CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2007-0086

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF SACRAMENTO UTILITIES DEPARTMENT
SACRAMENTO RIVER WATER TREATMENT PLANT
SACRAMENTO COUNTY

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

1. The City of Sacramento (hereafter known as "Discharger") submitted a Report of Waste Discharge (RWD) dated 28 July 2005, to apply for Waste Discharge Requirements (WDRs) for the existing Sacramento River Water Treatment Plant (WTP). Additional information was received on 25 August 2005, 2 November 2005, 31 July 2006, and 5 March 2007.

2. The Sacramento River Water Treatment Plant, which is owned by the Discharger, is at 1 Water Street in Sacramento, as shown on Attachment A, which is attached hereto and made part of the Order by reference. The WTP is in Section 36, T9N, R4E (MDB&M), and comprises Assessor's Parcel No. 601-0210-038-0000.

3. The Sacramento River WTP has been operating since the 1920s, and was recently expanded to increase the design treatment capacity to 160 million gallons of water per day. Discharges of waste at the facility were previously regulated under WDRs Order No. 80-173 (NPDES No. CA0005037). The NPDES permit allowed the then-existing discharge to the Sacramento River to continue only until 1 May 1983. The NPDES permit expired on 1 September 1985.

Existing Facility and Discharge

4. Raw water from the Sacramento River is pumped to the Sacramento River WTP for treatment prior to distribution as a public water supply. The WTP's raw water intake is just below the confluence of the American and Sacramento Rivers. The following table summarizes raw and treated water characterization data provided in the RWD for monthly samples obtained between July 2003 and June 2004.

	Result (mg/L except as noted)	
Constituent/Parameter	Raw Water	Treated Water
Aluminum	0.32 [1]	0.83 [1]
Arsenic	<0.002 [1]	<0.002 [1]
Chloride	2.3 to 6.6	4.1 to 8.8
Copper	<0.01 [1]	<0.01 [1]
Fluoride	<0.10	0.73 to 0.95

	Result (mg/L except as noted)	
Constituent/Parameter	Raw Water	Treated Water
Iron	0.22 [1]	<0.01 [1]
Sodium	9 [1]	8.7 [1]
Sulfate	3.6 to 7.6	11 to 24
Nitrate	0.3 [1]	0.27 to 0.68
Hardness, total	34 to 58	46 to 74
Alkalinity, total (as $CaCO_3$)	38 to 61	40 to 58
Specific conductance	97 to 156	126 to 196
Total dissolved solids	66 to 110	83 to 129
Total coliform organisms, MPN/100mL	650 to >7,100	--
E. coli, MPN/100mL	15 to 120	--
Mean chlorine residual	--	0.28 to 0.55
pH	7.3 to 7.8	8.0 to 8.5

-- Not analyzed; Not reported in the RWD.
[1] Based on a single sampling event.

The analytical results indicate that both the raw and treated water are of high quality, and that the treatment processes increases the overall salinity of the water by approximately 19 mg/L, much of which appears to be attributable to sulfate from the use of alum as a flocculant, which is discussed below.

5. The Sacramento River WTP provides treatment by settling, coagulation with aluminum sulfate, chlorine disinfection, fluoridation, and pH adjustment. A site plan is presented as Attachment B, which is attached hereto and made part of the Order by reference.

6. The first step of the treatment process is the Grit Basin, which is used to settle grit, sand, and sediments. The raw water then flows to the flash mixer, where treatment chemicals are added. The water then is conveyed to the flocculation basins and the sedimentation basins. Water flows by gravity from the sedimentation basins to the filters, and then to the CT Basin, where chlorine, lime, and hydroflusilicic acid are added for disinfection, pH control, and fluoridation. After the CT basin, the water flows to onsite reservoirs (clear wells) for further settling before being pumped into the water distribution system. Attachment C, which is attached hereto and made part of the Order by reference, presents a simplified process schematic.

7. The treatment system is equipped to add cationic or nonionic polymers at various stages of treatment. However, such additives are not currently used except as described below.

8. Approximately two to ten cubic yards of solids are generated in the Grit Basin per week. This rate is expected to double when the WTP reaches full treatment capacity.

Solids from the Grit Basin are taken to a landscape materials vendor for commercial sale.

9. Alum sludge from the sedimentation basins and spent lime from the CT Basin and the reservoirs are pumped to the sludge drying lagoons, where polymers are sometimes added to accelerate settling. Supernatant water from the sludge drying lagoons has historically been discharged to the grit basin, the sanitary sewer, or the storm drain system.

10. Filter backwashing generates dilute alum sludge (filter wash water), which is discharged to the filter wash water (FWW) lagoons for settling/decanting and evapoconcentration. Supernatant water has historically been discharged to the grit basin, the sanitary sewer, or the storm drain system.

11. The Discharger recognizes that discharges of supernatant water to the storm drain system require a National Pollutant Discharge Elimination System (NPDES) Permit, and proposes to install locks on the valves that would allow supernatant water to flow into the storm drain system.

12. Based on a single sample collected in September 2005, the RWD characterized the chemical composition of sludge drying lagoon supernatant as summarized below.

Constituent/Parameter	Dissolved Concentration (ug/L except as noted)	Applicable Water Quality Limit [1] (ug/L except as noted)
pH, std. Units	7.5	6.5 to 8.4
Alkalinity, total mg/L as $CaCO_3$	45	NA
Total dissolved solids, mg/L	82	450
Total coliform, MPN/100 mL	**11**	2.2
Fecal coliform, MPN/100 mL	<2	NA
Aluminum	**250**	200
Arsenic	<10	0.004
Boron	<100	700
Cadmium	<1	0.07
Chromium	<5	50
Copper	<10	170
Iron	<50	300
Lead	<5	2.0
Manganese	<5	0.50
Mercury	<0.2	1.2
Nickel	<5	12

Constituent/Parameter	Dissolved Concentration (ug/L except as noted)	Applicable Water Quality Limit [1] (ug/L except as noted)
Silver	<3	85
Zinc	22	2,000
Ammonia nitrogen, mg/L	0.13	1.5 [2]
Nitrate + nitrite nitrogen, mg/L	<0.1	10
Bromide, mg/L	<1	NA
Chloride, mg/L	11	106
Fluoride, mg/L	<0.1	1.0
Phosphate as P, mg/L	<0.1	NA
Potassium, mg/L	1.7	NA
Sodium, mg/L	8.6	69
Sulfate, mg/L	13.4	250

NA None applicable.

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

[2] As ammonia.

The analytical results above indicate that the lagoon supernatant water may exceed applicable water quality limits for aluminum and total coliform organisms. The analytical detection limits were higher than the applicable water quality limit for arsenic, cadmium, lead, and manganese. However, there is no apparent reason for these constituents to be present in the supernatant at concentrations higher than the raw water supply.

13. The Sacramento River WTP has four sludge drying lagoons and two filter wash water lagoons. Except for Sludge Lagoon No. 4, all of the lagoons are concrete-lined and constructed below grade. Selected design data for the lagoons are summarized below.

