



County of Santa Cruz

HEALTH SERVICES AGENCY

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ENVIRONMENTAL HEALTH

May 11, 2011

Ms. Laura Brown, General Manager
Soquel Creek Water District

Subject: Status Report on the Potential for Surface Water Transfers in Northern Santa Cruz County

Dear Laura:

Your Board has requested a status report on the County's efforts to explore the feasibility of conjunctive use and water transfers in the northern Santa Cruz County area. The following report summarizes the potential benefits, identifies potential limitations/challenges, and next steps for further evaluating the potential to transfer excess winter streamflow from the City of Santa Cruz intake on the San Lorenzo River to reduce overdraft in both the Scotts Valley and Soquel areas. This information will also be shared with the Board of Supervisors and the Santa Margarita Groundwater Committee.

It is important to note that discussions about this potential water transfer have so far been restricted to staff of the affected water agencies. There have been no formal discussions with the governing boards so there has been no vetting of political or jurisdictional issues. Moreover the work to date must be considered preliminary in nature much as one would consider an engineering feasibility report. More modeling and engineering analysis is required as described in this report.

Background

Conjunctive water use involves utilization of multiple water sources, usually both surface and groundwater sources, in a way that maximizes water storage and availability under different climatic conditions. This can involve transfers among water agencies of winter streamflow, summer groundwater, recycled water, and water from desalination. Conjunctive use can both provide for increased water supply reliability and increased summer stream flows for fish habitat as a result of increasing groundwater storage and reducing summer stream diversions.

Under the Santa Cruz Integrated Regional Water Management Program, County staff have worked with other agency partners on a Proposition 50 funded effort to identify the best approaches for conjunctive use and increased groundwater storage in the Lower San Lorenzo Watershed. The first phase of this work is currently being completed by Kennedy/Jenks Consultants. The consultant evaluated a variety of water sources and methods for increasing groundwater storage, including: restoration of stormwater infiltration in urbanized areas of Scotts Valley, water transfers of surplus winter streamflow from Santa Cruz to reduce Scotts Valley area groundwater pumping, and use of winter streamflow for direct groundwater recharge.

County staff have expanded on the consultant's work to further evaluate the availability of surplus winter water from the San Lorenzo River to reduce groundwater pumping and increase groundwater

storage in both the Scotts Valley and Soquel areas. Both of these areas are experiencing overdraft and could benefit from this conjunctive use effort as an augmentation to their water supply portfolios, although the initial yield and reliability for the Soquel area appears to be significantly less than the present supplemental supply need. The results of this preliminary analysis look very promising and Proposition 84 grant funds will be used to further develop operational details, address legal and regulatory requirements, and complete engineering designs and cost estimates. Pending that more in depth analysis, we can present a generalized description of the potential system operation and possible benefits.

Operational Approach

The source of additional water would be the San Lorenzo River where it enters the Santa Cruz City Limits at Tait Street. This is the City of Santa Cruz's primary source of water where they have a water right to take up to 12.2 cubic feet per second (cfs) throughout the year. However, during most winters when demand is low and the City's north coast stream sources have more available flow, the City only uses about 5.4 cfs from the River, which would leave 6.7 cfs that could potentially be available for transfer to Scotts Valley and Soquel. The additional flow would be treated at the City' Graham Hill treatment plant and delivered as potable water to the other areas for direct use instead of pumped groundwater (in-lieu recharge) or for infiltration to the basin (managed recharge).

It was assumed that additional diversions from the River would only take place during the period of December through March and only at times when a downstream bypass flow of at least 25 cfs could be maintained for protection of fish migration and habitat. Diversions would not take place during very high flows (greater than 300 cfs) due to the high likelihood of excessive, untreatable turbidity. Staff analyzed average daily flow records for the past 35 years to identify which days had flow conditions that would have allowed a diversion of additional water for transfer to the other agencies. The amounts that could be diverted each day were added up to calculate how much total flow could be diverted each year. This amount was then compared to the 2008 winter demand for the Scotts Valley and Soquel service areas. It was assumed that Scotts Valley would have the higher priority for receiving water because the underlying Santa Margarita groundwater basin is in the San Lorenzo Watershed, it is a smaller basin that would recover more quickly with reductions in pumping, and a recovery of groundwater levels would provide more immediate fish benefits in terms of increased summer baseflow in Bean Creek.

Two other scenarios were also run: one assuming that the City would reduce pumping from the north coast and that less San Lorenzo River water would be available for transfer (only 5.8 cfs), and another assuming that there would be more available for transfer (13.5 cfs) as a result of infrastructure upgrade and increased water rights. The annual amounts that could be available for transfer are shown on the attached chart.

