

CALIFORNIA REGIONAL WATER QUALITY CONTROL REGIONAL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2007-0149

WASTE DISCHARGE REQUIREMENTS

FOR
KNIGHTS LANDING COMMUNITY SERVICES DISTRICT
KNIGHTS LANDING WASTEWATER TREATMENT FACILITY
YOLO COUNTY

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

1. On 5 April 2007, the Knights Landing Community Services District (hereafter Discharger) submitted a Report of Waste Discharge (RWD) for the expansion of an existing wastewater treatment facility (WWTF) that serves the town of Knights Landing. Additional information was received from the Discharger on 21 May 2007.
2. The Discharger owns and operates the WWTF and is responsible for compliance with these waste discharge requirements (WDRs).
3. The WWTF is ½ mile south of County Road 116 near Knights Landing, in Section 23, T11N, R2E, MDB&M. The facility site location is shown on Attachment A, which is attached hereto and made part of this Order by reference. The facility occupies Assessor's Parcel No. 056-017-39.
4. WDRs Order No. 94-020, adopted by the Regional Water Board on 28 January 1994, prescribes requirements for the Discharger's WWTF and the discharge of treated effluent to evaporation/percolation ponds and a 31.5-acre spreading basin. The Discharger proposes to expand the facility to accommodate planned development in the community. Therefore, Order No. 94-020 will be rescinded and replaced with this Order.
5. For the purposes of this Order, "WWTF" shall mean the main sewage lift station; the wastewater treatment, storage, and disposal ponds; and the land spreading area.

Existing Facility and Discharge

6. Sewage from the community flows by gravity sewer to a wet well lift station at the WWTF, which has two pumps to pump the wastewater to the WWTF. The existing WWTF consists of eight wastewater stabilization ponds¹ on approximately 20 acres and a 31.5-acre spreading basin. The facility site plan is shown on Attachment B, which is attached hereto and made part of this Order by reference.

¹ Laugenour and Meikle, the engineers of record for the WWTF, developed a particular pond numbering system, and have consistently used that system in the RWD and all design and record drawings. However, the Discharger uses a different pond numbering system for operation and monitoring purposes, and has done so for several years. In order to be consistent with the Discharger's actual operations, this Order uses the Discharger's pond numbering system. Therefore, pond numbers used in the Findings of this Order may not match those used in the RWD. Attachment B shows both numbering systems.

7. The stabilization ponds are operated as two parallel passive stabilization systems with four ponds each. Influent wastewater is split between the two primary ponds, which have a total depth of 11 feet and an operating depth of eight feet (including accumulated sludge). The other six ponds have a total depth of eight feet and a five-foot operating depth. According to the RWD, three feet of freeboard is maintained at all times.
8. The 31.5-acre spreading basin receives overflow from the eight existing ponds during the wet season only. The berm that surrounds the spreading area is approximately three feet above the surrounding grade and the depth varies from three to five feet below the top of the containment berm.
9. The WWTF does not use aerators or other active treatment systems. Reduction of biochemical oxygen demand (BOD) and total suspended solids (TSS) is achieved through atmospheric oxygen diffusion during extended retention in the WWTF ponds. The wastewater is not disinfected.
10. An influent flow meter was installed in February 2007. Prior to that, the Discharger estimated influent flows based on pump run times. The winter of 2006/2007 was a relatively dry season with only 8.6 inches of rain from November 2006 through March 2007 and little rainfall thereafter. Therefore, flow monitoring data collected by the Discharger from April 2007 through June 2007 may provide the most accurate estimate of the current average daily dry weather flow. Based on these data, the current average daily dry weather flow is estimated to be 80,000 gallons per day (gpd). This estimate correlates well with the average daily dry weather flows for 2005 and 2006, which were developed based on pump run time estimates.
11. There is not sufficient accurate flow monitoring data to assess wet weather influent flows as a function of precipitation. However, the influent pump run time and monthly precipitation data for the unusually wet winter of 2005/2006 indicate a strong precipitation-dependent increase in influent flows with a lag of three to four months. This indicates that rising groundwater levels during extended periods of heavy rainfall can cause significant infiltration of groundwater into the Knights Landing sanitary sewer system. It also indicates that the lowest monthly influent flows for this facility can be expected to occur in August through October each year unless the infiltration rate is reduced from current levels.
12. Based on the infiltration and inflow (I/I) estimation method required per the Yolo County Improvement Standards, the RWD estimated the daily infiltration rate at 27,000 gpd from November through April during normal rainfall years. This appears to be reasonable as a preliminary estimate. However, further flow monitoring over several years, including some years with higher than normal precipitation, is needed to provide data for a more thorough analysis of I/I and its potential impact on WWTF capacity.
13. In 2002, 119 tons of sludge were removed from Pond 1 and disposed of at a local landfill. In 2005, 289 tons of sludge were removed from Pond 2 and similarly disposed. The RWD estimates that sludge removal should be undertaken again in 2012, and proposes to use part of the spreading basin as a temporary sludge drying bed during the summer. Ponds 1

and 2 are the primary ponds and can be expected to accumulate sludge faster than the “downstream” ponds. Sludge levels in the other six ponds have not been evaluated. Because the ponds are operated as two sets of four ponds in series, the six “downstream” ponds can also accumulate sludge, which might ultimately affect the capacity of the WWTF. Therefore, it is appropriate to require that the Discharger periodically evaluate sludge levels in all wastewater ponds and remove sludge as needed to ensure adequate capacity.

Chemical Characteristics

14. Based on analytical results for three samples (one from each supply well), which were tested in February 2006, the chemical character of the municipal water supply, which is obtained from three groundwater wells, is summarized below.

Parameter	Units	Range of Results
Total dissolved solids	mg/L	320 to 760
Electrical conductivity ¹	umhos/cm	500 to 1,200
Total hardness	mg/L	101 to 416
Total alkalinity	mg/L	238 to 271
Boron	ug/L	880 to 1,760
Calcium	mg/L	19 to 63
Chloride	mg/L	38 to 200
Magnesium	mg/L	13 to 63
Sodium	mg/L	66 to 83
Iron	ug/L	<100 to 130
Manganese	ug/L	20 to 140
Nitrate	mg/L	<2 to 2.3
Sulfate	mg/L	14 to 100

¹ Estimated from TDS concentrations using and assumed conversion factor of 1.56.

The community water supply is moderately saline and moderately hard, and high concentrations of boron were reported. The reason for the apparent wide variation between the wells is not known, but may be associated with different well designs (i.e., dissimilar depths and/or screened intervals). The prevalence of non-regenerating water softeners, which can contribute excess salinity to the WWTF influent, is not known.

15. According to the RWD, commercial and industrial wastewater contributions to the WWTF are minimal, and influent wastewater quality is most similar to typical domestic wastewater. Influent characterization data for 18 wastewater samples analyzed between February and June 2007 are summarized below.

Constituent/Parameter	Analytical Results		
	Minimum	Maximum	Mean
BOD (mg/L)	59	700	292
Total Suspended Solids (mg/L)	42	1,100	337
Electrical Conductivity (umhos/cm) ¹	931	1,519	1,249

Analytical Results (single sample ²)	
Sodium, mg/L	96
Iron, ug/L	560
Boron, ug/L	1,500
Chloride, mg/L	122
Manganese, ug/L	40
Total nitrogen, mg/L	9
Total suspended solids, mg/L	101

¹ Based on monitoring results for the two primary ponds (Ponds 1 and 2).

² Based on a single sample obtained in March 2007.

The cause of the apparent large variation in BOD, TSS, and electrical conductivity in the two primary ponds is not known. However, because the influent samples are taken as grab samples from the ponds, the variability may be due to changes in the dilution/evapoconcentration state of the wastewater associated with weather variation through the year. Based on these data, use of the municipal water supply does not appear to cause an unreasonable incremental increase in salinity as measured in the WWTF influent.

16. Effluent characterization data for 17 wastewater samples analyzed between February and June 2007 are summarized below.

Constituent/Parameter	Analytical Results ¹		
	Minimum	Maximum	Mean
Electrical Conductivity (umhos/cm)	1,329	2,184	1,600

Analytical Results (single sample ²)	
Sodium, mg/L	199
Boron, ug/L	2,700
Chloride, mg/L	217
Total nitrogen, mg/L	9

Constituent/Parameter	Analytical Results ¹		
	Minimum	Maximum	Mean
Total suspended solids, mg/L		101	

¹ Based on monitoring results for 18 wastewater samples taken from the last two ponds (Ponds 7 and 8).

² Based on a single sample obtained in May 2007.

The electrical conductivity, sodium, boron, and chloride data indicate that evapoconcentration as the wastewater flows from the primary ponds through to the final ponds increases the overall salinity of the wastewater significantly beyond concentrations that would be considered a reasonable increment over the water supply concentrations.

Planned Changes in Discharge

17. The Discharger plans to expand the existing WWTF to serve a new residential subdivision. The subdivision is expected to increase the population served by the WWTF from approximately 1,018 to 1,320.
18. The WWTF treatment and disposal capacity will be increased by converting part of the existing 31.5-acre land spreading area to two percolation/evaporation ponds (Ponds 9 and 10). The remainder will continue to be used as land spreading area when needed. The walls of the headworks structure will be raised by one foot to provide 100-year flood protection. The rest of the WWTF is outside the 100-year floodplain.
19. Pond 9 will have a surface area of approximately 5.0 acres and a maximum volume of 31 acre-feet at two feet of freeboard. Pond 10 will have a surface area of approximately 4.5 acres and a maximum volume of 30 acre-feet at two feet of freeboard.
20. The Discharger has completed a water balance for the expanded facility to demonstrate that adequate treatment, storage and disposal capacity is available for the new subdivision and other future developments. The water balance was prepared based on reasonable estimates of site-specific influent flows, precipitation, evaporation, percolation, and groundwater infiltration into the sewer system. The water balance was used to model storage and disposal capacity during the 100-year, 365-day precipitation event. The model indicates that the expanded WWTF will have sufficient capacity for 105,000 gpd as an average daily dry weather flow (from August through October each year) and 48.4 million gallons (MG) as a total annual influent flow (including I/I).
21. The WWTF Operation and Maintenance Manual submitted with the Report of Waste Discharge is over 30 years old and needs to be updated to address the expansion and other facility improvements, and to delete references to waste management practices that are no longer allowed (e.g., onsite burial of scum and sludges with dead animals).