Lagoon ID	Surface Area (square feet)	Depth (feet)		Capacity (cubic feet) [million gallons]
		Total	Operating	
1	32,000	7.5	5	160,000 [1.2]
2	32,000	7.5	5	160,000 [1.2]
3	31,000	7.5	5	155,000 [1.2]
4	70,000	8	5	350,000 [2.6]
FWW 1	19,900	7.5	5	99,500 [0.7]
FWW 2	26,500	7.5	5	132,500 [1.0]

Sludge Lagoon No. 4 is constructed above grade with 8-foot berms and has a design freeboard of 2.5 feet. Lagoons 1, 2, and 3 and both of the filter wash water ponds are designed to operate at less than two feet of freeboard (1.5 and 1.8 feet of freeboard, respectively). Pond levels are monitored by a SCADA system, and decant pumps automatically divert excess water to the headworks or sewer system when water levels approach the design freeboard of the ponds.

14. After the supernatant is decanted and the sludge begins to dry, it is mixed in the lagoon with a front-end loader to facilitate drying. Sludge is removed from the lagoons when it is no longer free draining and taken to an unpaved area south of the largest clear well for further drying to a solids content of 20 to 50 percent before final disposal. Current sludge generations rates range from 1,500 to 6,000 dry tons per year. At full treatment capacity, the WTP is expected to generate 3,000 to 12,000 dry tons of sludge per year.

15. According to a 2000 geotechnical engineering report included in the RWD, approximately 26,000 to 31,000 cubic yards of sludge was stockpiled in the northeastern portion of the WTP site in the area that is now Lagoon No. 4. The material was described in the report as sandy silt or silty sand with no visible appearance of alum. The report states that the material is suitable for use as general engineered fill beneath pile-supported structures. The Discharger states that the material was removed from the site and disposed of at a permitted landfill before the new lagoons were constructed.

16. According to calculations presented in the RWD, the current system of lagoons provides adequate sludge drying capacity for the WTP at the current peak month demand of 90 mgd. However, as treated water production increases up to the design treatment capacity of 160 mgd, the lagoons may no longer be adequate. Sludge drying will be enhanced by creating contained piles with a front-end loader. If necessary, a contractor will be retained to perform mechanical dewatering, and the Discharger may construct mechanical sludge dewatering facilities later if needed.

17. Dried sludge is currently disposed of at an off-site solid waste landfill. However, the Discharger wishes to use a less costly means of disposal. The Discharger submitted a conceptual Sludge Management Plan that describes specific management protocols for the following disposal options:

    a. Soil composting and amending;

    b. Non-structural fill material;

    c. Turf farming;

    d. Landfill alternative daily cover; and

    e. Raw material for cement or brick manufacturing.

    The sludge management plan includes restrictions to prevent or minimize sludge exposure to storm water runoff and waterways, and a plan to ensure that the sludge is

provided only to public agencies or businesses with appropriate licenses. However, the plan does not include any positive means to ensure compliance with the restrictions, and it is beyond the scope of this Order to regulate those uses.

18. The RWD characterized the chemical composition of the dewatered solids as summarized below.

	Analytical Result		
Constituent/Parameter	Total Concentration (mg/kg except as noted)	Soluble Concentration [2] (ug/L)	Applicable Water Quality Limit [3] (ug/L)
Aluminum	5,700 to 26,000 [1]	*<1,000*	200
Arsenic	<2.5 to 11 [1]	*<100*	0.004
Cadmium	<0.5 to <1.5 [1]	*<1,000*	0.07
Chromium	1 to 40 [1]	<10	50
Copper	<2.0 to 31 [1]	<100	170
Lead	<3.0 to 9 [1]	*<50*	2.0
Magnesium	--	5,200	NA
Manganese	--	**850**	50
Mercury	<0.06 to <0.1 [1]	*<50*	1.2
Molybdenum	<1.5 to <2.0 [1]	--	10
Nickel	4 to 56 [1]	*<50*	12
Selenium	<1.0 to 8.0 [1]	--	20
Vanadium	6 to 41 [1]	--	50
Zinc	3 to 78 [1]	<200	2,000
Nitrate + nitrite nitrogen	<1 [2]	--	10,000
Ammonia nitrogen	68 [2]	--	1,500
pH, std. units	6.9 [2]	--	6.5 to 8.4
Sulfate	110 [2]	--	250
Volatile Organic Compounds	--	<2,500	variable

-- Not analyzed.

NA Not applicable.

[1] Data range is based on pooled data from two sludge sources: the Sacramento River WTP and the Discharger's E.A. Fairbairn WTP (which is approximately three miles upstream on the American River and employs the same treatment processes). Six samples were obtained and analyzed between October 2002 and October 2004.

[2] Based on a sample obtained and analyzed in September 2005.

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

These data indicate that the sludge is non-hazardous based on total constituent concentrations. It is not clear from the RWD whether samples tested for soluble concentrations were prepared using deionized water as the extractant, or whether a citrate buffer was used. Use of the citrate buffer is appropriate for determining whether the waste is hazardous, but can overstate the threat to groundwater quality under ambient site conditions (where the waste will only be exposed to non-aggressive waters). Additionally, because of the relatively high analytical reporting limits, the soluble concentration data presented above are not sufficient to determine whether the discharge poses a threat to water quality.

19. Between October 2006 and February 2007, the Discharger performed additional analyses of sludge from the filter wash water lagoons and sedimentation basins to assess whether the waste is inert. Five samples of each waste type were subjected to the Waste Extraction Test using deionized water as the extractant to simulate the effects of natural rainwater percolating through the waste. The analytical results are summarized below.

	Range of Analytical Results (ug/L except as noted)		Applicable Water Quality Limit (ug/L except as noted)
Constituent/Parameter	Sedimentation Basin Sludge	Filter Wash Water Lagoon Sludge [3]	
Aluminum	<1,000 [1]	--	200
Arsenic	<100	<100	0.004
Boron	<1,000 [1]	--	700
Cadmium	<10	<10	0.07
Chromium	<50	<50	50
Copper	<100	<100	170
Iron	<500	<500	300
Lead	<50	<50	2.0
Magnesium	<5 to 5.6 [2]	<5 [2]	NA
Manganese	850 to 2,000	**1,800 to 2,000**	50
Mercury	<50	<50	1.2
Molybdenum	<100	<100	10
Nickel	<50	<50	12
Potassium [2]	<10 [1, 2]	--	None
Silver	<30	<30	35
Sodium [2]	<10 to 2.8 [2]	<10 [2]	69 [2]
Thallium	<100	<100	0.1
Vanadium	<20 to 2.6	<20	50
Zinc	<200	<200	2,000

Constituent/Parameter	Range of Analytical Results (ug/L except as noted)		Applicable Water Quality Limit (ug/L except as noted)
	Sedimentation Basin Sludge	Filter Wash Water Lagoon Sludge [3]	
pH, std. units	5.1 to 7.5	7.2	6.5 to 8.4
Total dissolved solids [2]	81 to 160 [2]	69 to 94 [2]	450 [2]
Bromide [2]	<10 to 1.4 [2]	<10 [2]	2.3 [2]
Chloride [2]	<1 to 31 [2]	<1 [2]	106 [2]
Fluoride	<100	<100	1,000

-- Not analyzed.

