Recycled (Reclaimed) Water Report

Synopsis

Water has long been a concern in the cities and county of Santa Cruz. Its use is controlled mainly by special districts. The Grand Jury studied the Scotts Valley Water District's (SVWD) experience using recycled water with the idea of helping future applications in the county, such as the new project planned in the Pajaro Valley. The Grand Jury also looked at other water districts in the county. This report concludes that the City and Water District of Scotts Valley should merge. A countywide water management agency or organization should also be considered so that water agencies can work together instead of individually.

Definitions

Acre-foot: 325,851 gallons, or enough water to cover an acre of land one foot deep with water. An average California household uses from one-half to one acre-foot of water per year. A million gallons per day (mgd) equals 1,120 acre-feet a year.

Aquifer: Underground water-holding rock layer.

Package septic systems: Pre-manufactured septic systems usually shared by several homes.

Potable water: "Water that is satisfactory for drinking, culinary, and domestic purposes and meets the requirements of the health authority having jurisdiction."[1]

Recycled (reclaimed) water: Domestic wastewater which, through tertiary water treatment by a public agency, is suitable for "a direct beneficial use or a controlled use that would not otherwise occur."[2]

Tertiary water: Wastewater treated so that it is "adequately oxidized, clarified, coagulated, filtered and disinfected, so that at some location in the treatment process, the seven day median number of total coliform bacteria in the daily samples does not exceed 2.2 per 100 milliliters. …the water shall be filtered so that the daily average turbidity (see turbidity) does not exceed 2 turbidity units upstream from the disinfection process."[3]

Title 16: Federal funding provided for water recycling projects.

Turbidity: Cloudiness from solid particles suspended in water.

[1] Uniform Plumbing Code, 2000 Edition, section 218.
[2] Uniform Plumbing Code, 2000 Edition, Appendix J, section J2.
[3] Uniform Plumbing Code, 2000 Edition, Appendix J, section J2.

Background

All water districts in the county are autonomous. Their structure, tier revenue, connection/maintenance costs, "sphere of influence," customers (residential/agricultural), all vary. Their "sphere of influence" may cross county borders. Most have serious problems, such as the depletion of water-supply aquifers or salt-water intrusion from the Monterey Bay into their wells. Many water districts are evaluating various approaches to solving those problems, such as building desalination plants, using recycled water treatment, damming rivers and importing water from other counties.

Sources

Interviewed:

California Department of Health Services representatives.
Local Agency Formation Commission representatives.
San Lorenzo Valley Water District officials.
Santa Cruz City Water Department officials.
Santa Cruz Wastewater Treatment Plant officials.
Scotts Valley Planning Department officials.
Scotts Valley Wastewater Treatment Plant officials.
Scotts Valley Water District officials.
Scotts Valley Water District Recycled Water employees.
Soquel Water District officials.
Watsonville Public Works officials.

Reviewed:

Annual Report October 2003, Reclaimed Water Supply Agreement Between City of Scotts Valley and Scotts Valley Water District for Re-Use of Reclaimed Water.
Scotts Valley Banner, Multiple Issues.
Scotts Valley Water District Groundwater Management Program 2002-2003.
Scotts Valley Water District invoices.

Findings

1. Santa Cruz County has limited water resources.

2. Using recycled water can make fresh water available for other uses.

3. Special Water Districts are autonomous with their own elected boards.

4. The City of Santa Cruz has its own water department. It serves the citizens of Santa Cruz and those of the unincorporated area of Live Oak.

5. The City of Capitola's residents receive their water from an autonomous special district, the Soquel Creek Water District. This district also serves the unincorporated areas of Soquel and Aptos.

6. Two special districts serve the City of Scotts Valley: the Scotts Valley Water District and the San Lorenzo Valley Water District.