22. According to the RWD, the lift station wet well, wet well overflow sump, and sewer system provide a reserve storage capacity of approximately eight hours at current influent flows. In the event of a power failure, a standby generator and pump can be used to transfer sewage from the wet well to the primary ponds. The Discharger plans to install an autodialer system to notify the plant operator of any alarm conditions.

Wastewater Collection System

23. The Knights Landing sewer system consists of 6-, 8-, and 10-inch vitrified clay pipe that connects to a 12-inch gravity interceptor. The interceptor discharges into the main lift station at the WWTF for distribution to the treatment ponds.
24. 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*. The Internet web location for State Water Board Order No. 2006-0003-DWQ is:
http://www.waterboards.ca.gov/resdec/wqorders/2006/wqo/wqo2006_0003.pdf.
25. 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.
26. 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.
27. The Discharger is expected to take all necessary steps to adequately maintain, operate, and prevent discharges from its sanitary sewer collection system. This Order requires the Discharger to prepare and implement a *Sewer System Management Plan (SSMP)* consistent with State Water Board Order No. 2006-0003-DWQ. Although State Water Board Order No. 2006-0003-DWQ does not require that the overflow emergency response program portion of the SSMP be completed before February 2010, it is appropriate to require that the Discharger submit this portion of the SSMP sooner because the Discharger currently has no specific plan to respond to sanitary sewer overflows. Because

of the small size of the sewer system, requiring this portion of the SSMP earlier will not be overly burdensome to the Discharger.

Site-Specific Conditions

28. The WWTF site is at an elevation ranging from approximately 26 to 28 feet mean sea level (MSL), and the area is relatively flat with drainage toward the Sacramento River. Because of the extensive levee protection in the area, drainage enters agricultural drains from where it can be pumped into the river.
29. The facility is adjacent to the Knights Landing Ridge Cut, which carries drainage from local agricultural fields into the Sacramento River.
30. Annual precipitation in the vicinity averages approximately 17 inches. The 100-year total annual precipitation is approximately 32 inches. The reference evapotranspiration rate is approximately 55 inches per year.
31. Based on the National Resource Conservation Service soil survey, the soils at the WWTF are Clear Lake clay, Sacramento clay (drained), and Sycamore silty clay loam (drained). Published infiltration rates for the soils are less than 0.6 inches per hour (or 14.4 inches per day). The RWD estimates that the wastewater pond percolation rates are 3.0 inches per day as a sustained pond percolation rate.
32. After the headworks improvements have been completed, all portions of the WWTF will be outside the 100-year flood zone.
33. The WWTF is surrounded by agricultural fields.

Groundwater Considerations

34. There are currently three groundwater monitoring wells at the facility, which were installed in 1986 (see Attachment B). The three wells are completed to a depth of approximately 70 feet below the top of the wastewater pond berm, and are screened from 15 to 65 feet below that reference elevation.
35. Based on the RWD's analysis of groundwater monitoring data for April 2000 through November 2006, groundwater elevations at the WWTF typically range between 16.5 and 23.7 feet above mean sea level (MSL), which corresponds to a groundwater depth ranging from 7 to 14 feet below the surrounding (undisturbed) ground surface.
36. The gradient direction of the shallow groundwater varied from east to southwest, but did not exhibit a consistent seasonal variation. The gradient magnitude varied from 0.002 to 0.0003 ft/ft. The Knights Landing Ridge Cut, which parallels the WWTF along its entire length (see Attachment B), may strongly influence groundwater levels and flow directions.
37. Based on the shallow depth of the water table, the variable groundwater flow direction, and the proximity of the wells to the wastewater ponds, none of the three wells is

consistently upgradient or downgradient of the discharge area. Monitoring well MW-1, at the northwest end of the WWTF, is predominantly upgradient, but is within about 40 feet of the primary ponds. MW-2 is near the southeast corner of the first eight ponds, and is sometimes down gradient of the ponds. MW-3, near the southwest corner of the first eight ponds, is also sometimes downgradient of the ponds. Recent groundwater monitoring data (six events from February 2006 through May 2007) are summarized below.

Constituent/Parameter	Range of Analytical Results ¹			Applicable Water Quality Limit ^{1, 2}
	MW-1	MW-2	MW-3	
Total coliform organisms ³	<2 to >1,600	<2 to >1,600	<2 to 130	2.2
Electrical conductivity ⁴	1,080 to 1,220	1,600 to 2,030	1,700 to 2,020	700
Total dissolved solids ⁵	650 to 710	990 to 1,020	1,010 to 1,040	450
Nitrate nitrogen	<0.45 to 2.3	<0.1 to 3.8	<0.1 to <0.45	10
Sodium ⁶	3	302	350	69
Iron ^{6, 7}	<50	80	60	300
Boron ^{6, 7}	2,740	4,310	3,890	700
Chloride ⁶	44	280	228	106
Manganese ^{6, 7}	540	770	250	50

¹ mg/L except as noted.

² Water quality limit to apply the narrative water quality objectives specified in the Basin Plan for protection of the beneficial uses of groundwater.

³ MPN per 100 mL.

⁴ umhos/cm.

⁵ Results are from two monitoring events in February and May 2007.

⁶ Results are from one monitoring event in February 2007.

⁷ ug/L

Despite the apparent inadequacy of the existing monitoring well network, the results for electrical conductivity, total dissolved solids, sodium, iron, chloride, and manganese strongly indicate that the WWTF has degraded groundwater quality. In the case of sodium and chloride, the degradation appears to have exceeded the applicable water quality limit. Additionally, coliform organisms were routinely detected in wells MW-2 and MW-3, whereas they were only detected in MW-1 once.

Therefore, it is appropriate to require that the Discharger install additional monitoring wells designed to consistently monitor groundwater up- and downgradient of the wastewater ponds, including the two new ponds. 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. In the interim, it is appropriate to require that the Discharger not allow the salinity of the influent and effluent to increase, and to require that the Discharger develop and begin to implement a salinity minimization plan.

Antidegradation Analysis

38. State Water Board Resolution No. 68-16 (“Policy with Respect to Maintaining High Quality Waters of the State”) (hereafter Resolution No. 68-16) requires a regional water board in regulating the discharge of waste to maintain high quality waters of the state (i.e., background water quality) until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than as described in plans and policies, including water quality objectives in the applicable Basin Plan. The discharge is required to meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and highest water quality consistent with maximum benefit to the people will be maintained. It is the responsibility of the Discharger to provide information for the Regional Water Board to evaluate whether any degradation caused by the discharge is consistent with this policy, as well as the amount of degradation that would be consistent.
39. There is evidence that the existing WWTF has degraded groundwater quality with respect to salinity indicators (electrical conductivity, total dissolved solids, sodium, chloride, and boron); iron and manganese (indicators of acidic or reducing soil conditions in the limited vadose zone below the ponds), and coliform organisms (pathogen indicators that have not been adequately filtered due to the limited depth of fine-grained soils below the WWTF). In the case of certain salinity indicators (electrical conductivity, total dissolved solids, sodium, and chloride), it appears that the discharge has caused groundwater to exceed the applicable water quality limits.
40. Some degradation of groundwater beneath the WWTF is consistent with Resolution No. 68-16 provided that degradation:
 - a. Is confined to a reasonable area;
 - b. Is minimized by means of full implementation, regular maintenance, and optimal operation of best practicable treatment and control (BPTC) measures;
 - c. Is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations of this Order; and
 - d. Does not result in water quality less than that prescribed in the applicable Basin Plan.
41. In general, some 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 California. 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. Degradation of groundwater by constituents (e.g., toxic chemicals) other than those specified in the groundwater limitations in this Order, and by constituents that can be effectively removed by conventional treatment (e.g., total coliform bacteria) is inconsistent

with maximum benefit and/or BPTC. When allowed, the degree of degradation permitted depends upon many factors (i.e., background water quality, the waste constituent, the beneficial uses and most stringent applicable water quality objective, source control measures, waste constituent treatability).

42. This Order acknowledges that some degradation may occur as a result of the discharge of wastewater to land, but the Regional Board finds that such degradation at this facility is consistent with the maximum benefit to the people of the state. Economic prosperity of local communities and associated industry is of benefit to the people of California, and therefore sufficient reason exists to accommodate growth and some groundwater degradation, provided that the terms of the Basin Plan and the factors in Finding No. 40 are met. This Order is consistent with State Water Board policy.

Treatment and Control Practices

43. The facility treats wastewater to secondary standards through passive treatment, but its design and the Discharger's operational practices do not incorporate any specific measures to reduce the potential for groundwater degradation. Because of the shallow water table, there is minimal potential for constituent attenuation in the vadose zone, and there is evidence that groundwater has been degraded. In addition, the appropriate level of degradation that complies with Resolution No. 68-16 has not been fully evaluated. Therefore, the Discharger's current effort probably does not constitute BPTC as intended in Resolution No. 68-16, and is it appropriate for this Order to establish a schedule for tasks to formally evaluate groundwater degradation, develop and begin to implement a salinity reduction program, and evaluate BPTC for the other constituents that have degraded groundwater quality (iron, manganese, boron, and coliform organisms). Completion of these tasks, and implementation of the approved strategies developed from that work, will ensure that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved.
44. This Order establishes interim effluent limitations for salinity and interim groundwater limitations that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. The Provisions of this Order contain tasks for assuring that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved. Accordingly, the discharge is consistent with the antidegradation provisions of Resolution No. 68-16. Based on the results of the scheduled tasks, the Regional Water Board may reopen this Order to reconsider effluent and groundwater limitations and other requirements to comply with Resolution No. 68-16.

Basin Plan, Beneficial Uses, and Regulatory Considerations

45. 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 California Water Code, waste discharge requirements must implement the Basin Plan.

