STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF DECEMBER 4-5, 2008
Revised on November 12, 2008

ITEM NUMBER: **28**

SUBJECT: **Adoption of Master Reclamation Permit Order No. R3-2008-0039, City of Watsonville (Supplier of Recycled Water) and Pájaro Valley Water Management Agency (Distributor of Recycled Water), Santa Cruz County**

KEY INFORMATION:

Treatment System Location:	401 Panabaker Lane, Watsonville
Discharge Type:	Tertiary-treated recycled wastewater
Design Capacity:	7.7 million-gallons-per-day (mgd), or 4,000 acre-feet-per-year (AFY)
Treatment:	Coagulation-flocculation-sedimentation, cloth media filtration, ultraviolet light disinfection
Disposal:	None
Reclamation:	Agricultural irrigation
Existing Orders:	None

SUMMARY

The attached Master Reclamation Permit (Permit) proposed today for the Board's consideration specifies waste discharge requirements for the Supplier's Recycled Water Facility (Recycling Plant) and water reclamation requirements for the distribution of recycled water through the Coastal Distribution System (Distribution System). Compliance with the comprehensive requirements for recycled water production and use should protect the public health and the quality of groundwaters underlying the reuse areas. Therefore, staff recommends the Board adopt Master Reclamation Permit No. R3-2008-0039, which includes Monitoring and Reporting Program (MRP) No. R3-2008-0039.

BACKROUND

As documented in numerous groundwater studies conducted over the past five decades, the Pájaro Valley groundwater basin is in an overdraft condition. An overdraft condition occurs when the amount of water withdrawn exceeds the amount of water replenishing the basin. The rate of seawater intrusion in the groundwater basin has also been increasing in recent years. The combination of overdraft conditions and seawater intrusion has impaired the beneficial uses of the groundwater for municipal and domestic supply and for agricultural irrigation. The impairment has limited the fresh groundwater supply needed to sustain the long-term agricultural and urban economy of the Pájaro Valley. Appendix 1 to this staff report, the United State Geological Survey's Fact Sheet entitled *Geohydrology of Recharge and Seawater Intrusion in the Pájaro Valley,* provides detailed information on seawater intrusion into potable groundwaters in the Pájaro Valley.

In 1984, the State Legislature formed the Pájaro Valley Water Management Agency (PVWMA, hereafter the Distributor), whose goals are, among others, to reduce long-term overdraft and to eliminate seawater intrusion in the Pájaro Valley. Accordingly, the Distributor characterized the

groundwater basin's hydrogeology, estimated the sustainable annual water yield and the amount of overdraft, characterized the extent of seawater intrusion, and developed a Basin Management Plan (Plan) to achieve its goals. The Plan describes the project recommended to achieve the Distributor's goals, the Recommended Alternative (Proposed Project). The full revised Plan is at www.pvwma.dst.ca.us under Basin Management Plan. The Plan provides more detailed information on the groundwater basin's geology, hydrology, groundwater levels and quality, seawater intrusion and the Proposed Project. Much of the Plan's information and data date back to 1998; this staff report updates the information and data as necessary.

INTRODUCTION

The Proposed Project combines water conservation and water supply development, including the Watsonville Area Water Recycling Project (Recycling Project). The Recycling Project comprises the production and distribution of recycled water to irrigate farmlands near Monterey Bay.

To the extent the issues relate to understanding the causes of the groundwater's beneficial use impairment and to measures directed at restoring those uses, the Discussion below summarizes the following:

- The Pájaro Valley groundwater basin's hydrogeology;
- Demonstration of seawater intrusion and beneficial use impairment based on water quality data;
- The Recycling Plant treatment processes;
- The Distribution System operation, and
- The Permit's waste discharge and water reclamation requirements.

DISCUSSION

A. BENEFICIAL USE IMPAIRMENT

1. **Geology and hydrology.** The fundamental understanding of the geologic structure of the groundwater basin has not changed significantly since the State Water Resources Control Board's first evaluation in 1953, although the amount of information has increased. The water-bearing units in the Pájaro Valley include alluvial, dune sand, and terrace deposits, and the various layers of the permeable Aromas Sand (a formally designated geological formation consisting chiefly of sand) and the moderately permeable Purisima Formation. The majority of wells producing usable water have been developed in the alluvium and Aromas Sand in the upper 1,000 feet of the groundwater basin.

   The alluvial materials generally comprise the upper 100 to 200 feet of the basin and vary greatly in composition. The upper part of the Aromas Sand is found beneath the alluvium, roughly 100 to 200 feet below sea level, and is the most intensively pumped. The lower part of the Aromas Sand extends to approximately 900 feet below sea level near the mouth of the Pájaro River. The geologic formations provide no barrier to seawater intrusion.

   The Pájaro River is the largest coastal stream, measured by annual flows, between San Francisco Bay and the Salinas River. It contributes substantial surface inflow to the Pájaro Valley groundwater basin. The primary sources of recharge to the Pájaro Valley groundwater basin are infiltration of rainfall, seepage of streamflow from the Pájaro River and its tributaries, and percolation of irrigation water. Recharge areas for the deeper water-bearing zones mainly exist in the Pájaro Valley's eastern portion.