[1] Based on results for one sample analyzed in September 2005.

[2] mg/L.

[3] Based on three samples analyzed in January and February 2007.

Based on the results for manganese, the sludge generated by the WTP cannot be considered inert, and may pose a threat to water quality if discharged to land in an uncontrolled manner.

Site-Specific Conditions

20. The site is approximately 1,000 feet from the west bank of the Sacramento River at the northwestern end of downtown Sacramento at elevations ranging from 20 to 30 feet above the City of Sacramento Datum (CSD). Site drainage is to the Sacramento River via an outfall just south of the WTP.

21. Based on the geotechnical report presented in the RWD, surface soils at the site consist of up to 20 feet of dredged fill (sand and silty sand) placed in the 1920s. The fill is underlain by up to 15 feet of interbedded clays, silts, and silty clays and up to 40 feet of sands interbedded with clays and thin gravel lenses.

22. The WTP site is protected from the 100-year flood by levees.

23. The average annual precipitation near the facility is approximately 18 inches.

24. The reference evapotranspiration rate (ET_0) for the area is approximately 57 inches per year.

Groundwater Considerations

25. The geotechnical investigation described above encountered groundwater at a depth of approximately 20 feet below ground surface (bgs), approximately 5 feet above CSD. Based on data from piezometers at the WTP site, groundwater elevations

varied between 3 to 25 feet above CSD during 1993 to 1999, and shallow groundwater at the site typically follows the stage of the Sacramento River with a time lag of approximately three days.

26. There are five shallow monitoring wells at the WTP site (MW-3, -6, -7, -8, and -9). Construction details for these wells were not included in the RWD, but the geotechnical report indicates that they are used to monitor shallow groundwater levels. In addition, Union Pacific Railroad Company owns several monitoring wells south of the WTP site that are used to monitor various hydrostratigraphic zones below the former Southern Pacific Transportation Company (SPTCo) State Superfund site, which is immediately south of the WTP site (Attachment A). One of the SPTCo shallow zone wells (W-14R) is due east of the WTP flocculation/sedimentation basin (Attachment B).

27. The local direction of the groundwater gradient is typically towards the southeast (during high river flow conditions) to the southwest (during low flow conditions). However, groundwater elevation maps presented in the February 2006 Semi-Annual Groundwater Monitoring Report for the former SPTCo site indicate that there is a mound centered around MW-9 (near the western sedimentation basin), and that the mound has been consistently present since at least early 2003. The SPTCo report states that the mounding may be due to water losses at the WTP. Similarly, the WTP geotechnical report states that the mounding (about 5 feet in height) is indicative of leakage from WTP structures or utilities.

28. A single sample of shallow groundwater was obtained from each of four on-site piezometers constructed during a January 1994 geotechnical investigation (GW-1 through GW-4, inclusive, as shown on Attachment B). Analytical data from these samples is summarized below with lagoon supernatant water characterization data presented for comparison purposes.

Sampling Location ID		GW-1	GW-2	GW-3	GW-4	Wastewater (Lagoon Supernatant) [2]
Presumed Orientation [1]		Cross	Down	Up	Cross	
Constituent	Units	Analytical Result				
Antimony	ug/L	<200	<20	<200	<200	--
Arsenic	ug/L	17	68	26	<5	<10
Cadmium	ug/L	<50	99	<50	<50	<1
Chromium	ug/L	410	2,200	610	<50	<5
Copper	ug/L	300	1,600	480	<50	<10
Lead	ug/L	160	410	180	<150	<5
Mercury	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel	ug/L	450	2,600	730	<100	<5
Silver	ug/L	<50	<50	<50	<50	<3

Sampling Location ID		GW-1	GW-2	GW-3	GW-4	Wastewater (Lagoon Supernatant) [2]
Presumed Orientation [1]		Cross	Down	Up	Cross	
Constituent	Units	Analytical Result				
Vanadium	ug/L	380	2,600	660	<50	--
Zinc	ug/L	860	3,000	950	62	22

-- Not analyzed.
[1] With respect to the WTP lagoons.
[2] A single sample was filtered prior to preservation; results are for dissolved concentrations (see Finding No. 12).

Based on the chain of custody for the samples and the unusually high metals concentrations, it appears that the samples were not filtered prior to preservation. Therefore, the results are not likely to represent dissolved metal concentrations, and cannot be compared to the analytical results for the lagoon supernatant.

29. Based on the second 2005 Semi-Annual Groundwater Monitoring Report for the SPTCo. site, groundwater samples from monitoring well W-14R exhibited the following characteristics between 2001 and 2005.

Sampling Location ID		W-14R [2]	Wastewater (Lagoon Supernatant) [3]
Presumed Orientation [1]		Downgradient	
Constituent/Parameter	Units	Analytical Result	
Arsenic	ug/L	2.5 to 3.7	<10
Cadmium	ug/L	<0.1 to <0.5	<1
Chromium	ug/L	<0.2 to 1.2	<5
Copper	ug/L	<0.5 to 1	<10
Lead	ug/L	<0.5 to 1	<5
Mercury	ug/L	<0.5	<0.2
Nickel	ug/L	<0.22 to 0.8	<5
Silver	ug/L	0.45 to 1.3	<3
Vanadium	ug/L	<0.1 to 1.2	--
Zinc	ug/L	<5 to 54	22

-- Not analyzed.
[1] With respect to the WTP lagoons.
[2] Range of analytical results.
[3] A single sample was filtered prior to preservation; results are for dissolved concentrations (see Finding No. 12).

Other than solvent, fuel, and other organic contaminants that are constituents of concern for the rail yard site, no other analyses are available for this well. As with previous data, the relatively high reporting limits for the supernatant water preclude meaningful comparison of these results. Therefore, it is appropriate to require ongoing monitoring of the supernatant liquid.

Basin Plan, Beneficial Uses, and Regulatory Considerations

30. 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 Board. Pursuant to Section 13263(a) of the California Water Code, waste discharge requirements must implement the Basin Plan.

31. Surface water drainage is to the Sacramento River upstream of the "I" Street Bridge. The beneficial uses of the Sacramento River are municipal and domestic supply; agricultural supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; warm and cold water migration of aquatic organisms; warm water spawning reproduction and/or early development; wildlife habitat; and navigation.

32. The beneficial uses of underlying groundwater are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

33. 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.

34. 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.

35. 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". Chapter IV, Implementation, of the Basin Plan contains the "Policy for Application of Water Quality Objectives". This Policy specifies, in part, that compliance with narrative water quality objectives may be evaluated considering numerical criteria and guidelines developed and/or published by other agencies and organizations.

