STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF DECEMBER 3, 2004

Revised on November 8, 2004

ITEM NUMBER: 18

SUBJECT: **Re-Issuance of Waste Discharge Requirements for Sunnyslope County Water District, Ridgemark Estates Subdivision, San Benito County – Order No. R3-2004-0065**

KEY INFORMATION

Discharger:	Sunnyslope County Water District
Location:	Approximately three miles southeast of Hollister and west of Airline Highway (Highway 25)
Waste Type:	Domestic wastewater
Treatment & Disposal:	Facultative (aerobic and anaerobic) pond systems with percolation/evaporation disposal
Permitted Capacity:	370,000 gallons per day (30-day average)
Reclamation:	None
Existing Orders:	Waste Discharge Requirements Order No. 89-58

SUMMARY

The Sunnyslope County Water District (Discharger) currently operates a municipal wastewater treatment and disposal facility for the Ridgemark Estates Subdivision (development) under Waste Discharge Requirements (WDR) Order No. 89-58. WDR Order No. 89-58 is significantly out of date and requires updating to reflect uncertainties and deficiencies in the facility's treatment and disposal efficiency and capacity. The following discussion describes the existing facility conditions and modifications contained in the proposed Order. The most significant changes recommended in the proposed Order include decreased flow limitations, increased treatment system influent, effluent and groundwater monitoring requirements and a request for a detailed treatment and disposal system evaluation for the development and implementation of a Long-term Wastewater Management Plan (LTWMP). Staff has worked with the Discharger and San Benito County stakeholders to develop a compliance schedule which will either result in a complete wastewater facility upgrade or the connection of the development to the City of Hollister wastewater collection system within a three-year period. Although elimination of wastewater treatment and disposal activities by the Discharger is the preferred alternative there are no assurances that a tie-in to the Hollister collection system will occur, or will occur in a reasonable time frame. As the facility requires immediate attention, the Order requires the evaluation of wastewater treatment and disposal capacity improvements in tandem with the evaluation of a collection system tie-in with the City of Hollister.

DISCUSSION

Development Description & History

The Discharger provides wastewater collection, treatment, and disposal services for the Ridgemark Estates Subdivision. The 636-acre development is located approximately three miles southeast of the City of Hollister and is approximately bounded by Airline Highway (Highway 25) to the east/northeast and Southside Road to the west/southwest. The development consists of two subdivisions, Ridgemark Estates I (north) and Ridgemark Estates II (south), completed in 1974 and 1988, respectively. Two smaller subdivisions, Quail Hollow and Oak Creek, adjacent to Ridgemark Estates are also serviced by the wastewater treatment and disposal facility. The subdivisions have been almost completely built-out with a residential population of approximately 3,741 living in 1,169 single-family homes and condominium units. The wastewater treatment facility also services a golf/tennis clubhouse, laundry, restaurant and a 32 room hotel.

Wastewater Treatment

The development is serviced by two separate wastewater treatment systems located within each of the subdivisions (see Attachment A), hereafter referred to as Ridgemark I (RM-I), located in the northern portion of the development, and Ridgemark II (RM-II), located within the southern portion of the development adjacent to the Ridgemark Estates golf course. Both systems consist of partial mix facultative (aerobic-anaerobic) treatment (stabilization) and 'disposal' ponds in series. Final effluent disposal is via percolation and evaporation. Ridgemark I was brought on-line in 1974, and consists of two treatment ponds (RM-I ponds 1 & 2) and three disposal ponds (RM-I ponds 3, 4, and 5). Pond 5 was constructed in 1985, when it was determined that additional disposal/percolation capacity was required. However, pond 5 has historically been maintained at lower than design levels due to slope stability and safety issues (a landslide occurred adjacent to pond 5 after it was initially filled). Ridgemark II was brought on-line in 1988, and consists of two treatment ponds (RM-II ponds 1 and 2) and two disposal ponds (RM-II ponds 3 and 4).

The primary treatment ponds (RM-I pond 1 and RM-II pond 1) provide solids settling, anaerobic digestion of bottom sludge (settled solids and biomass), and aerobic/facultative oxidation of soluble and colloidal organics. Oxygen is maintained in the upper layer of the facultative ponds primarily by algal photosynthesis and natural surface re-aeration. Supplemental aeration is provided by mechanical surface aeration in RM-I pond 1 and RM-II pond 1. The secondary treatment ponds (RM-I and RM-II ponds 2) act in a similar fashion to provide additional solids removal and waste stabilization.

The remaining ponds (RM-I ponds 3, 4, and 5 and RM-II ponds 3 and 4), frequently identified as percolation/evaporation ponds in facility engineering reports, now act primarily as polishing and storage ponds with an undetermined infiltration/percolation capacity. Significant evaporation is likely occurring in these ponds due to extended hydraulic retention times and large surface areas as indicated by the significant concentration of salts in the effluent as will be discussed in following sections. Ambiguities in terminology and discussions within historical engineering reports indicate these ponds were originally designed as polishing ponds and terminal storage basins with the intent of utilizing spray irrigation or water reclamation as the final disposal alternative and not percolation. Spray irrigation was implemented in 1999 resulting in a landslide above the final disposal area and was subsequently discontinued. The development's two eighteen hole golf courses provide a logical and convenient end use for reclaimed wastewater. However, the cost of treating the wastewater to reclamation standards and regrading the golf courses so drainage does not flow onto adjacent residential properties and into storm drains exceeds that of using the better quality surface water and groundwater being utilized on the golf courses. In addition, the poor quality (high total dissolved solids) of the wastewater makes it undesirable for agricultural use.

As the 'percolation/evaporation' ponds have essentially contained wastewater since their construction, any fortuitous infiltration/percolation capacity has diminished over time due to prolonged wetting and solids loading. Subsequently, a shallow disposal pond/spreading basin (pond 6) was installed in 1990 to augment the facility's disposal capacity at RM-I as the wastewater flow gradually increased in excess of evaporation and decreasing percolation rates. Pond 6 is located northwest of RM-I and serves as the final percolation disposal area for RM-I. Wastewater is pumped intermittently from RM-I pond 5 to the final disposal area (pond 6). Wastewater flow from pond 5 to pond 6 is regulated by on/off float switches in pond 5. Disposal and excess storage capacity are also diminishing at RM-II. RM-II pond 3 began discharging to RM-II pond 4 last year and the wastewater level in pond 4 is currently at a depth of approximately two feet. It is uncertain how long it will take RM-II pond 4 to reach capacity requiring alternative disposal options.

Geographic Setting & Geology

The development is located in the Hollister Valley south of the City of Hollister and north of Bird Creek Hills between the Diablo Range to the east/northeast and the Gabilian Range to the west/southwest. The rolling hills comprising the development were formerly a turkey ranch, and pasture and grazing land. The surrounding area is principally composed of agricultural mixed farming, intermixed with rural development.

The development is located within an active seismic zone. The Calaveras Fault zone lies to the south and west. The Tres Pinos Fault zone, a branch of the Calaveras Fault, passes through the development immediately south and parallel to Airline Highway and the San Andreas Rift zone is located several miles to the south.

The alluvial materials in the Hollister Valley include Quaternary alluvium and terrace deposits, with terrace deposits more prevalent along the east side of the valley. Stream gravel is present along the San Benito River. As such, the surface layers in the development area are composed of undifferentiated alluvium and San Benito Gravels (clay, sand and gravel).

Soils encountered immediately beneath the RM-II ponds consist of brown clay from 5 to 23 feet below ground surface, underlain by stratified consolidated sands, gravels and clays. Groundwater has been historically encountered at depths of 61 feet to 107 feet below ground surface.

The final disposal percolation area (pond 6) is located on the western slope of Pereira Hill above Southside Road. Soils encountered immediately beneath pond 6 consist of gravelly loam from ground surface to approximately 2 to 4 feet below ground surface underlain by stratified consolidated sands and gravels. Depth to groundwater has been historically encountered at depths of 90 feet to 140 feet below ground surface.

Soils beneath RM-I are assumed to be similar to those encountered beneath pond 6 as the RM-I ponds are located on elevated terrace/knoll just southeast of Pereira Hill. Depths to groundwater are also assumed to be similar to that encountered in the pond 6 monitoring well (MW-1). The RM-I monitoring well (MW-2) is located below the terrace adjacent to Southside Road. Soils encountered in monitoring well MW-2 consist primarily of large to medium gravels, sand, and streaks of clay. Groundwater has been historically encountered in MW-2 at levels of 40 feet to 50 feet below ground surface.