2. **Groundwater levels.** Groundwater levels in the basin vary annually depending on weather conditions, recharge, groundwater pumping, and other factors. However, the Pájaro Valley groundwater levels have generally fallen due to excessive pumping. The decline in groundwater levels has not been uniform since hydrologic conditions and other factors affect groundwater levels. This is confirmed by existing well data maintained by the Distributor. As mapped in Appendix 2, the Distributor installed five monitoring well clusters in the area proposed for irrigation with recycled water (PV1, PV3, PV4, PV6, and PV8). Each cluster of three wells monitors the shallow, middle, and deeper water-bearing zones. The shallow wells monitor the alluvium while the middle and deeper wells monitor different intervals within the Aromas Sand. The Distributor monitors the wells regularly for groundwater elevations and constituents of concern, including total dissolved solids, sodium, nitrate, and chloride.

   Historically, groundwater levels were higher than today in inland areas, and artesian conditions existed near the coast, causing water to surface in some of the coastal areas. Under such conditions, seawater could not intrude into freshwater aquifers. However, by the 1940s, with the major development of groundwater resources to support a growing agricultural industry, some wells were still artesian, but only during winter months. By the 1970s, water levels west of Watsonville were consistently below sea level from approximately May to December, often never recovering to levels above sea level. These conditions caused seawater to enter the freshwater aquifers near the coast.

   Much of the Pájaro Valley's groundwater generally moves from the various unconfined recharge areas in the eastern valley toward a large pumping trough that forms in the center of the valley near Watsonville. Also, seawater flows from the ocean toward the pumping trough. Well data indicate depressed groundwater levels are expanding in the Pájaro Valley aquifers. It is notable that current well levels near the coast are similar to historic levels, but groundwater in many wells is becoming increasingly salty due to seawater intrusion.

3. **Pollution due to seawater intrusion.** The Pájaro Valley groundwater basin is connected to the ocean, and no seismic faults or barriers exist to prevent seawater intrusion. The average concentration of chloride in seawater is 19,000 milligrams per liter (mg/L). According to the Basin Plan, chloride levels in irrigation water exceeding 142 mg/L will likely impair the development of crops exposed to the water, thereby impairing the agricultural supply (AGR) beneficial use.

   Increasing chloride concentration in groundwaters is a good indicator of seawater intrusion. Chloride is useful for monitoring intrusion because it is chemically stable and moves at the same rate as the intruding seawater. The horizontal migration of seawater occurs slowly as seawater mixes with the fresh water as it moves inland. Initially, chloride concentrations increase gradually. However, as the bulk of the seawater plume moves inland, chloride concentrations can rise rapidly.

   Based on background chloride concentrations in groundwater from inland recharge areas, in 1974, the U.S. Geological Survey determined that chloride levels exceeding 100 mg/L in coastal wells indicate seawater intrusion.

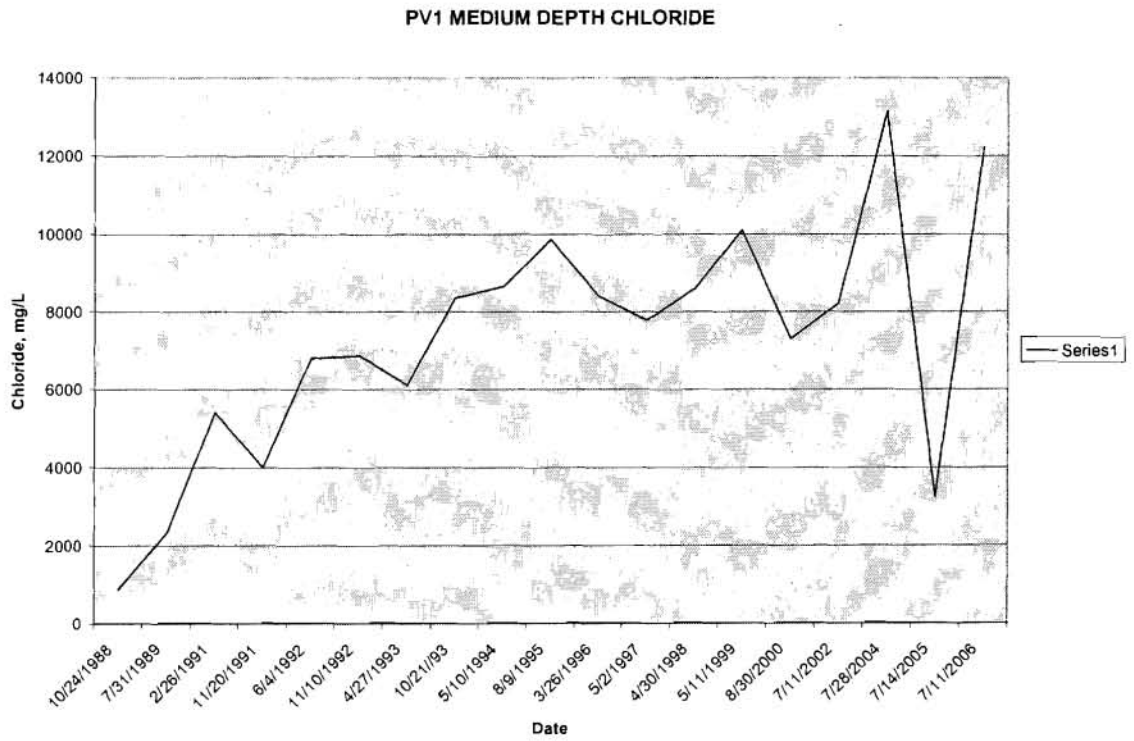
   Well data from 1998 until the present generally indicate that inland seawater intrusion is extensive. Maps provided in Appendices 3 through 6 show the extent of the intrusion in 1951, 1966, 1998, and 2005.

