

CALIFORNIA REGIONAL WATER QUALITY CONTROL REGIONAL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2009-0109

WASTE DISCHARGE REQUIREMENTS
FOR
MAXWELL PUBLIC UTILITIES DISTRICT
MAXWELL WASTEWATER TREATMENT FACILITY
COLUSA COUNTY

The California Regional Water Quality Control Regional Board, Central Valley Region, (hereafter Central Valley Water Board) finds that:

1. On 1 August 2008, Maxwell Public Utilities District submitted a Report of Waste Discharge (RWD) for land discharge of treated wastewater from the existing wastewater treatment facility (WWTF), which serves the town of Maxwell. Additional information to complete the RWD was received from the Discharger on various dates in November and December 2008, and February 2009.
2. Maxwell Public Utilities District (hereafter "Discharger") owns and operates the Maxwell WWTF and is responsible for compliance with these Waste Discharge Requirements (WDRs).
3. The Maxwell WWTF includes a sanitary sewer system and wastewater treatment plant. Treated effluent is currently discharged to an unnamed tributary of Lurline Creek under WDRs Order No. R5-2009-0009 (NPDES No. CA0079987). The treatment plant is at the intersection of East Avenue and South Avenue in Maxwell in (Section 3, T16N, R3W, MDB&M). The treatment plant occupies Assessor's Parcel Number (APN) 014-110-034, as shown on Attachment A, which is attached hereto and made part of this Order by reference.
4. The previous NPDES Permit, WDRs Order No. R5-2002-0022 was adopted by the Central Valley Water Board on 1 March 2002. On the same date, the Central Valley Water Board adopted Cease and Desist Order (CDO) No. R5-2002-0023 because the Discharger could not consistently comply with the Effluent Limitations for ammonia contained in the NPDES permit. The CDO required that the Discharger comply with the effluent limitations by 1 February 2007.
5. On 5 August 2003, the Executive Officer issued Administrative Civil Liability Complaint (ACLC) No. R5-2003-0505 for \$588,000 in mandatory minimum penalties pursuant to California Water Code (CWC) Section 13385 (h) and (i) to the Discharger for violations of Waste Discharge Requirements Order No. 96-071 (the previous NPDES permit) and Order No. R5-2002-0022. Because the Discharger is a small community with a financial hardship, the ACLC allowed the Discharger to complete a compliance project in lieu of paying the penalty. On 22 October 2003, the Discharger entered into a Stipulated Settlement Agreement with the Executive Officer that allowed the Discharger to complete a compliance project in lieu of paying the penalty. The Discharger proposed land

disposal as its compliance project and agreed to complete the project by 1 February 2007.

6. In February 2006, the Discharger requested that the time schedule set forth in the CDO be extended to 31 December 2009 because of difficulties acquiring the land needed for the compliance project. In February 2007, the Discharger again requested the deadline be moved to 18 May 2010, which coincides with the full compliance deadline in the California Toxics Rule. On 22 June 2007, the Central Valley Water Board adopted Time Schedule Order (TSO) No. R5-2007-0073, which required that the Discharger complete certain milestones and begin operation of the improved treatment plant and land discharge by 18 May 2010.
7. In order to comply with the TSO, the Discharger completed a Wastewater Facilities Plan, completed an environmental review pursuant to the California Environmental Quality Act (CEQA), submitted the RWD cited above, and made substantial progress toward acquiring land for the project. The Discharger proposes to upgrade the WWTF to include effluent storage and a water recycling site, and will eliminate the discharge to surface waters after the project is completed.
8. Subsequently, on 18 September 2008, the Executive Officer issued Administrative Civil Liability Order (ACLO) No. R5-2008-0561 for \$1,617,000 in mandatory minimum penalties for additional violations of Waste Discharge Requirements Order No. R5-2002-0022. The 2008 ACLO replaces the Stipulated Settlement Agreement, incorporates the recent violations, extends the Record of Violations through 30 April 2008, and allows the Discharger until 18 May 2010 to complete the compliance project in lieu of paying the penalties.

Existing Facility and Discharge

9. The existing WWTF serves approximately 1,056 residents. The following table summarizes recent influent flow rates.

Water Year ¹	Total Annual Influent Flow (MG)	Average Annual Flow (mgd)	Average Dry Weather Flow ² (mgd)	Peak Month Flow ³ (mgd)
2003-04	67	0.19	0.10	0.35
2004-05	69	0.19	0.14	0.43
2005-06	66	0.18	0.14	0.35
2006-07	39	0.11	0.08	0.14
2007-08	NA	NA	0.08	0.32

NA Data not available.

¹ October through September (the beginning of the typical rainy season through the end of the typical dry season).

² Average daily flow for the months of June through September, which consistently exhibit the lowest precipitation and influent flows.

³ Typically occurs in January

Comparison of the average dry weather flows and the peak month flow indicates that inflow and infiltration (I/I) contributes significantly to influent flows during the rainy season.

Additionally, the significant reduction in dry weather flows for the last two years (which have been dryer than normal) indicates that infiltration due to high groundwater may be a year round problem during normal conditions. The RWD states that the Discharger has performed smoke testing on a portion of the sewer system and found that most of the identified I/I problems are associated with building laterals that are not part of the public sewer system. The Discharger has sent repair notices to the affected properties and plans to do more smoke testing in the future.

10. The sewer system consists of approximately 4.4 miles of gravity pipeline. The sewer pipes are principally concrete (approximately 65%), PVC (approximately 23%), and vitrified clay (12%). There are no lift stations upstream of the wastewater treatment plant.
11. Wastewater from the main sewer is normally routed through a Parshall flume and a comminuter to the influent wet well, from which it is pumped to the aeration lagoon. After approximately three days detention in the aeration lagoon, the wastewater flows through a series of three oxidation ponds to a chlorine contact basin where sodium hypochlorite solution is added, and then to a dechlorination system prior to discharge to surface waters. Attachment B, which is attached hereto and made part of this Order by reference, is a site plan for the treatment plant. When the comminuter is out of service, flows from the flume are rerouted through a bar screen. Likewise, the aerated lagoon can be bypassed.
12. Design data for the existing treatment plant ponds are summarized below.

Pond Name	Surface Area (acres)	Approximate Volume ¹ (MG)	Depth ² (feet)
Aeration Lagoon	0.22	0.6	10
Oxidation Pond #1	2.15	1.9	3
Oxidation Pond #2	2.15	1.9	3
Oxidation Pond #3	2.15	1.9	3

¹ Total volume at two feet freeboard.

² Design operating depth with two feet of freeboard

13. The Discharger regularly monitors treated effluent for pH, total dissolved solids (TDS), electrical conductivity (EC), hardness, biochemical oxygen demand (BOD), total suspended solids, ammonia nitrogen, and total coliform organisms. Effluent monitoring data for these parameters for April 2004 through April 2007 are summarized below.

Parameter	Units	Treated Effluent Results		
		Minimum	Maximum	Mean
pH	std.	6.3	10.0	7.3
TDS	mg/L	910	1,280	1,055
EC	umhos/cm	750	4,030	1,797
Hardness as CaCO ₃	mg/L	157	429	285
BOD	mg/L	5	70	24
Total suspended solids	mg/L	5	220	57
Ammonia nitrogen	mg/L	0.2	8.1	1.7
Total coliform organisms	MPN/100 mL	<2	1,600	72

Additional analyses were completed for a single effluent sample taken on 28 November 2007. Results for selected constituents are tabulated below.

Parameter	Units	Treated Effluent Result
Chloride	mg/L	219
Nitrate + nitrite nitrogen	mg/L	0.97
Ammonia nitrogen	mg/L	6.43
Sulfate	mg/L	158
Arsenic	ug/L	1.9
Copper	ug/L	5.9
Iron	ug/L	34
Manganese	ug/L	45.7

There are no industrial or commercial dischargers within the Discharger's service area whose hydraulic, BOD, or TDS loading is greater than two percent of the WWTF's overall load.

Planned Changes in the Facility and Discharge

14. As noted above, the Discharger proposes to upgrade the WWTF to improve treatment reliability and add effluent storage and a water recycling site. Upon completion of the improvements project, the Discharger will eliminate the discharge to surface waters to comply with the TSO. The Discharger has secured approval for a \$1.7 million grant from the State Water Resources Control Board for this purpose, and additional funding is being provided by the United States Department of Agriculture's Rural Community Assistance Program in the form of a grant and low interest loan.
15. The improvements project will consist of:
 - a. Increasing the depth of the existing aerated pond (Aeration Pond No.1);
 - b. Converting Oxidation Pond #1 to a second aerated pond (Aeration Pond No. 2) with a deeper fermentation pit;
 - c. Deepening the Oxidation Ponds #2 and #3 to convert them to facultative lagoons (Facultative Lagoon Nos. 1 and 2);
 - d. Constructing an effluent pumping station and pipeline to convey treated effluent to an effluent storage pond at the water recycling site; and
 - e. Improving the new water recycling site to provide irrigation and tailwater systems.

A conceptual site plan for the upgraded treatment plant is shown on Attachment C, which is attached hereto and made part of this Order by reference.
16. The project plans indicate that an average of 3 feet of sludge will be removed from the existing oxidation ponds during construction. The plans require that the contractor decant free liquids into one of the ponds and dry the sludge either within the ponds or by placing it on a three-acre field south of the existing ponds. Once dry to an unspecified degree, the sludge is to be spread on the field. The RWD did not include a plan to ensure that the applied sludge will comply with the federal biosolids regulations, which include requirements for pathogen reduction, vector attraction reduction, and contaminant concentration limits. Additionally, the RWD did not specify storm water runoff control, the rate of application with respect to nutrients or cropping plans to ensure nitrogen uptake to prevent degradation of water quality. Therefore, it is appropriate to require that the Discharger find another means of sludge disposal or obtain separate WDRs prior to beginning land application. This is discussed further in Finding No. 25.
17. The aerated ponds' increased depth and anti-erosion plates will focus aeration to the pond surface, allowing solids settling and digestion in the deeper fermentation pit portion of Aeration Pond No. 2. The two remaining oxidation ponds will function as facultative lagoons. Construction of the reconfigured ponds will involve removal of accumulated sludge, over excavation of the first two feet of soil, and replacement of that soil at 90 percent relative compaction to form a reduced permeability liner. Design data for the upgraded treatment ponds is summarized in the following table.

Pond Name	Surface Area (acres)	Volume ¹ (MG)	Total Depth ² (feet)	Operating Depth ³ (feet)
Aeration Pond #1	1.24	3.55	15	13
Aeration Pond #2	2.08	6.09	15	13
Facultative Lagoon #1	2.00	2.83	7 to 11	5
Facultative Lagoon #2	2.00	2.96	7	5

¹ Total volume at two feet freeboard.

² Depth from berm crest to pond bottom.

³ Design operating depth with two feet of freeboard.

The bottom elevation of Aerated Pond No. 1 and the facultative lagoons will remain the same (approximately, 80, 83.5, and 83 feet NAVD 88¹, respectively). Aerated Pond No. 2 will be excavated two to eight feet deeper to 80 feet NAVD 88.

18. The Discharger has been disinfecting treated effluent for several years to comply with its NPDES permit. Disinfection is not required to comply with the water recycling regulations set forth in Title 22 of the California Code of Regulations (Title 22) for irrigation of pasture unless milking animals are allowed to graze on the recycling site. The Discharger does not wish to allow grazing for milking animals at the water recycling site. The RWD stated that the Discharger would continue disinfecting the effluent and provide treated effluent that meets the requirements for disinfected secondary-23 recycled water as defined in Title 22. The Discharger subsequently stated its preference to discontinue disinfection. However, based on site-specific hydrogeologic conditions, which are discussed below, it is appropriate to require that all effluent be disinfected in accordance with the Discharger's original proposal unless and until it has been demonstrated that disinfection is not required to protect human health or groundwater quality. Sodium hypochlorite will be injected into the effluent just downstream of the effluent pump station. The effluent will be in contact with the chlorine as it is pumped through approximately 7,500 feet of pipeline to the effluent storage pond. Based on anticipated peak flows, the chlorine contact time will be approximately 44.5 minutes.

19. In general, the quality of the treated effluent is not expected to change substantially. Disinfected secondary effluent will be pumped from the wastewater treatment plant to a new effluent storage pond at the water recycling site. The effluent storage pond will cover approximately 30 acres and will provide approximately 263 acre feet of storage at two feet of freeboard. The maximum operating depth of the effluent storage pond will be 14 feet, and the total depth will be 16 feet. The RWD states that the effluent storage pond will be constructed from native clay soils compacted to achieve an estimated saturated permeability rate of 0.000001 (1 x 10⁻⁶) cm/sec. However, the RWD did not specify the thickness of the bottom liner or construction quality assurance procedures to ensure consistent and proper placement/compaction or verify the as-built permeability rate.

¹ North American Vertical Datum, 1988.