7. Private water companies also serve parts of the San Lorenzo Valley.

8. The City of Watsonville has its own water department, which buys its water from a special district, the Pajaro Valley Water Management Agency (PVWMA) to supply its residents. Watsonville-area residents outside the city limits are also supplied by the PVWMA. The agency crosses county boundaries and serves customers in neighboring counties.

9. Many county residents receive their water from private wells and small private water associations.

Aquifers

10. Scotts Valley and the San Lorenzo Valley water districts share a common aquifer.

11. The Soquel Creek Water District's aquifer is used not only by the district, but also by the City of Santa Cruz, Cabrillo College and private homes.

Wastewater Treatment

12. The City of Santa Cruz's regional wastewater treatment plant treats the sewage of the City of Santa Cruz and much of the mid-county area. This secondarily treated water flows from the plant into the bay through an underwater pipe that dumps it one and one-half miles offshore.

13. The sewage plant in the City of Santa Cruz was the second to the last in the state to go to secondary treatment and this was only after losing a court battle with the federal government.

14. About 250 tons per week of bio-solids, or sludge, are trucked to a large composting farm in the San Joaquin Valley to be processed and sold for use on non-food crops such as cotton.

15. Many county residents have private or package septic systems.

Problems

16. Between the years of 1991 and 2003, the water levels in the San Lorenzo Valley Water District have fallen approximately 90 feet in the wells of the southern distribution area.

17. The City of Santa Cruz suffers from a lack of water supply capacity, particularly during drought years.

18. The water level in the Scotts Valley Water District's aquifers has been dropping for decades.

19. The Soquel Creek aquifer has been degrading since 1955. Water officials say the district's aquifer is consistently overdrawn. Currently, it has the worst saline level in the 20 years they have been keeping records.

20. The Pajaro Valley Water Management Agency's wells are suffering from seawater intrusion.

A Valuable Resource

21. The City of Santa Cruz's regional wastewater treatment plant discharges 10 million gallons of water per day, five million from the city and five million from the unincorporated area it serves.

22. Watsonville's wastewater treatment plant produces seven million gallons of water per day.

23. The City of Scotts Valley's tertiary water treatment agency has a capacity of one million gallons per day.

Tertiary Water Plants

24. Tertiary plant designs and uses vary widely. Each is designed and built based on the intended use.

25. Several reasons make building tertiary water treatment plants desirable:

    - By decreasing demand for fresh water, it relieves pressure on aquifers.
    - The water can be used to recharge aquifers.
    - It recycles and re-uses a valuable resource.

26. Several obstacles exist to wider use:

    - Some people are reluctant to use treated sewage water.
    - The review period for projects is longer than with regular water installations.

Using Recycled Water

27. Recycled water can be used for non-residential (commercial) water closets, urinals, and trap primers for floor drains and floor sinks.[4]

28. Residential uses for recycled water are limited to front yard in-ground landscape irrigation. Outside hose connections cannot be connected to recycled water. Back yard use is restricted.

29. Recycled water use requires the property owner or manager to be educated in the maintenance of the system. This would entail the maintenance and visibility of signage, annual testing of the back flow protection device and the responsibility of not allowing any modifications to the recycled water plumbing.

City of Santa Cruz

30. The Santa Cruz city water supply comes from North Coast wells and ground water taken from the San Lorenzo River during the rainy season and stored in the Loch Lomond reservoir. Environmental, geologic and political factors prevent the city from increasing its storage capacity.

31. During drought years, the City of Santa Cruz must rely on conservation and occasional mandatory rationing to supply its customers.

32. The city is in the planning process for a desalination plant to convert seawater to fresh water for drought years.

33. The City of Santa Cruz has explored the idea of tertiary sewage water treatment but has rejected it for several reasons:

    - The current secondary treatment system doesn't use the correct process. It uses "trickling filters" rather than the necessary "nutrient removal" approach.
    - The city doesn't have enough space.
    - Odors could be a problem in a densely populated area.
    - It would take more electrical power.
    - It would affect rates.
    - The City has no distribution system for the recycled water it would generate.