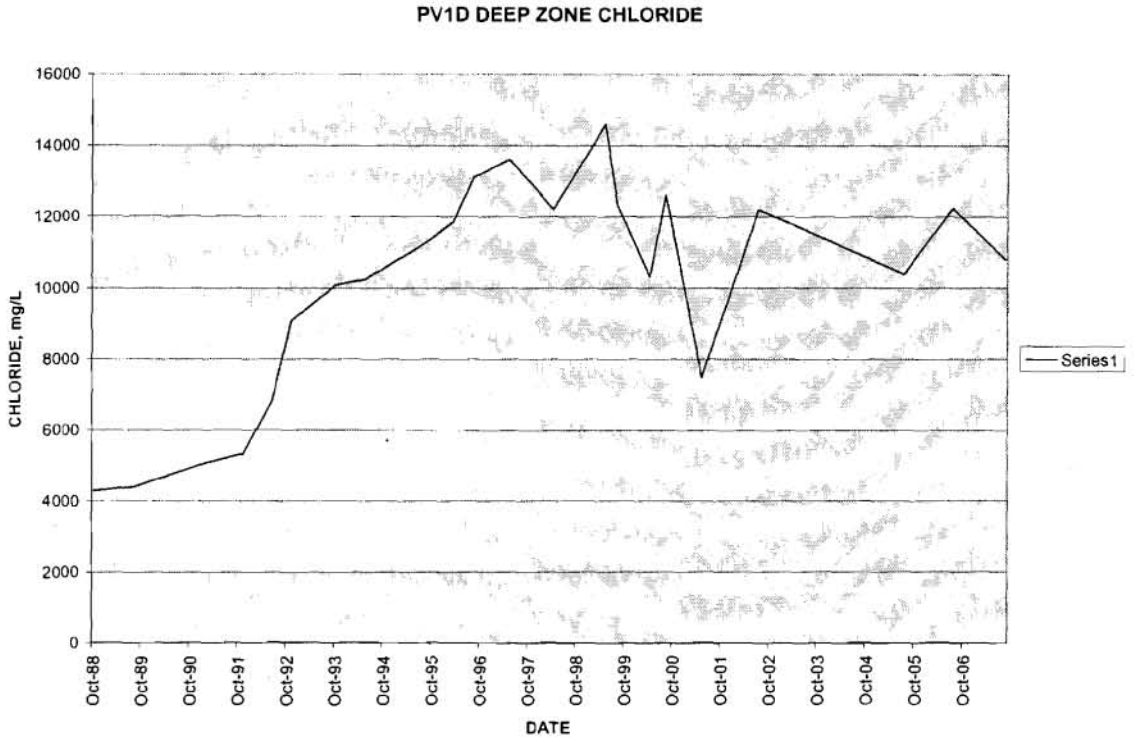
   A number of deeper wells have shown substantial increases in chloride concentrations in recent years, indicating that the volume of fresh water displaced in the intruded area is increasing.

Chloride levels are generally highest in the deeper confined aquifers consisting of Aromas Sand and the Purisima Formation, with values ranging from 200 to 8,500 mg/L. In contrast, shallow wells tend to have lower chloride levels (50 to 500 mg/L), and a number of neighboring shallow wells show marked differences in chloride levels.

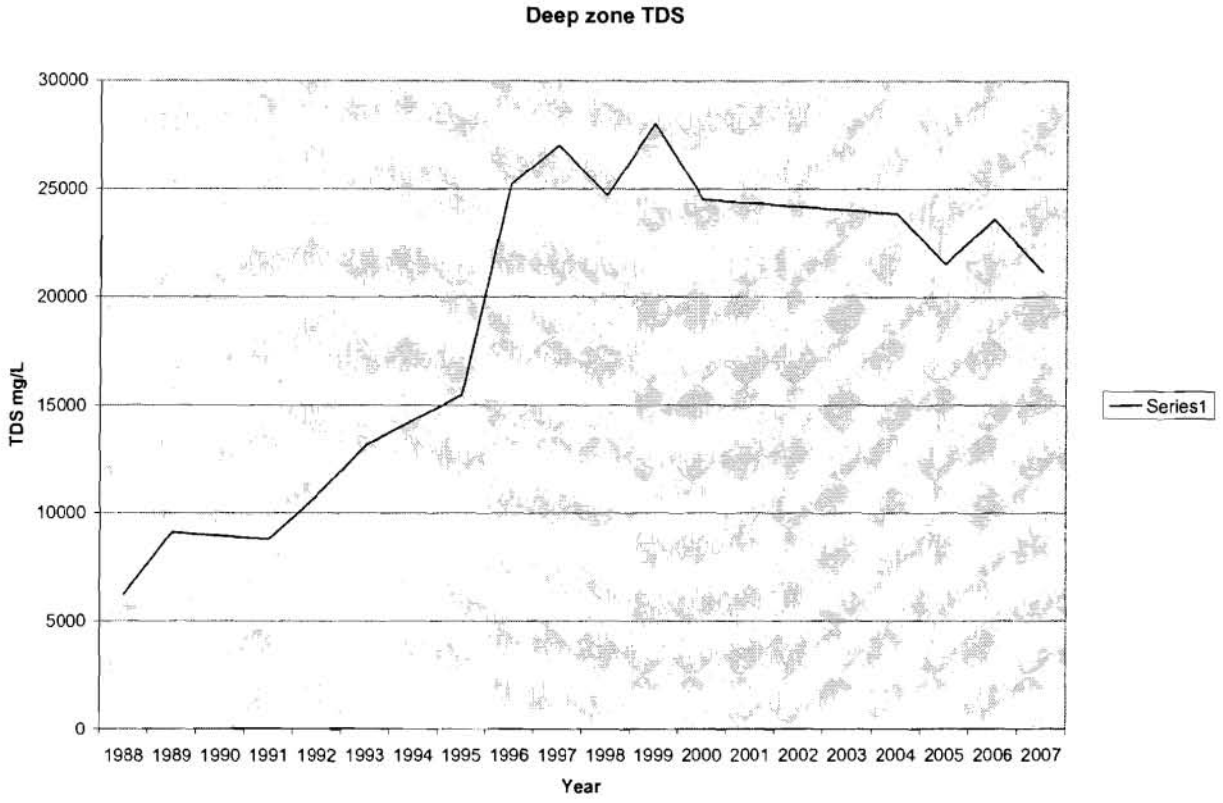
The data indicate that seawater is intruding along the coast in the middle and lower portions of the Aromas Sand and that poor-quality water is present in the deeper production zones. This implies, as intrusion moves inland and wells are lost to seawater impacts, that the option of drilling deeper for better quality water is probably not a viable option.