46. Surface water drainage is to the Sacramento River near its confluence with the Colusa Basin Drain. The beneficial uses of that reach of the Sacramento River are municipal and domestic supply; agricultural supply; water contact recreation; noncontact water recreation; warm and cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; and navigation.
47. The beneficial uses of the underlying groundwater are municipal and domestic supply (MUN), agricultural supply (AGR), and industrial supply (IND and PRO).
48. The Basin Plan establishes numerical and narrative water quality objectives for surface water and groundwater within the basin. Numerical water quality objectives are maximum limits directly applicable to the protection of designated beneficial uses of the water. The Basin Plan requires that the Regional Water Board, on a case-by-case basis, follow specified procedures to determine maximum numerical limitations that apply the narrative objectives when it adopts waste discharge requirements.
49. The Basin Plan includes a water quality objective for Bacteria that 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. The numerical value of this objective is equal to the limit of analytical detection for coliform organisms in water. Well sited and operated facilities that discharge treated domestic wastewater to land should not cause detectable levels of coliform organisms in groundwater due to adequate filtration in the vadose zone. Therefore, a coliform limit of less than 2.2 MPN/100 mL is consistent with both the water quality objective for Bacteria and antidegradation directives of State Water Board Resolution No. 68-16.
50. The Basin Plan includes a water quality objective for Chemical Constituents that, at a minimum, requires waters designated as domestic or municipal supply to meet the maximum contaminant levels (MCLs) specified in the following provisions of Title 22, California Code of Regulations: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, Table 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) of Section 64449, and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. The Basin Plan's incorporation of these provisions by reference is prospective, and includes future changes to the incorporated provisions as the changes take effect. The Basin Plan recognizes that that the Regional 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.
51. The Basin Plan contains narrative water quality objectives for Chemical Constituents, Tastes and Odors, and Toxicity. The Toxicity objective, in summary, 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. The Chemical Constituents objective requires that groundwater "...shall not contain chemical constituents in concentrations that adversely affect beneficial uses." The Tastes and Odors objective requires that groundwater "...shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses."

52. Chapter IV, Implementation, of the Basin Plan contains the "Policy for Application of Water Quality Objectives." This Policy specifies, in part, that "[w]here compliance with these narrative objectives is required (i.e., where the objectives are applicable to protect specified beneficial uses), the Regional Water Board will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives." The Policy also states:

"[t]o evaluate compliance with the narrative water quality objectives, the Regional Water Board considers, on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations..." and

"[i]n considering such criteria, the Board evaluates whether the specific numerical criteria, which are available through these sources and through other information supplied to the Board, are relevant and appropriate to the situation at hand and, therefore, should be used in determining compliance with the narrative objective. For example, compliance with the narrative objective for taste and odor may be evaluated by comparing concentrations of pollutants in water with numerical taste and odor thresholds that have been published by other agencies."

53. To apply narrative water quality objectives, interim numerical limits in this order have been selected based on case-specific information, including applicable beneficial uses of groundwater beneath the facility and information provided by the Discharger. Based on the information available and consistent with Resolution No. 68-16, interim numerical limits have been selected to protect the beneficial uses and prevent degradation. State Water Board Resolution No. 68-16 requires that existing water quality be maintained unless specific demonstrations are made, and does not allow degradation that would impair beneficial uses or violate applicable policies, including water quality objectives. In the future, should the Discharger supply case-specific information justifying that alternate limits are more appropriate, these interim numerical limits may be reevaluated.
54. State Board Order No. WQO-2003-0014 upheld the Regional Board's use of numeric groundwater limits, and states that numeric groundwater limits must be restricted to those constituents present in the waste, breakdown products of constituents present in the waste, and those that might be leached from the soil beneath the wastewater disposal area. The Groundwater Limitations of this Order comply with State Board Order No.

WQO-2003-0014, as described below. Additional information regarding each of these chemicals is found in the Information Sheet.

- a. Monitoring data provided in the RWD show that boron is present in the WWTF effluent. Boron occurs naturally in waters, and is known to be present in the cleaning products used in domestic households². Boron has been found in the WWTF effluent at a concentration of 2.7 mg/L. Boron has the potential to degrade groundwater quality at this site because there is little ability for attenuation in the vadose zone. The groundwater underlying the facility has the designated beneficial use of agricultural supply. According to Ayers and Westcot³, boron can cause yield or vegetative growth reductions of sensitive crops if present in excess of 0.7 mg/L in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of boron is the narrative Chemical Constituents objective, which is applied following the “Policy of Application of Water Quality Objectives” in the Basin Plan. A numerical groundwater limitation of 0.7 mg/L for boron, based on Ayers and Westcot, is relevant and appropriate to apply the narrative Chemical Constituents objective to protect agricultural use of groundwater in the absence of information to support less protective limits.

- b. Monitoring data provided in the RWD show that chloride is present in the WWTF effluent. Additionally, chloride is known to be present in domestic wastewater, as it is one of the major components of total dissolved solids. Chloride is a major anion in natural water and wastewater, and is added to the waste stream because sodium chloride is present in the human diet and is excreted unchanged from the human body^{2,4}. Chloride concentrations at other facilities vary depending on the salinity of the source water and the activities resulting in wastewater discharge. Chloride has been found in the wastewater at a concentration of 217 mg/L. Chloride has the potential to degrade groundwater quality at this site because there is little ability for attenuation in vadose zone. According to Ayers and Westcot, chloride can cause yield or vegetative growth reductions of sensitive crops if present in excess of 106 mg/L in irrigation water applied by sprinklers, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of chloride is the narrative Chemical Constituents objective, which is applied following the “Policy of Application of Water Quality Objectives” in the Basin Plan. A numerical groundwater limitation of 106 mg/L for chloride, based on Ayers and Westcot, is relevant and appropriate to apply the narrative Chemical Constituents objective to protect agricultural use of groundwater in the absence of information to support less protective limits.

² American Public Health Association et al., 1985. Standard Methods for the Examination of Water and Wastewater, 16th Edition.

³ Ayers, R.S. and D.W. Westcot, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations- Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985). This paper contains the results of studies of the impacts of various chemicals on agricultural uses including crop irrigation and stock watering. Therefore, it is appropriate to use the data contained therein to apply the narrative Chemical Constituent water quality objective.

⁴ Metcalf and Eddy, 2003. Wastewater Engineering Treatment and Reuse, 4th Edition.

- c. The Discharger has not yet sampled its effluent for iron. Iron is naturally occurring in all waters due to its presence in soils and rock², and is liberated from the soil under reducing conditions associated with the biodegradation of organic matter. Iron is known to be present in domestic wastewater, and at other domestic wastewater facilities has been found at concentrations ranging from 70 to 190 ug/L. It is also expected to be present in the effluent from this facility. Iron has the potential to degrade groundwater quality at this site because there is little ability for attenuation in the vadose zone. The Chemical Constituents objective prohibits concentrations of chemical constituents in excess of California MCLs in groundwater that is designated as municipal or domestic supply. The California secondary MCL for iron is 0.3 mg/L, and groundwater beneath the facility is designated as municipal or domestic supply. It is therefore appropriate to adopt a numerical groundwater limitation of 0.3 mg/L for iron to implement the Chemical Constituents objective to protect the municipal and domestic use of groundwater.
- d. The Discharger has not yet sampled its effluent for manganese. Manganese occurs naturally in waters and is added to the waste stream through both domestic and industrial use². Manganese has been found at other domestic wastewater treatment facilities at concentrations ranging from 2 to 21 ug/L, and is expected to be present at this facility. Manganese has the potential to degrade groundwater quality at this site because there is little ability for attenuation in the vadose zone. In addition, naturally occurring manganese can be solubilized from soil under reducing conditions caused by the land disposal of domestic wastewater, and is more prevalent in dissolved forms in groundwater². The Chemical Constituents objective prohibits concentrations of chemical constituents in excess of California MCLs in groundwater that is designated as municipal or domestic supply. The California secondary MCL for manganese is 0.05 mg/L, and groundwater beneath the facility is designated as municipal or domestic supply. It is therefore appropriate to adopt a numerical groundwater limitation of 0.05 mg/L (50 ug/L) for manganese to implement the Chemical Constituents objective to protect the municipal and domestic use of groundwater.
- e. Monitoring data provided in the RWD show that sodium is present in the WWTF effluent. Additionally, sodium is known to be present in domestic wastewater, as it is one of the major components of total dissolved solids. Sodium is a major cation in natural water, due to its prevalence in the earth's crust, and in wastewater because sodium chloride is present in the human diet and is excreted unchanged by the body². Sodium concentrations at other domestic wastewater facilities vary depending on the salinity of the source water and the activities resulting in wastewater discharge. Sodium has been found in the wastewater at this facility at a concentration of 199 mg/L. Sodium has the potential to degrade groundwater quality at this facility because there is little ability for attenuation in vadose zone. According to Ayers and Westcot, sodium can cause yield or vegetative growth reductions of sensitive crops if present in excess of 69 mg/L in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of chloride is the narrative Chemical Constituents objective, which is applied following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 69 mg/L for sodium, based on Ayers and Westcot, is relevant

and appropriate to apply the narrative Chemical Constituents objective to protect agricultural use of groundwater in the absence of information to support a less protective limit.

- f. Total dissolved solids, which were found to be present in the wastewater based on electrical conductivity (EC) measurements of up to 2,184 umhos/cm, have the potential to degrade groundwater quality at this site because there is little ability for attenuation in the vadose zone. According to Ayers and Westcot, dissolved solids can cause yield or vegetative growth reductions of sensitive crops if present in excess of 450 mg/L (or 700 umhos/cm EC) in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of total dissolved solids is the narrative Chemical Constituents objective, which is applied following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 450 mg/L for total dissolved solids, based on Ayers and Westcot, is appropriate to apply the narrative Chemical Constituents objective to protect the unrestricted agricultural use of groundwater in the absence of information to support a less protective limit.
- g. The Discharger has not yet sampled its effluent for nitrate. However, total nitrogen was present at a concentration of 9 mg/L. This constituent has the potential to degrade groundwater quality with nitrate because ammonia nitrogen in wastewater readily converts to nitrate and there is little ability for nitrate attenuation in the vadose zone at this site. The Chemical Constituents objective prohibits concentrations of chemical constituents in excess of California MCLs in groundwater that is designated as municipal or domestic supply. The California primary MCL for nitrate is equivalent to 10 mg/L as nitrogen, and groundwater beneath the facility is designated as municipal or domestic supply. It is therefore appropriate to adopt a numerical groundwater limitation of 10 mg/L for nitrate as nitrogen to implement the Chemical Constituents objective to protect the municipal and domestic use of groundwater.
- h. The Discharger has not yet sampled its effluent for nitrite. However, total nitrogen was present at a concentration of 9 mg/L. This constituent has the potential to degrade groundwater quality with nitrite because ammonia nitrogen in wastewater readily converts to nitrate and nitrite and there is little ability for nitrite attenuation in the vadose zone at this site. The Chemical Constituents objective prohibits concentrations of chemical constituents in excess of California MCLs in groundwater that is designated as municipal or domestic supply. The California primary MCL for nitrite is 1 mg/L as nitrogen, and groundwater beneath the facility is designated as municipal or domestic supply. It is therefore appropriate to adopt a numerical groundwater limitation of 1 mg/L for nitrite as nitrogen to implement the Chemical Constituents objective to protect the municipal and domestic use of groundwater.
- i. The Discharger has not yet sampled its effluent for ammonia. However, total nitrogen was present at a concentration of 9 mg/L, which has the potential to degrade groundwater quality with ammonia because total nitrogen includes both ammonia and organic nitrogen (which readily mineralizes to the ammonia form), and there is little

ability for ammonia attenuation in the vadose zone at this site. According to Amoore and Hautala⁵, who evaluated odor of ammonia in water, the odor threshold for ammonia in water is 1.5 mg/L (as ammonia). Concentrations that exceed this value can impair the municipal or domestic use of the resource by causing adverse odors. The applicable water quality objective to protect the municipal and domestic use from discharges of odor producing substances is the narrative Tastes and Odors objective, which is applied following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 1.5 mg/L for ammonia (as ammonia), based on Amoore and Hautala, is relevant and appropriate to apply the narrative Tastes and Odors objective to protect the municipal and domestic use of groundwater.