City of Scotts Valley

34. The Scotts Valley Water District built a tertiary wastewater treatment plant in 1997. It treats secondary sewage water that was previously being piped to the Santa Cruz

[4] Uniform Plumbing Code, 2000 Edition, Appendix J.

City ocean outfall. The tertiary-treated water was to be used for irrigation water and would thereby lessen the demand on the aquifer.

35. The Scotts Valley Water District's tertiary water treatment plant was originally projected to cost $4.9 million. It was financed with a Certificate of Participation for $4.25 million along with surplus funds. The district did not understand the full extent of the California Department of Health Service's requirements. With significant changes to the original design, the cost of the plant ultimately rose to nearly $10 million.

36. The district planned for potential developments to use recycled water by installing connection points when Scotts Valley Drive was reconstructed.

37. The tertiary treatment plant was built on land owned by the City of Scotts Valley. The water district paid for the building, then gave the plant to the city and agreed to pay for its maintenance and operations and to handle the distribution. A 1996 agreement stipulated how the city would pay for the treated water it needed. The city would pay a calculated reduced price to the SVWD based on the amount it used. The city has challenged the terms of the agreement and has been meeting with the district for months to agree on a new formula.

38. Under the present rate structure, recycled water is priced at 80% of the price of potable water.

39. The tertiary plant has been operational for two years. It has a capacity of one million gallons per day but operates at much less because of a lack of customers. At the end of calendar year 2003, the district had one customer: the City of Scotts Valley. By mid-2004, it will have 10 connections. Seven of those are for the City of Scotts Valley. When the plant resumes operations for this irrigation season (the dry months of the year), a handful of new customers are expected.

40. The system cost $100,000 to operate during the July 2002-June 2003 season. The Grand Jury was unable to discover whether revenues cover expenses.

41. A financial plan and rate study was prepared for the district in April 2002. It calls for a 33% rate increase over five years for all of the district's customers. The district had originally projected that recycled water users would use 200 acre-feet per year. Because of the lack of customers the rate study may have to be re-negotiated and rates increased.

42. Scotts Valley Water District officials said the delay in getting more customers online is caused by a bottleneck in the Monterey office of the California Department of Health Services, which approves all recycled water projects.

43. The California Department of Health Services in Monterey said it welcomes more projects from Scotts Valley. It says there is no delay in processing them. Health

officials said early drawings often did not meet standards and this caused the delays.

44. The SVWD currently allows recycled water to be used only for landscape irrigation.

45. The City of Scotts Valley's Planning Department said it is the Scotts Valley Water District's responsibility to take care of all water issues.

46. Scotts Valley water officials said the present rate structure is not sufficient to encourage existing non-residential customers to convert to recycled water for landscaping.

Pajaro Valley

47. The City of Watsonville is a full service city with its own sewage, water, garbage, fire and police departments.

48. In 1997 with the over-pumping of wells and seawater intrusion, the Pajaro Valley Basin Management Plan addressed the development of recycled water.

49. A pipeline project is in process to bring fresh water from the Central Valley to help solve the problem. This water will be mixed with recycled water to reduce the salinity to the level required for agricultural use.

50. U.S. Representative Sam Farr (D-Carmel Valley) wrote legislation at the federal level to get Bureau of Reclamation Title 16 grant funding. The PVWMA received Congressional authorization (not just an appropriation), for up to $20 million in Bureau of Reclamation funding for the water-recycling project.

51. The city and the water district will contribute 75% of the cost of the plant and distribution, with the remaining 25% coming from the federal government.

52. Feasibility studies have been completed and a formal design by Rivers and Mountains Conservancy (RMC) has been finished. Completion is scheduled for late 2007.

53. This project is strictly for agricultural use, primarily for growing strawberries, and crosses county boundaries.

San Lorenzo Valley

54. The San Lorenzo Valley Water District (SLVWD) has two separate distribution systems. In the north, water is gathered from the surface and from wells, while in the south only wells are used.