The following graphs plot chloride concentrations over time in a monitoring well cluster (PV1) near the coast. See Appendix 2 to this staff report for well cluster locations. The data are current up to August 2007 and demonstrate that seawater is intruding into deeper permeable formations.





The groundwater monitoring data for total dissolved solids (TDS) also demonstrate seawater intrusion into the water supply aquifers. The average TDS concentration from 2004 through 2007 in the medium zone PV1 well averaged 13,580 mg/L and exceeded 20,000 mg/L in the deep zone during the past four years, as illustrated in the following graph. The average TDS concentration in seawater is 33,000 mg/L.



4. **Groundwater nitrate pollution.** The City of Watsonville monitors nitrogen concentrations in effluent from its municipal wastewater treatment facility (WWTF). The annual average concentration of 27.5 mg/L nitrate as nitrogen (124 mg/L as nitrate) is substantially greater than the water quality objective and the enforceable Maximum Contaminant Level (MCL) of 10 mg/L as nitrogen (45 mg/L as nitrate), as noted below in section 5. Since any ammonia nitrogen or urea nitrogen in the WWTF effluent will convert almost entirely to nitrate in the soil, it poses a threat to underlying groundwater and must be managed accordingly.

   Groundwater samples from the PV well clusters have contained varying nitrate levels in shallow, medium and deep water-bearing zones. Nitrate in many samples exceeded the MCL by several times. Therefore, the groundwaters' beneficial use for municipal and domestic supply (MUN) is impaired, likely due to the application of nitrate fertilizer over many years. The WWTF cannot have contributed because it has always discharged into the ocean. However, during the season of irrigation with recycled water, the Distributor will send the nitrogen from the WWTF to farmlands. The Nitrate Management Plan, required in the proposed Permit and discussed below, seeks to balance the nitrogen in the recycled water with fertilizer nitrogen, and thereby protect groundwater quality.

5. **Water quality standards.** The Central Coast Water Quality Control Plan's (Basin Plan) Section II.A.4. (Objectives for Groundwater) provides both narrative and numeric groundwater quality objectives for the MUN and agricultural supply (AGR) beneficial uses. The water quality objectives include MCLs for drinking water supply as set forth in California Code of Regulations, Title 22, Division 4, Chapter 15. The recommended MCL for TDS in drinking water is 500 mg/L. The nitrate MCL is 10 mg/L as nitrogen.

The Basin Plan states that "ground waters shall not contain concentrations of chemical constituents in amounts that adversely affect beneficial uses" and provides that "interpretation of adverse effect shall be as derived from the California Agricultural Extension Service guidelines provided in Table 3-3" on page III-14 of the Basin Plan. Table 3-3 provides that irrigation water containing chloride in excess of 142 mg/L may cause increasing problems to crops and/or soils. The Basin Plan is at www.waterboards.ca.gov/centralcoast under Basin Plan.

Beneficial use impairment. Comparison of chloride and TDS groundwater analyses presented above with water quality objectives demonstrates that seawater intruding into the freshwater-bearing zones has impaired the MUN and the AGR beneficial uses. Moreover, as discussed above, excessive pumping for mainly agricultural uses caused the seawater to intrude. In addition, it is likely that excessive fertilizer use on area farmlands has increased the groundwater nitrate concentration to levels where the MUN beneficial use is impaired.

B. MEASURES TO ADDRESS BENEFICIAL USE IMPAIRMENT

1. USE OF RECYCLED WATER FOR AGRICULTURAL IRRIGATION

An assessment of recycling opportunities identified agricultural irrigation in the coastal portion of the Pájaro Valley as the best opportunity for the use of recycled water. Agriculture in the Pájaro Valley generates hundreds of millions of dollars in revenues each year. The Pájaro Valley produces a variety of vegetable crops, many of which may be consumed raw. In the mid-1970s, the Water Board completed a water quality management plan for the area; the plan recommended use of recycled water for crop irrigation.