- j. pH, which is typically 7.0 to 9.5 standard units in oxidation pond domestic wastewater treatment systems, has the ability to degrade groundwater quality at this site because there is little potential for buffering in the limited vadose zone. According to Ayers and Westcot, pH less than 6.5 or greater than 8.4 can cause yield or vegetative growth reductions of sensitive crops if present in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of substances that affect pH is the narrative Chemical Constituents objective, which is applied following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation range of 6.5 to 8.4 for pH, based on Ayers and Westcot, is relevant and appropriate to apply the narrative Chemical Constituents objective to protect unrestricted agricultural use of groundwater in the absence of information to support a less protective limit.

55. The "Antidegradation" section of the attached Information Sheet lists the various waste constituents identified thus far as fitting the restriction of the Findings along with limits of each constituent necessary to protect beneficial uses known to be adversely affected at certain concentrations of the waste constituent in groundwater. The listing identifies the constituent, the beneficial use, and its associated limit, as well as the technical reference for the limit. Some limits may become less stringent when the water supply is limited to certain applications of a beneficial use and due to other case-specific circumstances. However, relaxing limits designed to protect beneficial uses requires additional factual information, which is not currently available. Pursuant to the Controllable Factors Policy in Chapter IV of the Basin Plan, groundwater limitations for each constituent reflect the most stringent listed limit for the waste constituent so as to apply all narrative and numeric water quality objectives, unless natural background quality is worse than the objective, in which case the background level becomes the limitation.

Other Regulatory Considerations

⁵ Amoore, J.E. and E. Hautala, *Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution*, Journal of Applied Toxicology, Vol. 3, No. 6, (1983). These authors studied the concentration of chemicals in air that caused adverse odors, and then calculated the concentration in water that would be equivalent to that amount in air. Therefore, it is appropriate to use the data contained therein to apply the narrative Tastes and Odors water quality objective.

56. 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 plant facilities are designed to contain all storm water runoff that might have contacted the waste regulated under this Order. Because there is no storm water discharge from the industrial portion of the facility, the Discharger is not required to obtain coverage under NPDES General Permit No. CAS000001.
57. 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 will exceed 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.
58. Section 13267(b) of the California Water Code 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. R5-2007-0149" 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.
59. 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.
60. 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.

61. On 19 June 2007, in accordance with the California Environmental Quality Act (Title 14 CCR, Section 15261 et. seq.), Knights Landing Community Services District certified a Negative Declaration for expansion of the wastewater treatment facility to accommodate anticipated growth within its sphere of influence. Mitigation measures were not made a condition of the approval of the project.
62. 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.
63. The Regional Water Board is using the Standards in 40 CFR 503 as guidelines in establishing this Order, but the Regional 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.
64. 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. While the wastewater treatment facility is exempt from Title 27, the data analysis methods of Title 27 are appropriate for determining whether the discharge complies with the terms for protection of groundwater specified in this Order.
65. The discharge authorized herein and the treatment and storage facilities associated with the discharge, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, California Code of Regulations (CCR), Section 20005 et seq. (hereafter Title 27). The exemption, pursuant to Section 20090(a) of Title 27, is based on the following:
 - a. The waste consists primarily of domestic sewage and treated effluent;
 - b. The waste discharge requirements are consistent with water quality objectives; and
 - c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.
66. Pursuant to California Water Code 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

67. All 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.
68. 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.

69. In a public meeting, all comments pertaining to the discharge were heard and considered.

IT IS HEREBY ORDERED that, pursuant to Sections 13263 and 13267 of the California Water Code, Order No. 94-020 is rescinded and Knights Landing Community Services District, its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

[Note: 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.]

A. Discharge Prohibitions

1. Discharge of wastes from any portion of the WWTF and the sanitary sewer system) to surface waters or surface water drainage courses is prohibited.
2. Discharge of waste classified as 'hazardous' under Section 2521, Chapter 15 of Title 23 or 'designated', as defined in Section 13173 of the California Water Code is prohibited.
3. Bypass or overflow of untreated or partially treated waste is prohibited.
4. Discharge of treated wastewater downstream of the treatment plant, other than at the percolation/evaporation ponds and spreading area described in the Findings is prohibited.

B. Discharge Specifications

1. **Effective immediately**, the average daily dry weather flow⁶ shall not exceed 80,000 gpd, and the average daily flow⁷ shall not exceed 120,000 gpd during the months of November through July, inclusive.
2. **Effective upon the Executive Officer's written approval** of the report required pursuant to Provision F.1.a, the average daily dry weather flow shall not exceed 105,000 gpd; the average daily flow shall not exceed 142,000 gpd during the months of November through July, inclusive; and the total annual influent flow shall not exceed 48.4 million gallons.
3. 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.
4. Wastewater treatment, storage, and disposal shall not cause pollution or a nuisance as defined by Section 13050 of the California Water Code (CWC).

⁶ Dry weather is defined as the months of August through October, inclusive.

⁷ Average daily flow is defined as the total flow for the month divided by the number of days in the month.

5. The Discharger shall operate all systems and equipment to optimize the quality of the treated effluent.
6. Public contact with wastewater shall be precluded or controlled through such means as fences and signs, or acceptable alternatives.
7. Objectionable odors originating at the facility shall not be perceivable beyond the limits of the property owned by the Discharger.
8. As a means of discerning compliance with Discharge Specification No. 7, the dissolved oxygen content in the upper one foot of any wastewater storage pond shall not be less than 1.0 mg/l.
9. Wastewater 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.
10. Effective **1 October 2008**, 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.
11. The facility 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.
12. Freeboard in any pond (including the spreading basin) shall never be less than two feet as measured from the water surface to the lowest point of overflow.
13. 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.11 and B.12.

C. Effluent Limitations

1. Wastewater discharged into any of the wastewater ponds or the land spreading area sites shall not cause the wastewater contained therein to exceed the following interim performance limit for salinity:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>30-Day Average</u>
Electrical Conductivity	umhos/cm	2,300

- No stored wastewater or effluent shall have a pH less than 6.5 or greater than 9.0.

D. 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.

- Sludge and solid waste shall be removed from screens, sumps, ponds, and clarifiers as needed to ensure optimal plant operation.
- 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.
- 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.
- 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.
- 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. 2000-10-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.
- 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 Regional Water Board. If during the life of this

Order, the State accepts primacy for implementation of 40 CFR 503, then the Regional Water Board may also initiate enforcement where appropriate.

E. Interim Groundwater Limitations

1. Release of waste constituents from any wastewater treatment or storage system component associated with the wastewater treatment facility shall not cause groundwater under and beyond that system component, as determined by an approved well monitoring network, to:
 - a. Contain any of the following constituents in concentration greater than those listed below or greater than natural background quality, whichever is greater:

<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 Coliform Organisms	MPN/100 mL	less than 2.2
Electrical Conductivity ¹	umhos/cm	700
Total dissolved solids ¹	mg/L	450
Nitrite (as N)	mg/L	1
Nitrate (as N)	mg/L	10
Ammonia (as NH ₄)	mg/l	1.5

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].

- b. Exhibit a pH of less than 6.5 or greater than 8.4 pH units.
 - c. Impart taste, odor, chemical constituents, toxicity, or color that creates nuisance or impairs any beneficial use.

F. Provisions

1. The following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared as described in Provision F.3:
 - a. **Upon completion** of the facility expansion and headworks improvements, and prior to any use of Ponds 9 and 10, the Discharger shall submit a report prepared by a California licensed engineer certifying that the expansion and associated improvements (excluding the headworks flood protection improvements) have

been completed as described in the Report of Waste Discharge and are fully operational.

- b. By **30 April 2008**, the Discharger shall submit a *Groundwater Monitoring Well Installation Workplan* prepared in accordance with, and including the items listed in, the first section of Attachment C: “*Requirements for Monitoring Well Installation Workplans and Monitoring Well Installation Reports.*” The workplan shall describe installation of at least three new groundwater monitoring wells designed to ensure that background water quality is adequately characterized and any potential water quality impacts from the discharge are detected. The system shall be designed to yield samples representative of the uppermost portion of the first aquifer underlying the WWTF. The workplan shall provide the name and contact information for the registered professional that will prepare the groundwater monitoring reports required by the Monitoring and Reporting Program (MRP).
- c. By **30 August 2008**, the Discharger shall submit a *Monitoring Well Installation Report* prepared in accordance with, and including the items listed in, the second section of Attachment C: “*Monitoring Well Workplan and Monitoring Well Installation Report Guidance.*” The report shall describe the installation or destruction of any wells, describe well development, and explain any deviation from the approved workplan.
- d. By **30 October 2008**, the Discharger shall submit an *Operation and Maintenance Plan* (O&M Plan) for the WWTF. A copy of the O&M Plan shall be kept at the facility for reference by operating personnel and key personnel shall be familiar with its contents. The O&M Plan shall provide the following:
 - i. Operation and Control of Wastewater Treatment - A description of the wastewater treatment equipment; operational controls; treatment requirements/effluent limitations; flow diagrams including valve/gate locations; operation of the treatment systems during start-up, normal operation, by-pass, shut-down, and draining procedures; potential operational problems including a troubleshooting guide.
 - ii. Sludge Management - A description of the frequency of and procedure for evaluating sludge accumulations in the ponds, and determining when sludge removal is needed to ensure adequate capacity and optimal operation of the WWTF.
 - iii. Personnel - Recommended staffing requirements, staff qualifications, training requirements and schedule, and operator certification requirements.
 - iv. Maintenance – Maintenance procedures, equipment record system, scheduling and use of the maintenance record system, inventory system, special tools, warranty provisions and expiration dates, maintenance cost and budgeting system, maintenance schedule of all equipment including lubricants, filters, UV bulbs, etc.