Surface Water

The development is approximately one mile north of the confluences of Bird Creek and Tres Pinos Creek with the San Benito River. Tres Pinos Creek is located approximately one mile south of the RM-II treatment/disposal ponds and the San Benito River is located approximately one half mile west of the RM-I treatment/disposal ponds and final disposal pond 6. No other major surface water bodies are near the development excepting Paicines Reservoir approximately six miles to the southeast and San Justo Reservoir approximately five miles to the northwest. In addition, Ridgemark Estates maintains twelve storage reservoirs and retention ponds within the development for landscape/golf course irrigation and stormwater retention. The combined storage capacity of these is approximately 128.7 acre-feet (41.9 million gallons).

Groundwater

The development is located within the Tres Pinos Creek Valley groundwater basin.

Three dedicated groundwater monitoring wells are located on the site as shown on Attachment A. Monitoring well MW-1 is located adjacent to the final disposal area pond 6, MW-2 is located approximately 1,000 feet southeast and downslope of the RM-I ponds, and MW-3 is located between RM-II ponds 3 and 4.

Groundwater in the basin is generally of poor quality as a result of high mineral content. Elevated total dissolved solids (TDS – typically referred to as salts), and the components of TDS such as chloride, sodium, sulfate, boron, and metals, particularly iron and manganese, are common. Various areas within the basin are also subject to elevated levels of nitrate, presumably resultant of historical agricultural practices.

Groundwater quality in the area around Ridgemark Estates can be determined from selected municipal drinking water wells as tabulated in the following 'water supply' section. Background shallow groundwater conditions are assumed to be similar based on groundwater data from monitoring well MW-2, but additional data are necessary to verify this assumption.

Water Supply

Ridgemark Estates' domestic water supply is provided by the Sunnyslope County Water District via two wells, well 5 and well 8 located within or adjacent to the development. Approximate well locations are shown on Attachment A. Additional wells (denoted as RMK wells on Attachment A) are also utilized by Ridgemark Incorporated for golf course irrigation.

Ridgemark Estates water supply quality (Sunnyslope Water District well nos. 5 and 8) is summarized in the following table.

Water Supply Quality for Selected Constituents – Ridgemark Estates

Constituent	Concentration (average)	Units
TDS[a,b]	816	mg/L
Chloride[b]	103	mg/L
Sodium[b]	105	mg/L
Nitrate[c]	16.5 (3.7)	mg/L as NO_3 (as N)

Notes:

a) Total Dissolved Solids

b) Average of semiannual water supply data between March 1996 and September 2003

c) Average of Nitrate data for Sunnyslope County Water District Well nos. 5 and 8 between May 1995 and September 2003

Compliance History

Review of our files and the Discharger's facility violation history indicates regular exceedances of the maximum pH discharge specification of 8.4 units at the RM-II treatment facility dating back to 1994. RM-II pond 2 infuent pH levels have been recorded as high as 8.8 units. Several notices of violation have been issued to the Discharger over the years to address the high influent pH levels. A wastewater collection system analysis was conducted in 1997, documenting high pH levels within the collection system, but no trend or individual source of elevated pH was observed. Elevated pH levels are presumably a result of excessive detergent usage within the community to combat 'hard water.' Subsequently, the Discharger has been unable to implement corrective measures and reduce the influent pH of RM-II wastewater.

The Discharger has also regularly exceeded discharge specifications for total dissolved solids (TDS) and chloride at RM-II and for chloride only at RM-I since prior to 1996. Discharge specifications are 2,000 milligrams per liter (mg/L) for TDS and 500 mg/L for chloride. Minimum, maximum and average TDS and chloride effluent concentrations as compared to water supply are tabulated from semiannual monitoring data between March 1996 and September 2003, for the two facilities in the following table.

Semiannual TDS & Chloride Data Synopsis – Ridgemark Estates

Units	Water Supply		RM-I Effluent[a,b]		RM-II Effluent[a]	
mg/L	*TDS*	*Cl*	*TDS*	*Cl*	*TDS*	*Cl*
Min	760	81	1600	500	1670	570
Max	860	120	1940	660	2480	940
Avg.	816	103	1760	587	2086	761

Notes :

a) Minimum, maximum and average values calculated from March 1996 to September 2003 semiannual monitoring data

b) RM-I and RM-II effluent concentrations for samples collected from pond 2 (both facilities)

The TDS and chloride excursions have historically been assumed to be attributable to water supply and domestic usage (water softeners). Several notices of violation have been issued to the Discharger over the years in response to TDS and chloride excursion, but no additional enforcement has been taken given this is a regional as well as state-wide problem lacking an immediate or economically feasible solution. Increased salts concentrations are expected as the water supply is used residentially and commercially then discharged to the sewer. However, facility data evaluated by staff for the proposed Order indicate significant increases in salts concentrations are also occurring within the treatment ponds as a result of elevated levels of evaporation. Salts and related evaporation issues are discussed in greater detail in following sections of this staff report.

Review of groundwater monitoring data conducted as part of this order revision indicates the Discharger may be impacting groundwater quality beneath the treatment and disposal sites. As will be discussed in later sections of this staff report, increased concentrations of sodium, chloride, TDS, and nitrate have been observed in selected monitoring wells over time. Additional investigation activities are required to confirm and quantify groundwater impacts. As such the Discharger needs to establish additional monitoring wells to assess upgradient (background) and downgradient groundwater conditions in the vicinity of both treatment facilities and pond 6.

The Discharger does not have a history of excessive sewer system overflows or spills as a result of weekly sewer collection system maintenance that focuses on known problematic areas within the collection system. As a general rule the Discharger reportedly flushes the entire collection system three to four times per year. Only two low volume spills of less than 100 gallons were reported during 2003.

Wastewater Flow

Both facilities are permitted for a combined daily flow of 370,000 gallons averaged over each month (30-day average). RM-I was originally designed for a flow rate of 168,000 gallons per day (gpd) and RM-II was designed for a flow rate of 240,000 gpd. Daily wastewater influent flows are plotted as a 30-day running average in Figure 1 (attached) for the period from September 2001 through December 2003. Average 30-day wastewater flows are approximately 187,000 gpd for RM-I and 82,000 gpd for RM-II for a total of 269,000 gpd for both treatment facilities. The peak in RM-I 30-day running average flow towards the end of 2003 as shown in Figure 1 was likely a result of faulty influent flow meter readings.

Although RM-I appears to exceed its design flow capacity of 168,000 gpd, both treatment facilities were significantly over designed based on excessive loading and hydraulic detention time assumptions as will be discussed in later sections of this staff report.

Treatment Efficiency

Existing monitoring requirements provide only limited data regarding RM-I and RM-II treatment efficiencies. Existing effluent sampling consists of daily flow measurements, weekly dissolved oxygen and pH analyses, and semiannual (March and September) TDS, sodium, chloride, nitrate, and total nitrogen sampling. Influent wastewater sampling was not required in the existing order.

Organic Stabilization - Biochemical oxygen demand (BOD) analyses conducted in May of 2002 indicated both RM-I and RM-II were achieving approximately 93% removal of influent BOD. Final effluent BOD concentrations at RM-I (pond 3) and RM-II (pond 3) were 15 mg/L and 16 mg/L, respectively. These data indicate sufficient and relatively high levels of organic stabilization are likely occurring within the two facilities. This is further substantiated by dissolved oxygen data and the absence of odors emanating from the facilities. However, a previous BOD analysis conducted in 1994 indicated RM-I and RM-II were achieving only approximately 74% and 67% BOD removal, respectively. No major operational or physical changes have been made to the facility since this time.

Supplemental aeration is currently provided via two 7.5 horsepower (hp) splash type surface aerators in RM-I pond 1 and two 5 hp splash type surface aerators in RM-II pond 1. Available design criteria and calculations for BOD loading oxygen requirements indicate the provided supplemental aeration is sufficient to stabilize organic loading. In addition, oxygen and aerator power requirement calculations conducted by staff using typical oxygen transfer rates for surface aerators, 30-day average flow rates, and May 2002 BOD data indicate the provided aerators should provide nearly double the stoichiometric oxygen requirement to stabilize 100% of influent BOD.

