reduction remains an option. Allowances would be made for special needs such as large families and customers would have one year to make reductions.

7. **Submetering.** Savings can be encouraged when people know their usage or become aware of changes such as leaks in their particular residential unit. The District could provide incentives/rebates for apartment or condominium submeter installation or require installation without cost to the District. Two areas to focus upon include:
   7.1. Mandatory installation of submeters for apartments or condominiums within 3 years.

7.2. Mandatory installation of submeters for mobile homes within 5 years with cost protections for residents.

8. Pressure Reduction. Develop pressure reduction options for individual residences and commercial customers as well as for neighborhoods or subdivisions. Two possible target areas include:

8.1. Individual residences particularly in areas of high system pressure.

8.2. Mandatory pressure reduction on new developments over a pre-determined number of units or square feet.

9. **Education Programs.** Model education programs represent an investment in future water savings. Some options include:

9.1. Establish and/or expand existing education programs to reach private well users outside the District but within shared aquifers to increase their conservation.

9.2. Establish a partnership with the Life Lab program to have children grow and study drought tolerant plants at school and then plant them at home.

9.3. Establish and/or support existing educational or nursery programs for drought tolerant plants. Use a nonprofit partnership program such as the Homeless Garden Project for growing or installing plants. Provide incentives for verified replacement of "traditional" landscaping or provide free plants to customers along with conservation information.

10. **Gray Water.** Start a gray water task force to include representatives of the County, Cities, a nonprofit organization, and the business community. Include the publishing of technical assistance materials, providing audits, and the development of a contractor education and/or certification program. Work in partnership with the County's Environmental Health Department to ensure protection of public health.

11. **Conservation Institute.** Begin a summer water conservation institute in conjunction with UCSC, Cabrillo, and vocational training programs to provide assistance with retrofits and landscaping conversion.

12. Low Water Use Incentives. Establish a reward system for low water use, which might include one or more of the following options:

12.1. Provide a financial incentive to those who use substantially less water.

12.2. Consider establishing a market based conservation program such as would be suggested by the "Fair Use Management" approach. Shares representing a certain quantity of water would be allocated to each customer according to type of use, with a portion of unused shares available for sale to those willing to pay the market price, thus addressing the finite nature of the resource at any given time.

12.3. Use rewards such as tokens or coupons that can be exchanged for drought tolerant plants or car washes at facilities that use recycled water for use below a certain level or for each unit of water not used within a certain allotment.

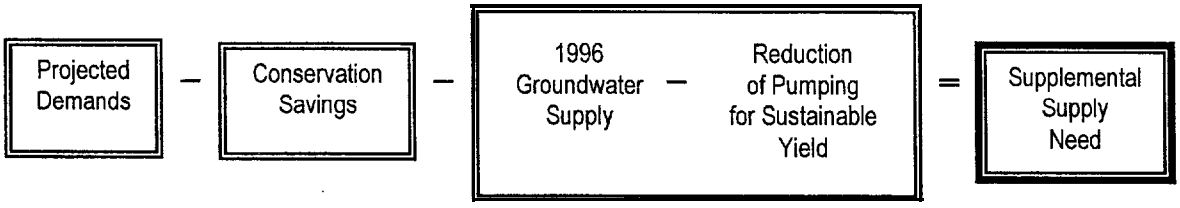
13. Conservation Committee. Establish, as quickly as possible, a water conservation committee with District, private, and governmental participation and a budget to carry out projects.

Water Needs Assessment

The District's water supply needs were determined using the following components:

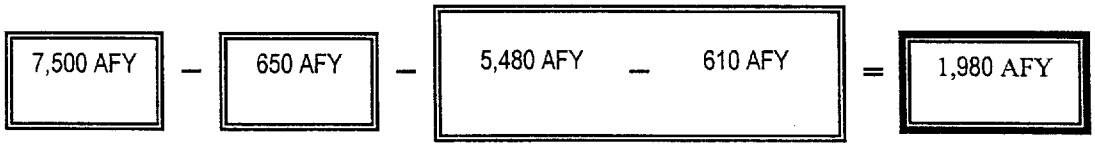
- Water Demand Projections – Using 1996 as existing conditions, the demand projections were developed to year 2030. High-end and low-end future demands were estimated using the land use-based approach and the parcel-based approach for development, respectively. The high-end projections assume that new development will occur at the density range allowed by the County of Santa Cruz General Plan. The low-end projections assume that development will occur at lower densities based on parcel size.
- Existing Groundwater Production – The actual District production for 1996 was used.
- Groundwater Model Results on Basin Sustainable Yield – The Soquel-Aptos Integrated Groundwater and Surface Water Model (IGSM) was developed and used to simulate basin baseline conditions and develop the basin sustainable yield for the Purisima formation. Assuming that pumping changes are limited to the District wells only, the analysis indicated that 1996 aquifer pumping levels need to be reduced by approximately 610 AFY in selected production wells to alleviate the undesirable conditions of depressed and declining coastal monitoring well water levels. Depending on the outcome of the sustainable yield of the Aromas formation (yet to be determined), additional pumping reduction for District wells within the Aromas formation may be required.
- Recommended Conservation Program – The PAC recommended conservation measures are projected to result in an estimated water savings for the District of approximately 650 AFY by the year 2030.

After accounting for current and projected demand, factoring in potential savings from an aggressive conservation program, and addressing a minimum level of pumping reduction to correct overdraft and avoid undesirable impacts, it was determined that the District needs to augment its current supply by approximately 1,200 to 2,000 AFY over the next 30 years.