- v. Emergency Response – A description of the vulnerability analysis including emergencies such as power outage, severe weather, or flooding. An equipment and telephone list for emergency personnel and equipment vendors. Coordination procedures with fire, police, and health department personnel, and an emergency operating plan.
 - vi. Safety – A general discussion of the hazards of collection systems, mechanical equipment, explosion, pathogens, oxygen deficiencies, chemical and electrical hazards, etc.
 - vii. Appendices – Shall include flow diagrams, valve/gate locations, copy of WDRs, miscellaneous form samples, manufacturer’s manuals, and a list of reference materials.
- e. By **30 October 2008**, the Discharger shall submit a report prepared by a California licensed engineer certifying that the headworks flood protection improvements have been completed as described in the Report of Waste Discharge and are fully operational.
- f. By **1 November 2008**, the Discharger shall submit an *Interim Sewer System Management Plan (SSMP)*, which shall contain technical reports consistent with the requirements of the State Water Board General Order No. 2006-0003-DWQ. The following portions of the SSMP shall be included in the Interim SSMP:
- i. Item D.13.vi, Overflow Emergency Response Plan.
- g. By **30 August 2010**, the Discharger shall submit a *Background Groundwater Quality Study Report*. For each groundwater monitoring parameter/constituent identified in the MRP (including coliform organisms), the report shall present a summary of monitoring data and calculation of the concentration in background monitoring wells. Determination of background quality shall be made using the methods described in Title 27 CCR, Section 20415(e)(10), and shall be based on data from at least eight consecutive quarterly (or more frequent) groundwater monitoring events. For each monitoring parameter/constituent, the report shall compare the calculated background concentration with the interim numeric limitations set forth in Groundwater Limitation F.1.a. Where background concentrations are statistically greater than the interim limitations specified in Groundwater Limitation F.1.a, the report shall recommend final groundwater limitations which comply with Resolution 68-16 for the waste constituents listed therein. Subsequent use of a concentration as a final groundwater limitation will be subject to the discretion of the Executive Officer. If desired, the Discharger may include site- and/or locale-specific information regarding the crops that farmers can reasonably expect to grow in the area based on soil types and weather patterns, as well as other relevant data and/or information to demonstrate that groundwater limitations for salinity constituents higher than the Interim Groundwater Limitations of this Order would not unreasonably impair the beneficial uses of groundwater for agricultural irrigation. The sources and interpretation of such information shall be thoroughly discussed in the report.

- h. By **30 December 2010**, the Discharger shall submit and implement a *Salinity Evaluation and Minimization Plan* to address sources of salinity 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:
- i. 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.
 - ii. 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.
 - iii. An estimate of salinity load reductions that may be identified through the methods identified in subparagraph ii.
 - iv. A plan for monitoring the results of the salinity pollution prevention program.
 - v. A description of the tasks, costs, and time required to investigate and implement various elements in the salinity pollution prevention plan.
 - vi. 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 Dischargers intended pollution prevention activities for the immediate future.
 - vii. A description of the Discharger's existing salinity pollution prevention programs.
 - viii. 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.
 - ix. An analysis, to the extent feasible, of the costs and benefits that may be incurred to implement the pollution prevention program.
 - x. Progress to date in reducing the concentration and/or mass of salinity in the discharge.

Progress in implementation of the plan shall be reported each year in the Annual Monitoring Report required pursuant to Monitoring and Reporting Program No. R5-2007-0149.

- i. **At least 180 days prior** to any biosolids removal and disposal, the Discharger shall submit a *Biosolids Cleanout Plan*. The plan shall include a detailed plan for

sludge removal, sludge 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 sludge will be removed from the site prior to the onset of the rainy season (1 October).

2. If the Background Groundwater Quality Study shows that the discharge of waste is causing groundwater to contain waste constituents in concentrations statistically greater than background water quality then, within **180 days** of the request of the Executive Officer, 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 for each waste constituent listed in the Groundwater Limitation F.1.a of this Order. 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. 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.
4. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2007-0149, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.
5. 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)."
6. The Discharger shall submit to the Regional 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 Regional Water Board in writing when it returns to compliance with the time schedule.

7. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with this Order.
8. The Discharger shall provide certified wastewater treatment plant operators in accordance with Title 23 of the California Code of Regulations, Division 3, Chapter 26.
9. As described in the Standard Provisions, the Discharger shall report promptly to the Regional Water Board any material change or proposed change in the character, location, or volume of the discharge.
10. The Discharger shall report to the Regional 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."
11. Upon the reduction, loss, or failure of the sanitary sewer system resulting in a sanitary sewer overflow, the Discharger shall 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.
12. 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.
13. 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 Regional 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

California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

14. 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 Regional Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or recession of this Order.
15. 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.
16. The Regional Water Board will review this Order periodically and will revise requirements when necessary.

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 26 October 2007.

PAMELA C. CREEDON, Executive Officer

REVISED

ALO: 11/6/07

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-0149
FOR
KNIGHTS LANDING COMMUNITY SERVICES DISTRICT
KNIGHTS LANDING WASTEWATER TREATMENT FACILITY
YOLO COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring the wastewater treatment facility (WWTF) influent, wastewater ponds, groundwater, 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.

Regional 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.

WWTF INFLUENT MONITORING

The Discharger shall monitor influent wastewater in accordance with the following. Samples shall be representative of the influent to the first treatment ponds. A composite sample comprised of equal volumes from Ponds 1 and 2 is 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>
Flow	gpd	Flow Meter Observation	Daily	Monthly
BOD ¹	mg/L	Grab	Monthly	Monthly
Total Suspended Solids	mg/L	Grab	Monthly	Monthly

¹ Five-day, 20° Celsius biochemical oxygen demand.

WWTF EFFLUENT MONITORING

The Discharger shall monitor effluent wastewater in accordance with the following. Samples shall be representative of the effluent contained in the influent to the last treatment ponds. A grab sample from Pond 9 or 10 is considered representative of the effluent if either or both of these ponds contain more than one foot of water. Otherwise, a composite sample comprised of equal volumes from Ponds 7 and 8 is considered representative of the effluent. 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 ¹	mg/L	Grab	Monthly	Monthly
Electrical Conductivity	umhos/cm	Grab	Monthly	Monthly
Total dissolved solids	mg/L	Grab	Quarterly	Monthly ²
Sodium	mg/L	Grab	Quarterly	Monthly ²
Chloride	mg/L	Grab	Quarterly	Monthly ²
Boron	mg/L	Grab	Quarterly	Monthly ²
Total Kjeldahl nitrogen	mg/L	Grab	Monthly	Monthly
Nitrate nitrogen	mg/L	Grab	Monthly	Monthly

¹ Five-day, 20° Celsius biochemical oxygen demand.

² Results shall be reported in the Monthly Monitoring Report for the month during which samples were obtained.

WWTF POND MONITORING

The Discharger shall monitor all ponds at the WWTF, including the spreading basin, 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	Monthly
pH	pH units	Grab	Weekly	Monthly
Odors	--	Observation	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.

FACILITY INSPECTIONS

The Discharger shall inspect the WWTF at least weekly. At a minimum, the inspection shall include the following elements:

- a. Condition of fences designed to prevent public access (monthly).
- b. Odors discernible at the property boundary (weekly).
- c. Integrity of all berms, dikes, and levees, including consideration of damage from erosion, wave action, and burrowing rodents (weekly).
- d. Headworks damage and debris accumulation (weekly).
- e. Flow metering system function (weekly).
- f. Piping systems, including control valves and visible piping (weekly).

GROUNDWATER MONITORING

The Discharger shall establish a quarterly sampling schedule for groundwater monitoring, with samples obtained approximately every three months.

This monitoring program applies to all three 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 plans and specifications to the Regional Water Board 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	Quarterly
Groundwater elevation ¹	0.01 feet	Calculated	Quarterly	Quarterly
Gradient	feet/feet	Calculated	Quarterly	Quarterly
Gradient direction	Degrees	Calculated	Quarterly	Quarterly
pH	pH units	Grab	Quarterly	Quarterly
Total dissolved solids	mg/L	Grab	Quarterly	Quarterly
Nitrate nitrogen	mg/L	Grab	Quarterly	Quarterly

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Ammonia nitrogen	mg/L	Grab	Quarterly	Quarterly
Total Kjeldahl nitrogen	mg/L	Grab	Quarterly	Quarterly
Total coliform organisms ²	MPN/100 ml	Grab	Quarterly	Quarterly
Standard minerals ³	mg/L	Grab	Quarterly	Quarterly
Metals ⁴	ug/L	Grab	Annually	Annually ⁵

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 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 Water Quality Limit for each constituent.

⁵ Results for constituents analyzed annually shall be reported in the fourth quarterly monitoring report each year.

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.

WATER SUPPLY MONITORING

The Discharger shall monitor the community water supply wells as required by the California Department of Public Health (formerly Department of Health Services), and shall report the following minimum monitoring data for each water supply well to the Regional 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
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.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., influent, pond, 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 Regional Water Board.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Regional Water Board on the **1st day of the second month following sampling** (i.e. the January Report is due by 1 March). Such reports shall bear the certification and signature of the Discharger's authorized representative. An example Monthly Monitoring Report is included as Attachment A.

At a minimum, the monthly monitoring reports shall include:

1. Results of the following monitoring:
 - a. WWTF influent monitoring;
 - b. WWTF effluent monitoring; and
 - c. WWTF pond monitoring.

2. A comparison of monitoring data to the discharge specifications, 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. If requested by staff, copies of laboratory analytical report(s).
5. A summary facility inspection and repair report. The following items shall be inspected at the specified frequency and specifically addressed in the report:
 - a. Condition of fences designed to prevent public access (monthly).
 - b. Odors discernible at the property boundary (weekly).
 - d. Integrity of all berms, dikes, and levees, including consideration of damage from erosion, wave action, and burrowing rodents (weekly).
 - e. Headworks damage and debris accumulation (weekly).
 - f. Flow metering system function (weekly).
 - g. Piping systems, including control valves and visible piping (weekly).

The facility inspection and repair report shall include the name of the person conducting the inspections, dates of inspection, problems identified, repairs recommended, repairs completed, and dates of completion.