Nitrogen Removal - Review of semiannual effluent nitrate, total nitrogen, and total Kjedahl nitrogen data indicate the two treatment facilities are effecting no appreciable nitrogen removal (nitrification and denitrification) in the first two treatment ponds. Potential nitrification/denitrification processes in subsequent ponds are undocumented and unlikely. Inspection of Figures 2 and 3 shows that nitrogen is almost entirely present as organic and/or ammonia nitrogen (total Kjeldahl nitrogen) within RM-I and RM-II pond 2. The absence of nitrification (biological conversion of ammonia to nitrate) could be attributable to a combination of factors including inadequate oxygenation, elevated ammonia concentrations (toxicity), and unfavorable pH conditions. The given data do not differentiate between organic nitrogen and ammonia nitrogen. However, organic nitrogen in the form of proteinaceous matter and urea present in domestic wastewater is readily converted to ammonia nitrogen under anoxic conditions likely to exist in the collection system and portions of the facultative treatment/disposal ponds. Subsequently, the given data indicate elevated ammonia levels are potentially present in both treatment systems. In addition, wastewater at both facilities regularly exhibits pH levels pushing the upper range value of 8.6 units suitable for nitrification to occur. High influent pH levels are reportedly a result of detergent use within the Ridgemark community. To what effect ammonia concentrations and high pH are inhibiting nitrification is uncertain.

Nitrogen removal can also occur via the volatilization of soluble ammonia directly to the atmosphere, but generally accounts for less than 10% removal. In some cases stabilization ponds with extended hydraulic retention times and large pH fluctuations can facilitate increased volatilization of ammonia (up to 80%). It is uncertain to what extent the two treatment systems are facilitating nitrogen removal through ammonia volatilization.

Although dissolved oxygen measurements typically indicate sufficient levels within RM-I and RM-II ponds 1 and 2, supplemental aeration and operational controls may not provide sufficient excess aeration/oxygen to oxidize influent ammonia to nitrate. Sampling locations, times and techniques coupled with potential non-uniform dissolved oxygen concentrations in the ponds may not be providing representative data. Nitrification requires sustained dissolved oxygen concentrations in excess of 1 mg/L in the absence of organics (BOD) and a stoichiometric oxygen-to-ammonia ratio of 4.3-to-1 by mass. Additional aerators, adjustment of aeration run timers and/or placement of aerators may improve nitrification if toxicity and/or pH effects are not the limiting factor. Additional aeration/mixing may also aid in lowering ammonia concentrations through volatilization thus reducing toxicity. Even if suitable nitrifying conditions are established within the treatment ponds it is unlikely the current system configuration will facilitate denitrification (biological conversion of nitrate to elemental nitrogen) to any appreciable extent.

The facility design was assumed to facilitate an unspecified mode of nitrogen removal at the time it was last permitted in 1989. Unfortunately, facultative stabilization ponds are not generally conducive to complete nitrogen removal through nitrification and denitrification processes, but can be effective for nitrification only under controlled conditions. Various process configuration and control measures, beyond the scope of standard flow-through stabilization ponds, are required to facilitate complete nitrogen removal.

Total Suspended Solids Removal - Total suspended solids (TSS) removal efficiency is undocumented aside from four effluent samples collected in September and October 1999, prior to disposal in pond 6. TSS concentrations ranged from 27 mg/L to 73 mg/L (average 47 mg/L). Removal of TSS is assumed to be relatively high given the quiescent nature and long hydraulic retention times of the polishing/holding ponds. However, seasonal variations in TSS loading to pond 6 are likely occurring as a result of algal growth and carry-over during the warmer summer months.

Salts – Conventional wastewater treatment processes are not capable of reducing salt concentrations and in many cases domestic use and wastewater treatment only increase or concentrate final effluent salt loading.

Semiannual data for TDS, chloride, and sodium depicted in Figures 4, 5, and 6 (attached) indicate significant increases in effluent (pond 2) concentrations at both facilities as compared to domestic water supply. The water supply is of relatively poor quality due to high mineral content as is consistent with groundwater in the basin resulting in the widespread use of water softeners in the community. The data indicate RM-II effluent exceeds the 2,000-mg/L TDS discharge specification and both RM-I and RM-II effluent exceeds the 500-mg/L chloride discharge specification of the existing Order. The existing Order has no sodium limit. These data also show that sodium, chloride, and TDS levels in groundwater beneath RM-II (MW-3) closely mirror those of the effluent concentrations within pond 2.

Increases in salt concentrations at the facility are primarily attributable to the domestic use of water softening devices in the community and concentration through evaporation of wastewater from the treatment ponds. A three month TDS evaluation conducted in 1999 (see Figure 7) indicates a significant portion of the increase is attributable to evaporation and concentration of salts within the treatment ponds. This is especially the case for RM-II as a result of an excessive hydraulic retention time, large pond surface areas, low permeability of soils beneath the ponds (assumed low percolation capacity), and no effluent discharge from the system other than percolation or evaporation. Data from the study are summarized in the following table showing the relative increases in TDS due to domestic use and evaporation from the treatment ponds:

Total Dissolved Solids Evaluation – Ridgemark Estates

Ridgemark Facility			*RM-I*		*RM-II*	
Source		*Water Supply*	*Inf.*	*Eff.*	*Inf.*	*Eff.*
Avg. TDS (mg/L)[a]		814	1396	1816	1383	2108
Increase mg/L (%)	Dom. Use[b]		582 (72)		569 (70)	
	Evap[c]			420 (52)		725 (89)
	Total		1002 (124)		1294 (159)	

Table Notes:

a) Average concentrations calculated for 13 samples collected between 5/6/99 and 7/28/99 from various points within the treatment ponds; data plotted in Figure 7.
b) TDS increase attributable to domestic use.
c) TDS increase attributable to evaporation in treatment system

The 1999 evaluation indicates that an observed increase of approximately 70% to 72% in TDS concentration was attributable to the domestic use of water softeners. An additional 52% and 89% increase in TDS concentrations for RM-I and RM-II, respectively, was attributable to evaporation of wastewater from the treatment ponds. Total TDS increases in wastewater effluent of approximately 124% and 159% from that of the water supply were observed for RM-I and RM-II, respectively. The observed increase in TDS concentrations due to evaporative losses within the treatment/disposal ponds does not constitute a net increase in salt loading (lbs/year), whereas the increase due to domestic use is primarily attributable to increased salt loading through the discharge of brine from self-regenerating type water softeners. Increased TDS concentrations in the effluent as a result of evaporation are attributable to excessive hydraulic retention times and large surface areas of the treatment ponds.

Comparison of water supply and effluent sodium and chloride concentrations indicate even higher relative increases in concentration as a result of domestic use and evaporation. Calculations using average water supply and effluent data result in sodium and chloride concentration increases of up to 446% and 739%, respectively.

Increased salt concentrations in the effluent percolated to the groundwater basin do not meet the discharge specifications of the existing Order or median groundwater objectives in the Basin Plan. As a result, the observed salt loading is potentially impacting the beneficial uses of groundwater (municipal and domestic supply and agricultural supply) beneath the wastewater treatment facilities. As indicated above groundwater may already be impacted in the vicinity of RM-II based on available TDS data, but it is unclear to what extent beneficial uses are at risk. Sampling data for the Discharger's water supply well nos. 5 and 8 show no historical increase in TDS.

Treatment Capacity

Review of historical engineering reports indicates the two treatment facilities were designed using conservative (high) BOD loading rates (lbs/day) and long hydraulic retention times. Influent BOD analysis conducted in 1994 indicated BOD loading was significantly lower (up to 53% less for RM-I and 89% for RM-II) than originally projected, and the long retention times used in the original design are no longer considered appropriate for stabilization ponds. Although RM-I is currently receiving flows in excess of its 168,000 gpd design hydraulic capacity, current engineering practice indicates the treatment facility likely has additional hydraulic capacity. On the otherhand, RM-II is only operating at approximately 35% of its design hydraulic capacity of 240,000 gpd with a 30-day average daily influent flow of 82,000 gpd. At current flows the approximate hydraulic retention times of 21 days and 16 days for RM-I ponds 1 and 2, respectively, for a total hydraulic retention time of 37 days is at the high end of the acceptable range for stabilization ponds. The total hydraulic retention time within the RM-I ponds (ponds 1 through 5) is likely in excess of 65 days given the provided pond volumes and an average influent flow of 187,000 gpd. At current flows the estimated hydraulic retention times for RM-II ponds 1, 2, and 3 are 66 days, 20 days, and 33 days respectively, for a total hydraulic retention time of approximately 119 days. These estimates do not account for evaporation or percolation losses from the ponds. Standard design hydraulic retention times for facultative stabilization ponds published by Metcalf and Eddy range from 5 to 30 days.