At that time, agricultural irrigation of vegetable crops with recycled water was not widely accepted. To respond to concerns from the agricultural community, the Monterey Regional Water Pollution Control Agency sponsored an 11-year, $7-million pilot and demonstration project known as the Monterey Wastewater Reclamation Study for Agriculture (Reclamation Study). Study objectives were to answer questions about virus and bacteria survival on crops, soil permeability, and yield and quality of crops, and to demonstrate field operations for the farmers who would use reclaimed water.

Study participants conducted five years of field operations, irrigating crops with two types of tertiary-treated wastewater, with an irrigation well-water control for comparison. Artichokes, broccoli, cauliflower, celery, and several varieties of lettuce were grown on test plots and a demonstration field. Crops produced with recycled water were healthy and vigorous, and the irrigation system operated without complications. No bacteria or viruses were found in recycled water used for irrigation or on samples of crops grown with the water. No tendency was found for metals to accumulate in soils or on plant tissues. Soil permeability was not impaired. The results of the study provided evidence that using recycled water can be as safe as irrigating with well water, and that large-scale water reclamation can be accomplished.

2. RECOMMENDED ALTERNATIVE (PROPOSED PROJECT)

The Revised Basin Management Plan describes the Proposed Project. The Proposed Project's goal is to balance the outflow and inflow of groundwater from the basin and eliminate seawater intrusion in the Pájaro Valley. Since the Reclamation Study demonstrated the safety of recycled water for crop irrigation, the Distributor will use as much recycled water the Supplier can provide to substitute for pumped groundwater supplies.

a. Phased implementation. The Supplier and Distributor plan to implement the Proposed Project in two phases. Phase 1 comprises the following components:

- A water conservation program, which will reduce demand by 5,000 AFY;
- The Harkins Slough project, which will supply 1,100 AFY;
- The Harkins Slough portion of the Distribution System;
- A water metering program and
- A water resource monitoring program.

The Distributor has completed Phase 1.

Phase 2 comprises the following:

- The remaining portion of the Distribution System;
- The Recycling Plant, which will provide 4,000 AFY, and
- Watershed management programs, including a nitrate management program (Nitrate Plan), a well management program, and a recharge area protection program.

As discussed below, the Central Valley Project (CVP) waters would have been included in Phase 2.

b. **Water supply.** The Proposed Project as initially conceived would have imported up to 13,400 AFY from the CVP pipeline near Gilroy through a 54-inch diameter, 23-mile long pipeline.

However, the import pipeline plan may never be built because of its high cost and other factors. To replace the lost CVP water, in the near term, the Distributor plans to supply the Distribution System with a blend of recycled water, local groundwater and City of Watsonville potable water. To meet local agricultural demands, the Harkins Slough portion of the project will provide up to 800 AFY from groundwater wells and up to 600 AFY from local recharge wells while the city portion of the project will provide up to 1,600 AFY of potable water. Added to the 5,000 AFY in reduced demand resulting from conservation, 4,000 AFY from the Recycling Plant, 1,000 AFY from the Harkins Slough project, the Distributor predicts that the total supply should help make up for the water pumped along the coast and bring the groundwater basin into balance. As stated, the elimination of overdraft conditions should begin to halt seawater intrusion and begin to restore the groundwaters' currently impaired beneficial uses.

To address longer term water supply needs, the Distributor is actively involved in the Integrated Regional Water Management Plan (Regional Water Plan) process, which may identify alternatives to importing CVP water. The Regional Water Plan process will analyze a number of potential strategies of mutual benefit with two inland water districts, and it is hoped the process will identify new, feasible options to cooperatively fund and build a "multi-purpose" import pipeline. The Distributor adopted the Regional Water Plan in 2007.

Options include purchasing excess CVP water from the Santa Clara Valley Water District, which needs the water only during drought years, and/or from the San Benito County Water District, which also owns excess CVP water. The Distributor plans to use the water to either recharge the groundwater basin near the coast or provide the water for irrigation.

c. **Recycling Plant.** Secondary effluent contains substantial quantities of colloidal solids, which harbor potentially harmful bacteria and do not settle out of the wastewater. To kill or remove all potentially harmful bacteria and to comply with the Title 22 water recycling criteria, the Supplier must employ a third series of treatment processes; that is, tertiary treatment. Tertiary treatment proposed for the Recycling Plant comprises coagulation-flocculation-sedimentation (CFS), cloth media filtration, and ultraviolet disinfection. The CFS and filtration process reduce the solids to very low levels, which allows the subsequent disinfection process to remove almost all the remaining bacteria and the associated health threat. The Recycling Plant will treat secondary-treated effluent from the City's existing wastewater treatment facility to tertiary standards for

distribution through the Distribution System to irrigation water use areas. The Recycling Plant design flowrate is 7.0 million gallons per day which approximates 4,000 AFY, as noted above. Appendix 7 to this staff report provides a more detailed description of the Recycling Plant's unit processes.

d. **Distribution System.** The Distributor will operate the Distribution System, which will comprise 31 miles of pipeline to provide recycled water to 238 users of 9,500 acres of irrigated farmlands. The Distributor will blend the recycled water with low concentrations of groundwater pollutants (TDS, sodium, chloride, and nitrate). The Distributor's next goal is to install backflow preventers and other hardware to enable the Distribution System to distribute the recycled water to the use areas in compliance with the Permit as discussed below.

e. **Oversight of recycled water system operations**

Agency Supervisor. The Distributor plans to select an Agency Supervisor to oversee all programs and facilities related to the use of recycled water. The Agency Supervisor will be required to:

- Know the entire recycled water distribution system and all water reuse criteria in the Permit;
- Be responsible for implementing and overseeing programs as required by the Permit;
- Represent the Distributor with the City and the Users in all matters related to recycled water;
- Ensure that all User Supervisors are properly trained regarding the use of recycled water; and
- Be responsible for monitoring and reporting subject to Permit requirements.