B. Quarterly Monitoring Reports

The Discharger shall submit quarterly monitoring reports to the Regional Water Board by the **1st day of the second month after the quarter** (i.e. the January-March quarter is due by May 1st) each year.

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

The Quarterly Monitoring Report shall include the following:

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 fourth quarter monitoring report. The Annual Report shall include all monitoring data required in the monthly/quarterly schedule. The Annual Report shall be submitted to the Regional 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 regular quarterly monitoring report for the last quarter 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), 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. A copy of the WWTF operator's current certification.
10. A discussion of the following:
 - a. Compliance with the interim performance limits for salinity specified in the Effluent Limitations of the WDRs;
 - b. Salinity reduction efforts implemented in accordance with the approved *Salinity Evaluation and Minimization Plan*;
 - c. Other best practical treatment and control measures implemented pursuant to the approved *BPTC Evaluation Workplan* (if one was required by the Executive Officer); and
 - d. Based on monitoring data, an evaluation of the effectiveness of the salinity reduction/BPTC measures that were implemented.

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: _____
PAMELA C. CREEDON, Executive Officer

_____ 26 October 2007

(Date)

Attachment A: Example Monthly Monitoring Report

ALO:11/06/2007

**MONITORING AND REPORTING PROGRAM NO. ____
ATTACHMENT A
EXAMPLE MONTHLY MONITORING REPORT**

[Note: The following is a suggested monthly report format that complies with the reporting requirements set forth in the MRP and the Standard Provisions and Reporting Requirements. The Discharger is not required to use the example monthly monitoring report, but all monthly monitoring reports must comply with the MRP and the Standard Provisions and Reporting Requirements.]

DATE: _____

TO:

Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670

Attention: Anne Olson

FROM:

Knights Landing Community
Services District
P.O. Box 548
Knights Landing, CA 95645

MONTHLY MONITORING REPORT FOR _____
(month) (year)

**KNIGHTS LANDING COMMUNITY SERVICES DISTRICT
KNIGHTS LANDING WASTEWATER TREATMENT FACILITY
YOLO COUNTY**

Enclosed is the monthly monitoring report for the Knights Landing Community Services District wastewater treatment facility in Yolo County. The report covers the monitoring period noted above.

The following attachments comprise this monitoring report:

- A. Influent Monitoring Summary
- B. Effluent Monitoring Summary
- C. Pond Monitoring Summary
- D. Violation Reporting
- E. Facility Inspection and Repair Report and Violation Summary
- F. Field instrument calibration logs dated _____
- G. Analytical laboratory report(s) dated _____

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine.

(signature)

(date)

(printed name)

(month) _____ (year) _____

A. INFLUENT MONITORING

Day of Month	Influent Flow (gpd)	BOD (mg/L)	TSS (mg/L)
Monitoring frequency:	Daily	Weekly	Weekly
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
Average			

BOD = biochemical oxygen demand TSS = total suspended solids gpd = gallons per day

(month) _____ (year) _____

B. EFFLUENT MONITORING

Sampling Date			
Sample Location			
Sample Type			
Constituent/Parameter	Sampling Frequency	Analytical Result	Units
BOD	Monthly		
Electrical conductivity	Monthly		
Total dissolved solids	Quarterly		
Sodium	Quarterly		
Chloride	Quarterly		
Boron	Quarterly		
Total Kjeldahl nitrogen	Monthly		
Nitrate nitrogen	Monthly		

C. POND MONITORING

Parameter:	Freeboard	Dissolved Oxygen	pH	Odors	Berm Condition
Monitoring Frequency:	Weekly	Weekly	Weekly	Weekly	Weekly
Sample Type:	Observation	Grab	Grab	Observation	Observation
Units:	feet	mg/L	pH units		
Week 1					
Date:					
Pond No. 1					
Pond No. 2					
Pond No. 3					
Pond No. 4					
Pond No. 5					
Pond No. 6					
Pond No. 7					
Pond No. 8					
Pond No. 9					
Pond No. 10					
Spreading Area					

(month) _____ (year) _____

Parameter:	Freeboard	Dissolved Oxygen	pH	Odors	Berm Condition
Monitoring Frequency:	Weekly	Weekly	Weekly	Weekly	Weekly
Sample Type:	Observation	Grab	Grab	Observation	Observation
Units:	feet	mg/L	pH units		
Week 2					
Date:					
Pond No. 1					
Pond No. 2					
Pond No. 3					
Pond No. 4					
Pond No. 5					
Pond No. 6					
Pond No. 7					
Pond No. 8					
Pond No. 9					
Pond No. 10					
Spreading Area					

Week 3					
Date:					
Pond No. 1					
Pond No. 2					
Pond No. 3					
Pond No. 4					
Pond No. 5					
Pond No. 6					
Pond No. 7					
Pond No. 8					
Pond No. 9					
Pond No. 10					
Spreading Area					

Week 4					
Date:					
Pond No. 1					
Pond No. 2					
Pond No. 3					
Pond No. 4					
Pond No. 5					
Pond No. 6					
Pond No. 7					
Pond No. 8					
Pond No. 9					
Pond No. 10					
Spreading Area					

(month) _____ (year) _____

E. SUMMARY FACILITY INSPECTION AND REPAIR REPORT

Inspection Date	Inspector	Problems identified, repairs recommended, repairs completed, and date of completion
Fence Condition (monthly)		
Odors (weekly)		
Pond berms (weekly)		
Headworks (weekly)		
Flow meter (weekly)		
Piping system (weekly)		

INFORMATION SHEET

ORDER NO. R5-2007-0149
KNIGHTS LANDING COMMUNITY SERVICES DISTRICT
KNIGHTS LANDING WASTEWATER TREATMENT FACILITY
YOLO COUNTY

Background

Knights Landing Community Services District owns and operates the Knights Landing wastewater treatment facility (WWTF), which is ½ mile south of County Road 116 near Knights Landing, in Yolo County. The Discharger proposes to expand the facility to accommodate planned development in the community. Monthly sewer service rates were \$27 in 2006, and the corresponding residential connection fee was \$11,100 per equivalent dwelling unit.

The existing WWTF consists of a wet well lift station, eight wastewater stabilization ponds on approximately 20 acres and a 31.5-acre spreading basin. The stabilization ponds are operated as two parallel passive stabilization systems with four ponds each. The spreading basin receives overflow from the eight existing ponds during the wet season only. The WWTF does not use aerators or other active treatment systems. The current average daily dry weather flow is estimated to be 80,000 gallons per day (gpd). Rising groundwater levels during extended periods of heavy rainfall may cause significant infiltration of groundwater into the sewer system.

The community water supply is moderately saline and moderately hard, with high concentrations of boron. Influent wastewater quality is most similar to typical domestic wastewater and the use of the municipal water supply does not appear to cause an unreasonable incremental increase in salinity as measured in the WWTF influent. However, evapoconcentration as the wastewater flows from the primary ponds through to the final ponds increases the overall salinity of the wastewater significantly beyond concentrations that would be considered a reasonable increment over the water supply concentrations.

The Discharger plans to expand the existing WWTF to serve a new residential subdivision, which will increase the population served by the WWTF from approximately 1,018 to 1,320. The WWTF treatment and disposal capacity will be increased by converting part of the existing land spreading area to two percolation/evaporation ponds. The remainder will continue to be used as land spreading area when needed. The walls of the headworks structure will be raised by one foot to provide 100-year flood protection.

The Discharger's water balance capacity model indicates that the expanded WWTF will have sufficient capacity for 105,000 gpd as an average daily dry weather flow (from August through October each year) and 48.4 million gallons (MG) as a total annual influent flow (including I/I).

There are currently three groundwater monitoring wells at the facility, and groundwater is typically encountered at depths ranging from 7 to 14 feet below the surrounding ground surface. The gradient direction of the shallow groundwater varies from east to southwest, but does not exhibit a consistent seasonal variation. The Knights Landing Ridge Cut, which parallels the WWTF along its entire length may strongly influence groundwater levels and

flow directions. The groundwater monitoring results for electrical conductivity, total dissolved solids, sodium, iron, chloride, and manganese strongly indicate that the WWTF has degraded groundwater quality. Additionally, coliform organisms were routinely detected in the downgradient monitoring wells.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water drainage is to the Sacramento River near its confluence with the Colusa Basin Drain. The *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Fourth Edition* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Beneficial uses often determine the water quality objectives that apply to a water body. For example, waters designated as municipal and domestic supply must meet the maximum contaminant levels (MCLs) for drinking waters. The Basin Plan sets forth the applicable beneficial uses (industrial, agricultural, and municipal and domestic supply in this instance) of groundwater, procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity.

Antidegradation

The antidegradation directives of State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation Policy" require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Waters can be of high quality for some constituents or beneficial uses and not others. Policies and procedures for complying with this directive are set forth in the Basin Plan.

Resolution 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of degradation can be justified. It is incumbent upon the Discharger to provide technical information for the Regional Board to evaluate that fully characterizes:

- All waste constituents to be discharged;
- The background quality of the uppermost layer of the uppermost aquifer;
- The background quality of other waters that may be affected;
- The underlying hydrogeologic conditions;
- Waste treatment and control measures;
- How treatment and control measures are justified as best practicable treatment and control;
- The extent to which the discharge will impact the quality of each aquifer; and
- The expected degree of degradation below water quality objectives.

In allowing a discharge, the Regional Board must comply with CWC Section 13263 in setting appropriate conditions. The Regional Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Regional Board need not authorize the full utilization of the waste assimilation capacity of the

groundwater (CWC 13263(b)) and must consider other waste discharges and factors that affect that capacity.

Certain domestic wastewater constituents are not fully amenable to waste treatment and control and it is reasonable to expect some impact on groundwater. Some degradation for certain constituents is consistent with maximum benefit to the people of California because the technology, energy, water recycling, and waste management advantages of municipal utility service to the State far outweigh the environmental impact of a community that would otherwise be reliant on numerous concentrated individual wastewater systems. Economic prosperity of local communities is of maximum benefit to the people of California, and therefore sufficient reason to accommodate wastewater discharge provided terms of reasonable degradation are defined and met. The proposed Order authorizes some degradation consistent with the maximum benefit to the People of the State but does not authorize pollution (i.e., violation of any water quality objective).