Contrary to standard logic, excess treatment capacity does not always provide a benefit, unless in standby, and can adversely effect treatment efficiency and final effluent quality. The observed increase in salts concentrations at RM-I and RM-II is partially attributable to excessive capacity and extended hydraulic retention times within the treatment/disposal ponds resulting in significant evaporation of wastewater. Total evaporative losses are unknown without conducting a hydraulic balance analysis on the two treatment systems. To what extent excess hydraulic capacity has an adverse effect on waste stabilization is also unclear. Available data and field observations indicate the facilities are effecting a sufficient reduction in BOD and TSS, but additional data and analysis are necessary to document this. However, inadequate nitrogen removal (nitrification/denitrification) is of significant concern, but is more likely a result of operational controls related to mixing and aeration, as well as potential pH and toxicity issues that were discussed previously.

The RM-I and RM-II treatment facilities have been operated for approximately 30 years and 16 years, respectively, without sludge removal. Facultative and partial mix ponds can typically operate for extended periods without significant sludge accumulation as the sludge blanket reaches a seasonal homeostasis. Sludge depth soundings taking in March 2002 from RM-I pond 1 indicate sludge depths of up to 36 inches near the inlet with decreasing sludge depths generally occurring in areas away from the pond inlet. Sludge accumulation in RM-II pond 1 is uncertain, but accumulated solids are assumed to be significantly less than in RM-I and are likely confined to the deep inlet chamber (digestion pit) portion of the pond.

Disposal Capacity

Serious questions have been raised by local San Benito County agencies regarding Ridgemark Estates' wastewater treatment facility disposal capacity. As previously mentioned, RM-I ponds 3, 4, and 5 and RM-II ponds 3 and 4 were originally designed as polishing ponds and terminal storage basins with the intent of water reclamation as the final disposal alternative. These ponds now act primarily as polishing and storage ponds with an undetermined percolation capacity that also facilitate a significant level of wastewater evaporation. The large volumes (1.7 million gallons to 3.8 million gallons) and depths (10 feet to 17 feet) of these ponds are more characteristic of storage and treatment basins than shallow percolation beds or spreading basins which require frequent wetting and drying cycles and regular maintenance (removal of soil top layer containing deposited fines, ripping and disking) for optimal percolation rates. Annual drying and ripping/disking has been conducted in the summer/fall since 1991 on pond 6 only. RM-II ponds 3 and 4 have been ripped/disked twice with no appreciable increase in infiltration/percolation due to the hardpan clay soils encountered beneath the ponds. Although the disposal of significant volumes of wastewater appears to be occurring at RM-I and RM-II through percolation and evaporation, pond 6 is the only 'disposal area' remotely designed and operated in accordance with standard engineering practices for the disposal of wastewater via infiltration/percolation.

The relative amounts of percolation and evaporation occurring at RM-I and RM-II are uncertain given the absence of a detailed hydraulic balance analysis. Estimated wastewater flows to pond 6 from RM-I pond 5 calculated from pump run timer data and rated pump flow capacities are plotted on Figure 8 for the period between September 1, 2001 and December 31, 2003. During this 852-day data period, wastewater was pumped from pond 5 to pond 6 during only 301 days, or approximately 35% percent of the days. Comparison of 30-day running averages for RM-I influent and pond 6 effluent flows plotted in Figure 9 also indicate approximately 36% (68,000 gpd) of the influent flow to RM-I (187,000 gpd) is pumped to pond 6. Anomalous peaks in the pond 6 effluent data are reportedly due to sticking pump float switches resulting in excessive pump run times and are not necessarily representative of actual flow rates. Based on this evaluation, approximately 65% of the RM-I wastewater disposal flow is assumed to be occurring via percolation and evaporation in the RM-I ponds 1 through 5. Given no effluent flow from RM-II, 100% of the wastewater disposal flow is occurring via percolation and evaporation in RM-II ponds 1 through 4. Calculations using the 1999 TDS concentration data indicate evaporation of roughly 34% and 47% of the wastewater from ponds 1 and 2 alone would be required to cause the observed TDS increases at RM-I and RM-II, respectively. This results in approximately 31% and less than 53% of remaining wastewater disposal flows for RM-I and RM-II, respectively, being attributable to infiltration/percolation (not including pond 6 for RM-I). These are only rough estimates used to evaluate how wastewater disposal is likely occurring at the two facilities. The RM-II ponds have been slowly filling up since they were brought on-line in 1988, indicating that RM-II influent flows exceed the infiltration/percolation disposal flow and evaporative losses from the RM-II ponds.

Notwithstanding the concentration of salts in the wastewater being discharged to the groundwater basin, evaporation is not strictly prohibited or generally problematic. Natural land treatment systems like the stabilization ponds utilized at Ridgemark Estates are expected to facilitate a certain level of evaporation. However, significant levels of evaporation appear to be exacerbating the salts loading problem faced by the Discharger.

Original design calculations for pond 6 are not available. However, subsequent reports indicate pond 6 was sized for a flow of 370,000 gpd using 2 minutes per inch (0.5 inches/minute) drop test results and undocumented safety factors. The available infiltration/percolation disposal area of pond 6 is approximately 1.52 acres and basin infiltration tests conducted June 4, 2002 resulted in an infiltration/percolation rate of approximately 1 inch/hour within pond 6 (0.0167 inches/minute). Conservative estimates by staff using this value indicate pond 6 can handle flows of up to approximately 99,000 gpd given adequate flow equalization and regular maintenance. At the current RM-I 30-day average flow of 187,000 gpd a minimum area of approximately 3 acres would be required for infiltration/percolation disposal; approximately 3.5 acres for a peak daily flow of 223,000 gpd. This does not account for buffer zones, access roads, berms/levees, and additional land requirements for other facility appurtenances. In addition, redundancy and safety factors are normally added to the minimum design requirements to account for seasonal variations in wastewater flow, variations in infiltration/percolation rates due to groundwater fluctuations and storm events, maintenance activities, and normal wetting/drying operational cycles.

Anecdotal reports of periodic seepage from the hillside slope below pond 6 raises additional concerns regarding the stability and safety of pond 6. Excessive hydraulic loading to pond 6 may cause daylighting of effluent and compromise slope stability below pond 6.

Review of available data reveals inadequacies in disposal capacity and the inevitable failure of wastewater disposal for both facilities at current wastewater flows. The fortuitous infiltration/percolation capacity of the RM-I and RM-II ponds will likely continue to diminish over time as a result of prolonged loading requiring additional and dependable disposal capacity for both facilities. This is especially evident considering the RM-II ponds are slowly filling and will reach capacity sometime in the near future. This will require pumping of RM-II wastewater to RM-I or some other disposal location. It is unlikely that RM-I and pond 6 can handle the additional flow given pond 6 is likely pushing capacity at current estimated hydraulic loading rates from pond 5 and is insufficient to handle the total RM-I influent flow.

The Discharger has been aware of this problem for some time and has been evaluating potential disposal locations prior to 2001. Recent attempts by the Discharger to acquire property south of the development for additional wastewater disposal have reportedly been thwarted by public opposition and local agency concerns regarding site suitability and appropriate environmental review. The Discharger is currently negotiating with the landowner and is working with the San Benito County Water District to evaluate groundwater quality and flow in the proposed disposal area.

Groundwater Monitoring

As previously discussed there are three groundwater monitoring wells associated with the two wastewater treatment facilities and pond 6. For this evaluation semiannual groundwater quality data from the monitoring wells is compared to effluent data (pond 2) and water supply data. The Discharger's water supply wells (well 5 and well 8) are located either within or proximal to the development and are assumed to provide a general assessment of background groundwater quality for the area. However, the water supply wells generally tend to pump water from deeper portions of the groundwater basin and may not be representative of shallower groundwater encountered in the monitoring wells. The relative locations of monitoring wells and water supply wells with respect to the wastewater treatment facilities are presented on Attachment A.