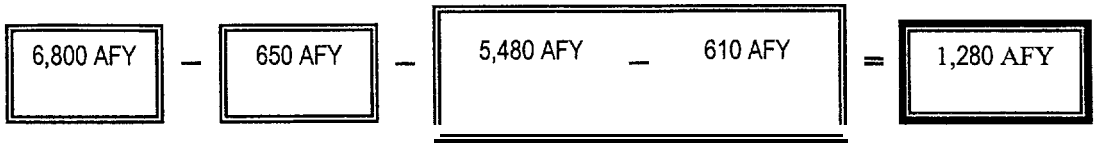


Using the upper and lower range year 2030 demand projections, the District's need is determined as follows.

Upper Range of Need:



Lower Range of Need:



Water Supply Options

The Public Advisory Committee identified and considered various water supply options in the IRP process. The list of water supply options was then narrowed down by the PAC to three supply options: desalination; off-stream diversion; and recycled water. Each option was evaluated using the same set of criteria that included economic feasibility, availability and reliability of supply, environmental quality implementation risk and uncertainty, water quality, operational flexibility, ability to meet future needs, and public safety. Their recommendations follow.

Supplemental Water Supply Option Recommendations

Based on the Water Needs Assessment, the PAC recommends the following supplemental supply options for the District's consideration.

1. **Off-Stream Diversion Option.** Pursue the Off-Stream Diversion Project to offset winter demands and inject water into the aquifer contingent upon the following:
   - 1.1. Determine that there is capacity within the aquifer to absorb the amount of water available for injection without losing water to the ocean. Determine the aquifer response when water is injected/recharged to evaluate the overall benefit to groundwater levels along the coast. Use an independent peer review, Technical Advisory Committee or consultant to verify findings.
   - 1.2. Work with California Department of Fish and Game and other interested entities to understand their issues related to fisheries protection and other stream resources.
   - 1.3. Analyze the environmental impacts, especially related to the biological health of the stream system, and mitigate accordingly.

   If the above studies demonstrate to the District Board that the project is feasible and impacts can be addressed, then proceed with the project in the following manner:
   - 1.4. Working with the appropriate agencies, identify possible stream enhancement activities, such as riparian and streambed restoration, erosion control, fish habitat and other environmental enhancement projects.
   - 1.5. Obtain all necessary environmental and other permits and approvals.
   - 1.6. Develop a stream-flow monitoring program that includes baseflow and other types of monitoring as identified by the permitting agencies.
   - 1.7. Develop an interactive Public Information Program regarding all aspects of the project.

1.8. Utilize an open participation process with the neighborhood surrounding the project in developing the facilities design. Pay particular attention to ways of minimizing visual, noise, and other potential impacts to surrounding areas.

2. **Desalination Option.** Consider participating in the development of a regional desalination supply; if, in the future, the District's Board determines it is necessary. If the District pursues this option, consideration should be given to working with the City of Santa Cruz to locate the plant site proximate to the existing ocean outfall or working with other water agencies that may pursue a desalination project. Track the most up-to-date technologies for more cost-effective treatment options.

3. **Recycled Water Option.**
   - 3.1 Consider participating in the development of a recycled water supply for non-potable applications (such as irrigation), if, in the future, the City of Santa Cruz or another agency implements this supply option.
   - 3.2 Identify and encourage the installation of dual water systems in existing and new developments with large turf areas (e.g., playing fields, golf courses) and other major non-potable water uses (e.g., industrial users) for future applications of recycled water.
   - 3.3 Request that the County and Cities consider dual water system installations for new developments of major non-potable water users by non-District customers (e.g., Cabrillo College, County parks, major industrial projects, etc.).

Additional Recommendations

1. **Baseflow of Soquel Creek. The** District should continue to work with other agencies and private interests to protect and enhance the baseflow of Soquel Creek. Efforts should include monitoring groundwater levels along Soquel Creek; developing a watershed management plan; cooperatively working with others to evaluate the adjudication of the Creek; and consideration of a Watermaster.

2. **Imported Supply.** The District should work with the County and the Pajaro Valley Water Management Agency (PVWMA) to evaluate and maximize the potential indirect increase in the amount of water available in the District's portion of the Aromas Red Sands Aquifer. This increase could result from the importation of water, other supply projects to the Pajaro Valley, or a decrease of pumping in the Pajaro Basin.
   - 1.1 Use the updated PVWMA groundwater model to evaluate the effect of groundwater pumping in the Pajaro area (particularly Corralitos) on water levels, gradients, and yields in the Aromas formation in the southern part of the District.
   - 1.2. Evaluate the potential impact on water levels and yields within the District that could result from importation of water and in-lieu recharge in the Pajaro Basin, particularly in the Corralitos area.
   - 1.3. If there are indirect benefits to the District, work with PVWMA to consider changes in the Pajaro Basin Management Plan to maximize benefits to the District in return for District support in proportion to those benefits.

3. On-Stream Reservoir. Retain this option for the distant future should the need for an additional project arise.

2.1. Work with the State Water Resources Control Board and Scotts Valley Water District to retain a modified application for a water rights permit on the West Branch of Soquel Creek to not preclude a possible reservoir project at the Glenwood site.

2.2. Seek County support for this application.

2.3. Do not sell land holdings in the Glenwood area.

2.4. Request that the County retain this option as a possible future regional project in the General Plan.