36. CWC Section 13241 requires the Regional Water Board to consider various factors, including economic considerations, when adopting water quality objectives into its Basin Plan. CWC Section 13263 requires the Regional Water Board to address the factors in Section 13241 in adopting waste discharge requirements. The State Water Resources Control Board (State Water Board), however, has held that a Regional Water Board need not specifically address the Section 13241 factors when implementing existing water quality objectives in waste discharge requirements because the factors were already considered in adopting water quality objectives. The interim groundwater limitations implement adopted water quality objectives in the manner prescribed by the Basin Plan. No additional analysis of Section 13241 factors is required.

Groundwater Degradation

37. State Water Board Resolution No. 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 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. 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.

38. Some degradation of groundwater beneath the solids and backwash water lagoons is consistent with Resolution 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 water treatment solids and filter backwash water; and

d. Does not result in water quality less than that prescribed in the applicable basin plan.

Antidegradation Analysis

39. Some degradation of groundwater by some of the typical waste constituents released with discharge from a water treatment plant after effective source control, treatment, and control is consistent with maximum benefit to the people of California. The technology, energy, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous domestic water wells, and the impact on the water resource 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 prohibited. 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 water quality objective, source control measures, and waste constituent treatability).

40. Economic prosperity of local communities is of maximum benefit to the people of California, and therefore sufficient reason exists to accommodate growth and groundwater degradation around the WTPs, provided that the terms of the Basin Plan are met.

Treatment and Control Practices

41. The WTP provides treatment and control of the discharge that incorporates reinforced concrete treatment structures and waste containment ponds to prevent percolation of waste constituents to the underlying groundwater.

42. Based on the superior chemical character of the raw water treated at the WTP, the nature of the treatment processes, and the fact that all treatment and waste management structures at the WTP are constructed of reinforced concrete (which has inherently low permeability), the discharge poses little threat to groundwater quality. At this time, there is no reason to believe that additional BPTC measures are needed to achieve the highest water quality consistent with the maximum benefit to the people of the State.

43. This Order establishes interim groundwater limitations for the WTP site 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. Although this Order does not require groundwater monitoring, it does include requirements for continued monitoring of the raw water, the supernatant, and the

sludge. If monitoring results reveal a previously undetected threat to water quality, or indicate a change in waste character such that the discharge poses a threat to water quality, the Executive Officer may require groundwater monitoring and/or the Regional Water Board may reopen this Order to reconsider groundwater limitations and other requirements to comply with Resolution No. 68-16. Accordingly, the discharge is consistent with the antidegradation provisions of Resolution No. 68-16.

Other

44. The State Water Board adopted Order No. 97-03-DWQ (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. Storm water is discharged from the facility to the Sacramento River. Therefore, it appropriate for this Order to require that the Discharger either obtain coverage under General Permit No. CAS000001 or submit a Notice of Non-Applicability to demonstrate that the General Permit is not applicable to the facility.

45. As discussed above, supernatant water from the sludge drying lagoons and filter wash water lagoons has historically been discharged to the grit basin, the sanitary sewer, or the storm drain system. A discharge of waste to surface waters requires a National Pollutant Discharge Elimination System (NPDES) permit. Therefore, it is appropriate for this Order to require that the Discharger cease all discharges of supernatant water to the storm drain system.

46. 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”

47. The technical reports required by this Order and the attached Monitoring and Reporting Program No. R5-2007-0086 are necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.

48. The California Department of Water Resources set standards for the construction and destruction of groundwater wells, 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.

49. 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.

50. On 28 November 2000, the Sacramento City Council adopted Resolution No. 2000-686 certifying the *Final Environmental Impact Report (FEIR) for the City of Sacramento Water Facilities Expansion Project*. The FEIR did not identify any water quality impacts attributable to the discharge of waste at the WTP, and no related mitigation measures were proposed.

51. 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 WTP is exempt from Title 27, the data analysis methods of Title 27 may be appropriate for determining whether the discharge complies with the terms for protection of groundwater specified in this Order.

52. Section 20230 of Title 27 states, in part:

> *"(a) Defined - Inert waste is … solid waste that does not contain … soluble pollutants at concentrations in excess of applicable water quality objectives, and does not contain significant quantities of decomposable waste.*
>
> *"(b) Units That Accept - Inert wastes do not need to be discharged at classified Units.*
>
> *"(c) WDRs Optional - The RWQCB can prescribe individual or general WDRs for discharges of inert wastes."*

The Discharger has not demonstrated that the sludge and grit generated by the facility are inert wastes. Therefore, it is appropriate to require that any sludge and grit disposal site(s) be appropriately permitted.

53. The discharge authorized herein and the treatment and storage facilities associated with the discharge 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(b) of Title 27, is based on the following:

    a. The Board is issuing waste discharge requirements;

    b. The discharge complies with the Basin Plan; and

    c. The waste does not need to be managed according to Title 22, CCR, Division 4.5, and Chapter 11, as a hazardous waste.

54. 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

55. 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.

56. 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.

57. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that, pursuant to Sections 13263 and 13267 of the California Water Code, the City of Sacramento and 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, including supernatant and supernatant water, to surface waters or surface water drainage courses is prohibited.

2. Discharge of waste classified as hazardous, as defined in Sections 2521(a) of Title 23, CCR, Division 3, Chapter 15, Section 2510, et seq., (hereafter Chapter 15), or 'designated', as defined in Section 13173 of the California Water Code, is prohibited.

3. Discharges of waste to locations other than the lagoon system described in Finding Nos. 5 through 13, inclusive, and shown on Attachment B is prohibited. However, non-free-draining water treatment sludge may be temporarily stockpiled on-site in compliance with the Discharge Specifications of this Order.

B. Discharge Specifications:

1. Discharges to the lagoons shall be limited to the volume of waste that can be completely contained in the lagoons in compliance with this Order.

2. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations.

3. Neither the treatment nor the discharge shall cause a nuisance or condition of pollution as defined by the California Water Code, Section 13050.

4. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the water treatment plant site boundaries.

5. The Discharger shall operate all systems and equipment to optimize the quality of the waste discharged to the lagoons. Such optimization does not extend to means and measures that would necessarily cause violation of the facility permit issued by the Department of Health Services.

6. 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.

7. The facility shall have sufficient treatment, storage, and disposal capacity to accommodate wastewater flow and design seasonal precipitation during the winter months.

8. Freeboard in any structure or lagoon containing waste shall never be less than two feet as measured from the water surface to the lowest point of the top of the lagoon sidewall.

9. The Discharger may temporarily stockpile sludge and grit that does not contain free-draining water on the facility grounds **between 1 June and 30 October each year**, provided that best management practices are implemented to ensure that any storm water that contacts the stockpiled sludge does not enter the facility's storm water drainage system.

C. Solids Disposal Requirements:

1. Collected screenings, sludge, and other solids generated at the facility shall be disposed of in compliance with the *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.

2. The use of sludge for creation of soil amendments or alternative daily cover shall comply with Title 27, Section 20690 and any applicable requirements of the California Integrated Waste Management Board and its designated Local Enforcement Agency (if any).

3. Sand, silt, and grit removed from the plant headworks may continue to be taken to a landscape materials vendor for commercial sale.

4. Any proposed change in solids disposal practice shall be reported to the Executive Officer at least 90 days in advance of the change.