Groundwater monitoring has been conducted around the facility, however additional background groundwater quality data are needed; therefore staff is unable to establish final groundwater limits. Certain aspects of wastewater treatment and control practices may not be justified as representative of Best Practicable Treatment and Control (BPTC). Reasonable time is necessary to gather specific information about the WWTP to make informed, appropriate, long-term decisions. This proposed Order, therefore, establishes interim performance standards for salinity in the form of effluent limitations as well as interim receiving water limitations to assure protection of beneficial uses of groundwater of the State pending the completion of certain tasks and provides time schedules to complete specified tasks. During this period, degradation may occur from certain constituents, but can never exceed water quality objectives (or natural background water quality should it exceed objectives) or cause nuisance.

Water quality objectives define the least stringent limits that could apply as water quality limitations for groundwater at this location, except where natural background quality unaffected by the discharge of waste already exceeds the objective. The values below reflect water quality objectives that must be met to maintain specific beneficial uses of groundwater. Unless natural background for a constituent proves higher, the groundwater quality limit established in proposed Order is the most stringent of the values for the listed constituents.

<u>Constituent</u>	<u>Units</u>	<u>Limit</u>	<u>Beneficial Use</u>	<u>Water Quality Objective</u>	<u>Criteria or Justification</u>
Ammonia	mg/L	1.5	MUN ¹	Tastes and Odors	Odor Threshold ²
Boron	mg/L	0.7	AGR ³	Chemical Constituents	Protect sensitive crops ⁴
	mg/L	1.0	MUN ¹	Toxicity	Calif. Drinking Water Notification Level based on toxicity ¹¹
Chloride	mg/L	106	AGR ³	Chemical Constituents	Protect sensitive crops irrigated via sprinklers ⁴
		142	AGR ³	Chemical Constituents	Protect sensitive crops ⁴

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2007-0149
 KNIGHTS LANDING COMMUNITY SERVICES DISTRICT
 KNIGHTS LANDING WASTEWATER TREATMENT FACILITY
 YOLO COUNTY

<u>Constituent</u>	<u>Units</u>	<u>Limit</u>	<u>Beneficial Use</u>	<u>Water Quality Objective</u>	<u>Criteria or Justification</u>
		250	MUN ¹	Chemical Constituents	Recommended Secondary MCL ⁵
		500	MUN ¹	Chemical Constituents	Upper Secondary MCL ⁵
Iron	mg/L	0.3	MUN ¹	Chemical Constituents	Secondary MCL ⁶
Manganese	mg/L	0.05	MUN ¹	Chemical Constituents	Secondary MCL ⁶
Nitrate plus Nitrite as N	mg/L	10	MUN ¹	Chemical Constituents	Primary MCL ⁷
Nitrite as N	mg/L	1	MUN ¹	Chemical Constituents	Primary MCL ⁷
Sodium	mg/L	69	AGR ³	Chemical Constituents	Protect sensitive crops ⁴
Total Dissolved Solids	mg/L	450 ⁸	AGR ³	Chemical Constituents	Protect sensitive crops ⁴
		500	MUN ¹	Chemical Constituents	Recommended Secondary MCL ⁵
		1,000	MUN ¹	Chemical Constituents	Upper Secondary MCL ⁵
Total Coliform Organisms	MPN/100 ml	<2.2	MUN ¹	Bacteria	Basin Plan numerical objective and non-detect MCL ⁸
Trihalomethanes	ug/L	80	MUN ¹	Chemical Constituents	
Bromoform	ug/L	4	MUN ¹	Toxicity	USEPA IRIS Cancer Risk Level ⁹
Bromodichloromethane	ug/L	0.27	MUN ¹	Toxicity	Cal/EPA Cancer Potency Factor ¹²
Chloroform	ug/L	1.1	MUN ¹	Toxicity	Cal/EPA Cancer Potency Factor ¹²
Dibromochloromethane	ug/L	0.37	MUN ¹	Toxicity	Cal/EPA Cancer Potency Factor ¹²
pH	pH Units	6.5 to 8.5	MUN ¹	Chemical Constituents	Secondary MCL ¹⁰
		6.5 to 8.4	AGR ³	Chemical Constituents	Protect sensitive crops ⁴

¹ Municipal and domestic supply

² J.E. Amooore and E. Hautala, Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution, Journal of Applied Toxicology, Vol. 3, No. 6 (1983).

³ Agricultural supply

⁴ Ayers, R. S. and D. W. Westcot, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985)

⁵ Title 22, California Code of Regulations (CCR), Section 64449, Table 64449-B which is incorporated by reference into the Basin Plan.

⁶ Title 22, CCR, Section 64449, Table 64449-A which is incorporated by reference into the Basin Plan.

⁷ Title 22, CCR, Section 64431, Table 64431-A which is incorporated by reference into the Basin Plan.

⁸ Title 22, CCR, Section 64439, which applies the narrative objective to fully protect the cited beneficial use.

⁹ USEPA Integrated Risk Information System, <http://www.epa.gov/iris>.

¹⁰ Title 40, Code of Federal Regulations, Section 143.3, which applies the narrative objective to fully protect the cited beneficial use.

- ¹¹ California Department of Public Health, Division of Drinking Water and Environmental Management, Drinking Water Notification Levels, <http://www.cdph.ca.gov/programs/Pages/DWP.aspx>.
- ¹² CAL/EPA Toxicity Criteria Database (OEHHA), <http://www.oehha.org/risk/ChemicalDB>.

Domestic wastewater contains numerous dissolved organic and inorganic constituents that together comprise Total Dissolved Solids (TDS). Each component constituent is not individually critical to any beneficial use. Critical constituents are individually listed. The cumulative impact from the other constituents, along with the cumulative affect of the constituents that are individually listed can be effectively controlled using TDS as a generic indicator parameter.

Not all TDS constituents pass through the treatment process and soil profile in the same manner or rate. Chloride tends to pass through both rapidly to groundwater. However, groundwater chloride concentrations in the region are highly variable, which might limit the use of chloride as an indicator parameter of groundwater degradation. Boron is another TDS constituent that may occur in wastewater in concentrations greater than in groundwater because it is a common ingredient of detergents. Other indicator constituents for monitoring for groundwater degradation due to land application of wastewater include total coliform bacteria, ammonia, total nitrogen, and Total Trihalomethanes (TTHMs) a by-product of chlorination. Dissolved iron and manganese are useful indicators to determine whether components of the WWTP with high-strength wastewater constituents, such as sludge handling facilities, are ineffective in containing waste. Exceptionally high TDS and nitrogen also typifies this type of release.

Treatment Technology and Control

Given the character of domestic wastewater, secondary treatment technology is generally sufficient to control degradation of groundwater from decomposable organic constituents. Adding disinfection significantly reduces populations of pathogenic organisms, and reasonable soil infiltration rates and unsaturated soils can reduce them further. Neither organics nor total coliform organisms, the indicator parameter for pathogenic organisms, should be found in groundwater beneath a facility that is well-sited, well-designed, and well-operated. The WWTF provides only passive oxidation systems and no disinfection.

Domestic wastewater typically contains nitrogen in concentrations greater than water quality objectives, which vary according to the form of nitrogen. Groundwater degradation by nitrogen can be controlled by an appropriate secondary treatment system (e.g., oxidation ditch), tertiary treatment with nitrogen reduction, and agronomic reuse crops that are harvested and removed from the land application area. The effectiveness varies, but generally best practicable treatment and control is able to control nitrogen degradation of groundwater at a concentration well below the water quality objectives. The proposed interim limitation reflects water quality objectives.

Dissolved solids can pass through the treatment process and soil profile; effective control of such constituents relies primarily upon source control and pretreatment measures. In the best of circumstances, long-term land discharge of treated wastewater will degrade groundwater with dissolved solids (as measured by TDS and EC). The proposed Order sets

interim groundwater limitations equivalent to water quality objectives, while site-specific, constituent-specific limits are developed in conjunction with a BPTC evaluation of source control and pretreatment.

Other constituents in domestic wastewater that may pass through the treatment process and the soil profile, include recalcitrant organic compounds, radionuclides, and pharmaceuticals. Hazardous compounds are not usually associated with domestic wastewater and when present are reduced in the discharge to inconsequential concentrations through dilution and treatment. It is inappropriate to allow degradation of groundwater with such constituents, so proposed limits are nondetectable concentrations.

A discharge of treated wastewater water that overloads soils with nutrients and organics can result in anaerobic conditions in the soil profile, which in turn creates organic acids and decreases soil pH. Under conditions of low soil pH (below 5), iron and manganese compounds in the soil can solubilize and leach into groundwater. Overloading the land application areas is preventable. Though iron and manganese limits are set at their respective water quality objectives, groundwater pH is expected to remain the same as background.

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 containment of classified waste, requires extensive 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 is acceptable under Title 27 regulations.

Discharges of domestic sewage and treated wastewater 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. Discharges of domestic sewage and treated effluent which are regulated by WDRs and treatment and storage facilities associated with the WWTP are considered exempt from Title 27 under Section 20090(a), provided that the discharges and facilities will not result in a violation of any water quality objective. As the exemption specifically excludes the discharge to land of: 1) solid waste such as grit and screenings that result from treatment of domestic sewage, and 2) residual sludge that will not be further treated at the WWTP, such discharges must comply with provisions of Title 27.

The discharge of treated wastewater and the operation of treatment and/or storage facilities associated with a wastewater treatment plant can be allowed without requiring compliance with Title 27 only if groundwater degradation complies with the Basin Plan, Resolution No. 68-16 (Antidegradation Policy), and does not violate any water quality objectives.

Discharge Prohibitions and Specifications

The proposed Order allows the monthly average inflow rate to the WWTF to increase to 105,000 gpd as an average daily dry weather flow upon the Executive Officer's approval of a

report certifying that the facility expansion has been completed as proposed and is fully operational.

The proposed Order's effluent limitation for electrical conductivity is an interim performance limit selected to prevent any increases in the current salinity of the WWTF influent and effluent. It was selected based on the highest recent results for electrical conductivity in the WWTF pond system

The discharge specifications regarding dissolved oxygen and freeboard are consistent with Regional Board policy for the prevention of nuisance conditions and overtopping, and are applied to all such facilities.

The Order requires the Discharger to submit the following technical reports:

- a. Certification that improvements to the WWTF headworks structure to prevent flood inundation have been completed;
- b. A Monitoring well Installation Workplan;
- c. A Monitoring Well Installation Report;
- d. A Background Groundwater Quality and Degradation Evaluation Report;
- e. A Salinity Evaluation and Minimization Plan;
- f. A BPTC Evaluation Workplan (if groundwater quality has been degraded);
- g. An Operation and Maintenance Plan; and
- h. An Interim Sewer System Management Plan;

Monitoring Requirements

Section 13267 of the CWC authorizes the Regional Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment civil administrative liability where appropriate.