20. The eastern portion of the 150-acre water recycling site (APN 014-100-030) will be improved to create two 37-acre irrigation areas, as shown on Attachment D, which is attached hereto and made part of this Order by reference. Each irrigation area will be planted to alfalfa and irrigated with recycled effluent for one year before the discharge is rotated to the other field. The irrigation area that is not receiving recycled effluent will be irrigated with surface water from the Glenn-Colusa Irrigation District canal. The remainder of the water recycling site may be improved to create additional water recycling areas in the future. The effluent recycling site will not have a perimeter fence; however, the effluent storage pond site will have a fence to prevent unauthorized access.
21. Each irrigation area will have a tailwater collection system that will drain tailwater to a small tailwater pond at the northeast corner of the site. Tailwater will be pumped from the small pond and recycled back to the effluent storage pond via the force main that conveys treated effluent from the wastewater treatment plant to the storage pond.
22. Irrigation water will be applied by flood irrigation as needed during the dry season. Application rates and frequencies will vary during the irrigation season depending on weather. Irrigation with recycled effluent will cease prior to the onset of the rainy season (typically October through May). Precipitation that falls on the recycled water irrigation areas during the rainy season will be allowed to percolate and/or run off into existing drainage ditches.
23. The Discharger is proposing to lease the effluent recycling site to a local farmer, who would be responsible for planting, supplemental fertilization, irrigation, and harvesting of the crop. However, the Discharger has not yet entered into an agreement, so the name of the recycled water user is not known. The entity responsible for actual use of the recycled effluent must be named in this Order as a co-discharger to ensure compliance with this Order. Therefore, it is appropriate to require that the Discharger submit a revised RWD signed by both parties to request an ownership change amendment prior to any use of the recycled water by the prospective co-discharger. It is also appropriate to require that the co-dischargers jointly submit an Effluent Recycling Site Operation and Maintenance Plan that details farming operations, irrigation practices, and the responsibilities of each co-discharger with respect to compliance with this Order.
24. According to the RWD, the improved WWTF and water recycling site will provide a firm treatment, storage and disposal capacity of 0.332 mgd as an average annual flow, and should accommodate projected growth for 20 years, assuming a 3.6 percent annual population growth rate.
25. The RWD included a water balance for the both the current and post-project design flow scenarios to demonstrate adequate treatment, storage and disposal capacity for current demand and anticipated development through approximately 2028. The water balance was prepared based on reasonable estimates of influent flows, I/I, precipitation, evaporation, and percolation. The water balance was used to model storage and disposal capacity during the 100-year, 365-day precipitation event with at least two feet of

freeboard in every pond. The model indicates that the upgraded WWTF will provide the following capacities:

<u>Condition</u>	<u>Capacity</u>
Average daily flow	0.332 mgd
Average daily dry weather flow ¹	0.224 mgd
<u>Peak wet weather flow</u>	1.50 mgd

¹ June through September, inclusive.

The model shows that I/I is critical to the WWTF's effluent disposal capacity. Therefore, it is appropriate to require that the Discharger continue its I/I reduction efforts, including requiring property owners to correct I/I associated with property laterals not owned by the Discharger.

26. The RWD estimates that sludge removal will be required approximately every ten years following completion of the improvements project. According to the RWD, individual ponds will be taken out of service and drained when sludge removal is needed. Sludge will then be pumped from the ponds and land applied at the effluent recycling site or hauled to a landfill for disposal. The RWD did not provide details of how the sludge will be handled and/or treated to meet the pathogen and vector-attraction reduction requirements set forth in the U.S. Environmental Protection Agency's biosolids regulations at Title 40, Code of Federal Regulations, Part 503 (40 CFR 503). Therefore, land application of biosolids at the Discharger's property is outside the scope of this Order.
27. All wastewater pumping stations will have duplex pumps. A standby generator with an automatic transfer switch will provide backup power for the pumps. The effluent storage pond and tailwater storage pond will have overflow structures that will allow controlled releases of stored wastewater in the event of an emergency. The water recycling areas will be surrounding by shallow berms, which will provide up to 160 acre-feet of emergency storage.
28. Based on a 13 November 2008 inspection, current WWTF operations do not comply with State Water Board Operator Certification requirements. At the time of the inspection, the WWTF had three operators: one Class II operator and two Operators in Training (OITs). Currently, the OITs are not receiving constant direct supervision and are responsible for day to day operations and NPDES compliance monitoring and reporting. This violates the Operator Certification requirements. The inspection also found that many of the recently submitted monitoring reports contain questionable data. A Notice of Violation was issued on 16 January 2009 requiring the Discharger to submit a report signed and certified by the chief plant operator clarifying the monitoring report inconsistencies found during the inspection. The report must also include actions that the Discharger will take to prevent recurrence the violations.

Wastewater Collection System

29. The sanitary sewer system collects wastewater and consists of sewer pipes, manholes, and/or other conveyance system elements that direct raw sewage to the treatment facility. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the treatment facility. Temporary storage and conveyance facilities (such as wet wells, regulated impoundments, tanks, highlines, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained-within these temporary storage/conveyance facilities. Sanitary sewer overflow is also defined in State Water Resources Control Board (State Water Board) Order No. 2006-0003-DWQ, *Statewide General Waste Discharge Requirements for Sanitary Sewer Systems*.
30. Sanitary sewer overflows consist of varying mixtures of domestic and commercial wastewater, depending on land uses in the sewage collection system. The chief causes of sanitary sewer overflows include grease blockages, root blockages, debris blockages, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, storm or groundwater inflow/infiltration, lack of capacity, and/or contractor caused blockages.
31. Sanitary sewer overflows often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen demanding organic compounds, oil and grease, and other pollutants. Sanitary sewer overflows can cause temporary exceedance of applicable water quality objectives, pose a threat to public health, adversely affect aquatic life, and impair the public recreational use and aesthetic enjoyment of surface waters in the area.
32. The Discharger is expected to take all necessary steps to adequately maintain, operate, and prevent discharges from its sanitary sewer collection system and comply with State Water Board Order No. 2006-0003-DWQ.

Site-Specific Conditions

33. Based on the Consumer Confidence Reports prepared pursuant to Section 116470 of the Health and Safety Code for 2005 through 2007, the chemical character of the municipal water supply, which is obtained from three wells, is summarized below.

Parameter	Units	Analytical results	
		Water Supply ¹	Treated Effluent
Total dissolved solids	mg/L	500 to 735	1,055 ²
Electrical Conductivity	umhos/cm	920 to 1,200	1,800 ²
Total hardness	mg/L	224 to 237	285 ²
Chloride	mg/L	82 to 183	219

Parameter	Units	Analytical results	
		Water Supply ¹	Treated Effluent
Sodium	mg/L	100 to 140	--
Nitrate (NO3)	mg/L	2 to 12	0.97 ³
Sulfate	mg/L	91 to 133	158 ³
Iron	mg/L	100 to 1,824	34 ³
Manganese	mg/L	40 to 122	45.7 ³

-- Not analyzed

¹ Typically based on one sample per well

² Mean of results for 2004 through 2007

³ Based on results for a single sample

Based on these data, the community water supply is hard, moderately saline, and contains levels of iron and manganese that sometimes exceed the secondary Maximum Contaminant Level (MCL). The prevalence of self-regenerating water softeners, which can contribute excess salinity to the WWTF influent, is not known. The incremental increase in salinity (measured as electrical conductivity) is approximately 750 umhos/cm, which is high compared to other municipalities in the Central Valley Region.

34. The wastewater treatment plant is at an elevation of approximately 82 feet above mean sea level (MSL), and the area around the plant is relatively flat with drainage to the southeast east via an unnamed tributary of Lurline creek. The proposed effluent recycling site is at an approximate elevation of 90 feet MSL and drains eastward via agricultural drains to Lurline Creek.
35. The 2003 revised Flood Insurance Rate Map for the area indicates that both the wastewater treatment plant and the water recycling site are within Flood Zone A, which is within the portion of the 100-year flood plain for which no base flood elevations have been determined. Similarly, the water recycling site may experience flooding during the 100-year flood event. However, the drawings provided with the RWD indicate that both the treatment and effluent storage pond berms will be high enough to provide more two feet of external freeboard to protect against inundation or washout during flooding. The Discharger has a flood insurance policy for the existing WWTF and will obtain flood insurance for the recycling site.
36. Surrounding land uses are primarily agricultural. Annual precipitation in the vicinity averages approximately 15 inches, the 100-year total annual precipitation is approximately 33 inches, and the reference evapotranspiration rate is approximately 57 inches per year.

Groundwater Considerations

37. Surface soils in Maxwell area are predominantly fine-grained soils (silts and clay) deposited by flooding of major streams during the Holocene period. Shallow soils at the wastewater treatment plant consist of clay and sandy clay to a depth of 8 to 10 feet below ground surface (bgs).
38. The Discharger has been monitoring groundwater monthly at the wastewater treatment plant using five shallow monitoring wells since December 2002. The monitoring well locations are shown on Attachments B and C.
39. Groundwater is typically found at depths ranging from one to six feet bgs at the wastewater treatment plant. Based on monthly monitoring of groundwater elevations since March 2004, the groundwater flow direction is predominantly to the northeast. Monitoring well GMW-3 is consistently upgradient of the wastewater ponds and wells GMW-4 and GMW-5 are consistently downgradient of the ponds. Wells GMW-1 and GMW-2 are cross-gradient and may serve as background wells in combination with GMW-3.
40. Historical groundwater analytical data for the wastewater treatment plant wells are summarized below. Electrical conductivity and pH were monitored monthly; all other parameters were monitored quarterly.

Constituent/ Parameter	Units	Mean Analytical Results				
		Background Wells			Downgradient Wells	
		GMW-1	GMW-2	GMW-3	GMW-4	GMW-5
Total coliform org.	MPN/100 mL	3	5	6	85 ¹	26 ¹
Fecal coliform org.	MPN/ 100 mL	<2	<2	<2	3	2
pH	std.	7.74	7.82	7.76	7.87	7.64
Electrical conductivity	umhos/cm	1,448	1,388	1,749	1,627	1,931
Total dissolved solids	mg/L	858	835	1,035	983	1,098
Total nitrogen	mg/L	0.3	0.3	0.2	0.5	0.6
Ammonia nitrogen	mg/L	0.10	0.06	0.06	0.20	0.15
Chloride	mg/L	102	73	233	151	254
Sodium	mg/L	201	205	241	261	210
Boron	ug/L	448	598	544	696	602

¹ The total coliform data set for this well had a single extreme outlier value that was not considered in calculating the mean. Most results were non-detect.

Based on these data, there is evidence that the existing WWTF has degraded

groundwater quality with respect to coliform organisms, EC, nitrogen, chloride, sodium, and boron. However, a statistical analysis of the data is required to determine background concentrations and whether the degradation, if confirmed, has caused exceedance of applicable water quality limits.

41. Based on 14 soil borings completed at the proposed effluent storage pond site, soils are primarily stiff to hard, clay and sandy clay interbedded with 0.5-foot to 8-foot thick layers or lenses of silty and clayey sand. Five monitoring wells were installed at the water recycling site in April 2008. Their locations are shown on Attachment D. A silty sand layer was encountered in two of five monitoring well borings from 13 to 22.5 feet bgs and 8.5 to 13 feet bgs, respectively. The wells were installed to a total depth of 25 feet bgs with 10 feet of screen from 15 to 25 feet bgs.
42. Following well development, the five new monitoring wells were sampled in April and December 2008. Static groundwater levels prior to sampling ranged from 4.5 to 9.0 feet below the top of the well casing in April 2008, and from 8.0 to 10.0 feet in December 2008. However, the groundwater elevation and gradient cannot be determined because the Discharger has not surveyed the wells. Based on regional groundwater maps prepared by the Department of Water Resources for spring and summer 2006, the groundwater flow direction in the Maxwell area tends to be eastward year round. However, flow directions in the shallow groundwater may be different and/or more variable due to agricultural pumping, irrigation, and drainage practices in the area. Based on the assumed groundwater flow direction, MW-6 is at the upgradient end of the water recycling site, MW-7 and MW-8 are cross gradient, MW-9 is within the recycling area, and MW-10 is at the downgradient end. There is no well directly downgradient of the planned effluent storage pond.
43. Analytical data for the April and December 2008 groundwater sampling events are summarized below.

Constituent/ Parameter	Units	Analytical Results ¹				
		Upgradient ²		Cross Gradient ²		Downgradient ²
		MW-6	MW-7	MW-8	MW-9	MW-10
Total coliform org.	MPN/100 mL	<2	70	<2	<2	7
		<2	<2	<2	<2	<2
pH	std.	8.07	8.07	7.89	8.07	8.13
		8.17	8.05	7.79	7.67	7.73
Hardness	mg/L	234	197	286	163	302
		138	256	364	126	202
Alkalinity	mg/L	403	237	468	193	333
		432	238	444	172	416

Constituent/ Parameter	Units	Analytical Results ¹				
		Upgradient ²		Cross Gradient ²		Downgradient ²
		MW-6	MW-7	MW-8	MW-9	MW-10
Bicarbonate	mg/L	491	289	571	235	406
		527	290	542	210	508
EC	umhos/cm	1,100	741	870	383	1,770
		880	478	812	300	847
TDS	mg/L	672	414	502	208	1,000
		546	275	467	181	523
Total Kjeldahl nitrogen	mg/L	0.2	0.5	0.7	<0.2	0.3
		0.2	0.2	<0.2	<0.2	0.2
Ammonia nitrogen	mg/L	0.10	0.15	<0.02	0.06	0.13
		0.10	0.12	0.06	0.05	0.06
Nitrate nitrogen	mg/L	0.18	1.63	0.98	0.25	0.02
		<0.05	2.68	0.20	0.03	0.02
Chloride ³	mg/L	82.8	73.7	7.69	4.85	324
		11.4	5.33	3.71	5.23	9.65
Sodium	mg/L	136	69	49	22	211
		NA	NA	NA	NA	NA

NA Not analyzed.

¹ First value is result for April 2008; second value is result for December 2008.

² Well orientation with respect to groundwater flow direction is presumed based on regional groundwater maps. This interpretation may not be correct and must be calculated when well survey data are available.

³ Reported chloride concentrations less than 15 mg/L are unusually low and may be due to laboratory error.

These data show high spatial and temporal variability despite the fact that the discharge has not yet begun. The primary purpose of the data is to provide an understanding of pre-discharge groundwater quality, which will serve as a baseline to assess post-discharge data. It is appropriate to require that the Discharger continue monitoring groundwater at the new site and periodically evaluate whether degradation has occurred after the discharge has begun.

Basin Plan, Beneficial Uses, and Water Quality Objectives

44. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board. Pursuant to Section 13263(a) of the CWC, waste discharge requirements must implement the Basin Plan.