Potential Benefits

Based on this preliminary analysis, and subject to potential limitations as described in the next section, the following benefits might result if this scheme were pursued:

- Under the flow regime of the past 35 years, using current infrastructure and excess water available under current water rights, diversion of excess winter (Dec.-March) flows could produce an average of 800 acre-feet per year (af/yr). Scotts Valley's winter demand of 480 af, could be fully satisfied 31 out of 35 years. This includes both the Scotts Valley Water District and the southern portion of the San Lorenzo Valley Water District. After Scotts Valley winter demand was met, an average of 340 af/yr could be delivered to the Soquel Creek Water District, which amounts to about one third of Soquel's winter demand. Soquel could receive at least 200 af. 22 out of 35 years.

- In the longer term, if water rights were increased and pumping capacity was upgraded, additional Soquel demand could be met and/or water could be made available for direct recharge into the Scotts Valley groundwater basin.. Under this scenario, with up to 13.5 cfs total available for transfer the average total annual yield would be 1415 af/yr, with Soquel receiving an average of 810 af/yr, and an additional average of 140 af/yr available for direct recharge in Scotts Valley. Increased yields might be able to be obtained through upgrade of the treatment plant capacity and further increasing the water right. In the long term, this could potentially supply blend water to also allow direct recharge of Scotts Valley recycled water during the winter.
- Computer modeling of the Santa Margarita Groundwater Basin suggests that winter in-lieu recharge for Scotts Valley (approx. 500af/yr) would result in a 0.25 cfs increase in summer baseflow of Bean Creek. Additional direct recharge of an additional 500 af/yr could increase Bean Creek summer baseflow by another 0.25 cfs, for a total increase of 0.5 cfs after 10-20 years of recharge, providing a significant increase in salmonid rearing habitat in Bean Creek and an increase in flow in the lower San Lorenzo River.
- The potential for increasing summer flow in Soquel Creek by reducing deep aquifer pumping (i.e., District wells) has not been modeled. In theory, a significant reduction of groundwater pumping in the Soquel basin could eventually allow groundwater levels to come up with some increase in summer flow of Soquel Creek. These benefits would most likely take more than 20 years to occur and the direct benefit to baseflow from the proposed transfer scheme would depend on how this added resource would be used, e.g. how much would be stored in the Purisima A/AA units that underlie Soquel Creek as opposed to other aquifers within the Soquel/Aptos groundwater area and any exchange agreements that would bank this water for drought use by the City of Santa Cruz. Any water that comes to Soquel would most likely be utilized first to recover coastal groundwater levels, which would have with less benefit for the inland areas and stream baseflows.
- Other conjunctive use projects are also being evaluated to address the overall water supply shortage issue in Northern Santa Cruz County. These include: 1) a project being considered by Scotts Valley Water District and the City of Santa Cruz that would result in the delivery of recycled water from Scotts Valley to the Pasatiempo Golf Course for summer irrigation, with the savings in potable water being delivered from Santa Cruz to Scotts Valley; and 2) the regional seawater desalination project being evaluated by the City of Santa Cruz and Soquel Creek Water District. The proposed surface water transfer would work well within the context of the other conjunctive use projects and further enhance and diversify water supply portfolios for the region.

Additional Considerations and Possible Challenges

There are a number of factors which could result in an increase or decrease in the possible yield of this proposed project. These issues will be subject to further consideration and definition:

- The City is currently negotiating with the National Marine Fisheries Service and California Department of Fish and Game regarding the terms of a habitat conservation plan (HCP) which would allow them to continue taking water from streams while minimizing the adverse impacts on threatened and endangered fish species. It is likely the final HCP may require the City to take less water from the north coast streams, which would require them to take more from the San Lorenzo River, reducing the amount of surplus available for transfer to other agencies until such time as the water rights could be expanded. A 20% reduction in water diverted from north coast streams, would reduce the amount that could be transferred to other agencies by an average of 110 af/yr.
- The allowed diversion season was assumed to be December 1 to March 31, pursuant to broad northern California guidelines promulgated by the resource agencies. However, there are frequently large volumes of flow in the San Lorenzo River later in the spring, and the diversion season could potentially be extended, provided adequate downstream releases were provided.
- The proposed downstream release of 25 cfs. at Tait Street needs to be further evaluated. A more detailed review of the City's data on habitat conditions and discussion with the resource agencies

might indicate that the minimum winter release could be reduced without any adverse impact on habitat. On the other hand, a greater release might be required. The total diversion proposed under current water rights would only amount to 6-10% of the total River flow during that four-month period, based on records from 2009 (a dry year) and 2010 (a normal year).