55. The district is always concerned about how federal agencies, for environmental reasons, allow the district to acquire surface water in the northern distribution system. Because of declining water levels in wells in the southern distribution system, SLVWD plans to link these two distribution systems.

56. San Lorenzo Valley Water District is currently working with Santa Cruz County staff to evaluate ground water recharge. The Hanson Aggregate and Lone Star quarries will be closing, and the county is funding requests for proposals to use these quarries to hold onsite water runoff for ground water percolation and retention.

Soquel Creek

57. The flow rate of Soquel Creek and the ground water aquifer have a direct interaction. When the water district's wells are turned off, the creek rises.

58. The district is considering joining with the City of Santa Cruz in building a desalination water plant.

59. Soquel Creek Water District management believes the county should manage the county's water resources.

Conclusions

1. Several types of agencies provide water and sewage disposal: private, special districts, city-owned and combinations of these.

2. Many separate districts are struggling with similar water problems.

3. Local water agencies sometimes compete instead of cooperate in using scarce water resources.

4. Building tertiary water treatment systems is expensive, complex and subject to many barriers to successful use and ongoing maintenance.

5. Building tertiary water treatment systems is also a worthwhile re-use of a valuable resource. It has the potential to be of great value in helping the county cope with its ongoing water needs.

6. Residential usage of recycled water for a single-family dwelling is difficult to maintain. The present rate structure does not motivate the property owner to implement it.

7. The present rate structure in Scotts Valley is not sufficient to encourage existing non-residential customers to convert to recycled water for landscaping.

8. A great potential water source is being wasted in Scotts Valley while various agencies argue about who is responsible for the problems. The city's expensive tertiary-treatment plant is under-used, customers are paying higher rates and hundreds of millions of gallons of water are still being sent to the ocean.

Recommendations

1. The Scotts Valley Water District should be commended for making use of an important new technology. It should also be commended for having the foresight to install water connection points for future development included in the reconstruction of Scotts Valley Drive.

2. The problems implementing the system show that one agency needs to have sole responsibility and control over it in the future. The City of Scotts Valley should acquire the water distribution and maintenance systems that serve the citizens serviced by the SVWD. This responsibility should be controlled and maintained by the Department of Public Works.

3. The distribution and usage of recycled water from the Scotts Valley plant should be aggressively pursued beyond the district's borders. (As suggested in Recommendation 4).

4. Santa Cruz County and the major water providers, with the assistance of Local Agency Formation Commission (LAFCO), should consider a permanent countywide water management agency or organization to help oversee water problems jointly, instead of individually.

Responses Required

Entity	Findings	Recommendations	Respond Within
City of Santa Cruz Water Department	1, 2, 4, 11 - 14, 17, 21, 24 - 26, 30 - 33, 58	3, 4	60 days (August 30, 2004)
City of Watsonville Water Department	1, 2, 8, 9, 15, 20 - 22, 24 - 29, 47 - 53	4	60days (August 30, 2004)
Local Agency Formation Commission	1 - 9	2, 3, 4	60 days (August 30, 2004)
Pajaro Valley Water Management Agency	1 - 3, 8, 9, 15, 20 - 22, 25 - 29, 47 – 53	4	60 days (August 30, 2004)
San Lorenzo Valley Water District	1 - 3, 6, 7, 9, 10, 15, 16, 54 - 56	3, 4	60 days (August 30, 2004)
Santa Cruz County Board of Supervisors	1 - 3, 9, 15, 56	4	90 days (September 30, 2004)
Scotts Valley Water District	1 - 3, 6, 9, 10, 15, 18, 23 - 29, 34 – 46	1, 2, 3, 4	60 days (August 30, 2004)
Soquel Creek Water District	1 - 3, 5, 9, 11, 15, 19, 57 - 59	3, 4	60 days (August 30, 2004)