45. Surface water drainage is to Lurline Creek, which is tributary to the Colusa Basin Drain. The beneficial uses of the Colusa Basin Drain are agricultural supply (AGR); water contact recreation; canoeing and rafting; warm and cold freshwater habitat; warm water spawning, reproduction, and/or early development; and wildlife habitat.
46. The beneficial uses of the underlying groundwater are municipal and domestic supply, agricultural supply, and industrial supply.
47. The Basin Plan establishes narrative water quality objectives for chemical constituents, tastes and odors, and toxicity in groundwater. It also sets forth a numeric objectives for total coliform organisms
48. The Basin Plan's narrative water quality objective for chemical constituents, at a minimum, requires waters designated as domestic or municipal supply to meet the MCLs specified in Title 22. The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.
49. In summary, the narrative toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.
50. The Basin Plan's numeric water quality objective for bacteria requires that the most probable number (MPN) of coliform organisms over any seven-day period shall be less than 2.2 per 100 mL in MUN groundwater. The applicability of this objective to groundwater designated as MUN has been affirmed by State Water Board Order No. WQO-2003-0014 and by subsequent decisions of the Sacramento County Superior Court and California Court of Appeal, 3rd Appellate District.
51. The Basin Plan encourages water recycling where practicable. When the proposed project is complete, the Discharger will recycle all treated effluent for beneficial uses.

Antidegradation Analysis

52. State Water Resources Control Board Resolution No. 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 68-16) prohibits degradation of groundwater unless it has been shown that:
 - a. The degradation is limited and will provide social and economical benefit to the people of the State;
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses;

- c. The degradation is not expected to result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and
- d. The discharger employs best practicable treatment or control (BPTC) to minimize degradation.

Resolution 68-16 prohibits degradation of groundwater quality as it existed in 1968, or at any time thereafter that groundwater quality was better than in 1968, other than degradation that was previously authorized. An antidegradation analysis is required for a new discharge location, and/or an increased volume of waste and/or an increased concentration of waste constituents.

- 53. Degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after effective source control, treatment, and control is consistent with providing social and economical benefit to the people of the State. The technology, energy, water recycling, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impact on water quality will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.
- 54. There has been a wastewater treatment facility at the current site since before 1958, when the first WDRs were issued. Although the Discharger has been monitoring groundwater quality at the current WWTF site since 2002, the data have not been evaluated to statistically determine background groundwater quality. The Discharger has also performed some pre-discharge groundwater monitoring at the proposed effluent recycling site. However, the data for that site are not sufficient to determine background groundwater quality.
- 55. The Discharger currently provides treatment and control of the discharge that incorporates:
 - a. Alarm and backup power systems to prevent bypass or overflow;
 - b. Secondary treatment of the wastewater; and
 - c. Disinfection.
- 56. When the improvements project is complete, the facility will provide the following additional treatment and control measures:
 - a. Improved treatment reliability; and
 - b. Recycling of all treated effluent for beneficial reuse.

However, the Discharger has not implemented any source control and the wastewater treatment plant and effluent storage ponds do not incorporate any specific measures to reduce the potential for groundwater degradation. As noted in Finding No. 19, the RWD states that the effluent storage pond will be constructed from native clay soils compacted to achieve an estimated saturated permeability rate of 10^{-6} cm/sec. However, the RWD did not specify the thickness of the bottom liner or construction quality assurance procedures to ensure consistent and proper liner placement/compaction or verify the as-built permeability rate. Therefore, the degree of water quality protection provided by this liner cannot be determined. This Order requires the Discharger to submit a Background Groundwater Quality Study Report and continue groundwater monitoring at the wastewater treatment facility sites to demonstrate whether the clay liners are adequate to protect groundwater from unreasonable degradation due to leakage from the ponds. If groundwater monitoring data shows that the discharge to the ponds has violated the groundwater limitations of this Order, this Order may be reopened to add additional requirements that address the violations.

Additionally, although a certified operator is designated to operate the plant, the operator does not provide adequate supervision of the Operators in Training (OITs) that perform most operations. Therefore, this Order requires that the Discharger provide the correct grades of certified operators and appropriate supervision for any OITs to ensure proper operation and maintenance of the WWTF.

57. Surrounding land uses are primarily irrigated agriculture, and these land uses predate the existing WWTF. Based on the limited data available and historic land uses, it is reasonable to expect that agricultural practices have degraded groundwater quality at both sites, and that it will not be possible to determine pre-1968 groundwater quality. Therefore, determination of compliance with Resolution 68-16 for this facility must be based on existing background groundwater quality.
58. The Discharger cannot fully evaluate existing and potential future impacts to groundwater quality until completion of the WWTF improvements and additional hydrogeologic studies. The limited antidegradation analysis below indicates that the proposed discharge may comply with the Basin Plan. However, this Order includes interim groundwater limitations that are effective immediately and do not allow exceedance of Basin Plan water quality objectives. Final Groundwater Limitations, which will become effective on 30 December 2014, are the Basin Plan water quality objectives or existing background groundwater concentrations, whichever is greater.
59. Constituents of concern that have the potential to degrade groundwater include salts (primarily EC, sodium, and chloride), nutrients and coliform organisms, as discussed below:
 - a. The EC of the effluent has averaged approximately 1,800 umhos/cm over the last five years. The maximum annual average EC during that period was 1,942 umhos/cm, whereas the EC of the water supply ranged from 920 to 1,200 umhos/cm. Therefore,

the discharge has the potential to cause violation of water quality objectives for salinity.

- b. For nutrients such as nitrate, the potential for unreasonable degradation depends not only on the quality of the treated effluent, but the ability of the vadose zone below the effluent storage/disposal ponds to provide an environment conducive to nitrification and denitrification to convert the effluent nitrogen to nitrate and the nitrate to nitrogen gas before it reaches the water table. Groundwater monitoring data for the wastewater treatment plant site do not indicate unreasonable degradation due to nitrate, and the crops grown at the water recycling site should remove most of the nitrogen in the applied wastewater. However, groundwater is quite shallow at the wastewater treatment plant and the planned effluent recycling site, so there is some threat that the discharge could cause a violation of the Maximum Contaminant Level for nitrate in shallow groundwater.
 - c. For coliform organisms, the potential for exceedance of the Basin Plan's numeric water quality objective depends on the level of disinfection provided and the ability of vadose zone soils below the treatment plant and effluent storage ponds and saturated soils within the shallow water bearing zone to provide adequate filtration. Groundwater monitoring data for the wastewater treatment plant indicates that the shallow soils beneath the treatment ponds (which are unlined and contain undisinfected wastewater) may not provide sufficient filtration. Groundwater conditions at the effluent storage pond site are similar and the effluent storage pond is designed to contain up to 14 feet of effluent. The higher hydraulic head in the effluent storage pond will increase the risk of degradation. However, as noted above, statistical analysis of the data is required to make that determination. This Order requires that the Discharger continue to disinfect treated effluent unless and until it is demonstrated that disinfection is not required to protect public health and groundwater quality. Disinfection would reduce the potential threat, but the use of sodium hypochlorite will also increase the salinity of the effluent and create trihalomethanes, neither of which is desirable. Additionally, disinfection will not prevent coliform impacts at the treatment plant site because treatment will take place in clay-lined ponds prior to disinfection. Depending on the outcome of the groundwater data analysis, it may be necessary to provide less permeable liners for the treatment ponds and/or change the method of disinfection.
60. Although this Order allows expansion of the WWTF, the growth rate used for the design is moderate and the primary purpose of the project is to eliminate a long-standing permitted discharge to surface waters rather than to accommodate growth. Sufficient reason exists to accommodate this growth as long as the discharger completes an antidegradation analysis and selects and implements appropriate salinity reduction and BPTC measures within a reasonable timeframe. It is also appropriate to allow some groundwater degradation as long as it is consistent with the Basin Plan and Resolution No. 68-16 because social and economic prosperity of local communities and associated industry is of benefit to the people of California. This Order establishes terms and conditions of discharge to ensure that the discharge does not unreasonably affect present and anticipated uses of groundwater and includes groundwater limitations that apply water quality objectives established in the Basin Plan to protect beneficial uses. This Order

establishes effluent limitations that are protective of the beneficial uses of the underlying groundwater, requires a groundwater quality evaluation and determination of the need for salinity reduction, and requires groundwater monitoring to quantify any water quality impacts. Following completion of the work required by the time schedule contained in the Provisions, this Order will be reopened, if necessary, to reconsider effluent limitations and other requirements to comply with Resolution 68-16. Based on the existing record, the discharge is consistent with the antidegradation provisions of Resolution 68-16.

Water Recycling

61. State Water Board Resolution No. 77-1, *Policy with Respect to Water Recycling in California*, encourages recycling projects that replace or supplement the use of fresh water, and *The Water Recycling Law* (CWC Sections 13500-13529.4) declares that utilization of recycled water is of primary interest to the people of the State in meeting future water needs.
62. The California Department of Public Health (DPH) has established statewide water recycling criteria in Title 22 CCR Section 60301 et. seq. (hereafter Title 22). A 1988 Memorandum of Understanding between DPH (which was then the Department of Health Services) and the State Water Board on the use of recycled water establishes basic principles relative to the two agencies and the regional water boards. The Memorandum allocates primary areas of responsibility and authority between the agencies and provides for methods and mechanisms necessary to assure ongoing, continuous future coordination of activities relative to use of recycled water.
63. Section 60323(a) of Title 22 states that no person shall produce or supply recycled water for direct reuse from a proposed water recycling plant unless an engineering report is submitted for review and approval by DPH and the Central Valley Water Board. Irrigation of pasturelands used for grazing is considered a beneficial reuse. In November 2008, the Discharger submitted the required Title 22 Engineering Report to DPH and the Central Valley Water Board. DPH approved the Title 22 Engineering Report on 25 February 2009. Because the Discharger will not allow grazing of milking animals at the effluent recycling areas, DPH's approval letter recommended that this Order not require daily coliform testing of the effluent because daily monitoring would impose a significant burden on the Discharger. Therefore, this Order does not require daily coliform testing of the effluent.
64. DPH requires that the American Water Works Association (AWWA) Guidelines for Distribution of Non-Potable Water and Guidelines for the On-site Retrofit of Facilities be implemented in design and construction of recycling systems. The approved Title 22 Engineering Report describes specific design details for the irrigation system that comply with Title 22.

Other Regulatory Considerations

65. The State Water Board adopted Order No. 97-03-DWQ (NPDES General Permit No. CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial dischargers. The wastewater-treatment facility has a design capacity of less than 1.0 mgd and does not have a pretreatment program, and is therefore not required to obtain coverage under NPDES General Permit No. CAS000001.
 66. On 2 May 2006, the State Water Board adopted Statewide General Waste Discharge Requirements for Sanitary Sewer Systems General Order No. 2006-0003-DWQ (General Order). The General Order requires all public agencies that own or operate sanitary sewer systems greater than one mile in length to comply with the Order. The Discharger's collection system exceeds one mile in length, and therefore the General Order is applicable. The Discharger has filed a Notice of Intent (NOI) for coverage under the General Order with the State Water Resources Control Board.
 67. Section 13267(b) of the CWC provides that: *"In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports"*.
- The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2009-0109" are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.
68. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and any more stringent standards adopted by the State or county pursuant to CWC Section 13801, apply to all monitoring wells.
 69. The action to adopt waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality (CEQA), in accordance with Title 14 CCR, Section 15301.

70. An Initial Study and Mitigated Negative Declaration were approved by the Colusa County Planning Commission on 4 August 2008 in accordance with the California Environmental Quality Act (CCR, Title 14, Section 15261 et. seq.). The Initial Study describes the project under review as WWTF upgrades within the existing facility footprint and construction of a new effluent recycling site as follows:
- a. An effluent pump station at the existing WWTF and a transmission pipeline from the WWTF to the recycling site.
 - b. An effluent storage pond at the recycling site.
 - c. An irrigation pump station adjacent to the effluent storage pond.
 - d. An irrigation delivery system.
 - e. An irrigation tailwater collection system.
- No potentially significant impacts to water quality were identified and no mitigation measures to prevent such impacts were imposed. Compliance with these waste discharge requirements will avoid significant impacts to water quality.
71. The United States Environmental Protection Agency (EPA) has promulgated biosolids reuse regulations in 40 CFR 503, *Standard for the Use or Disposal of Sewage Sludge*, which establishes management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria.
72. The Central Valley Water Board is using the Standards in 40 CFR 503 as guidelines in establishing this Order, but the Central Valley Water Board is not the implementing agency for 40 CFR 503 regulations. The Discharger may have separate and/or additional compliance, reporting, and permitting responsibilities to the EPA.
73. State regulations that prescribe procedures for detecting and characterizing the impact of waste constituents from waste management units on groundwater are found in Title 27, California Code of Regulations (hereafter Title 27). While the wastewater treatment facility is exempt from Title 27, the data analysis methods of Title 27 may be appropriate for determining whether the discharge complies with the terms for protection of groundwater specified in this Order.
74. The treatment and effluent recycling facilities associated with the discharge authorized herein, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, Section 20005 et seq. . The exemption is based on the following:
- a. The wastewater treatment ponds are unconditionally exempt from Title 27 pursuant to Section 20090(a) because they are treatment ponds associated with a municipal wastewater treatment plant.
 - b. The reuse of treated wastewater at the water recycling areas is unconditionally exempt from Title 27 pursuant to Section 20090(h) because it constitutes recycling of material produced by waste treatment.

Based on effluent monitoring data presented above, treated effluent discharged to the Effluent Storage Pond does not need to be managed as Hazardous Waste and may qualify for an exemption under Title 27 pursuant to Section 20090(b). However, the applicability of this exemption also depends on whether the discharge is in compliance with the Basin Plan. This will not be known until the discharge begins and the Discharger provides additional groundwater monitoring data and a Background Groundwater Quality Study. These will be used to determine appropriate final groundwater limitations to protect the beneficial uses of groundwater to determine whether additional treatment and/or improved containment are needed to ensure compliance with the Basin Plan. Because compliance with the Basin Plan cannot be determined immediately, this Order includes a compliance schedule for completion of those tasks.