- The analysis calculates available surplus on a daily basis, but accumulates and applies that surplus over the whole winter period. The analysis should be further refined by accounting for Scotts Valley and Soquel demand on a monthly or daily basis and doing a more detailed daily modeling of the City's operations and infrastructure.
- Although the initial transfers proposed would be within the allowed diversion amount of current City water right, the water right will require amendment by the state to expand the allowed place of use. A new water right or amendment typically takes at least 20 years for approval, although there may be some mechanisms to more rapidly allow conjunctive use water transfers on an interim basis. It has been suggested that north coast pre-1914 water rights could be transferred without state approval. However, such a transfer would still require approval of the resource agencies and the City does not want to give up its north coast water rights as that is their best quality water.
- Upgrades of City infrastructure and an increase in the water rights could increase the amount of water available for transfer by 75%. This might be further increased with an upgrade of the treatment plant capacity, if that were feasible. This could provide water for direct recharge, primarily in Scotts Valley, and could promote more rapid recovery of the groundwater basins. Any consideration of direct as opposed to in-lieu recharge would include an analysis of the feasibility, limitations and cost of developing recharge facilities.
- Under any agreement for water transfer, it is expected that the City will want to maintain its priority for full use of its existing water rights and would only approve transfer of unneeded surplus as long as that is available. For this reason, and the uncertainty of climate change impacts on precipitation, recharge, and runoff, the reliability of conjunctive use as a supply source is a concern for Soquel Creek Water District. Excess surface water through a water transfer scheme does not provide a guaranteed volume year-in and year-out.
- The proposed water transfer schemes for Scotts Valley and Soquel do not provide any immediate water to the City of Santa Cruz, which needs a source of 1600 af/yr in the event of a multiple year drought and likely an additional amount due to restrictions based on the Habitat Conservation Plan. Although some water could possibly come back to Santa Cruz from Soquel or Scotts Valley in the future, once the groundwater basins recover, it cannot be predicted when this would be available and how much would be available.

This water transfer scheme would not eliminate the need for the proposed desalination plant or some other significant source of supplemental water in combination with continued conservation efforts. Assuming Scotts Valley exercises its priority to receive water and the City of Santa Cruz's water rights for the San Lorenzo River are not increased, the average yield for Soquel Creek Water District from the transfer project would be 340 af/yr. This is substantially less than the minimum 1,200 af/yr guaranteed from the proposed desalination project and the forecasted needs of approximately 1,880 af/yr that Soquel may need to initially restore the basin.

Next Steps

Staff has shared this analysis and engaged in preliminary consultations with staff from the City of Santa Cruz, Soquel Creek Water District, Scotts Valley Water District, San Lorenzo Valley Water District and National Marine Fisheries Service. All the agencies believe the scheme for intraregional transfer of water should be further explored to maximize use of available water resources. The Santa Cruz Region was recently awarded a Proposition 84 Integrated Regional Water Management planning grant, which will provide \$210,015 to help fund many of next steps, with an expected completion in 2012:

- Present this conceptual plan to the governing bodies of all of the affected agencies to gauge interest in pursuing the scheme and seek commitments from each of the agencies to cooperate in the work required to bring the evaluation to successful completion.
- Work with the City of Santa Cruz and other agencies to review and fine-tune the potential operation of this project. The City has an operations model that could be modified to incorporate this and test various assumptions to determine the potential outcomes and volumes of water that can be delivered. Scotts Valley and Soquel would need to evaluate how their systems would operate with this additional source of supply and the cost, benefits and operational considerations regarding in-lieu vs. managed recharge.
- Consult further with resource agencies regarding assumptions used regarding habitat protection and any additional concerns they might have. Review current fishery and habitat data and develop additional data if needed to establish the required downstream release.
- Consult with the State Water Resources Control Board and water rights experts regarding the potential for options to seek expedited approval for water transfers within existing water rights or emergency or interim changes of use. Seek long term modification and expansion of water rights.
- Develop preliminary designs and cost estimates of needed infrastructure improvements and operational cost estimates.
- If the project is determine to be viable, develop cooperative agreements among the involved agencies, prepare necessary environmental documents, obtain approval for water transfers or water rights modifications.
- Construct the necessary system interties to Scotts Valley Water District (including the southern portion of San Lorenzo Valley Water District) and Soquel Creek Water District.
- Complete designs and construction of facilities for direct recharge of groundwater in the Scotts Valley area.
- Evaluate the possible use of groundwater injection wells or aquifer storage and recovery wells for managed recharge in the Soquel-Aptos area.

Conclusion

County Environmental Health staff will be coordinating the further development of this scheme for the sharing and effective use of available surface water resources. This work will be pursued with the assistance of grant-funded consultants and participation of the affected water agencies and resource agencies. We look forward to working with your District to further pursue this project. We will attend the May 17 meeting of your Board to make a brief presentation and answer any questions they might have.

Sincerely,



John A. Ricker

Water Resources Division Director

cc: Santa Cruz City Water Director
General Manager Scotts Valley Water District
General Manager, San Lorenzo Valley Water District

Annual Winter Surplus Water Availability, San Lorenzo River at Tait Street, Various Scenarios