User supervisor. The Distributor plans to ensure the recycled water Users appoint a User Supervisor for each parcel receiving recycled water. The User Supervisor will ensure that recycled water users comply with water reclamation requirements in the Permit and the Water User's Handbook.

Specifically, the User Supervisor shall:

- Ensure that Users operate and maintain all on-farm facilities that serve recycled water in accordance with the Permit;
- Operate the on-farm irrigation system in a manner to prevent human consumption of recycled water, to control and limit runoff, and to prevent contamination of on-farm wells;
- Ensure that all personnel are educated in practices and procedures for working with recycled water;
- Install and maintain warning signs at the use site;
- Prevent cross-connection between recycled water and potable water facilities;
- Notify the Distributor, and prepare and submit reports when there are system failures that cause unauthorized recycled water discharges; and
- Request the Distributor approve proposed modifications or additions to recycled water facilities.

User Supervisors will be given a copy of the Permit and the Water User's Handbook for guidance on the use of recycled water. The User Supervisors will be required to have these available at all times for inspection by Water Board staff, the Distributor, the City or State/County Health Officers.

f. **Watershed Management Programs** proposed by the Distributor include a nitrate management program and a recharge area protection program.

Nitrate Management Program. The proposed nitrate management program includes the following components: a Nitrate Management Plan (Nitrate Plan) and public outreach. The Nitrate Plan's goals are similar to the nitrate management plans of neighboring counties. In the Distributor's service area, most farmers add fertilizer to the irrigation water before its distribution to farmlands through a drip system. To conserve water and prevent the migration of nitrates to groundwaters, farmers need add only the amount of nutrients needed by the crops, to ensure that essentially no nitrate remains in the soil. Accordingly, the Distributor provides a free service to farmers. By monitoring soil moisture content and crop nutrient and water needs, the Distributor's service helps farmers optimize the quantities of fertilizer and water necessary for best crop growth. The Distributor plans to expand the service and conduct follow-up assessment to monitor its effectiveness. The Distributor also provides guidance to farmers in pocket guides:

- *On-farm Nitrogen Determination in Plant Sap, Soil, and Water* and
- *Using the Nitrate Present in Soil and Water in your Fertilizer Calculations.*

Used together, the guidance documents likely provide the best means to greatly reduce or eliminate nitrate entering groundwaters underlying the reuse areas. The guidance allows farmers to calculate the correct amount of fertilizer to add to the recycled water to optimize the nitrate in the irrigation water. Appendix 8 to this staff report provides the guidance documents.

Recharge area protection program. The County of Santa Cruz protects groundwater quality recharge areas through its land use permitting process. The County prohibits certain activities in recharge areas.

3. MASTER RECLAMATION PERMIT

a. Statutory basis for requirements. CWC §13523.1 provides that (a) Each regional board, after consulting with, and receiving the recommendations of, the State Department of Health Services and any party who has requested in writing to be consulted, with the consent of the proposed permittee, and after any necessary hearing, may, in lieu of issuing waste discharge requirements pursuant to Section 13263 or water reclamation requirements pursuant to Section 13523 for a user of reclaimed water, issue a master reclamation permit to a supplier or distributor, or both, of reclaimed water.

A master reclamation permit shall include, at least, all of the following:

(1) Waste discharge requirements, adopted pursuant to Article 4 (commencing with Section 13260) of Chapter 4.

(2) A requirement that the permittee comply with the uniform statewide reclamation criteria established pursuant to Section 13521. Permit conditions for a use of reclaimed water not addressed by the uniform statewide water reclamation criteria shall be considered on a case-by-case basis.

(3) A requirement that the permittee establish and enforce rules or regulations for reclaimed water users, governing the design and construction of reclaimed water use facilities and the use of reclaimed water, in accordance with the uniform statewide reclamation criteria established pursuant to Section 13521.

(4) A requirement that the permittee submit a quarterly report summarizing reclaimed water use, including the total amount of reclaimed water supplied, the total number of

reclaimed water use sites, and the locations of those sites, including the names of the hydrologic areas underlying the reclaimed water use sites.

(5) A requirement that the permittee conduct periodic inspections of the facilities of the reclaimed water users to monitor compliance by the users with the uniform statewide reclamation criteria established pursuant to Section 13521 and the requirements of the master reclamation permit.

(6) Any other requirements determined to be appropriate by the regional board.

Proposed Master Reclamation Permit Order No. R3-2008-0039 includes these requirements, in addition to requirements for the Distributor to require each User to designate a Site Supervisor to oversee recycled water use. In addition, the Permit requires the Distributor to develop and implement the following:

- a Contingency Plan to take effect if recycled water does not comply with Permit limitations or specifications,
- a Groundwater Monitoring Well Workplan, and
- a Nitrate Management Plan.