75. Pursuant to CWC Section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

Public Notice

76. All of the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.
77. The Discharger and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
78. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that, pursuant to Sections 13263 and 13267 of the CWC, Maxwell Public Utilities District, its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the CWC and regulations adopted thereunder, shall comply with the following:

1. Other prohibitions, conditions, definitions, and some methods of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.
2. The Discharge Prohibitions, Discharge Specifications, Recycled Water Specifications, and Effluent Limitations of this Order become effective when the improvements project is completed and discharge to the effluent storage pond begins. The discharge requirements contained in WDRs Order No. R5-2009-0009 (NPDES No. CA0079987) remain in effect until that Order is rescinded by the Central Valley Water Board.
3. The Groundwater Limitations, Provisions, and Groundwater Monitoring and Reporting Requirements shall be effective immediately upon adoption of this Order.

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.
2. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.
3. Discharge of waste classified as 'hazardous' under Section 2521, Chapter 15 of Title 23 or 'designated', as defined in Section 13173 of the CWC is prohibited.
4. Bypass or overflow of untreated or partially treated waste is prohibited.
5. Discharge of treated effluent to any site other than the effluent recycling site described in the Findings is prohibited.
6. Application of recycled water in a manner or location other than that described herein is prohibited.
7. The use of recycled water for purposes other than pasture irrigation as defined in Title 22 CCR Section 60304 and this Order is prohibited.
8. Land application of biosolids at the WWTF is prohibited except as approved by the Executive Officer in accordance with the General Solids Disposal Specifications.

B. Discharge Specifications

1. **Effective upon the Executive Officer's written approval** of the report required pursuant to Provision G.I.e, influent flows to the WWTF shall not exceed the following limits for any calendar year:

Influent Flow Measurement	Maximum Rate
Total Annual Flow	118 MG
Average Daily Flow ¹	0.32 mgd
Average Dry Weather Flow ^{2, 3}	0.22 mgd
Maximum Monthly Flow ⁴	0.51 mgd

¹ As determined by the total influent for the calendar year divided by 365.

² Dry weather is defined as the months of August through October, inclusive.

³ As determined by the total influent flow for the dry weather period divided by 92.

⁴ As determined by the total influent flow for the month divided by the number of days in that month.

2. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations.
3. Wastewater treatment, storage, and disposal shall not cause pollution or a nuisance as defined by Section 13050 of the CWC.
4. The Discharger shall operate all systems and equipment to optimize the quality of the treated effluent.
5. Public contact with wastewater shall be precluded or controlled through such means as fences and signs, or acceptable alternatives.
6. Objectionable odors originating at the facility shall not be perceivable beyond the limits of the wastewater treatment ponds, storage pond or effluent recycling site at an intensity that creates or threatens to create nuisance conditions.
7. As a means of discerning compliance with Discharge Specification B.6, the dissolved oxygen (DO) content in the upper one foot of any wastewater pond shall not be less than 1.0 mg/L for three consecutive daily sampling events. If the DO in any single pond is below 1.0 mg/L during a weekly sampling event, the Discharger shall take all reasonable steps to correct the problem and commence daily DO monitoring in all affected ponds until the problem has resolved. If unpleasant odors originating from affected ponds are noticed in developed areas, or if the Discharger receives one or more odor complaints, the Discharger shall report the findings to the Central Valley Water Board in writing within 5 days of that date and shall include a specific plan to resolve the low DO results within 10 days of that date.
8. Wastewater and tailwater ponds shall be managed to prevent breeding of mosquitoes. In particular,
 - a. An erosion control program shall be implemented to ensure that small coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized through control of water depth, harvesting, or herbicides.
 - c. Dead algae, vegetation, and debris shall not accumulate on the water surface.
9. All treatment, storage, and disposal facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
10. The WWTF shall have sufficient treatment, storage, and disposal capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the winter months. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

11. The Discharger shall operate and maintain all ponds sufficiently to protect the integrity of containment levees and prevent overtopping and/or structural failure. Unless a California-registered civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically from the lowest possible point of overflow). As a means of management and to discern compliance with this requirement, the Discharger shall install and maintain in each pond permanent staff gauges with calibration marks that indicate the water level at design capacity and enable determination of available operational freeboard.
12. On or about **15 October** of each year, available pond storage capacity shall at least equal the volume necessary to comply with Discharge Specifications B.10 and B.11.

C. Recycled Water Specifications

1. The Discharger shall treat the wastewater so that it complies with Title 22 CCR, Section 60301.225 ("Disinfected Secondary-23 Recycled Water") unless otherwise approved by the Executive Officer and the California Department of Public Health.
2. Recycled water shall be used in compliance with Title 22, Article 3 ("Uses of Recycled Water").
3. Application of recycled water shall comply with the following setback requirements:

Setback Definition ¹	Minimum Irrigation Setback, (feet)
Edge of recycled water recycling areas to property boundary	25
Edge of recycled water recycling areas to public roads	25
Edge of recycled water recycling areas to on-site roads that separate irrigation checks	0 (none)
Edge of recycled water recycling areas to irrigation wells	100
Edge of recycled water recycling areas to domestic wells	100
Edge of recycled water recycling areas to manmade or natural surface water drainage course ² or spring	25

¹ As defined by the wetted area produced during irrigation

² Excluding ditches used exclusively for tailwater return.

4. Public contact with recycled effluent at the recycling areas shall be controlled through use of fences and cautionary signs, and/or other appropriate means. Perimeter warning signs indicating that recycled water is in use shall be posted at adequate intervals along the property boundary and at each access road entrance. The size and content of these signs shall be as described in Section 60310 of Title 22.
5. Recycled water controllers, valves, and similar appurtenances shall be affixed with recycled water warning signs, and shall be equipped with removable handles or locking mechanisms to prevent public access or tampering. The contents of the signs shall conform to Section 60310 of Title 22, and the DPH District Engineer's requirements. Each sign shall be in English and Spanish languages.
6. Quick couplers and sprinkler heads, if used, shall be of a type, or secured in a manner, that permits operation only by authorized personnel. Hose bibs and other unlocked valves shall not be accessible to the public.
7. Any connection between the recycled water conveyance system and any potable water conveyance system, groundwater supply well or surface water supply source for the purpose of supplementing recycled water shall be equipped with a DPH-approved backflow prevention device.
8. Direct or windblown spray of recycled water shall be confined to the recycling areas, and shall not enter surface watercourses.
9. Spray irrigation of recycled water is prohibited when wind velocities exceed 30 mph.
10. Crops (which may include pasture grasses and native grasses) shall be grown on the recycling areas, and cropping activities shall be sufficient to take up all of the nitrogen applied, including any fertilizers and manure.
11. Grazing of milking animals within the recycling areas is prohibited.
12. The volume of recycled water applied to the recycling areas on any single day shall not exceed reasonable agronomic rates based on the vegetation grown, pre-discharge soil moisture conditions, and weather conditions.
13. Hydraulic loading of recycled water and supplemental irrigation water shall be at reasonable agronomic rates designed to maximize uptake and breakdown of waste constituents in the root zone and minimize the percolation of waste constituents below the root zone.
14. Irrigation of the recycling areas shall occur only when appropriately trained personnel are on duty, and the recycling areas shall be inspected as frequently as necessary to ensure continuous compliance with the requirements of this Order.

15. Irrigation using recycled water shall not be performed within 24 hours of a forecasted storm, during a storm, within 24 hours after any measurable precipitation event, or when the ground is saturated.
16. Storm water runoff from the recycling areas may only be released to surface water drainage courses if the discharge is in compliance with Recycled Water Specification C.15.
17. The discharge of recycled water shall remain within the designated recycling areas (as described in Finding No. 20 and depicted on Attachment D) at all times.
18. The discharge of recycled water shall be managed to minimize erosion.
19. The recycled water areas shall be managed to prevent breeding of mosquitoes. In particular:
 - a. There shall be no standing water 48 hours after irrigation ceases;
 - b. Tailwater ditches must be maintained essentially free of emergent, marginal, and floating vegetation; and
 - c. Low-pressure and unpressurized pipelines and ditches accessible to mosquitoes shall not be used to store recycled effluent.
20. Any tailwater ditch used to contain runoff shall be designed and maintained so that all tailwater flows to a single collection point.

D. Effluent Limitations

1. Effluent discharged to the effluent storage pond shall not exceed the following limits:

Constituent	Units	Annual Average	Monthly Average	Monthly Maximum
BOD ₅	mg/L	--	30	90
Settleable solids	ml/L	--	0.5	1.0
Total coliform organisms	MPN/100 mL	--	23	240
Electrical Conductivity	umhos/cm	1,950	--	--

¹ 5-day biochemical oxygen demand.

² Total suspended solids.

2. No wastewater contained in any pond shall have a pH less than 6.5 or greater than 10.0.

E. General Solids Disposal Specifications

Sludge, as used in this document, means the solid, semisolid, and liquid residues removed during primary, secondary, or advanced wastewater treatment processes. Solid waste refers to grit and screenings generated during preliminary treatment. Residual sludge means sludge that will not be subject to further treatment at the WWTF. Biosolids refers to sludge that has been treated and tested and shown to be capable of being beneficially and legally used pursuant to federal and state regulations as a soil amendment for agriculture, silviculture, horticulture, and land reclamation activities.

1. Sludge and solid waste shall be removed from screens, sumps, ponds, and clarifiers as needed to ensure optimal plant operation.
2. Treatment and storage of sludge generated by the WWTF shall be confined to the WWTF property, and shall be conducted in a manner that precludes infiltration of waste constituents into soils in a mass or at concentrations that will violate the Groundwater Limitations of this Order.
3. Any storage of residual sludge, solid waste, and biosolids at the WWTF shall be temporary, and the waste shall be controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or at concentrations that will violate the Groundwater Limitations of this Order.
4. Residual sludge, biosolids, and solid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27. Removal for further treatment, disposal, or reuse at disposal sites (i.e., landfills, WWTFs, composting sites, soil amendment sites) operated in accordance with valid waste discharge requirements issued by a regional water quality control board will satisfy this specification.
5. Use of biosolids as a soil amendment shall comply with valid waste discharge requirements issued by a regional water quality control board. In most cases, this will mean the General Biosolids Order (State Water Resources Control Board Water Quality Order No. 2004-12-DWQ, *General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities*). For a biosolids use project to be covered by the General Biosolids Order, the Discharger must file a complete Notice of Intent and receive a Notice of Applicability for each project.
6. Use and disposal of biosolids shall comply with the self-implementing federal regulations of Title 40, Code of Federal Regulations (CFR), Part 503, which are subject to enforcement by the U.S. EPA, not the Central Valley Water Board. If during the life of this Order, the State accepts primacy for implementation of 40 CFR 503, the Central Valley Water Board may also initiate enforcement where appropriate.

F. Groundwater Limitations

1. Effective immediately as interim groundwater limitations, the discharge, in combination with other sources, shall not cause underlying groundwater to contain waste constituents in concentrations statistically greater than existing background water quality. Background groundwater quality shall be calculated using the methods provided in Title 27 Section 20415(e)(10). Background values must be updated annually as described in the MRP.
2. Effective 30 December 2014, the final groundwater limitations will be the Basin Plan water quality objectives or the background groundwater quality (as determined by required studies approved by the Executive Officer), whichever is greater. If background values are not determined, the groundwater water quality objectives listed below will be the final groundwater limitations. If the Discharger determines that it cannot meet the final groundwater limitations without WWTF improvements, the Discharger shall provide a proposed time schedule to bring the discharge into compliance before the effective date. The water quality objectives are presented below:

<u>Constituent</u>	<u>Units</u>	<u>Limitation</u>
Boron	mg/L	0.7
Chloride	mg/L	106
Iron	mg/L	0.3
Manganese	mg/L	0.05
Sodium	mg/L	69
Total Dissolved Solids	mg/L	450 ¹
Total Nitrogen	mg/L	10
Nitrate (as N)	mg/L	10
Ammonia (as NH ₄)	mg/L	1.5
Bromoform	ug/L	4
Bromodichloromethane	ug/L	0.27
Chloroform	ug/L	1.1
Dibromochloromethane	ug/L	0.37

¹ A cumulative impact limit that accounts for several dissolved constituents in addition to those listed here separately [e.g., alkalinity (carbonate and bicarbonate), calcium, hardness, phosphate, and potassium].

G. Provisions

1. The following reports shall be submitted pursuant to Section 13267 of the CWC and shall be prepared as described in Provision G.5:

- a. If the Discharger enters into an agreement with another party to directly manage and control cropping and irrigation at the effluent recycling site, that party shall become a co-discharger and User of recycled water subject to the applicable terms of this Order. At least **90 days** prior to any operation of the irrigation system by such a party, the co-dischargers shall submit the following:
 - i. A completed Form 200 signed by both co-dischargers that will serve as an application for an amendment to this Order naming the User; and
 - ii. An *Effluent Recycling Site Operation and Maintenance Plan* for review and approval. The Plan shall be prepared in accordance with Attachment E: "*Effluent Recycling Site Operation and Maintenance Plan Guidance*", which is attached hereto and made part of this Order by reference. The Plan shall discuss all aspects of managing the effluent recycling operation to comply with the terms and conditions of this Order. A copy of the Plan shall be kept at the WWTF and the effluent recycling site for reference by operating personnel and they shall be familiar with its contents.
- b. By **30 December 2009**, the Discharger shall submit a copy of a letter that notifies the State Water Resources Control Board's Division of Water Rights of the Discharger's intent to cease discharges to surface waters.
- c. By **30 December 2009**, the Discharger shall submit a *Groundwater Monitoring Report* that completely documents pre-discharge groundwater monitoring conducted at the effluent recycling site in April and December 2008. The report shall comply with the reporting requirements for Semi-Annual Monitoring Reports set forth in Monitoring and Reporting Program No. R5-2009-0109, which is part of this Order. The report shall include a report prepared by a licensed Land Surveyor that documents the top of casing reference elevations that will be used to calculate groundwater elevations for all monitoring wells, including those at the wastewater treatment plant and the effluent recycling site.
- d. By **30 January 2010**, the Discharger shall submit a *Groundwater Monitoring Well Installation Workplan* if the analysis of groundwater elevations and flow direction determined in the report required by Provision G.1.b show that the effluent recycling site's groundwater monitoring well network is not adequate to determine background groundwater quality or monitor groundwater downgradient of the effluent storage pond or effluent recycling areas. If additional monitoring wells are needed at the wastewater plant to ensure adequate monitoring upgradient and downgradient of the unlined ponds, the workplan shall also include those additional wells. The workplan shall be prepared in accordance with, and including the items listed in, the first section of Attachment E: "Requirements for Monitoring Well Installation Workplans and Monitoring Well Installation Reports." The groundwater monitoring systems shall be designed to yield samples

representative of the uppermost portion of the first aquifer underlying the ponds and effluent recycling areas.