D. Groundwater Limitations:

1. Release of waste constituents from any wastewater treatment or storage system component associated with the WTPs shall not cause groundwater under and beyond that system component to:

   a. Contain any of the following constituents in concentrations greater than those listed below or greater than ambient background groundwater quality, whichever is greater:

Constituent	Units	Limitation
Arsenic	ug/L	0.004
Cadmium	ug/L	0.07
Chloride	mg/L	106
Chromium	ug/L	50
Copper	ug/L	170
Iron	ug/L	300
Lead	ug/L	2
Manganese	ug/L	50
Mercury	ug/L	1.2
Nickel	ug/L	12
Sodium	mg/L	69
Zinc	mg/L	2
Total trihalomethanes	ug/L	80
Bromoform	ug/L	4
Bromodichloromethane	ug/L	0.27
Chloroform	ug/L	1.1
Dibromochloromethane	ug/L	0.37
Total Coliform Organisms	MPN/100 mL	<2.2 over any 7-day period
Total Dissolved Solids [1]	mg/L	450

[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, toxicity, or color that creates nuisance or impairs any beneficial use.

E. 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 E.2:

   a. By **30 August 2007**, the Discharger shall submit either a Notice of Non-Applicability, an application for a No Exposure Certification, or a Notice of Intent to comply with State Board Water Quality Order No. 97-03-DWQ for discharges of storm water from the facility.

   b. By **30 August 2007**, the Discharger shall submit a report certifying that all valves that could allow discharge of pond supernatant or other waste to the storm drain system have been locked in the closed position or permanently modified to prevent discharges of waste to the storm drain system.

   c. By **30 December 2008**, the Discharger shall submit a *Solids Management System Improvements Plan* that describes any planned improvements to the sludge dewatering system required to support the water treatment capacity including, but not limited to, sedimentation basins, sludge drying lagoons, permanent mechanical sludge dewatering systems, and sludge storage facilities. Other alternatives such as periodic contract dewatering may be included.

   d. Within **90 days** of completion of new permanent structures designed to dewater sludge, or to contain sludge or supernatant, the Discharger shall submit a brief report describing those improvements. The report shall include as built site plans depicting the locations and geometry of all new or expanded basins, lagoons, or other waste containment facilities.

2. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geological 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 section 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.

3. The Discharger shall comply with Monitoring and Reporting Program No. R5-2007-0086, which is a part of this Order, and any revisions thereto as ordered by the Executive Officer.

4. The Discharger shall use the best practicable treatment and control, including proper operation and maintenance, to comply with this Order.

5. The Discharger shall report to the Regional Water Board any toxic chemical release data reported 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."

6. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

7. At least 90 days prior to termination or expiration of any lease, contract, or agreement involving the sites and facilities used to justify the capacity authorized herein and assure compliance with this Order, the Discharger shall notify the Regional Water Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.

8. 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 reported, then the Discharger shall state the reasons for noncompliance and shall provide a schedule to come into compliance.

9. 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. In the event of any change in control or ownership of the facility or land application areas, 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.

11. 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 rescission of this Order.

12. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel at each land application property shall be familiar with its contents.

13. The Regional Water Board will review this Order periodically and may 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 22 June 2007.

_____

PAMELA C. CREEDON, Executive Officer

ALO:6/22/2007

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-0086
FOR
CITY OF SACRAMENTO UTILITIES DEPARTMENT
SACRAMENTO RIVER WATER TREATMENT PLANT
SACRAMENTO COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring raw water, flocculation/sedimentation basin and filter backwash lagoon supernatant (wastewater), wastewater lagoons and basins (ponds), and water treatment sludge. 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 sample station locations prior to implementation of 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 grab sample shall be recorded on the sample chain of custody form. Field test instruments (such as those used to measure pH and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are calibrated prior to each monitoring event;
3. The instruments are serviced and/or calibrated per the manufacturer's recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of this MRP.

RAW WATER MONITORING

The Discharger shall monitor the quantity and quality of raw water from the river. The Discharger shall establish permanent monitoring stations within the WTP as needed to ensure that all samples are representative of these streams. At a minimum, the Discharger shall monitor raw water as follows:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Flow	gpd	Meter observation	Daily	Monthly
Total Dissolved Solids	mg/L	Grab	Monthly	Monthly
pH	Standard	Grab	Monthly	Monthly
Dissolved Metals [1, 2]	ug/L	Grab	Quarterly	Monthly
Standard Minerals [3]	mg/L	Grab	Quarterly	Monthly

[1] At a minimum, the following metals shall be included: arsenic, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, silver, thallium, vanadium, and zinc.

[2] Samples shall be filtered through a 0.45-micron filter prior to preservation.

[3] Standard Minerals shall include, at a minimum, the following elements/compounds: bromide, chloride, fluoride, and sodium.

SUPERNATANT WASTEWATER MONITORING

One sample of supernatant liquid from each type of pond shall be collected and shall be considered representative of the discharge. Wastewater monitoring shall include the following:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Flow	gpd	Meter observation	Daily	Monthly
Total Dissolved Solids	mg/L	Grab	Monthly	Monthly
pH	Standard	Grab	Monthly	Monthly
Dissolved Metals [1, 2]	ug/L	Grab	Quarterly	Monthly
Standard Minerals [3]	mg/L	Grab	Quarterly	Monthly

[1] At a minimum, the following metals shall be included: arsenic, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, silver, thallium, vanadium, and zinc.

[2] Samples shall be filtered through a 0.45-micron filter prior to preservation.

[3] Standard Minerals shall include, at a minimum, the following elements/compounds: bromide, chloride, fluoride, and sodium.

POND MONITORING

Each open pond or lagoon shall be monitored as specified below.

Parameter	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Freeboard [1]	0.1 feet	Staff gauge observation	Weekly	Monthly

[1] If the pond is empty on the scheduled monitoring date, the Discharger may report the freeboard monitoring result as “dry”.

POND LINER INSPECTION

The concrete liner of each pond and lagoon shall be inspected at least once per year. The location and severity of any cracking, spalling, or other damage shall be recorded along with specific recommendations for repairs as needed to prevent pond leakage.

SLUDGE DISPOSAL MONITORING

The Discharger shall maintain a written log of all sludge disposal activities. For each discrete quantity of sludge removed from the facility, the log shall contain the following information:

1. Date.
2. Name and signature of the recorder of the entry.
3. Volume or weight of sludge removed.
4. Name and address of permitted disposal site.
5. Analytical results for any sludge monitoring conducted at the request of the disposal facility.
6. Transport method.
7. Transporter.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., water, wastewater, 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). At a minimum, the reports shall include:

1. Results of all water, wastewater, pond, and sludge disposal monitoring performed during the month, including all daily, monthly, and quarterly sampling data;
2. A comparison of monitoring data to the discharge specifications and an explanation of any violation of those requirements. Data shall be presented in tabular format;
3. If requested by staff, copies of laboratory analytical report(s); and

A calibration log verifying calibration of all hand-held monitoring instruments and devices used to comply with the prescribed monitoring program.