RM-I; Monitoring Well 2 - Groundwater quality in monitoring well MW-2, located approximately 1,000 feet southwest and downslope of RM-I, appears to be representative of background groundwater conditions in the Ridgemark Estates Development as shown by semiannual groundwater monitoring data depicted in Figures 4, 5, 6, and 10. It is uncertain whether MW-2 is downgradient of RM-I and representative of groundwater influenced by percolate from the RM-I ponds.

RM-II; Monitoring Well 3 – This monitoring well is located between ponds 3 and 4 of RM-II. As previously mentioned, semiannual groundwater quality data from MW-3 closely models that of RM-II pond 2 sampling data for sodium, chloride, and TDS indicating potential degradation of water quality beneath RM-II (see Figures 4, 5, and 6). The presented data also depicts a notable increase in sodium, chloride, and TDS concentrations between March 1998 and September 2003 in MW-3. These data indicate percolate from RM-II ponds is either transporting salts through the observed clay layer beneath the RM-II site or that MW-3 is under the influence of RM-II wastewater due to an improperly constructed or damaged monitoring well. In either case groundwater data indicates some impact has and is occurring directly beneath RM-II. Well construction details for MW-3 indicate a concrete annular seal was installed from ground surface to 20 feet below ground surface within a clay layer observed in the boring from 5 feet to 23 feet below ground surface. Groundwater has been historically encountered at depths of 61 feet to 107 feet below ground surface within the consolidated sands and gravels observed beneath the clay layer.

Lack of historical groundwater monitoring data prior to 1996 and background groundwater quality data in the vicinity of RM-II preclude a definitive determination regarding the mode and relative impact of groundwater quality as a result of RM-II. Additional monitoring wells in the vicinity of RM-II are required to adequately evaluate groundwater quality beneath and adjacent to RM-II and quantify relative impacts.

Pond 6; Monitoring Well 1 - Monitoring well MW-1 is located adjacent to pond 6 and is approximately 240 feet deep. Semiannual groundwater sampling data for MW-1 also show relative increases in sodium, chloride, and TDS concentrations over time between March 1998 and September 2003 (Figures 4, 5 and 6). As with RM-II monitoring well 3 data, impacts are likely occurring beneath pond 6 due to salts loading, but additional monitoring wells are required to evaluate relative impacts.

Figure 10 shows significant increases in nitrate concentrations in groundwater beneath pond 6 (MW-1) between March 1998 and September 2003. Nitrate concentrations beneath pond 6 currently exceed the 8-mg/L (as nitrogen) groundwater limitation contained within the existing Order as well as the standard nitrate limitation of 10 mg/L (Maximum Contaminant Level). Although nitrogen data for RM-I indicates nitrification is not occurring in RM-I treatment ponds 1 and 2, nitrification may be occurring between pond 2 and pond 6 or within the vadose zone beneath pond 6, resulting in the observed excursion. The latter scenario is the most probable given nitrogen loading to pond 6 and the ubiquitous presence of nitrifying organisms in soil; however, offsite sources of nitrate cannot be ruled out without further investigation.

Salts Management Program

Salt loading is a basin wide concern. The Discharger, in conjunction with the San Benito County Water District and City of Hollister (as participants of the San Benito Water Resources Agency [WRA]), have been evaluating options to improve domestic water supply quality in San Benito County and subsequently the quality of wastewater being discharged back into the groundwater basin. In part, the intent of the Discharger and WRA is to provide a higher quality water supply that will reduce the community's dependence on water softeners.

The San Benito County Water District is currently importing higher quality surface water from the State Water Project (San Felipe Project) for use within the County. The Discharger and City of Hollister jointly operate a water treatment plant (Lessalt 1) for the demineralization of San Felipe water that is blended with domestic groundwater supplies for use within specific areas of Discharger's service area and the City of Hollister. Lessalt 1 came online November 2002; however, Ridgemark Estates does not benefit from the higher quality blended water supplied to other portions of the Discharger's service area. The Discharger is unable to supply this water to Ridgemark Estates due to insufficient water pressure within the delivery system. The Discharger previously submitted a time schedule to design and construct a second surface water treatment plant (Lessalt 2) to supply water to Ridgemark customers. This time schedule was set back to evaluate a groundwater demineralization treatment option in light of uncertainties regarding the availability and reliability of additional State water. A Groundwater Softening – Demineralization Feasibility Study vs. Surface Water Treatment Report is currently under review by local agencies.

The Discharger has also been party to inter-governmental meetings with the County of San Benito and the San Benito County Water District regarding a local water softener ordinance and potential future requirements for water softener use and brine discharge. A prohibition against the installation of non-demand type self-regenerating type water softeners has been in effect for the Ridgemark Estates wastewater service area for over ten years. Unfortunately, the prohibition is not enforceable resulting in it being virtually ineffective.

In light of the findings of this staff report, the Discharger needs to step up its evaluation and implementation of a viable Salt Management Program to address water supply quality, domestic salt loading, and evaporation in the treatment ponds to reduce salt concentrations and loading to the groundwater basin.

Satellite Systems & Reclamation

The Regional Board's Water Quality Control Plan for the Central Coastal Basin (Basin Plan) emphasizes the pursuit of regional wastewater management and includes the following Management Principle (Chapter V, Section IIIB):

"The number of waste sources and independent treatment facilities shall be minimized and the consolidated systems shall maximize their capacities for wastewater reclamation, assure efficient management of, and meet potential demand for reclaimed water."

That principle conforms to the Basin Plan goals (Chapter IV, Section 1):

"To manage municipal and industrial wastewater disposal as part of an integrated system of fresh water supplies to achieve maximum benefit of fresh water resources for present and future beneficial uses and to achieve harmony with the natural environment, and to continually improve waste treatment systems and processes to assure consistent high quality effluent based on best economically achievable technology."

Ridgemark Estates development is immediately south of the City of Hollister wastewater services area district. The San Benito County Water District is currently drafting a Regional Water Recycling

Facilities Plan Study and Environmental Review in conjunction with the Water Resources Agency of San Benito County that will incorporate an evaluation of a regional wastewater treatment and reclamation facility. The City of Hollister is also in the process of revising its Master Plan in addition to implementing a Long Term Wastewater Management Plan. Hollister is currently in the final design and permitting phase for a new wastewater treatment and disposal facility to be completed in the fall of 2005. Based on the preliminary design documents the proposed Hollister wastewater facility will have sufficient excess capacity to handle Ridgemark flows. The Discharger has formally expressed its desire for combined wastewater treatment services to City of Hollister engineering staff, City Council members and the mayor in the last several months. Current demands being placed on Hollister to upgrade its wastewater treatment and disposal facility likely preclude the timely consideration and implementation of incorporating Ridgemark Estates wastewater flows into the City's collection system. Staff has strongly recommended that a regional wastewater treatment plant be evaluated as part of the City's general plan.

It is prudent for the Sunnyslope County Water District to seriously evaluate and pursue consolidated wastewater treatment and disposal with the City of Hollister in order to effectively implement wastewater treatment and recycling. Discussion with the San Benito County Water District, San Benito County Planning, and San Benito County Division of Environmental Health departments indicate they are all in support of a regionalized wastewater treatment and reclamation facility in the Hollister area, and would work constructively to promote that idea. Discussions with Hollister City staff indicate they are also open to the idea, but are currently focusing resources on upgrading the City's wastewater treatment and disposal facility.

Additional proposed development within and around the Ridgemark Estates wastewater services area is pending and will put additional demands on wastewater treatment and disposal if implemented. The need for additional disposal capacity and wastewater treatment facility modifications is imminent and is therefore required by the proposed Order to meet current demands at Ridgemark Estates. However, staff will recommend against increased wastewater treatment and disposal system capacity above what is currently needed to facilitate additional development if the option of connecting to the City of Hollister wastewater collection system has not been adequately evaluated and diligently pursued as a viable alternative. As such, additional development of Ridgemark Estates should only occur as a result of sound planning decisions made in accordance with our Basin Plan and local planning policies.