- e. By **30 December 2010**, the Discharger shall submit a technical report that certifies completion of the WWTF and recycling site improvements construction work, certifies that operation of the effluent recycling system has begun, and transmits a copy of the Final Operation and Maintenance Manual submitted to the State Water Board Division of Financial Assistance. The report shall include as-built drawings of the WWTF and recycling site improvements.
- f. By **30 December 2010**, the Discharger shall submit a *Groundwater Monitoring Well Installation Report* for any new groundwater monitoring wells constructed to comply with Provision G.1.d. The report shall be prepared in accordance with, and including the items listed in, the second section of Attachment F: "*Monitoring Well Workplan and Monitoring Well Installation Report Guidance*", which is attached hereto and made part of this Order by reference. The report shall describe the installation and development of all new monitoring wells, and explain any deviation from the approved workplan.
- g. By **30 December 2011**, the Discharger shall submit and implement a *Salinity Evaluation and Minimization Plan* to address the sources of salinity discharged to the wastewater treatment system. At a minimum, the plan shall meet the following requirements outlined in CWC Section 13263.3(d)(3) Pollution Prevention Plans:
 - a. An estimate of all of the sources of a pollutant contributing, or potentially contributing, to the loadings of salinity in the treatment plant influent including water supply, water softeners, and other residential, commercial and industrial salinity sources.
 - b. An analysis of the methods that could be used to prevent the discharge of salinity into the facility, including application of local limits to industrial or commercial dischargers regarding pollution prevention techniques, public education and outreach, or other innovative and alternative approaches to reduce discharges of the pollutant to the facility. The analysis shall also identify sources, or potential sources, not within the ability or authority of the Discharger to control.
 - c. An estimate of salinity load reductions that may be identified through the methods identified in CWC Section 13263.3(d)(3)(ii).
 - d. A plan for monitoring the results of the salinity pollution prevention program.
 - e. A description of the tasks, costs, and time required to investigate and implement various elements in the salinity pollution prevention plan.
 - f. A statement of the Discharger's salinity pollution prevention goals and strategies, including priorities for short-term and long-term action, and a

description of the Discharger's intended pollution prevention activities for the immediate future.

- g. A description of the Discharger's existing salinity pollution prevention programs.
- h. An analysis, to the extent feasible, of any adverse environmental impacts, including cross-media impacts or substitute chemicals that may result from the implementation of the pollution prevention program.
- i. An analysis, to the extent feasible, of the costs and benefits that may be incurred to implement the pollution prevention program.
- j. Progress to date in reducing the concentration and/or mass of salinity in the discharge.

If this report is required, progress in implementation of the plan shall be reported each year in the Annual Monitoring Report required pursuant to Monitoring and Reporting Program No. R5-2009-0109.

- h. By **30 December 2012**, the Discharger shall submit a *Background Groundwater Quality Study Report* for the wastewater treatment plant and effluent disposal sites. The report shall present a summary of all historical monitoring data for each groundwater monitoring parameter/constituent identified in the MRP and calculation of the background groundwater concentration for electrical conductivity, total dissolved solids, nitrate nitrogen, total coliform organisms, sodium, chloride, and boron. Determination of background quality shall be made using the methods described in Title 27 CCR, Section 20415(e)(10), and shall be based on all groundwater monitoring events. The report shall compare the calculated background concentration with the concentration in each downgradient well.
- i. By **30 December 2012**, the Discharger shall submit an *Inflow and Infiltration (I/I) Assessment and Correction Workplan* that includes at a minimum the following:
 - Identification of known I/I sources;
 - A detailed scope of work to identify and quantify other I/I sources (e.g., smoke testing, video surveying, manhole surveying, etc.);
 - A plan to prioritize retrofits and replacements to reduce I/I;
 - A discussion of options and preliminary unit cost estimates for correcting various sources of I/I;
 - Identification of minor repairs that will be performed in the field as problems are discovered; and
 - A detailed schedule for I/I assessment of the entire sewer system and completion of both minor and major repairs.

2. If the *Background Groundwater Quality Study* shows that the discharge of waste is causing groundwater to contain waste constituents (other than electrical conductivity, total dissolved solids, sodium and chloride) in concentrations statistically greater than background water quality then, by **30 April 2013**, the Discharger shall submit a *BPTC Evaluation Workplan* that sets forth the scope and schedule for a systematic and comprehensive technical evaluation of each component of the facility's waste treatment and disposal system to determine best practicable treatment and control. The workplan shall contain a preliminary evaluation of each component of the WWTF and effluent disposal system and propose a time schedule for completing the comprehensive technical evaluation. The schedule to complete the evaluation shall be as short as practicable, and shall not exceed one year after receipt of comments on the workplan.
3. If the Discharger chooses to request relief from the requirement to disinfect the treated effluent, the Discharger shall submit the following:
 - a. A technical report that demonstrates, based on the Background Groundwater Quality Study and any other relevant site-specific information, that ceasing disinfection will not cause violation of the Groundwater Limitations of this Order; and
 - b. A letter from the California Department of Public Health Drinking Water Branch approving the cessation and recommending specific additional conditions of discharge, if any, to protect public health (e.g., a perimeter fence around the effluent recycling site).
4. **At least 180 days prior** to any sludge removal and disposal, the Discharger shall submit a *Sludge Cleanout Plan*. The plan shall include a detailed plan for sludge removal, drying, and disposal. The plan shall specifically describe the phasing of the project, measures to be used to control runoff or percolate from the sludge as it is drying, and a schedule that shows how all dried biosolids will be removed from the site prior to the onset of the rainy season (1 October). If the Discharger proposes to land apply biosolids at the effluent recycling site, the report shall include a Report of Waste Discharge and filing fee to apply for separate waste discharge requirements.
5. A discharger whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment, collection, and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the discharger shall notify the Central Valley Water Board by **31 January**.
6. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and

Professions Code sections 6735, 7835, and 7835.1. To demonstrate compliance with Sections 415 and 3065 of Title 16, CCR. all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

7. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2009-0109, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.
8. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and made part of this Order by reference. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."
9. The Discharger shall submit to the Central Valley Water Board on or before each compliance report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then the Discharge shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board in writing when it returns to compliance with the time schedule.
10. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with this Order.
11. The Discharger shall provide certified wastewater treatment plant operators in accordance with Title 23 of the California Code of Regulations, Division 3, Chapter 26.
12. As described in the Standard Provisions, the Discharger shall report promptly to the Central Valley Water Board any material change or proposed change in the character, location, or volume of the discharge.
13. The Discharger shall report to the Central Valley Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986."
14. The Discharger shall comply with the requirements of the Statewide General Waste Discharge Requirements (General WDRs) for Sanitary Sewer Systems (Water Quality Order No. 2006-0003), the Revised General WDRs Monitoring and Reporting Program (Water Quality Order No. 2008-0002-EXEC), and any subsequent revisions thereto. Upon the reduction, loss, or failure of the sanitary sewer system resulting in a sanitary sewer overflow, the Discharger shall notify the

Central Valley Water Board in accordance with Water Quality Order No. 2008-0002-EXEC and take any necessary remedial action to (a) control or limit the volume of sewage discharged, (b) terminate the sewage discharge as rapidly as possible, and (c) recover as much as possible of the sewage discharged (including wash down water) for proper disposal. The Discharger shall implement all applicable remedial actions including, but not limited to, the following:

- a. Interception and rerouting of sewage flows around the sewage line failure;
 - b. Vacuum truck recovery of sanitary sewer overflows and wash down water;
 - c. Use of portable aerators where complete recovery of the sanitary sewer overflows are not practicable and where severe oxygen depletion is expected in surface waters; and
 - d. Cleanup of sewage-related debris at the overflow site.
15. The Discharger shall not allow pollutant-free wastewater to be discharged into the wastewater collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.
 16. In the event of any change in control or ownership of the WWTF, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the CWC. Transfer shall be approved or disapproved by the Executive Officer.
 17. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.
 18. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
 19. The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0109
MAXWELL PUBLIC UTILITIES DISTRICT
MAXWELL WASTEWATER TREATMENT FACILITY
COLUSA COUNTY

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I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 8 October 2009.

Original signed by Kenneth D. Landau, for

PAMELA C. CREEDON, Executive Officer

ALO: 9/8/09

ATTACHMENT A



Drawing Reference:
Google Maps, google.com

SITE LOCATION MAP
MAXWELL PUBLIC UTILITIES DISTRICT
MAXWELL WASTEWATER TREATMENT FACILITY
COLUSA COUNTY

ORDER NO. R5-2009-0109



Approx. Scale:
1" = 2.7 miles

ATTACHMENT B



Drawing Reference:
RWD and Google Maps,
google.com

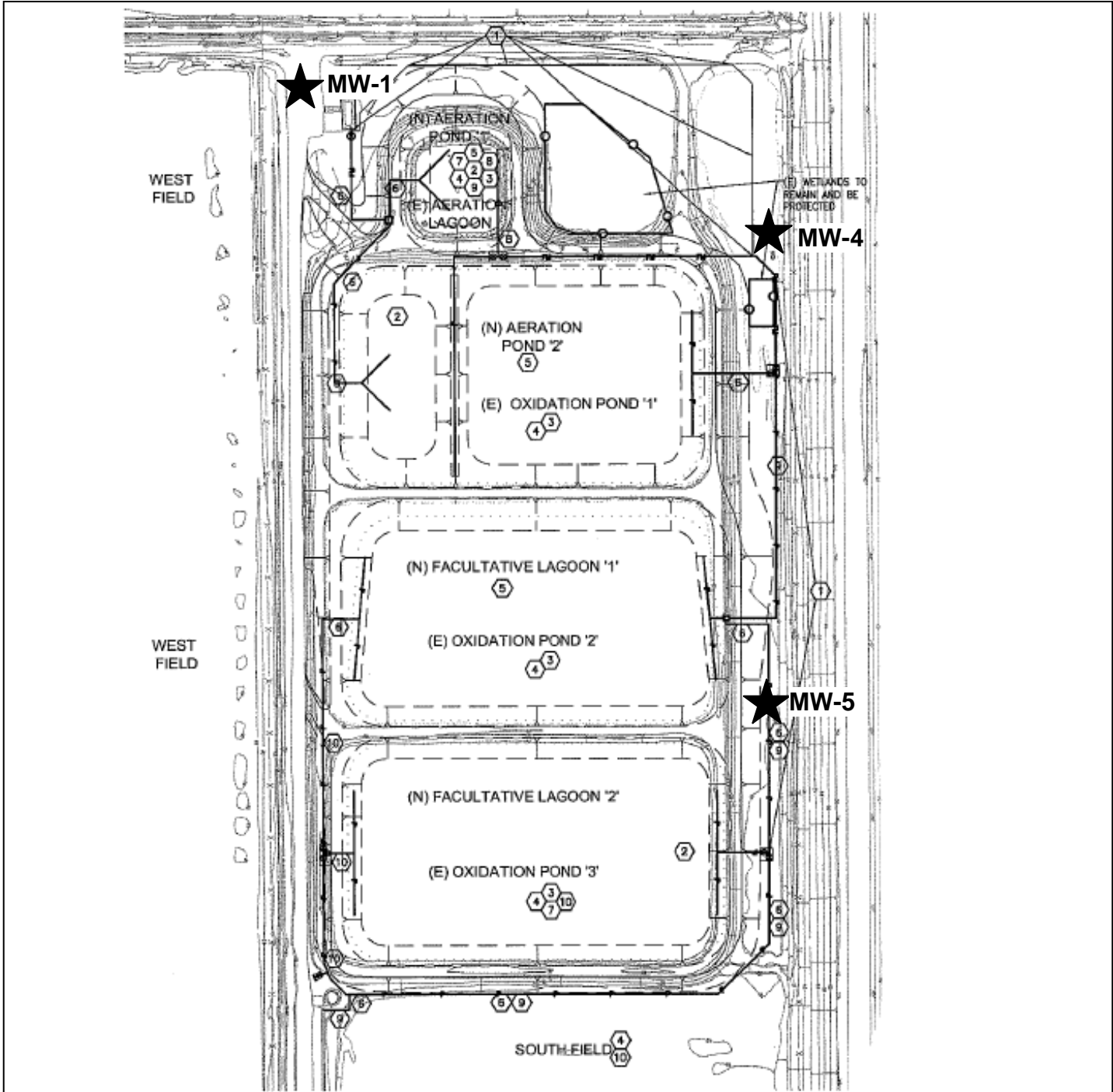
EXISTING WASTEWATER TREATMENT PLANT
MAXWELL PUBLIC UTILITIES DISTRICT
MAXWELL WASTEWATER TREATMENT FACILITY
COLUSA COUNTY

ORDER NO. R5-2009-0109



Approx. Scale:
1" = 200'