B. Annual Report

An 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 monthly monitoring report for the last sampling event of the year.
2. Volume of raw water treated during the previous year.
3. A detailed description of any operational changes or new systems for sludge handling or dewatering.
4. If requested by staff, tabular and graphical summaries of all data collected during the year with data arranged to confirm compliance with the WDRs.

5. A comparison of supernatant monitoring results for the year to the Groundwater Limitations, and a detailed explanation of significant differences, if any.
6. A summary pond liner inspection report and documentation of all liner repairs recommended and completed.
7. A summary of sludge disposal practices for the year, including tabulation of all sludge disposal monitoring data.
8. 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.
9. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.
10. A forecast of influent flows for the coming year, as described in Standard Provision No. E.4.

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 agent, 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

22 June 2007
(Date)

ALO:06/22/07

INFORMATION SHEET

ORDER NO. R5-2007-0086
CITY OF SACRAMENTO UTILITIES DEPARTMENT
SACRAMENTO RIVER WATER TREATMENT PLANT
SACRAMENTO COUNTY

Background

The City of Sacramento owns and operates the Sacramento River Water Treatment Plant (WTP) near downtown Sacramento. The WTP is designed to treat up to 160 million gallons of water per day. The Sacramento River WTP provides treatment by settling, coagulation with aluminum sulfate, chlorine disinfection, fluoridation, and pH adjustment. Alum sludge from the sedimentation basins and spent lime from the CT Basin and the reservoirs are pumped to the sludge drying lagoons. Filter backwashing generates dilute alum sludge (filter wash water), which is discharged to the filter wash water lagoons for settling/decanting and evapoconcentration. Decant water has historically been discharged to the grit basin, the sanitary sewer, or the storm drain system.

The WTP has three concrete-lined sludge drying lagoons, one earthen lagoon, and two concrete filter wash water lagoons. Sludge is removed from the lagoons when it is no longer free draining and further dried to a solids content of 20 to 50 percent before final disposal. Dried sludge is disposed of at an off-site solid waste landfill. The Discharger wishes to use a less costly means of disposal. The Discharger submitted a conceptual Sludge Management Plan that describes management protocols and includes specific restrictions to prevent or minimize sludge exposure to storm water runoff and waterways, and a plan to provide sludge only to public agencies or businesses with appropriate licenses and permits.

Soils at the site consist primarily of sands and silty sands to a depth of approximately 90 feet below ground surface, and shallow groundwater is encountered at a depth of approximately 44 feet. 20 feet of dredged fill (sand and silty sand) placed in the 1920s. The fill is underlain by up to 15 feet of interbedded clays, silts, and silty clays and up to 40 feet of sands interbedded with clays and thin gravel lenses. Based on data from piezometers at the WTP site, groundwater elevations varied between 3 to 25 feet above CSD during 1993 to 1999, and shallow groundwater at the site typically follows the stage of the Sacramento River with a time lag of approximately three days. The local direction of the groundwater gradient is typically towards the southeast (during high river flow conditions) to the southwest (during low flow conditions).

The derivation of selected terms and conditions of the proposed Order is discussed below.

Proposed Order Terms and Conditions

The antidegradation directives of Section 13000 of the California Water Code 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 (including by reference State

Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation" Policy).

Resolution No. 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 the discharge will impact the quality of each aquifer; and
- The expected degree of degradation.

In allowing a discharge, the Regional Board must comply with CWC section 13263 in setting appropriate conditions. The Regional Board is required 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.

Some degradation of the groundwater for certain constituents is consistent with maximum benefit to the people of California because the technology, energy, and waste management advantages of municipal water treatment plants far outweigh the environmental impact of a community that would otherwise be reliant on numerous domestic wells. Economic prosperity of local communities is of maximum benefit to the people of California, and therefore sufficient reason to accommodate this 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.

Based on the superior chemical character of the raw water treated at the WTP, the nature of the treatment processes, and the fact that most of the treatment and waste management structures at the WTP are constructed of reinforced concrete (which has inherently low permeability), the discharge poses little threat to groundwater quality. At this time, there is no reason to believe that additional BPTC measures are needed to protect groundwater quality. This proposed Order establishes interim groundwater limitations to assure protection of the beneficial uses of groundwater.

Groundwater Limitations

As described in Finding Nos. 25 and 26, the limited groundwater quality information provided in the RWD is not sufficient to determine final groundwater limitations. The interim groundwater limitations of the proposed Order are generally limited to those constituents known to be present in the waste. This does not apply to trihalomethanes, which are expected to be present in the waste based on the treatment technologies employed at the WTPs, and sodium and chloride, which are good basic salinity indicators. An interim groundwater limitation for each was selected in accordance with the most stringent limits set forth in the Basin Plan. The values tabulated below reflect water quality objectives that must be met to maintain specific beneficial uses of groundwater. The most stringent value applies unless it has been demonstrated that background groundwater quality exceeds that value or the beneficial use that is it designed to protect could not exist. For instance, the most stringent limit for TDS (450 mg/L) is based on protection of irrigation supply for the most salt-sensitive crops. If it can be shown that salt-sensitive crops will not be grown due to local climate and/or soil conditions, then the next highest limit applies. In general, the burden of making such a demonstration falls on the discharger.

Constituent	Units	Value	Beneficial Use	Criteria or Justification
Arsenic	ug/L	0.004	MUN [1]	California Public Health Goal [10]
Cadmium	ug/L	0.07	MUN [1]	California Public Health Goal [10]
Chloride	mg/L	106	AGR [2]	Chloride sensitivity on certain crops irrigated via sprinklers [3]
		142	AGR [2]	Chloride sensitivity on certain crops [3]
		250	MUN [1]	Recommended Secondary MCL [4]
		500	MUN [1]	Upper Secondary MCL [4]
Chromium, total	ug/L	50	MUN [1]	Primary MCL [5]
Copper	ug/L	170	MUN [1]	California Public Health Goal [10]
Iron	ug/L	300	MUN [1]	Secondary MCL [5]
Lead	ug/L	2	MUN [1]	California Public Health Goal [10]
Manganese	ug/L	50	MUN [1]	Secondary MCL [5]
Mercury	ug/L	1.2	MUN [1]	California Public Health Goal [10]
Nickel	ug/L	12	MUN [1]	California Public Health Goal [10]
Sodium	mg/L	69	AGR [2]	Sodium sensitivity on certain crops [3]
Zinc	ug/L	2,000	AGR [2]	Irrigation of crops [3]
		2,100	MUN [1]	USEPA Cancer Risk Estimate [6]
Total Dissolved Solids	mg/L	450[8]	AGR [2]	Salt sensitivity for certain crops [3]
		500	MUN [1]	Recommended Secondary MCL [4]

Constituent	Units	Value	Beneficial Use	Criteria or Justification
		1,000	MUN [1]	Upper Secondary MCL [4]
Total Coliform Organisms	MPN/100 ml	Less than 2.2	MUN [1]	Basin Plan
Trihalomethanes	ug/L	80	MUN [1]	Federal MCL [9]
Bromoform	ug/L	4	MUN [1]	USEPA Cancer Risk Estimate [6]
Bromodichloromethane	ug/L	0.27	MUN [1]	Cal/EPA Cancer Potency Factor [7]
Chloroform	ug/L	1.1	MUN [1]	Cal/EPA Cancer Potency Factor [7]
Dibromochloromethane	ug/L	0.37	MUN [1]	Cal/EPA Cancer Potency Factor [7]
pH	pH Units	6.5 to 8.5	MUN [1]	USEPA Secondary MCL [8]
		6.5 to 8.4	AGR [2]	Irrigation of crops [3]

1 Municipal and domestic supply.

2 Agricultural supply.

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).