PROPOSED ORDER

Significant Changes to Order

The proposed Order substantially overhauls and updates the existing order and associated monitoring and reporting program. The proposed Order focuses primarily on rectifying performance and disposal capacity deficiencies of the facility by establishing specific requirements and time schedules. Significant changes to the proposed Order include:

- A reduced influent flow limit from 370,000 gpd to 300,000 gpd to protect the facility from over-loading. The proposed flow limit reduction should be sufficient to handle current flows and allow for seasonal variation.
- Addition of monthly influent monitoring for BOD, TSS, TDS, sodium, chloride, nitrate, ammonia, and total nitrogen, and semiannual influent monitoring for sulfate and boron. Influent monitoring is intended to provide necessary data for evaluating treatment system requirements and modifications.
- Increased effluent monitoring frequency from semiannual to monthly for TDS, sodium, chloride and nitrate with the addition of monthly effluent BOD, TSS, nitrate, total nitrogen, total Kjeldahl nitrogen and ammonia monitoring, and the addition of semiannual sulfate and boron sampling. Effluent sampling is intended to coincide with influent sampling to evaluate treatment system performance.
- Increased groundwater monitoring frequency from semiannual to quarterly for TDS, sodium, chloride and nitrate with the addition of nitrite, ammonia and total nitrogen as analytes, and the addition of semiannual sulfate and boron sampling.

- Addition of semiannual water supply monitoring for nitrate, sulfate and boron.
- Addition of annual sludge depth monitoring and biosolids sampling and reporting requirements.
- Phased effluent limitations for BOD and TSS to maximize treatment and existing spreading basin/percolation pond disposal capacity.
- Phased effluent limitations for TDS, sodium, chloride, nitrate and ammonia to address salt issues, improve treatment system performance and protect beneficial uses of groundwater.
- Metering of disposal flows to pond 6 to document actual disposal flows.
- Annual maintenance of disposal pond(s) via scraping, disking or ripping to maximize infiltration capacity of existing and future disposal ponds.
- Requirement for a groundwater assessment workplan to install additional monitoring wells and evaluate potential groundwater impacts.
- Requirements for a detailed treatment and disposal system evaluation for the development of a long-term wastewater management plan (LTWMP). The LTWMP requires the evaluation of various Facility improvements to address treatment and disposal capacity limitations as well as evaluate a sewer connection to the City of Hollister wastewater treatment/reclamation facility. Subsequently, the LTWMP will result in either substantial improvements to the existing treatment and disposal facility or connection to the Hollister collection system. The proposed phasing of effluent limitations coincides with the LTWMP compliance schedule. This requirement is intended to facilitate treatment and disposal improvements while advocating and not preempting the desired alternative of a sewer connection with the City of Hollister.
- Requirement for an annual engineering report evaluating the performance and capacity of the wastewater treatment and disposal system.
- Requirement for an ongoing salt management program with annual submittal of an engineering report/evaluation. The salt management plan is intended to evaluate contributing sources and develop an implementation schedule for the reduction of salt loading to a level that will ensure compliance with effluent limitations and not negatively impact beneficial uses of groundwater.

The proposed Order would normally be subject to review/reissuance in ten years. In the event the Discharger does not tie-in to the City of Hollister collection system, substantial improvements to the facility, as required by the proposed Order, may warrant review and revision of the waste discharge requirements prior to this date.

Development of Effluent Limitations for Salts and Nutrients

Chloride and TDS discharge specifications were previously set at 500 mg/L and 2,000 mg/L, respectively, in the existing Order. The basis for these limits is unclear. Unfortunately, the lack of more stringent salt limits or additional requirements to address the salts problem only prolonged the salt loading problem and perhaps even allowed additional increases in salt loading to occur. It should be noted however that poor quality groundwater (and municipal supply) characterized by high TDS levels is a basin-wide problem with no immediate or economically feasible solution.

Regional Board staff does not recommend pursuing effluent treatment (end-of-pipe technology) to decrease salt loading in the effluent other than through control modifications to reduce wastewater evaporation and the concentration of salts in the effluent. Other measures will likely include improved water supply quality and reduced community dependence on and/or limiting use of water softeners.

Median groundwater objectives for TDS, sodium and chloride tabulated in the Basin Plan for the Tres Pinos sub-area of the Pajaro River groundwater basin are 1,000 mg/L and 150 mg/L, respectively (sodium and chloride objectives are the same). Based on data from Sunnyslope County Water District water supply wells in the vicinity of Ridgemark Estates, background groundwater quality is approximately 816 mg/L for TDS, 105 mg/L for sodium and 103 mg/L for chloride. Although current influent concentrations of these constituents are unknown, the 1999 study indicates influent TDS concentrations are above 1,300 mg/L and constitute an approximately 70% increase in TDS above water supply concentrations. It can be assumed increases in chloride and sodium concentrations as a result of domestic use are equally as significant given the observed high effluent concentrations and relationship between TDS, sodium and chloride.

Although a sodium limit is not in the existing permit, increases in sodium concentration exhibit a similar pattern at the facility as shown in the following table:

Semiannual Sodium Data Synopsis – Ridgemark Estates

Units[a]	*Water Supply*	*RM-I Effluent*[b]	*RM-II Effluent*[b]
mg/L	*Na*		
Min	83	370	320
Max	190	440	600
Avg.	105	404	469

Notes:

a) Minimum, maximum and average values calculated from March 1996 to September 2003 semiannual monitoring data

b) RM-I and RM-II effluent concentrations for samples collected from pond 2 (both facilities)

The rationale behind the proposed salt effluent limits is to phase in incrementally more stringent limits over time which are reasonably achievable by the Discharger and approach median groundwater objectives specified in the Basin Plan. As the Discharger regularly exceeds the current discharge specification limits for TDS and chloride, and would be equally likely to exceed a similar limit (500 mg/L) for sodium, no effluent limits are proposed for these parameters during the first three years of the permit. Current TDS, sodium and chloride effluent concentrations are what they are and there is no immediate way to reduce them. Therefore, the establishment of less or more stringent effluent limits will have no immediate effect on effluent quality and the latter will only result in the Discharger being in violation of the proposed Order. After three years, TDS, sodium and chloride effluent limits will be in effect to account for reduced effluent salt concentrations in an amount roughly equivalent to the approximated evaporative increases currently occurring at the facility. After an additional two years the limits will be reduced to a final limitation that can be feasibly achieved given reasonable water supply quality and domestic use contributions and which is economically and technologically feasible. The following table outlines the proposed phasing of effluent limitations for salt constituents:

Proposed Phasing of Effluent Limitations for Salt Constituents

Effective Date	*Limitation*[a] *(mg/L)*		
	TDS	*Sodium*	*Chloride*
No interim limits	--	--	--
January 30, 2008	1,500	300	300
January 30, 2010	1,200	200	200

Notes:

a) 30-day average

Additional reasoning for this phased approach will become apparent upon review of the LTWMP and salt management plan requirements. The phasing of these limits is intended to allow the Discharger adequate time to develop workplans, collect and analyze data, and evaluate and implement corrective measures.

The existing order also lacks effluent limitations for nutrients (nitrate and ammonia). The establishment of effluent limits for nutrients is equally as problematic as in the salts case since the Discharger would not be likely to comply with even reasonably lax limits under current facility conditions. Therefore, staff is proposing a similar phased approach in setting nutrient limits that tie into the LTWMP compliance schedule. The proposed limits are as follows:

Proposed Phasing of Nutrient Limitations

Effective Date	*Limitation as N (mg/L)*	
	Nitrate	*Ammonia*[b]
No interim limits	--	--
January 30, 2008	10	10
January 30, 2010	5	5

Notes:

a) 30-day average

b) Total ammonia as nitrogen

Effluent limitations for nitrate and especially ammonia are not typically required for the land disposal discharge of secondary effluent. Given the facility proximity to municipal water supply wells, existing regional groundwater impairment for nitrate, and potential impacts from the facility due to the lack of nitrification/denitrification, these limitations are warranted to improve facility performance and protect groundwater quality. The ammonia limits are primarily intended to address treatment system deficiencies, but should also help limit overall potential nitrate loading to groundwater. Ammonia is generally converted to nitrate as it percolates through the soil. Therefore the proposed final limits of 5 mg/L for nitrate and ammonia would constitute a theoretical discharge limitation for nitrate as potentially seen by the groundwater of 10 mg/L, which is equivalent to the Maximum Contaminant Level. It is assumed that physical and operational modifications to the treatment system which are designed to meet these limitations would be able to exceed these requirements.