ATTACHMENT C



★ MW-3

★ MW-2

Drawing Reference:
RWD
July 2009 Plan Set

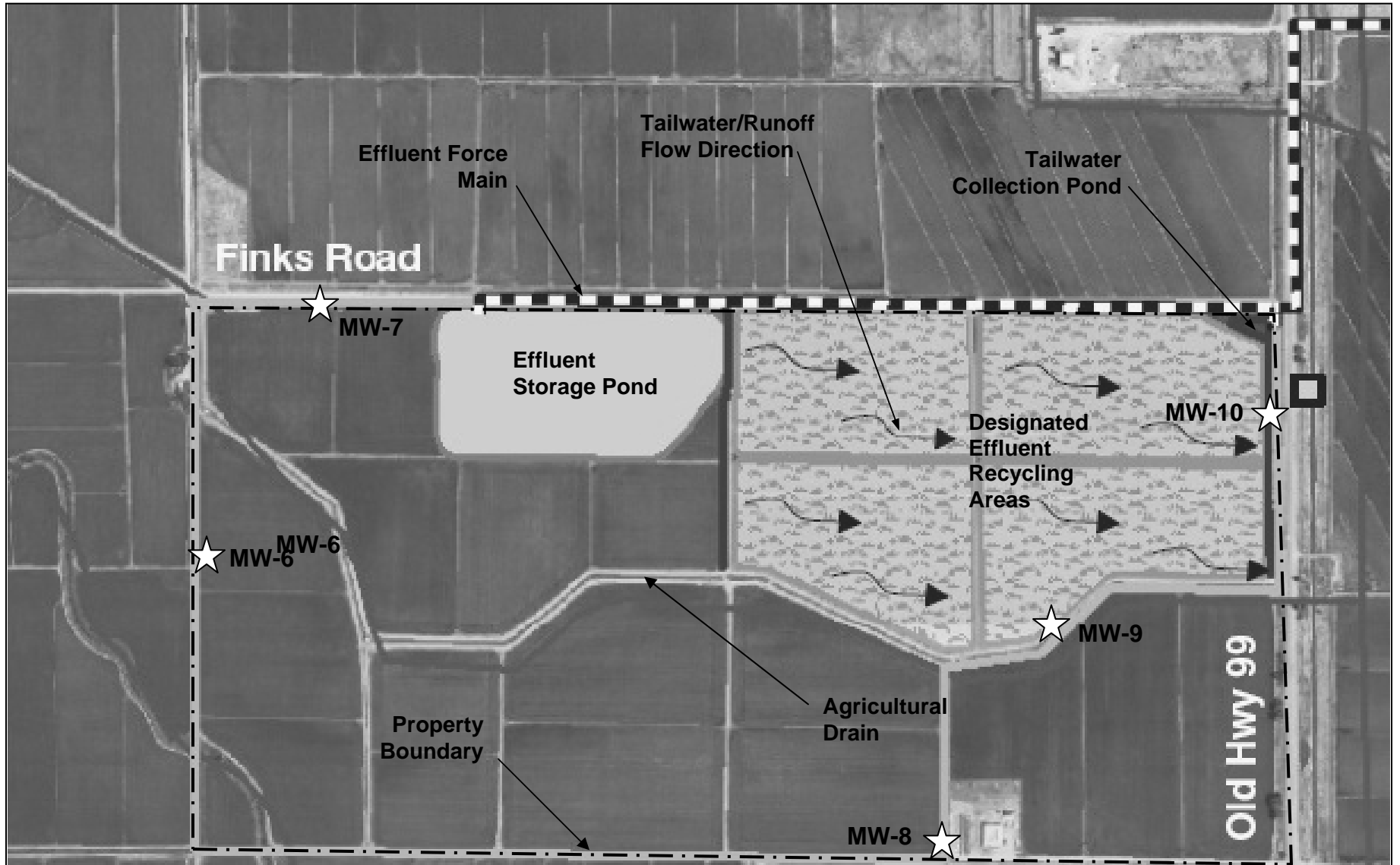
WASTEWATER TREATMENT PLANT IMPROVEMENTS
MAXWELL PUBLIC UTILITY DISTRICT
MAXWELL WASTEWATER TREATMENT FACILITY
COLUSA COUNTY



Approx. Scale:
1"=170'

ORDER NO. R5-2009-0109

ATTACHMENT D



Drawing Reference:
RWD

EFFLUENT RECYCLING SITE PLAN
MAXWELL PUBLIC UTILITIES DISTRICT
MAXWELL WASTEWATER TREATMENT FACILITY
COLUSA COUNTY

ORDER NO. R5-2009-0109



Approx. Scale:
1" = 700'

ATTACHMENT E

ORDER NO. R5-2009-0109
GUIDANCE FOR EFFLUENT RECYCLING SITE
OPERATION AND MAINTENANCE PLAN
MAXWELL WASTEWATER TREATMENT FACILITY
COLUSA COUNTY

The purpose of the Effluent Recycling Site Operation and Maintenance Plan is to provide rules of operation to all concerned parties, including the Producer of recycled effluent, the User of recycled effluent, and employees of any party who will have a role in day-to-day operation of the effluent recycling system. At a minimum, the plan shall include the following:

1. Background Information

- ◆ Discussion of the character of the recycled effluent with respect to potential public health effects, groundwater quality impacts, and surface water quality impacts.
- ◆ Projected recycled effluent generation rates, including seasonal variability.

2. Principles of Effluent Recycling

- ◆ General principles of land disposal of treated domestic wastewater.
- ◆ Applicable regulations to protect public health (i.e., Title 22 Water Recycling Regulations).
- ◆ Potential causes of, and prevention/control measures for, unpermitted discharges to surface waters.

3. Waste Discharge Requirements

- ◆ A summary of key elements of the WDRs, the associated Monitoring and Reporting Program (MRP), and the Standard Provisions and Reporting Requirements.

4. Operation, Monitoring, and Reporting Responsibilities

- ◆ An organization description and/or chart depicting all persons involved with management, operation, maintenance and monitoring of the effluent recycling system and recycling site, including their direct role and reporting responsibilities.

5. Operations

- ◆ A description of the recommended crops, potential crop problems, water usage of recommended crops, evapotranspiration rates, infiltration rates, planting/harvesting schedules.
- ◆ A detailed description of specific operating procedures for each irrigation check, including:
 - Method of wastewater application.
 - Volume and depth to be applied per irrigation event.
 - Assessing the need for, and frequency of, irrigation.
 - Specific procedures for managing and controlling tailwater and storm water to prevent unpermitted releases.

- ◆ The location, type, and operational procedures for each flow meter (a schematic diagram of locations is acceptable).
- ◆ Specific procedures and documentation requirements for setting up systems to release storm water from the effluent recycling site, including timing of irrigation events with respect to precipitation events, how managers will determine when storm water may be released, how this will be communicated to operations personnel, and how managers will ensure that tailwater is not accidentally released to surface water drainage courses.
- ◆ Supplemental fertilizer usage.
- ◆ Specific procedures to ensure that parties purchasing or using the crop are aware of the regulatory restrictions on its use.

6. Maintenance

- ◆ A detailed description of all equipment and site improvements associated with effluent recycling, including design basis, site plans, mechanical systems description, piping and instrumentation description and diagrams.
- ◆ Required runoff controls (narrative description and grading/drainage plan, including all berms, ditches, and other improvements needed to contain runoff and tailwater).
- ◆ Routine tailwater management practices (narrative description supplemented with drainage plan).
- ◆ Tailwater/storage ponds:
 - Describe aeration systems, if used.
 - Describe procedures and documentation requirements for inspections, maintenance and repairs.
- ◆ Structural runoff controls:
 - Describe procedures and documentation requirements for inspections, maintenance and repairs.
- ◆ Routine equipment maintenance, calibration procedures, and troubleshooting procedures;
- ◆ Coordination between Producer and User:
 - Describe how the Producer and User will coordinate recycled water delivery, track information required for monthly monitoring reports, and ensure compliance with loading rate limitations imposed by the WDRs.

7. Monitoring and Reporting

- ◆ Monitoring procedures, sampling procedures, sample handling and storage, use of field operations documentation logs, and report development.
- ◆ Emergency notification and action procedures in the event of imminent or actual violations of the WDRs.
- ◆ Quality assurance program to ensure that all calculations and monitoring reports are reviewed and certified by the appropriate persons.

ATTACHMENT F

ORDER NO R5-2009-0109 REQUIREMENTS FOR MONITORING WELL INSTALLATION WORKPLANS AND MONITORING WELL INSTALLATION REPORTS

Prior to installation of groundwater monitoring wells, the Discharger shall submit a workplan containing, at a minimum, the information listed in Section 1 below. Wells may be installed after staff approves the workplan. Upon installation of the monitoring wells, the Discharger shall submit a well installation report that includes the information contained in Section 2 below. All workplans and reports must be prepared under the direction of, and signed by, a registered geologist or civil engineer licensed by the State of California.

SECTION 1 - Monitoring Well Installation Workplan and Groundwater Sampling and Analysis Plan

The monitoring well installation workplan shall contain the following minimum information:

A. General Information:

- Purpose of the well installation project
- Brief description of local geologic and hydrogeologic conditions
- Proposed monitoring well locations and rationale for well locations
- Topographic map showing facility location, roads, and surface water bodies
- Large scaled site map showing all existing on-site wells, proposed wells, surface drainage courses, surface water bodies, buildings, waste handling facilities, utilities, and major physical and man-made features

B. Drilling Details:

- On-site supervision of drilling and well installation activities
- Description of drilling equipment and techniques
- Equipment decontamination procedures
- Soil sampling intervals (if appropriate) and logging methods

C. Monitoring Well Design (in narrative and/or graphic form):

- Diagram of proposed well construction details:
 - Borehole diameter
 - Casing and screen material, diameter, and centralizer spacing (if needed)
 - Type of well caps (bottom cap either screw on or secured with stainless steel screws)
 - Anticipated depth of well, length of well casing, and length and position of perforated interval
 - Thickness, position and composition of surface seal, sanitary seal, and sand pack
 - Anticipated screen slot size and filter pack

D. Well Development (not to be performed until at least 48 hours after sanitary seal placement):

- Method of development to be used (i.e., surge, bail, pump, etc.)
- Parameters to be monitored during development and record keeping technique

California Environmental Protection Agency

Method of determining when development is complete
Disposal of development water

- E. Well Survey (precision of vertical survey data shall be at least 0.01 foot):
Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey
Datum for survey measurements
List well features to be surveyed (i.e. top of casing, horizontal and vertical coordinates, etc.)
- F. Schedule for Completion of Work
- G. Appendix: Groundwater Sampling and Analysis Plan (SAP)
The Groundwater SAP shall be included as an appendix to the workplan, and shall be utilized as a guidance document that is referred to by individuals responsible for conducting groundwater monitoring and sampling activities.

Provide a detailed written description of standard operating procedures for the following:

- Equipment to be used during sampling
- Equipment decontamination procedures
- Water level measurement procedures
- Well purging (include a discussion of procedures to follow if three casing volumes cannot be purged)
- Monitoring and record keeping during water level measurement and well purging (include copies of record keeping logs to be used)
- Purge water disposal
- Analytical methods and required reporting limits
- Sample containers and preservatives
- Sampling
 - General sampling techniques
 - Record keeping during sampling (include copies of record keeping logs to be used)
 - QA/QC samples
- Chain of Custody
- Sample handling and transport

SECTION 2 - Monitoring Well Installation Report

The monitoring well installation report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved workplan.

- A. General Information:
Purpose of the well installation project
Brief description of local geologic and hydrogeologic conditions encountered during installation of the wells

Number of monitoring wells installed and copies of County Well Construction Permits
Topographic map showing facility location, roads, surface water bodies
Scaled site map showing all previously existing wells, newly installed wells, surface water bodies, buildings, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details (in narrative and/or graphic form):

On-site supervision of drilling and well installation activities

Drilling contractor and driller's name

Description of drilling equipment and techniques

Equipment decontamination procedures

Soil sampling intervals and logging methods

Well boring log:

- Well boring number and date drilled
- Borehole diameter and total depth
- Total depth of open hole (same as total depth drilled if no caving or back-grouting occurs)
- Depth to first encountered groundwater and stabilized groundwater depth
- Detailed description of soils encountered, using the Unified Soil Classification System

C. Well Construction Details (in narrative and/or graphic form):

Well construction diagram, including:

- Monitoring well number and date constructed
- Casing and screen material, diameter, and centralizer spacing (if needed)
- Length of well casing, and length and position of perforated interval
- Thickness, position and composition of surface seal, sanitary seal, and sand pack
- Type of well caps (bottom cap either screw on or secured with stainless steel screws)

E. Well Development:

Date(s) and method of development

How well development completion was determined

Volume of water purged from well and method of development water disposal

Field notes from well development should be included in report

F. Well Survey (survey the top rim of the well casing with the cap removed):

Identify the coordinate system and datum for survey measurements

Describe the measuring points (i.e. ground surface, top of casing, etc.)

Present the well survey report data in a table

Include the Registered Engineer or Licensed Surveyor's report and field notes in appendix

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2009-0109
FOR
MAXWELL PUBLIC UTILITIES DISTRICT
MAXWELL WASTEWATER TREATMENT FACILITY
COLUSA COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring the wastewater treatment facility (WWTF) influent and effluent, wastewater treatment and storage ponds, effluent reuse site, groundwater, water supply and biosolids disposal. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer.

Central Valley Water Board staff shall approve specific sampling locations prior to any sampling activities. All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form.

Field test instruments (such as those used to test dissolved oxygen, pH, and electrical conductivity) may be used provided that:

1. The user is trained in proper use and maintenance of the instruments;
2. The instruments are field calibrated prior to monitoring events at the frequency recommended by the manufacturer;
3. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of this MRP.

NOTE: The groundwater monitoring and reporting requirements of this MRP are effective immediately upon adoption of this Order. The groundwater monitoring and reporting requirements contained herein supersede those contained in MRP No. R5-2009-0009.

All other monitoring and reporting requirements are effective as of the first date of discharge to the new effluent storage pond and effluent reuse site.