4 Title 22, California Code of Regulations (CCR), Section 64449, Table 64449-B.

5 Title 22, CCR, Section 64449, Table 64449-A.

6 USEPA Integrated Risk Information System.

7 Cal/EPA Toxicity Criteria Database (OEHHA).

8 40 Code of Federal Regulations, 143.3.

9 40 Code of Federal Regulations, 141.64.

10 Negligible cancer risk level for drinking water (OEHHA).

It appears that groundwater upgradient of the WTP is of high quality. If waste monitoring indicates that the discharge of wastes at the WTP poses a threat to groundwater quality, groundwater monitoring may be required. If so, and determination of background concentrations support this empirical observation, then the most stringent limits cited in the table above will be the final groundwater limitation for those constituents. Otherwise, the statistically determined background groundwater concentration will be the final groundwater limitation for those constituents (and any others whose background groundwater concentrations exceed applicable water quality limits).

Coliform organisms may be present in the waste due to their presence in the source water and the fact that disinfection is performed before filtration. However, the coliform counts should generally be low and the potential for regrowth is limited because the waste contains very little organic matter (most having been oxidized during disinfection). Additionally, all but one of the lagoons have low-permeability concrete liners. These conditions should provide adequate filtration to prevent migration of coliform organisms to groundwater. However, because the Basin Plan specifies a numeric limit for coliform organisms in groundwater, that limit is included as a groundwater limitation.

Provision E.1.a
Storm water from the WTP site is discharged to the Sacramento River via a City-owned storm drain. Provision E.1.a requires that the Discharger submit either a Notice of Non-Applicability, an application for a No Exposure Certification, or a Notice of Intent to comply with State Board Water Quality Order No. 97-03-DWQ for discharges of storm water from the facility.

Prohibition A.1 and Provision E.1.b
The RWD states that decant from sludge drying lagoons and filter wash water lagoons has historically been discharged to the grit basin, the sanitary sewer, or the storm drain system. However, a discharge of waste to surface waters requires a National Pollutant Discharge Elimination System (NPDES) permit. The Discharger plans to install locks on all valves that allow discharge of wastewater to the storm drain system. Therefore, Prohibition A.1 prohibits discharge of wastes, including decant and supernatant water, from any WTP lagoon or basin to surface waters or surface water drainage courses. Additionally, Provision E.1.b requires that the Discharger submit a report certifying that all valves that could allow discharge of pond decant or other waste to the storm drain system have been locked in the closed position or permanently modified to prevent discharges of waste to the storm drain system.

Provision E.1.c
The WTP is designed to treat up to 160 mgd. However, the RWD indicated that additional sludge handling facilities and/or dewatering facilities may be needed to manage the waste before the WTP reaches its design capacity. Therefore, Provision E.1.c requires that the Discharger submit a report that describes the management strategies or improvements planned to handle sludge by 30 December 2008.

Any lagoons other than those described in the RWD and the proposed Order would be beyond the scope of the projects described in the respective CEQA environmental review documents and would trigger the need for revised WDRs.

Other Discharge Specifications
With the Exception of Sludge Lagoon No. 4, the waste lagoons are excavated completely below the surrounding grade, so there is no potential for berm failure to cause a spill. Discharge Specification B.8 allows a minimum operating freeboard of two feet, which is consistent with WDRs for other facilities that rely on lagoons for waste treatment, storage, and disposal.

Because the waste contains negligible organic mater, the standard specification requiring that the dissolved oxygen concentration in the lagoons be maintained above 1.0 mg/L oxygen is not necessary to prevent nuisance odors.

Solids Disposal Requirements
Currently, dried sludge from the water treatment process is disposed of at an off-site solid waste landfill. The Discharger wishes to use a less costly means of disposal and submitted a conceptual Sludge Management Plan that describes management protocols and includes

specific restrictions to prevent or minimize sludge exposure to storm water runoff and waterways, and a plan to provide sludge only to public agencies or businesses with appropriate licenses and permits. Analytical data indicate that the sludge is non-hazardous. However, it is not inert as defined in Section 20230 of Title 27 and may, under some circumstances, pose a threat to water quality if used or disposed of in an uncontrolled manner. Such use or disposal is beyond the scope of this Order and the Discharger does not wish to oversee or monitor such use or disposal. Therefore, this Order requires that all sludge be disposed of at appropriately permitted facilities only. This does not preclude its use as an ingredient in soil amendments that may be distributed commercially, as long as the facility that accepts the sludge as feedstock has appropriate permits and the permitting agency understands the nature of the sludge.