As with nutrients, effluent limitations for BOD and TSS are not typically required for land discharges. However, sufficient BOD removal is an indicator of adequate wastewater stabilization and lower TSS loading to the disposal ponds generally improves infiltration rates. Therefore, uncertainties in BOD and TSS removal efficiencies and limited disposal capacity at the facility warrant effluent limitations for these parameters. The following BOD and TSS effluent limitations are primarily performance based and are intended to establish milestones for improved treatment and disposal of wastewater:

Proposed Phasing of BOD and TSS Effluent Limitations

Effective Date	Limitation[a] (mg/L)	
	BOD	TSS
No interim limits	--	--
January 30, 2008	60	60
January 30, 2010[b]	30	30

Notes:

a) 30-day average

b) Technology based limits for secondary treatment set forth in 40 CFR 133.

The first phase of interim nutrient, BOD and TSS limitations are intended to allow the Discharger additional time to fine tune or modify treatment system improvements in the event the implemented measures are unable to meet the final limits.

Long-term Wastewater Management Plan

The proposed Order requires the Discharger to evaluate the wastewater treatment and disposal facility and take appropriate measures to address deficiencies in treatment performance and disposal capacity by January 30, 2008. As part of the LTWMP evaluation the Discharger is required to evaluate the feasibility of discontinuing existing wastewater treatment and disposal operations and discharging its wastewater to the City of Hollister wastewater collection system. Subsequently, the proposed Order requires the Discharger to either upgrade the existing facility to meet the proposed effluent limitations and provide sufficient disposal capacity, or discharge its raw wastewater to the City of Hollister's collection system.

The Hollister collection system tie-in scenario appears to be a technically viable option. However, establishing an amicable agreement between the Discharger and City in a timely manner may not be as simple as engineering a connection, or even be achievable. Although this is the preferred alternative, the existing facility requires immediate attention warranting contingencies in the event a Hollister tie-in is not feasible in a reasonable time frame. Therefore, the proposed Order requires the concurrent evaluation of facility improvements and tie-in to the City's collection system. The Discharger has the option of either implementing improvements to the facility or connecting to the City's collection system by the January 30, 2008, compliance deadline. If the Discharger connects to the City's wastewater collection system and discontinues wastewater treatment and disposal operations by the compliance deadline, the LTWMP will be complete. This approach is intended to facilitate wastewater treatment and disposal improvements at the facility without precluding the Hollister tie-in option.

ENVIRONMENTAL SUMMARY

These waste discharge requirements are for an existing facility and are exempt from provisions of the California Environmental Quality Act (Public Resources Code Section 21100, et.seq.) in accordance with California Code of Regulations, Title 14, Chapter 3, Section 15301.

COMMENTS & RESPONSES

On August 10, 2004, the Regional Board notified the Discharger and interested parties of its intent to issue waste discharge requirements for the discharge and provided them with a copy of the proposed Order and an opportunity to submit written views and comments.

Written comments were only received from Raines, Melton & Caralla, Inc. on the Discharger' behalf. Comments are addressed in this section, including excerpted or paraphrased portions of the actual comments, staff responses to comments, and any subsequent staff recommendations.

Raines, Melton & Carella, Inc./Sunnyslope County Water District; Written comments were received September 20, 2004 via letter (letter attached):

1. Comment: Staff report, Summary, page 1 - "Change the fifth sentence after the word 'upgrade' to read 'by January 30, 2008 or the connection of the development to the City of Hollister wastewater collection system within two months after the City of Hollister's wastewater treatment plant becomes operational."

   Staff Response: Although the City of Hollister's ability to complete and start up the new domestic wastewater plant by the October 15, 2005 compliance deadline is currently in question, it is likely the City will be able to complete the required improvements prior to January 30, 2008. In the event that a Hollister tie-in is chosen as the desired alternative and is completely designed and permitted, situations beyond the Discharger's reasonable control preventing or prolonging implementation of the connection will be considered in evaluating compliance with the Long-term Wastewater Management Plan schedule. As such, the following General Provision (No. 13) has been added to the proposed Order:

   "The Regional Board retains the authority to amend the time schedules for any or all of the effluent limitations or Long-Term Wastewater Management Plan compliance deadlines if it determines delays are due to circumstances beyond the Discharger's control."

2. Comment: Staff report, paragraph 4 of Compliance History, pages 4/5, - "Monitoring wells are not suitably located to conclude a possible impact."

   Staff Response: Language in the staff report and proposed Order acknowledges uncertainties in observed groundwater impacts based on limited groundwater monitoring data from existing site monitoring wells. Consequently, the proposed Order requires additional monitoring wells and sampling to further evaluate suspected impacts. No changes made.

3. Comment: Provision No. 10 of the proposed Order on page 2 – "At the end of the provision add, 'and RM-II'."

   Staff Response: Pond 6 does not currently act as the final infiltration/percolation area for RM-II. Although a lift station and piping exist for pumping RM-II pond 4 effluent to RM-I pond 5, pumps are currently not in place to transfer effluent from RM-II to RM-I. The second sentence in Finding No. 10 has been changed to read (change noted in italics):

   "Pond 6 is located northwest of RM-I and *currently* serves as the final infiltration/percolation disposal area for RM-I."

4. Comment: Finding No. 19 of the proposed Order on page 2 – "Replace the last sentence with the following, 'Flow from RM-II ponds has the ability to be pumped to RM-I Pond No. 5 to increase disposal capability at RM-II.'

   Staff Report: See staff response to comment No. 3. For clarification, the last sentence of Finding No. 19 has been changed to read:

   "The amount of available storage in RM-II pond 4 is uncertain. No additional disposal alternatives for RM-II are available at this time other than pumping RM-II pond 4 effluent to RM-I pond 5 for final disposal in pond 6. It is uncertain whether pond 6 can handle additional disposal flows from RM-II."

5. Comment: Finding No. 27 of the proposed Order on page 3 – "Add at the end of the fourth sentence, 'and photosynthesis.'"

   Staff Response: The following sentence was added to this provision for clarification:

   "Algal photosynthesis has also been implicated in pH fluctuations within the treatment and disposal ponds."

6. Comment: Finding No. 32 of the proposed Order on page 4 – "In the first sentence replace the word 'Burial' with 'Bird.'"

   Staff Response: Change made as recommended.

7. Comment: Finding No. 54 of the proposed Order on page 7 – "Is the TMDL allocation for surface water only? This paragraph is slightly confusing."

   Staff Response: Yes. Future TMDL allocations will be for surface water only. This is standard permit reopener language for TMDL implementation in the event wastewater disposal activities at the facility are found to contribute nutrient, silt, or fecal coliform loading to the San Benito River. No changes made.

8. Comment: Specification No. B.2, Table 6 on page 8 of the proposed Order – "Consideration should be given to setting monitoring well limits in lieu of ponds treatment requirements. Proposed effluent limits may be overly restrictive based on the groundwater quality in the area. Credit should be given for soil filtration to improve effluent water prior to reaching groundwater. Consideration should be given to preparation of a Background Groundwater Study to set appropriate monitoring well requirements."

   Staff Response: Staff feels that groundwater limitations, although useful when coupled with groundwater monitoring, are not sufficiently protective of water quality. Groundwater monitoring data lack confidence and are not necessarily representative of overall receiving water quality due to monitoring well placement, depth to groundwater, geochemistry, hydrogeology, pumping effects etc. The proposed effluent limits are intended to prevent/mitigate groundwater impacts whereas groundwater limitations and monitoring will only indicate when impacts have occurred. Existing groundwater data in the vicinity of the disposal areas indicates impacts may have already occurred and warrant effluent limits for salts (and nutrients).

   The proposed effluent limits for TDS, sodium and chloride are higher than the assumed background receiving water quality based on available groundwater supply well (municipal well no.s 5 and 8) and monitoring well (MW-2) data presented in Table 2 of the proposed Order. These wells are within the development and not immediately adjacent to the facility disposal areas (see Attachment A). Whereas groundwater quality within existing monitoring wells MW-1 and MW-3 appears to be more consistent with effluent quality than assumed background groundwater conditions.