Effective immediately, and continuing until the new WWTF is in operation, the Discharger shall submit a monthly *WWTF Improvements Status Report* in accordance with the schedule for Monthly Monitoring Reports contained herein. The status report shall describe all construction and related work completed during the month, state whether construction is proceeding on schedule, and state the expected date that the improved WWTF will be fully operational.

INFLUENT MONITORING

The Discharger shall monitor influent wastewater in accordance with the following. Samples shall be representative of the influent to the first treatment pond. Grab samples are considered representative of the influent. Influent monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Local precipitation	inches	Rain Gauge Observation ¹	Daily	Monthly
Flow	gpd	Flow Meter Observation	Daily	Monthly
BOD ¹	mg/L	Grab	Monthly	Monthly
Total Suspended Solids	mg/L	Grab	Monthly	Monthly

¹ Using either a properly calibrated and maintained on-site rain gauge or daily results from an appropriately sited precipitation observation station operated by others (specify station name; location; owner; and data source contact information, e.g., internet address).

² Five-day, 20° Celsius biochemical oxygen demand.

EFFLUENT MONITORING

The Discharger shall monitor effluent wastewater in accordance with the following. Samples shall be representative of the effluent discharged from the treatment plant to the effluent storage pond after full chlorine contact has been achieved. Grab samples taken from the effluent pipeline just prior to discharge to the effluent storage pond are considered representative. Effluent monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
BOD	mg/L	Grab	Weekly	Monthly
Settleable solids	ml/L	Grab	Weekly	Monthly
Total coliform organisms	MPN/100 mL	Grab	Weekly	Monthly
Electrical conductivity	umhos/cm	Grab	Weekly	Monthly
Total Kjeldahl nitrogen	mg/L	Grab	Monthly	Monthly
Nitrate nitrogen	mg/L	Grab	Monthly	Monthly
Sodium	mg/L	Grab	Quarterly	Monthly ¹
Chloride	mg/L	Grab	Quarterly	Monthly ¹
Boron	mg/L	Grab	Quarterly	Monthly ¹

¹ Results shall be reported in the Monthly Monitoring Report for the month during which samples were obtained.

POND MONITORING

The Discharger shall monitor all ponds at the WWTF and effluent reuse site in accordance with the following. Samples shall be collected from permanent monitoring locations that will provide samples representative of the wastewater in each pond. Freeboard shall be measured vertically from the water surface to the lowest elevation of the pond berm, and shall be measured to the nearest 0.10 feet. Pond monitoring shall include, at a minimum, the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Freeboard	0.1 feet	Staff Gauge Observation	Weekly	Monthly
Dissolved Oxygen ¹	mg/L	Grab	Weekly ²	Monthly
pH	pH units	Grab	Weekly	Monthly
Pond berm condition	--	Observation	Weekly	Monthly

¹ Samples shall be collected opposite each pond inlet at a depth of one foot between 0700 and 0900 hours.

² If the result for any pond is less than 1.0 mg/L, the sampling frequency shall be increased for a period sufficient to confirm the magnitude and duration of the problem and aid in identification and resolution of the problem in accordance with the Discharge Specifications.

In addition, the Discharger shall inspect the condition of the ponds once per week and document visual observations. Notations shall include observations of:

- a. Presence of weeds in the water or along the berm;
- b. Accumulations of dead algae, vegetation, scum, or debris on the pond surface;
- c. Animal burrows in the berms;
- d. Evidence of seepage from the berms or downslope of the P/E ponds
- e. Flies or mosquitoes in the water or at the water surface; and
- f. The color of the water (e.g., dark sparkling green, dull green, yellow, gray, tan, brown, etc.).

EFFLUENT RECYCLING SITE MONITORING

The Discharger shall monitor effluent reuse activities at the effluent reuse areas in accordance with the following. Reuse area monitoring shall be performed daily and the results shall be included in the monthly monitoring report. Erosion, ground saturation, tailwater runoff, and nuisance conditions shall be noted in the report. Reclaimed water shall also be monitored to determine loading rates at the reuse areas.

<u>Parameter</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
Flow from effluent storage pond to each reuse area ¹	gpd and inches/day	Flow Meter Observation	Daily	Monthly
Rainfall	inches	Measurement	Daily	Monthly
Net Acreage Receiving Recycled Water ¹	acres	Calculated	Daily	Monthly
Nitrogen Loading Rate ²	lbs/ac/month and cumulative lbs/ac/year	Calculated	Monthly	Monthly
Dissolved Solids Loading Rate	lbs/ac/month and cumulative lbs/ac/year	Calculated	Monthly	Monthly

¹ Specific reuse areas shall be identified.

² Including contributions from applied fertilizer.

GROUNDWATER MONITORING

Effective immediately, the Discharger shall establish a quarterly sampling schedule for groundwater monitoring.

These monitoring requirements apply to all existing monitoring wells, as well as those constructed after issuance of this MRP. Prior to construction of any additional groundwater monitoring wells, the Discharger shall submit a *Monitoring Well Installation Workplan* for review and approval. Once installed, all new monitoring wells shall be added to the MRP, and shall be sampled and analyzed according to the schedule below.

Prior to well purging, groundwater elevations shall be measured. Depth to groundwater shall be measured to the nearest 0.01 feet. Water table elevations shall be calculated and used to determine groundwater gradient and direction of flow. The monitoring wells shall be purged of at least three well volumes or until temperature, pH, and electrical conductivity have stabilized. Samples shall be collected and analyzed using approved EPA methods. Groundwater monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Depth to groundwater	0.01 feet	Measurement	Quarterly	Semi-Annual
Groundwater elevation ¹	0.01 feet	Calculated	Quarterly	Semi-Annual

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Gradient	feet/feet	Calculated	Quarterly	Semi-Annual
Gradient direction	Degrees	Calculated	Quarterly	Semi-Annual
pH	pH units	Grab	Quarterly	Semi-Annual
Electrical conductivity	umhos/cm	Grab	Quarterly	Semi-Annual
Total dissolved solids	mg/L	Grab	Quarterly	Semi-Annual
Nitrate nitrogen	mg/L	Grab	Quarterly	Semi-Annual
Ammonia nitrogen	mg/L	Grab	Quarterly	Semi-Annual
Total Kjeldahl nitrogen	mg/L	Grab	Quarterly	Semi-Annual
Total coliform organisms ²	MPN/100 ml	Grab	Quarterly	Semi-Annual
Standard minerals ³	mg/L	Grab	Quarterly ⁴	Semi-Annual
Metals ⁵	ug/L	Grab	Quarterly ⁴	Semi-Annual

¹ Groundwater elevations shall be determined based on depth-to-water measurements using a surveyed elevation reference point on the well casing.

² Using a minimum of 15 tubes or three dilutions.

³ Standard Minerals shall include, at a minimum, the following elements/compounds: boron, bromide, calcium, chloride, fluoride, magnesium, phosphate, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness as CaCO₃.

⁴ Standard minerals and metals shall be analyzed for at least six consecutive quarters to support the Background Groundwater Quality Study. Following completion of that study, monitoring for standard minerals and metals is not required.

⁵ At a minimum, the following metals shall be included: arsenic, copper, lead, iron, manganese, nickel, and zinc. Samples tested for metals shall be filtered prior to preservation to ensure that analytical results report dissolved concentrations.

WATER SUPPLY MONITORING

The Discharger shall monitor the community water supply wells as required by the California Department of Public Health and shall report the following minimum monitoring data for each water supply well to the Central Valley Water Board:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Volume pumped to community distribution system	MG	--	--	Annually
Total dissolved solids	mg/L	Grab	Annually	Annually
Electrical Conductivity	umhos/cm	Grab	Annually	Annually
Nitrate nitrogen	mg/L	Grab	Annually	Annually

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Standard minerals ¹	mg/L	Grab	Annually	Annually
Metals ²	ug/L	Grab	Annually	Annually

¹ Standard Minerals shall include, at a minimum, the following elements/compounds: boron, bromide, calcium, chloride, fluoride, magnesium, phosphate, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness as CaCO₃.

² At a minimum, the following metals shall be included: arsenic, copper, lead, iron, manganese, nickel, and zinc. Analytical methods shall be selected to provide reporting limits below the applicable water quality limit for each constituent.

BIOSOLIDS MONITORING

The Discharger shall keep records regarding biosolids generated by the treatment processes, including any analytical test results; the quantity of biosolids removed for disposal; the quantity of biosolids removed from the ponds and temporarily stored on site; and steps taken to prevent nuisance conditions. Records shall be stored onsite and available for review during inspections.

If biosolids are transported off-site for disposal, then the Discharger shall submit records identifying the hauling company, the amount of biosolids transported, the date removed from the facility, the disposal facility name and address, and copies of all analytical data required by the entity accepting the waste. These records shall be submitted as part of the Annual Monitoring Report.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., influent, effluent, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Central Valley Water Board.

A. Monthly Monitoring Reports

Monthly Monitoring Reports shall be submitted to the Central Valley Water Board on the **1st day of the second month following sampling** (i.e. the January Report is due by 1 March). Each report shall bear the certification and signature of the Discharger's authorized representative. At a minimum, the monthly monitoring reports shall include:

1. Results of the following monitoring:
 - a. Influent monitoring (including calculation of monthly average flow, monthly total flow, and total precipitation);

- b. Effluent monitoring;
 - c. Pond monitoring; and
 - d. Water reuse area monitoring.
2. A comparison of monitoring data to the discharge specifications and effluent limitations, disclosure of any violations of the WDRs, and an explanation of any violation of those requirements. Data shall be presented in tabular format.
3. Copies of current calibration logs for all field test instruments.
4. Copies of laboratory analytical report(s).
5. A summary pond condition inspection report that includes dates of inspection, problems identified, repairs recommended, repairs completed, and dates of completion.

B. Semi-Annual Monitoring Reports

The Discharger shall submit semi-annual monitoring reports to the Central Valley Water Board by the **1st day of August and February** each year.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Semi-Annual Monitoring Reports shall be prepared under the direct supervision of a registered Professional Engineer or Geologist and signed by the registered professional.

The Semi-Annual Monitoring Report shall include the following for each of the previous two calendar quarters:

1. Results of groundwater monitoring.
2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDRs, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged.
3. Calculation of groundwater elevations, an assessment of groundwater flow direction and gradient on the date of measurement, comparison of previous flow direction and gradient data, and discussion of seasonal trends, if any.
4. A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable).
5. A comparison of monitoring data to the groundwater limitations and an explanation of any violation of those requirements.

6. Summary data tables of historical and current water table elevations and analytical results.
7. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum.
8. Copies of laboratory analytical report(s) for groundwater monitoring.

C. Annual Report

An Annual Report shall be prepared as the second semi-annual monitoring report. The Annual Report shall include all monitoring data required in the monthly/quarterly schedule. The Annual Report shall be submitted to the Central Valley Water Board by **1 February** each year. In addition to the data normally presented, the Annual Report shall include the following:

1. The contents of the semi-annual monitoring report for the last half of the year.
2. Analytical results for all water supply and other annual monitoring.
3. If requested by staff, tabular and graphical summaries of all data collected during the year.
4. An evaluation of the performance of the WWTF, including discussion of capacity issues, infiltration and inflow (I/I) rates, pond sludge layer thickness, nuisance conditions, and a forecast of the flows anticipated in the next year.
5. An evaluation of the groundwater quality beneath the wastewater treatment facility.
6. A discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.
7. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.
8. Summary of information on the disposal of biosolids as described in the "Biosolids Monitoring" section.
9. The names of all certified wastewater treatment plant operators and OITs employed to operate, maintain, and/or monitor the WWTF; the number of hours per day that each is actively engaged in those functions; and a copy of the current certification for each operator and OIT.
10. A discussion of the following:
 - a. Specific I/I evaluation and reduction tasks completed during the year;
 - b. As applicable, specific salinity reduction efforts implemented in accordance with the

approved *Salinity Evaluation and Minimization Plan*;

- c. As applicable, specific best practical treatment and control measures implemented pursuant to the approved *BPTC Evaluation Workplan* (if one was required by the Executive Officer); and
- d. As applicable, an evaluation of the effectiveness of the salinity reduction/BPTC measures that were implemented based on monitoring data.

A letter transmitting the self-monitoring reports shall accompany each report. The letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agents, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered by: Original signed by Kenneth D. Landau, for
PAMELA C. CREEDON, Executive Officer
8 October 2009
(Date)

ALO:11/05/2009

INFORMATION SHEET

ORDER NO. R5-2009-0109
MAXWELL PUBLIC UTILITIES DISTRICT
MAXWELL WWTF
COLUSA COUNTY

Background

The Maxwell WWTF serves approximately 1,056 residents. The community is small and has a financial hardship.

The WWTF is currently regulated by WDRs Order No. R5-2009-0009 (NPDES No. CA0079987). The treatment plant currently provides secondary treatment and chlorine disinfection, and treated effluent is currently discharged to an unnamed tributary of Lurline Creek.

The previous NPDES Permit, WDRs Order No. R5-2002-0022, was adopted with a companion Cease and Desist Order (CDO) No. R5-2002-0023 because the Discharger could not consistently comply with the permit's Effluent Limitations for ammonia. The CDO required that the Discharger comply with the effluent limitations by 1 February 2007.

On 5 August 2003, the Executive Officer issued Administrative Civil Liability Complaint (ACLC) No. R5-2003-0505 for \$588,000 in mandatory minimum penalties to the Discharger for violations of Waste Discharge Requirements Order No. 96-071 and Order No. R5-2002-0022. Because the Discharger is a small community with a financial hardship, the ACLC allowed the Discharger to complete a compliance project in lieu of paying the penalty. On 22 October 2003, the Discharger entered into a Stipulated Settlement Agreement with the Executive Officer, which allowed the Discharger to complete a compliance project in lieu of paying the penalty. The Discharger proposed land disposal as its compliance project and agreed to complete the project by 1 February 2007.