Monitoring and Reporting Program (MRP) No. R3-2003-0039 requires comprehensive sampling to track the quality of recycled water supplied by the Distributor, the quality of the blended irrigation water distributed to the use areas, and the quality of groundwaters underlying the use areas. These data will demonstrate the effectiveness of the waste discharge requirements and water reclamation requirements at protecting groundwater quality. The MRP requires the Distributor to monitor the recycled water use areas for compliant irrigation practices; equipment repair including backflow devices; cross-connection tests, and other irrigation system features. The MRP requires quarterly and annual reporting of the acquired data.

COMMENTS

City of Watsonville (Supplier) and Pájaro Valley Water Management Agency (Distributor)

1. Supplier requests to change the design flowrate from 4,000 AFY to 7.7 mgd, the limiting design flowrate based on performance testing of the disinfection system.

Staff response. Staff concurs and changed WDR Order No. R3-2008-0039 accordingly.

2 Distributor notes that 18 miles of the Coastal Distribution System piping, serving approximately 4,000 acres, has been built to date.

Staff response. Comment noted.

3. Distributor proposes to change the following sentence on page 2, Item 7 of the Permit:

"Nearshore groundwater levels should subsequently rise and should then begin to prevent seawater intrusion into the nearshore aquifers".

Distributor proposes the following instead:

"Groundwater modeling has indicated that the coastal area is the most effective area to supply with recycled water to allow reduction or cessation of groundwater pumping."

Distributor justifies the proposed change as follows: "PVWMA selected the coastal area to supply with recycled water based on groundwater modeling which indicated that reduced pumping there would most efficiently reduce future seawater intrusion."

Staff response. Staff concurs, and recommends adding the following;

"It is hoped that nearshore groundwater levels will consequently rise and then begin to prevent seawater intrusion into the nearshore aquifers."

4. Distributor and Supplier propose to change the following sentence on page 3, Item 17 of the Permit:

   "**Recycled water limitations.** This Permit establishes recycled water limitations that require the Distributor to blend freshwater with the recycled water to reduce pollutants to levels that ensure the irrigation water complies with the Basin Plan's water quality objectives, including TDS, nitrate, and chloride. "

   Distributor and Supplier propose the following instead:

   "This permit establishes recycled water limitations that require the Distributor to comply with California Code of Regulations Title 22 Maximum Contaminant Levels and the Basin Plan's water quality objectives."

   Distributors justify the proposed change by stating that PVWMA will, at times, deliver recycled water that has not been blended with water from other sources.

Staff response. Staff concurs and modified the item accordingly.

5. Distributor and Supplier propose to add the following to Item B.1 on page 7: "except as noted above, in case of an inconsistency between the listed guidelines and the Permit, conditions stated in the Permit shall take precedence." According to the Distributor and Supplier, this would set the Permit's requirements above those in the specified guidance documents if a contradiction between the two arises.

Staff Response: Staff concurs and modified the item accordingly.

6. Distributor and Supplier propose to change the following sentence on page 9, Item C.1.2 of the Permit:

   After the word "WWTF", insert the words "Recycling Plant", change BOD_5 to CBOD, and specify 24-hour composite samples for both TSS and CBOD. The Distributor and Supplier justify the proposed changes since the effluent limitations apply to the Recycling Plant discharge, not to the secondary wastewater treatment facility (WWTF) discharge. The other changes render the specifications consistent with the Engineer's Report.

Staff Response: Staff concurs and modified the proposed Permit and MRP accordingly.

7. The Distributor states it will only distribute water in compliance with Title 22 requirements. The Distributor will protect the groundwater basin by educating users to apply recycled water at no more than the agronomic rate and to use the nitrogen in the recycled water to replace nitrogen provided by fertilizers. The Distributor asserts that the savings realized through reduced water

and fertilizer use will motivate users to comply with educational programs. In addition, the recycled water quality will already exceed the quality of groundwater in many areas of the basin.

Distributor and Supplier propose to replace this section including the Table entitled Recycled Water Limitations on page 11, Item D.1.1 of the Permit with:

"Before distributing recycled water to use areas, the recycled water shall comply with the requirements of CCR Title 22."

The referenced table included in the draft permit would set the 30-day average limitations in the recycled water distributed to the use areas to 10 milligrams per liter (mg/L) of nitrogen as nitrogen, 500 mg/L of total dissolved solids, and 140 mg/L of chloride.

Staff Response:

Proposed Order No. R3-2008-0039 (Section D.V) requires the Distributor to prepare a nitrate management plan whose goal shall be to ensure the recycled water does not further degrade the quality of groundwaters underlying the application sites, to ensure that competent professionals prepare the plan, and that the plan specifies a procedure to account for the nitrate applied to farmlands.

In a September 12, 2008, letter to the Distributor, the Executive Officer (EO) responded to Comment No. 7, above. First, since fertilizer has historically been relatively inexpensive, the EO questioned whether savings realized by reduced fertilizer use would influence growers to reduce the application of nitrogen fertilizer. Second, the EO argued that, while the Distributor would require growers to participate in educational programs and to use procedures provided in the handouts included in this staff report's Appendix 8, the procedures included no means to confirm that the growers actually added nitrogen fertilizer at the optimum rate. The letter requested the Distributor include a component to the proposed Nitrogen Management Program that will account for the actual fertilizer application rates.