   Although some reduction of TDS and sodium may occur through cation exchange in the soil column, chloride typically acts as a conservative tracer in subsurface flow regimes. Establishing dilution or assimilative capacity credits for soil filtration would require extensive site specific testing to demonstrate a suitable ion exchange capacity at the typical percolation rates and an understanding of when that capacity would be reached. Given that portions of the two facilities have been discharging to land/groundwater for between 14 to 30 years it is likely the assimilative capacity of soils beneath some of the treatment and disposal ponds has already been reached. In addition, this comment raises the question of whether effluent limits should account for potential leaching of salts or other minerals from soils to the groundwater.

   End of treatment effluent limits for salt constituents are warranted given the following: the existence of a basin wide groundwater salinity problem; significantly high TDS, sodium and chloride levels currently being discharged from the Ridgemark facilities; high TDS, sodium and chloride concentrations observed in MW-1 and MW-3; and uncertainties in site specific assimilative soil and groundwater capacities. No change made.

9. Comment: Specification No. B.2, Table 7 on page 9 of the proposed Order – "The Basin Plan states a 5 mg/L requirement as a median groundwater quality objective. Consideration should be given to setting monitoring well limits in lieu of ponds treatment requirements. Proposed effluent limits may be overly restrictive based on the groundwater quality in the area. Credit should be given for soil filtration to improve effluent water prior to reaching groundwater. Consideration should be given to preparation of a Background Groundwater Study to set appropriate monitoring well requirements."

   Staff Response: (see paragraph 1 of the staff response to comment no. 8 above)

   The Basin Plan median groundwater objective of 5 mg/L in Table 3-8 is for nitrogen (total). The proposed final effluent limits for nitrate and ammonia essentially equate to a total nitrogen limit of 10 mg/L as nitrogen (assuming negligible nitrite and organic ammonia contributions). The proposed final limits of 5 mg/L for nitrate and ammonia constitute a theoretical discharge limitation for nitrate as potentially seen by the groundwater of 10 mg/L (as nitrogen) assuming complete nitrification of ammonia in the soil column. This is consistent with the groundwater limitation of 10 mg/L (as nitrogen) for nitrate contained in the proposed Order (Specification B.4) and is equivalent to the Maximum Contaminant Level for nitrate.

   The denitrification of significant amounts of nitrate in the soil column is unlikely. As with the salts case discussed in the previous comment, establishing dilution or assimilative capacity credits for soil filtration/treatment would require extensive site specific testing to demonstrate suitable nutrient removal at the typical percolation and nutrient loading rates.

   Assuming an average background concentration of nitrate in groundwater in the vicinity of the facilities is in the range of 0.75 mg/L to 5 mg/L (see Table 2 of the proposed Order – not including MW-1 data), the proposed effluent limits are not overly restrictive.

   The establishment of effluent limits for nitrogen is twofold: 1) to address treatment system deficiencies, and 2) to prevent/mitigate groundwater impacts. No change made.

10. Comment: Specification No. B.3, page 9 of the proposed Order – "Change '8.4' to '9.0'. In addition to detergent issue, photosynthesis may also be contributing. Consider if no impact to monitoring wells a limit of 6.5 to 8.4 in monitoring wells. The Basin Plan on page III-8 indicate these guidelines are flexible and should be modified when warranted by local experience or special conditions of crop, soil, and method of irrigation."

    Staff Response: This comment is unclear. Staff assumes the comment requests an increase in the upper end of the pH effluent limit range to account for photosynthesis effects and other unspecified special conditions.

    The proposed pH effluent limits are consistent with other land discharges in our Region and are based on the University of California Agricultural Extension Service guidelines for irrigation (agricultural supply beneficial use). Although the proposed change by itself would not be anticipated to cause significant adverse impacts to groundwater quality, high pH values at the facility may be adversely affecting treatment system performance. As previously noted in this staff report, high pH levels in the influent wastewater and treatment ponds are potentially hindering nitrification. The optimum pH range for nitrification is 7.5 to 8.6 pH units (Metcalf & Eddy, third edition). In addition, the optimum range for bacterial growth is generally in the range of 6.5 to 7.5 pH units. Consequently, the pH issue needs to be addressed and the proposed effluent limits will remain unchanged to establish a treatment performance standard to ensure treatment system operation is conducive to nitrification and other biological processes. No change made.

11. Comment: Specification Nos. B.4 through B.9 under the subheading of Groundwater Limitations on page 9 of the proposed Order – "Change the title of this section to, 'Groundwater Limitations (for new monitoring wells proposed in Groundwater Assessment Workplan).'"

    Staff Response: The heading will remain unchanged. However, the point of compliance (monitoring wells) for these limits will be determined based on subsequent groundwater investigation data as appropriate. No change made.

12. Comment: Salts Management Program paragraph C.1 on page 10 of the proposed Order – "In the first sentence after the word 'program' add, 'as long as the discharger maintains their own wastewater treatment facility,...'"

    Staff Response: This comment is moot. The proposed Order will be rescinded in the event the Discharger discontinues wastewater treatment and disposal operations. No change made.

13. Comment: Long-Term Wastewater Management Plan paragraph D.1.c on page 11 of the proposed Order – "Change paragraph to read, '**By January 30, 2008**, the Discharge shall either complete improvements to the facility to meet the phased effluent limitations in this Order and provide adequate disposal capacity, or successfully connect to the City of Hollister wastewater collection system within 2 months after the City of Hollister's wastewater treatment plant becomes operational and cease all wastewater treatment and disposal operations at the facility.'"

    Staff Response: See staff response to comment No. 1 above.

14. Comment: Influent Monitoring on pages 1 and 2 of the proposed Monitoring and Reporting Program – "Change all sample types from '24 hr composite' to grab. Type of sampling needs to be consistent for influent and effluent."

    Staff Response: Type of sampling does not need to be consistent for influent and effluent. However, sampling needs to produce data representative of influent and effluent conditions. Influent flow and loading of BOD, TSS, nutrients, inorganics etc. is typically subject to diurnal fluctuations. Flow weighted composite sampling of influent wastewater will be more representative of daily loading to the wastewater treatment facilities. Effluent grab samples will be comparable to the influent composite samples given the long hydraulic retention times and assumption of sufficient mixing within the treatment ponds.

    Based on review of this comment the following language has been added to note a) of the influent monitoring table to require monthly composite sampling on a rotating schedule such that 24 hour composite samples will be collected during different days of the week, including Saturday and Sunday, for subsequent monthly sampling events:

    "Monthly 24 hr composite samples shall be collected on a Monday through Sunday rotating schedule and subsequent sampling events shall be separated by at least 16 days and no greater than 30 days."

15. Comment: Treatment and Disposal Pond Monitoring on page 2 of the proposed Monitoring and Reporting Program – "In note a) change the words, 'at least three representative locations' to 'a representative location.'"

    Staff Response: Sampling for pH and dissolved oxygen (DO) from three locations within the ponds is intended to provide a better assessment of sufficient mixing and aeration within the ponds. The collection of pH and DO readings from two additional locations from each pond will require minimal increases in staff time and will not incur additional analytical costs. No change made.

16. Comment: Solids/Biosolids Monitoring paragraph 1, first sentence, on page 4 of the proposed Monitoring and Reporting Program – "After the word 'Report' add the words, 'if solids/biosolids are removed from the ponds,'"

Staff Response: Annual depth measurements and volume estimates of solids in the ponds are required regardless of whether solids have been removed from the ponds. The remaining reporting requirements are only triggered when solids are removed from the ponds as inferred. No change made.

17. Comment: Solids/Biosolids Monitoring paragraph 2, first sentence, on page 4 of the proposed Monitoring and Reporting Program – "After the word 'analyzed' add the words, 'if solids/biosolids are removed from the ponds,'"

    Staff Response: This is already inferred by "prior to being reclaimed/disposed" at the end of the first sentence. No change made.

ADDITIONAL CHANGES

Staff corrected data transposed in Table 2 of the propose Order to accurately depict values for the presented min/max/avg monitoring well data.

Language has been added to Provisions C.5 and E.7 of the proposed Order requiring submittal of the first annual salt management plan and annual engineering technical reports by January 30, 2006.

RECOMMENDATION

Adopt Order No. R3-2004-0065 as proposed.

ATTACHMENTS

1. Raines, Melton & Carella, Inc., September 13, 2004, comment letter
2. Facility Data Figures 1 through 10
3. Draft Waste Discharge Requirements Order No. R3-2004-0065
4. Draft Monitoring & Reporting Program Order No. R3-2004-0065

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