In February 2006, the Discharger requested that the time schedule set forth in the CDO be extended to 31 December 2009 because of difficulties acquiring the land needed for the compliance project. In February 2007, the Discharger again requested the deadline be moved to 18 May 2010, which coincides with the full compliance deadline in the California Toxics Rule. On 22 June 2007, the Central Valley Water Board adopted Time Schedule Order (TSO) No. R5-2007-0073, which required that the Discharger complete certain milestones and complete the compliance project by 18 May 2010.

In order to comply with the TSO, the Discharger completed a Wastewater Facilities Plan, completed an environmental review pursuant to the California Environmental Quality Act (CEQA), submitted a Report of Waste Discharge, and made substantial progress toward acquiring land for the compliance project. The Discharger proposes to upgrade the WWTF to include effluent storage and a water recycling site, and will eliminate the discharge to surface waters after the project is completed. The improvements project will consist of:

- Increasing the depth of the existing aerated pond;
- Converting Oxidation Pond #1 to a second aerated pond with a deeper fermentation pit;
- Deepening the Oxidation Ponds #2 and #3 to convert them to facultative lagoons ;

- Constructing an effluent pumping station and pipeline to convey treated effluent to an effluent storage pond at the water recycling site; and
- Improving the new water recycling site to provide irrigation and tailwater systems.

Subsequently, on 18 September 2008, the Executive Officer issued Administrative Civil Liability Order (ACLO) No. R5-2008-0561 for \$1,617,000 in mandatory minimum penalties for additional violations of Waste Discharge Requirements Order No. R5-2002-0022. The 2008 ACLO replaces the Stipulated Settlement Agreement, incorporates the recent violations, extends the Record of Violations through 30 April 2008, and allows the Discharger until 18 May 2010 to complete the compliance project in lieu of paying the penalties.

According to the RWD, the improved WWTF and water recycling site will provide a firm treatment, storage and disposal capacity of 0.332 mgd as an average annual flow, and should accommodate projected growth for 20 years, assuming a 3.6 percent annual population growth rate.

Groundwater Conditions

Surface soils in Maxwell area are predominantly fine-grained soils (silts and clay) deposited by flooding of major streams during the Holocene period. Shallow soils at the wastewater treatment plant consist of clay and sandy clay to a depth of 8 to 10 feet below ground surface (bgs).

The Discharger has been monitoring groundwater monthly at the wastewater treatment plant using five shallow monitoring wells since December 2002. Groundwater is typically found at depths ranging from one to six feet bgs at the wastewater treatment plant, and the groundwater flow direction is predominantly to the northeast. Historical groundwater analytical data for the wastewater treatment plant wells indicate that the existing WWTF may have degraded groundwater quality with respect to coliform organisms, EC, nitrogen, chloride, sodium, and boron. However, a statistical analysis of the data is required to determine background concentrations and whether the degradation has caused exceedance of applicable water quality limits.

Soils at the planned effluent recycling site are primarily clay and sandy clay interbedded with layers or lenses of silty and clayey sand. Five monitoring wells were installed at the water recycling site in April 2008. These wells were sampled in April and December 2008. Static groundwater levels prior to sampling ranged from 4.5 to 9.0 feet below the top of the well casing in April 2008, and from 8.0 to 10.0 feet in December 2008. However, the groundwater elevation and gradient cannot be determined because the Discharger has not surveyed the wells. Based on regional groundwater maps prepared by the Department of Water Resources, it appears that there is no well directly downgradient of the planned effluent storage pond.

The groundwater analytical data for the effluent recycling site data show high spatial and temporal variability despite the fact that the discharge has not yet begun. The primary purpose

of the data is to provide an understanding of pre-discharge groundwater quality, which will serve as a baseline to assess post-discharge data.

The Discharger has not evaluated the existing groundwater monitoring data to determine whether the wastewater treatment plant has unreasonably degraded the underlying groundwater. It is appropriate to require that the Discharger install additional monitoring wells as needed at the effluent recycling site. It is also appropriate, after sufficient data have been collected, to require a formal determination of background groundwater quality and the degree to which degradation has occurred. This Order requires that the Discharger continue monitoring groundwater at the treatment plant and complete a formal determination of background groundwater quality and the degree to which degradation has occurred.

Basin Plan, Beneficial Uses, and Water Quality Objectives

Surface water drainage is to Lurline Creek, which is tributary to the Colusa Basin Drain. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board.

The Basin Plan encourages water recycling where practicable. Upon completion of the planned improvements, the Discharger will recycle all effluent for beneficial uses.

Antidegradation Analysis

State Water Resources Control Board Resolution No. 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 68-16) prohibits degradation of groundwater unless it has been shown that:

1. The degradation is consistent with the maximum benefit to the people of the State;
2. The degradation will not unreasonably affect present and anticipated future beneficial uses;
3. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and
4. The discharger employs best practicable treatment or control (BPTC) to minimize degradation.

Resolution 68-16 prohibits degradation of groundwater quality as it existed in 1968, or at any time thereafter that groundwater quality was better than in 1968, other than degradation that was previously authorized. An antidegradation analysis is required for a new discharge location, and/or an increased volume of waste and/or an increased concentration of waste constituents.

Degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after effective source control, treatment, and control is consistent with maximum benefit to the people of the State. The technology, energy, water recycling, and waste management advantages of municipal utility service far exceed any

benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impact on water quality will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.

There has been a wastewater treatment facility at the current site since before 1958, when the first WDRs were issued. Although the Discharger has been monitoring groundwater quality at the current WWTF site since 2002, the data have not been evaluated to statistically determine background groundwater quality. The Discharger has also performed some pre-discharge groundwater monitoring at the proposed effluent recycling site. However, the data for that site are not sufficient to determine background groundwater quality.

The Discharger currently provides treatment and control of the discharge that incorporates:

1. Alarm and backup power systems to prevent bypass or overflow;
2. Secondary treatment of the wastewater; and
3. Disinfection.

When the improvements project is complete, the facility will provide the following additional treatment and control measures:

1. Improved treatment reliability; and
2. Recycling of all treated effluent for beneficial uses.

However, the Discharger has not implemented any source control and the wastewater treatment plant and effluent storage ponds do not incorporate any specific measures to reduce the potential for groundwater degradation. The RWD states that the effluent storage pond will be constructed from native clay soils compacted to achieve an estimated saturated permeability rate of 10^{-6} cm/sec. However, the RWD did not specify the thickness of the bottom liner or construction quality assurance procedures to ensure consistent and proper liner placement/compaction or verify the as-built permeability rate. Therefore, the degree of water quality protection provided by this liner cannot be determined. This Order requires the Discharger to submit a Background Groundwater Quality Study Report and continue groundwater monitoring at the wastewater treatment facility sites to demonstrate whether the clay liners are adequate to protect groundwater from unreasonable degradation due to leakage from the ponds. If groundwater monitoring data shows that the discharge to the ponds has violated the groundwater limitations of this Order, this Order may be reopened to add additional requirements that address the violations.

Additionally, although a certified operator is designated to operate the plant, the operator does not provide adequate supervision of the Operators in Training OITs that perform most operations. Therefore, this Order requires that the Discharger provide the correct grades of certified operators and appropriate supervision for any OITs to ensure proper operation and maintenance of the WWTF.

Surrounding land uses are primarily irrigated agriculture, and these land uses predate the existing WWTF. Based on the limited data available and historic land uses, it is reasonable to expect that agricultural practices have degraded groundwater quality at both sites, and that it will not be possible to determine pre-1968 groundwater quality. Therefore, determination of compliance with Resolution 68-16 for this facility must be based on existing background groundwater quality.

The Discharger cannot fully evaluate existing and potential future impacts to groundwater quality until completion of the WWTF improvements and additional hydrogeologic studies. The limited antidegradation analysis below indicates that the proposed discharge may comply with the Basin Plan. However, this Order includes interim groundwater limitations that are effective immediately and do not allow exceedance of Basin Plan water quality objectives. Final Groundwater Limitations, which will become effective on 30 December 2014, are the Basin Plan water quality objectives or existing background groundwater concentrations, whichever is greater.

Constituents of concern that have the potential to degrade groundwater include salts (primarily EC, sodium, and chloride), nutrients and coliform organisms, as discussed below:

1. The EC of the effluent has averaged approximately 1,800 umhos/cm over the last five years. The maximum annual average EC during that period was 1,942 umhos/cm, whereas the EC of the water supply ranged from 920 to 1,200 umhos/cm. Therefore, the discharge has the potential to cause violation of water quality objectives for salinity.
2. For nutrients such as nitrate, the potential for unreasonable degradation depends not only on the quality of the treated effluent, but the ability of the vadose zone below the effluent storage/disposal ponds to provide an environment conducive to nitrification and denitrification to convert the effluent nitrogen to nitrate and the nitrate to nitrogen gas before it reaches the water table. Groundwater monitoring data for the wastewater treatment plant site do not indicate unreasonable degradation due to nitrate, and the crops grown at the water recycling site should remove most of the nitrogen in the applied wastewater. However, groundwater is quite shallow at the wastewater treatment plant and the planned effluent recycling site, so there is some threat that the discharge could cause a violation of the Maximum Contaminant Level for nitrate in shallow groundwater.
3. For coliform organisms, the potential for exceedance of the Basin Plan's numeric water quality objective depends on the level of disinfection provided and the ability of vadose zone soils below the treatment plant and effluent storage ponds and saturated soils within the shallow water bearing zone to provide adequate filtration. Groundwater monitoring data for the wastewater treatment plant indicates that the shallow soils beneath the treatment ponds (which are unlined and contain undisinfected wastewater) may not provide sufficient filtration. Groundwater conditions at the effluent storage pond site are similar and the effluent storage pond is designed to contain up to 14 feet of effluent. The higher hydraulic head in the effluent storage pond will increase the risk of degradation. However, as noted above, statistical analysis of the data is required to make that determination. This Order requires that the Discharger continue to disinfect treated effluent unless and until it is demonstrated that disinfection is not required to

protect public health and groundwater quality. Disinfection would reduce the potential threat, but the use of sodium hypochlorite will also increase the salinity of the effluent and create trihalomethanes, neither of which is desirable. Additionally, disinfection will not prevent coliform impacts at the treatment plant site because treatment will take place in clay-lined ponds prior to disinfection. Depending on the outcome of the groundwater data analysis, it may be necessary to provide less permeable liners for the treatment ponds and/or change the method of disinfection.

Although this Order allows expansion of the WWTF, the growth rate used for the design is moderate and the primary purpose of the project is to eliminate a long-standing permitted discharge to surface waters rather than to accommodate growth. Sufficient reason exists to accommodate this growth as long as the discharger completes an antidegradation analysis and selects and implements appropriate salinity reduction and BPTC measures within a reasonable timeframe. It is also appropriate to allow some groundwater degradation as long as it is consistent with the Basin Plan and Resolution No. 68-16 because economic prosperity of local communities and associated industry is of benefit to the people of California. This Order establishes terms and conditions of discharge to ensure that the discharge does not unreasonably affect present and anticipated uses of groundwater and includes groundwater limitations that apply water quality objectives established in the Basin Plan to protect beneficial uses. This Order establishes effluent limitations that are protective of the beneficial uses of the underlying groundwater, requires a groundwater quality evaluation and determination of the need for salinity reduction, and requires groundwater monitoring to quantify any water quality impacts. Following completion of the work required by the time schedule contained in the Provisions, this Order will be reopened, if necessary, to reconsider effluent limitations and other requirements to comply with Resolution 68-16. Based on the existing record, the discharge is consistent with the antidegradation provisions of Resolution 68-16.

Title 27

Title 27, CCR, section 20005 et seq. (Title 27) contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of classified waste, requires monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent in a classified waste is acceptable under Title 27 regulations.

Discharges of domestic sewage and treated effluent can be treated and controlled to a degree that will not result in unreasonable degradation of groundwater. For this reason, they have been conditionally exempted from Title 27. Treatment and storage facilities for sludge that are part of the WWTF are considered exempt from Title 27 under section 20090(a), provided that the facilities not result in a violation of any water quality objective. However, residual sludge (for the purposes of the proposed Order, sludge that will not be subjected to further treatment by the WWTF) is not exempt from Title 27. Solid waste (e.g., grit and screenings) that results from treatment of domestic sewage and industrial waste also is not exempt from Title 27. This residual sludge and solid waste are subject to the provisions of Title 27.

Accordingly, the municipal discharge of effluent and the operation of treatment or storage facilities associated with a municipal wastewater treatment plant can be allowed without requiring compliance with Title 27, but only if the resulting groundwater degradation is in accordance with the Basin Plan.

Discharge Prohibitions, Specifications and Provisions

The Discharger's water balance capacity analysis indicates that the upgraded WWTF will provide the following capacities:

<u>Condition</u>	<u>Capacity</u>
Average daily flow	0.332 mgd
Average daily dry weather flow ¹	0.224 mgd
<u>Peak wet weather flow</u>	1.50 mgd

¹ June through September, inclusive.

However, the model shows that I/I is critical to the WWTF's effluent disposal capacity. Therefore, it is appropriate to require that the Discharger continue its I/I reduction efforts, including requiring property owners to correct I/I associated with property laterals not owned by the Discharger.

The effluent limits for BOD of 30 mg/L monthly average and 90 mg/L daily maximum are based on reasonable expectations of performance of the secondary treatment system.

As noted above, the EC of the treated effluent is not currently within the generally accepted range of 500 umhos/cm over the EC of the water supply. This Order imposes an effluent limit of 1,950 umhos/cm as an annual average, which accommodates the temporal variability of the effluent EC without allowing any overall increase.

The proposed Order prescribes groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. The limitations require that the discharge not cause or contribute to exceedance of these objectives or natural background water quality, whichever is greatest.

The Provisions require submittal of certain technical reports to verify completion of the improvements project and compliance with requirements to install monitoring wells, evaluate groundwater quality, and implement salinity reduction and/or BPTC measures as necessary to comply with the groundwater limitations.

The Monitoring and Reporting Program is designed to verify compliance with effluent limitations, groundwater limitations, and operational requirements of the WDRs.