The proposed Order includes influent and effluent monitoring, pond monitoring, groundwater monitoring, sludge monitoring, and water supply monitoring.

The Title 27 zero leakage protection strategy relies heavily on extensive groundwater monitoring to increase a discharger's awareness of, and accountability for, compliance with the prescriptive and performance standards. Title 27 regulations pertaining to groundwater monitoring and the detection and characterization of waste constituents in groundwater have been in effect and successfully implemented for many years. No regulation currently specifies similar criteria more suitable for a situation where extensive land application of treated wastewater occurs. It is appropriate that the Title 27 groundwater monitoring procedures be extended and applied on a case-by-case basis under Water Code Section 13267.

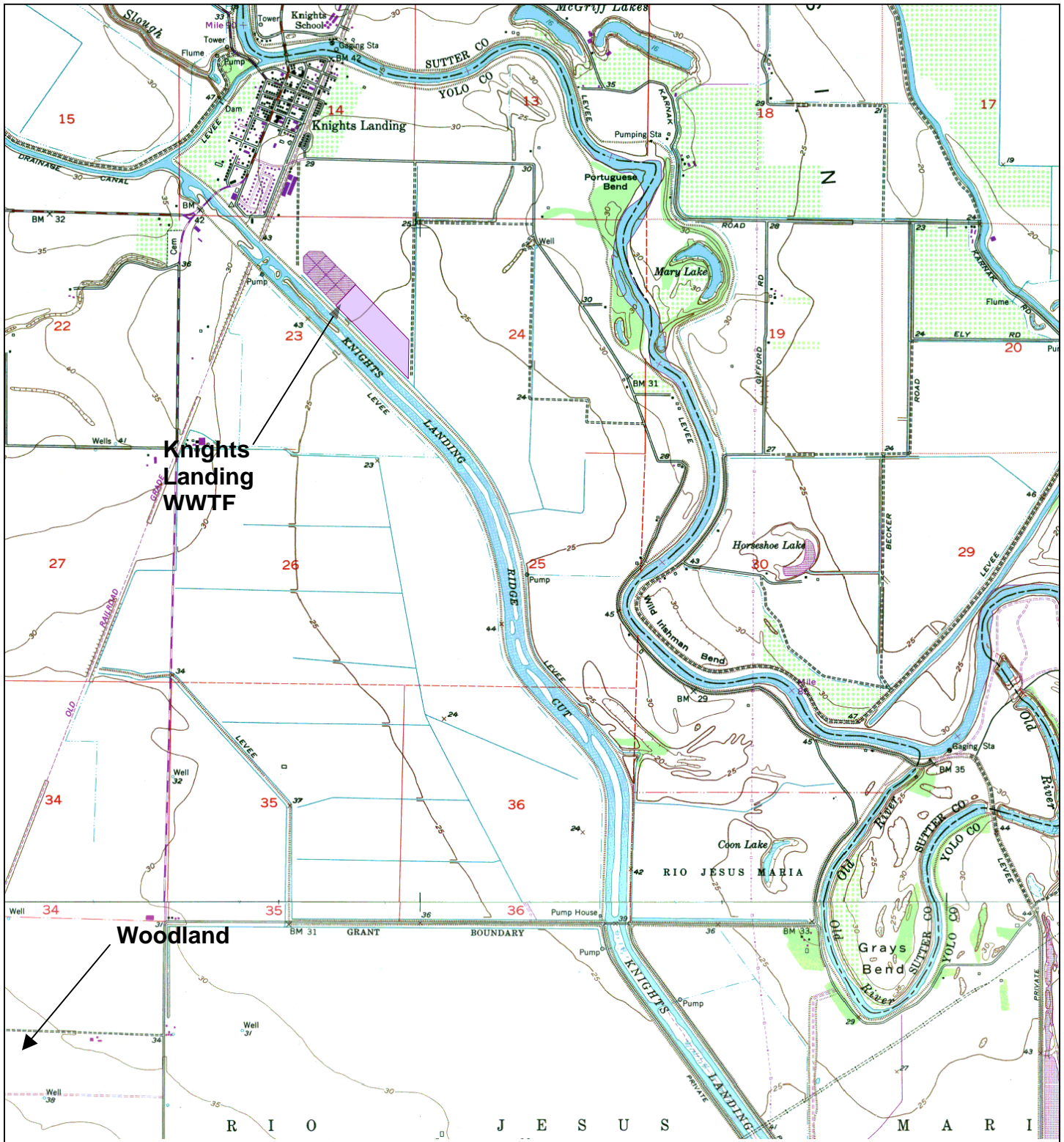
The Discharger must monitor groundwater for wastewater constituents expected to be present in the discharge, and capable of reaching groundwater, and violating groundwater limitations if its treatment, control, and environmental attenuation, proves inadequate. The Discharger is required to install additional groundwater monitoring wells around the facility. For each constituent listed in the Groundwater Limitations section, the Discharger must, as part of each monitoring event, compare concentrations of constituents found in each monitoring well to the background concentration or to prescribed numerical limitations to determine compliance.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. However, information is presently insufficient to develop final groundwater limitations, so the proposed Order contains interim limitations. Additional information must be developed and documented by the Discharger as required by schedules set forth in the proposed Order. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality at reasonable cost. It may be appropriate to reopen the Order if applicable laws and regulations change, but the mere possibility that such laws and regulations may change is not sufficient basis for reopening the Order. The CWC requires that waste discharge requirements implement all applicable requirements.

ALO: 11/6/07

ATTACHMENT A



Drawing Reference:
USGS 7.5 minute
quad map. Knights
Landing, CA

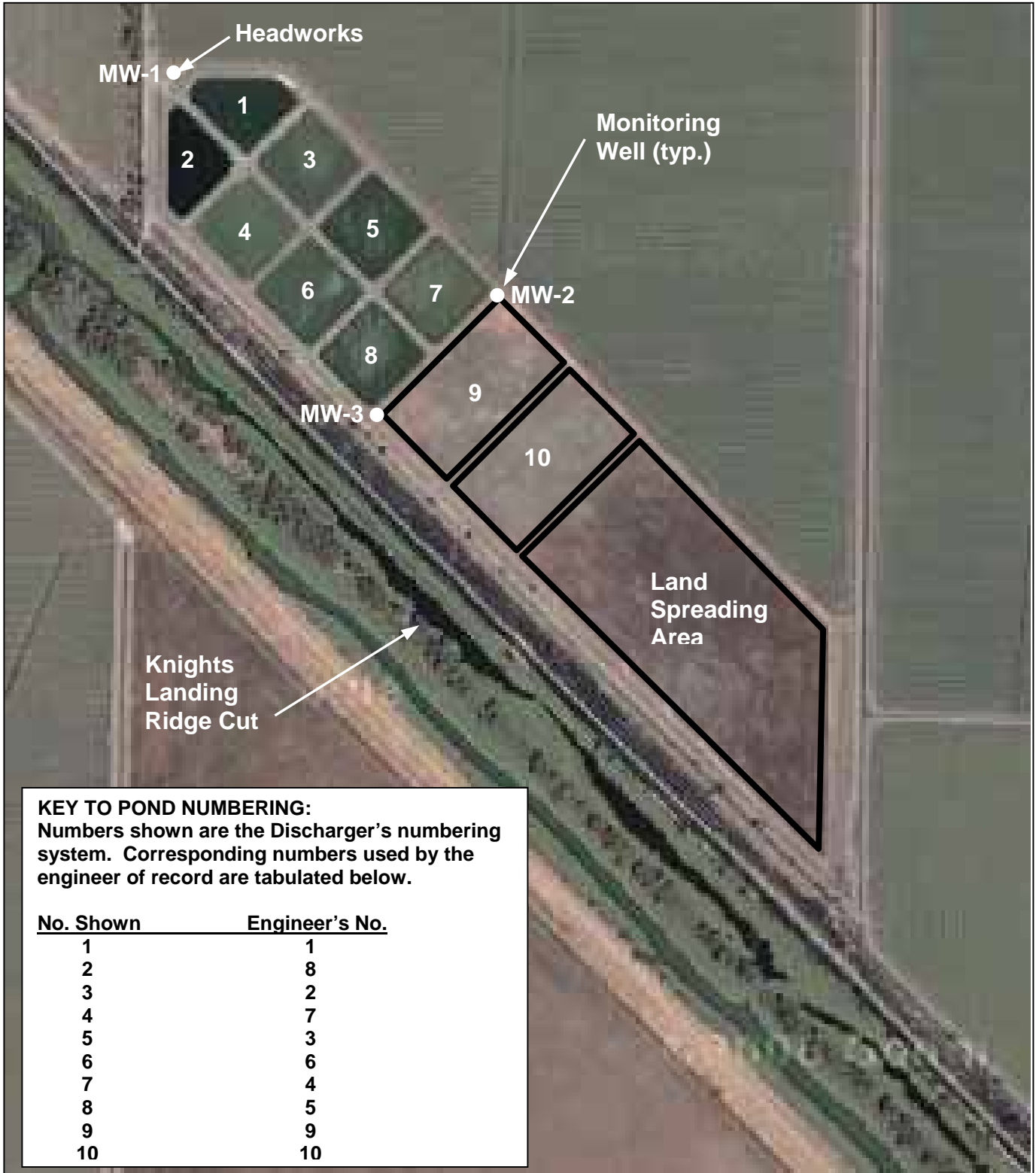
LOCATION MAP
KNIGHTS LANDING COMMUNITY SERVICES DISTRICT
KNIGHTS LANDING WWTf
YOLO COUNTY

ORDER NO. R5-2007-0149

N

Approx. Scale:
1" = 3,000'

ATTACHMENT B



KEY TO POND NUMBERING:
 Numbers shown are the Discharger's numbering system. Corresponding numbers used by the engineer of record are tabulated below.

<u>No. Shown</u>	<u>Engineer's No.</u>
1	1
2	8
3	2
4	7
5	3
6	6
7	4
8	5
9	9
10	10

Drawing Reference:
 Google Maps Aerial
 Photo, date unknown
 (www.google.com)

VICINITY MAP
 KNIGHTS LANDING COMMUNITY SERVICES DISTRICT
 KNIGHTS LANDING WWTF
 YOLO COUNTY

ORDER NO. R5-2007-0149



Approx. Scale:
 1" = 600'

ATTACHMENT C
ORDER NO. R5-2007-0149
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
- Method of determining when development is complete

California Environmental Protection Agency

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