The EO further requested the Distributor describe how it will use various nutrient and irrigation water management resources, including those that may be available through the grant administered by the Regional Board Pájaro Watershed Agricultural Irrigation and Nutrient Management Project, and through the Pájaro River Watershed Integrated Regional Water Management Plan.

In an October 27, 2008, letter (Attachment 8) the Distributor responded. The Distributor's response provided additional detail on how the Distributor will comply with the proposed Order's requirements included in Section D.V. At this time the Distributor cannot now specify its entire nitrate management program because resources from grant funds have not yet been delineated or provided to support irrigation and nutrient management. Also, the Distributor has not retained the services of an agronomic specialist to develop the plan.

However, in Attachment 8's Section No. 4 (Soil Sampling), the Distributor outlines how it will likely account for the amount of fertilizer actually used; that is, by means of an adequate number of soil samples obtained from farmlands irrigated with recycled water before and after the growing season. In the future, the Distributor will increase the area of farmlands wherein it samples soils to provide a more accurate representation of fertilizer and irrigation water use throughout its jurisdiction. If nitrate concentrations in the soils dramatically increase from year to year, the Distributor will pressure the offending grower(s) to optimize irrigation water and fertilizer use, ultimately employing its authority, as needed, to shut off the recycled water supply.

Staff concurs that this approach is likely the best way of regulating the use of irrigation water and fertilizer to ensure that the crops grown on the farmlands use all the water and nutrients applied, with little residual left in the soil. Therefore, staff removed the table from Item D.1.1 of the proposed Order and added the following:

"The Distributor shall ensure the Nitrate Management Plan includes procedures to optimize and account for irrigation water and fertilizer use to achieve these goals."

8. Distributor proposes to extend the due date for the Groundwater Management Plan to June 30, 2009 (Page 13, Item 4). Between August 2008 and March 2009, PVWMA staff will be inspecting sites, witnessing backflow prevention device tests, and issuing recycled water use permits. PVWMA plans to begin recycled water deliveries in March 2009.

Staff Response: Staff concurs and changed the due date accordingly.

9. The Nitrate Management Program (Program) discussed on page 14, Item V should be framed as an educational program PVWMA can provide to the farmers of the irrigated lands and should not hold PVWMA responsible for ensuring the users do not apply more nitrogen than required by the crops. PVWMA asserts that the economic benefit realized by adding less fertilizer to the irrigated lands will motivate farmers to adjust the rate they apply fertilizer to add nitrogen at no more than the agronomic rate.

   PVWMA proposes to submit the Program by March 31, 2009.

Staff Response: Please see discussion of the Nitrate Management Plan in Staff's Response to Comment No. 7, above.

10. Regarding Monitoring and Reporting Program page 4, Items E.1 and F.1, the Distributor proposes annual monitoring and reporting of groundwater. Annually, PVWMA samples its monitoring wells in addition to private wells and summarizes the results in an annual State of the Basin Report (Report). PVWMA suggests the annual monitoring and reporting adequately represent the quality of groundwaters underlying the irrigated farmlands.

Staff Response: Staff concurs, and changed the MRP accordingly.

11. The Distributor and Supplier recommend adding the following to page 7, Item 4 of the staff report, with the goal of clarifying the difference between the water quality goals of the groundwater basin from the goals of the tertiary treatment plant effluent.

    "The drinking water quality objective for the groundwater basin is a Maximum Contaminant Level (MCL) of 10 mg/L as nitrogen (45 mg/L as nitrate). The WWTF effluent contains an annual average concentration of 27.5 mg/l as nitrate. Nitrogen in the recycled water will be utilized by recycled water customers to replace existing fertilizer use, helping to reduce the amount of commercial fertilizers being applied to the soil. Furthermore, the cost of recycled water will provide financial incentive to growers to apply recycled water within the agronomic needs of the irrigated crops."

    The Distributor and Supplier justify this proposal by stating that the WWTF is not subject to meet drinking water quality objectives. As discussed in the comments on the Permit, PVWMA will educate its recycled water customers to use the nitrogen available in the recycled water to replace existing fertilizer use, helping to protect the groundwater basin.

Staff Response: Comment note; however, staff sees no need to add the comment to the Staff Report

12. The Distributor proposes to remove the following from page 10, Line 3 of the Staff Report:

"[T]he Distributor predicts that the total supply should make up for the water pumped along the coast and bring the groundwater basin into balance."

While the proposed project is part of the plan to eliminate overdraft conditions and halt seawater intrusion, it alone will not restore the basin's balance. PVWMA is continuing with other elements of the Basin Management Plan to identify additional water supplies, of which obtaining water from the Central Valley Project is an option.

Staff Response: Staff concurs and changed the phrase by adding the word 'help' between the words 'should' and 'make'.

RECOMMENDATION

Adopt Master Reclamation Permit Order No. R3-2008-0039, as proposed.

ATTACHMENTS

1. Appendix 1 - USGS report on Seawater Intrusion in the Pájaro Valley
2. Appendix 2 - Map of recycled water use area monitoring well locations
3. Appendices 3 – 6 - Maps of extent of seawater intrusion over time
4. Appendix 7 - Recycled Water Facility Treatment Processes
5. Appendix 8 - Pocket Guides to Determine Agricultural Nitrogen Applications
6. Proposed Master Reclamation Permit No. R3-2008-0039 and Monitoring and Reporting Program No. R3-2008-0039
7. October 27, 2008 letter from Pájaro Valley Water Management Agency