Monitoring Requirements

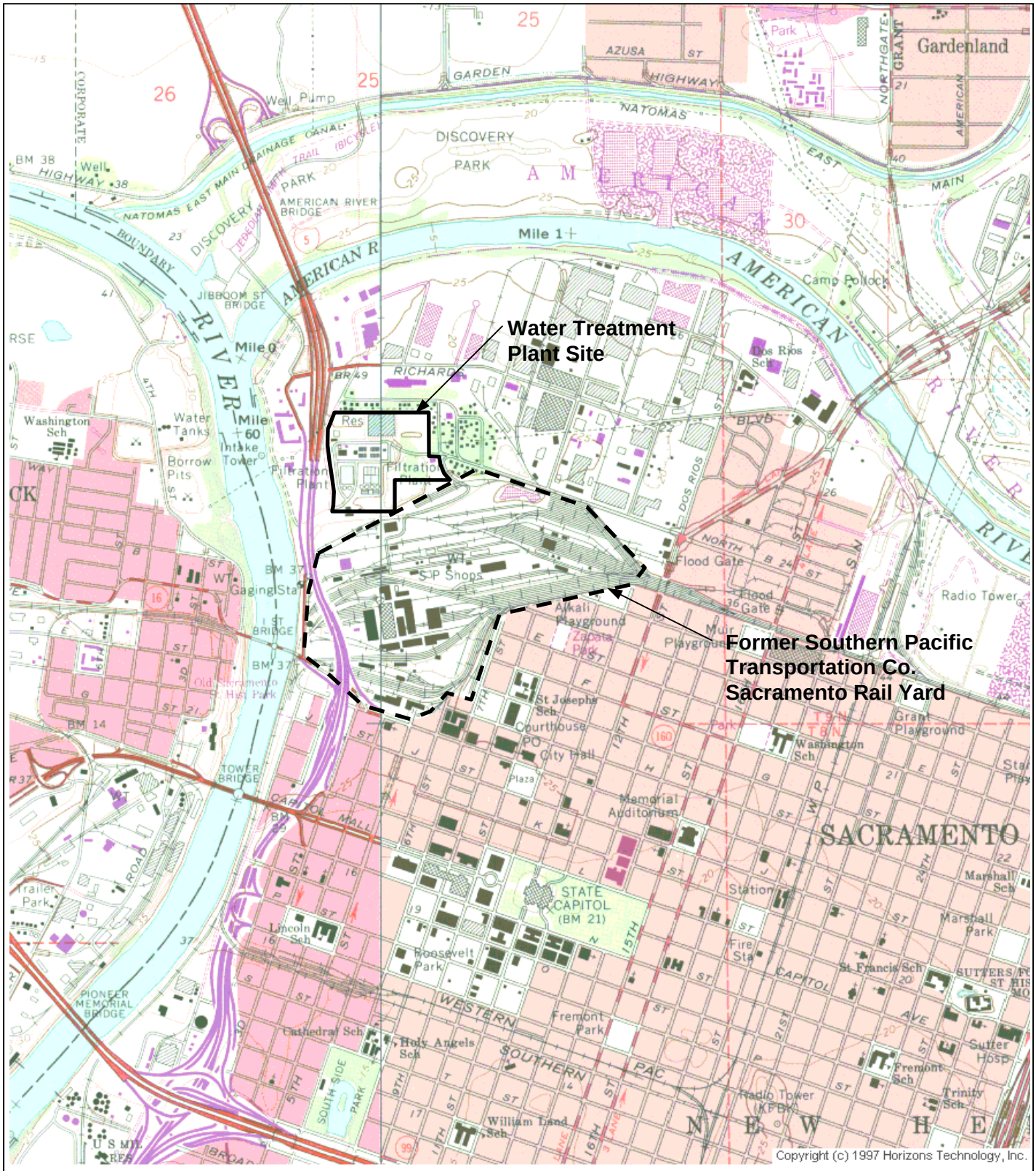
The proposed Order requires regular monitoring of raw water, pond decant, and water treatment sludge. In order to adequately characterize the waste, the Discharger is required to monitor for constituents previously detected in the waste as well as other metals not previously monitored, and compare these results to the Groundwater Limitations. If those metals not previously monitored are detected at concentrations that pose a threat to groundwater quality, the Monitoring and Reporting Program may be revised at the Executive Officer's discretion to require groundwater monitoring for those constituents.

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 the Monitoring and Reporting Program of the proposed Order. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality possible and that could involve substantial 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: 5/21/07

ATTACHMENT A



Drawing Reference:
USGS 7.5 minute quad.
Sacramento West, CA

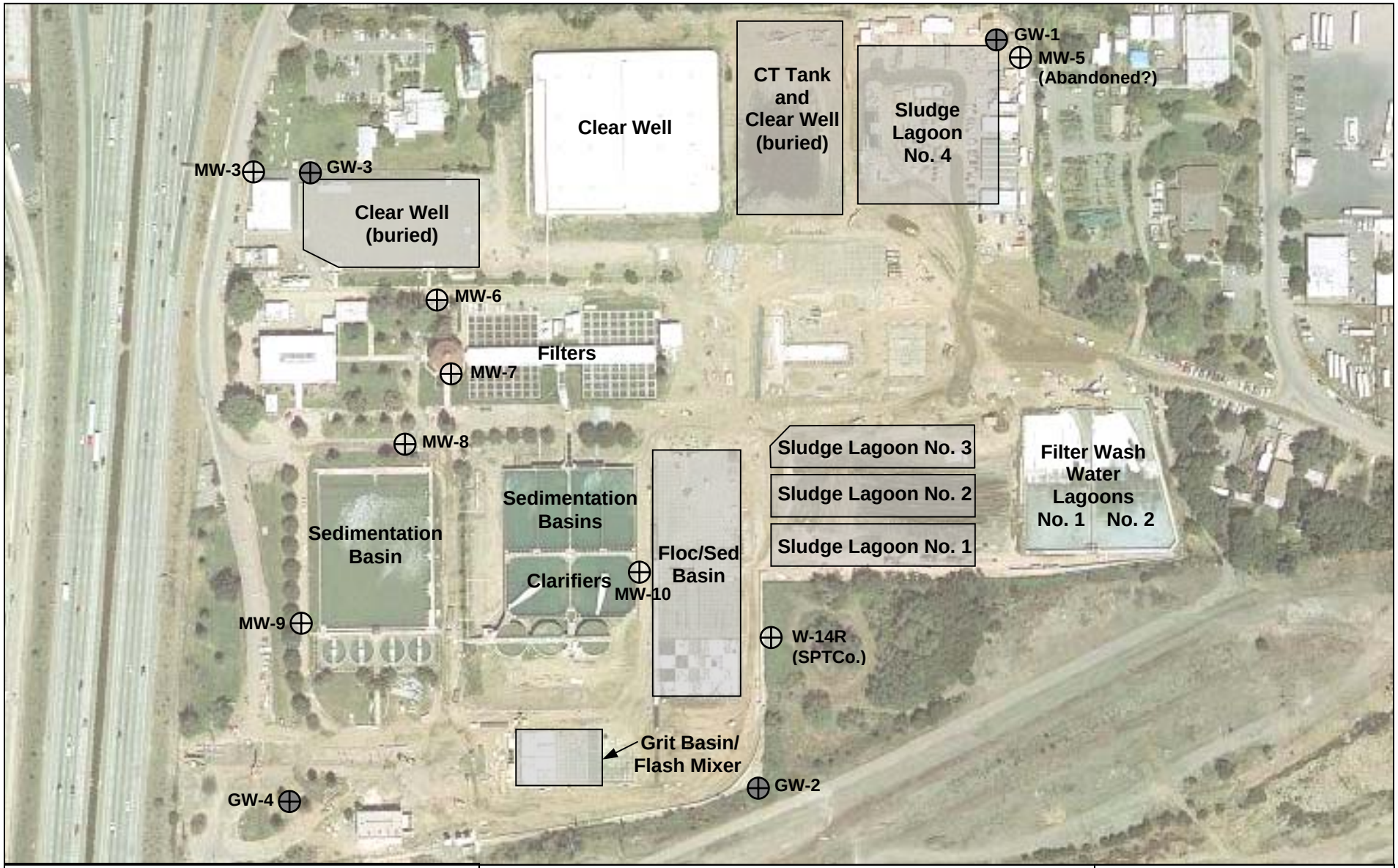
VICINITY MAP
CITY OF SACRAMENTO UTILITIES DEPARTMENT
SACRAMENTO RIVER WATER TREATMENT PLANT
SACRAMENTO COUNTY

ORDER NO. R5-2007-0086

N

Scale: 1" = Approx. 2,100'

ATTACHMENT B



Drawing References:
Drawing G-20, Report of Waste Discharge
TerraServer Sacramento Urban Areas aerial photograph, May 2002

⊕ Shallow Monitoring Well
⊕ Piezometer
(locations approximate)

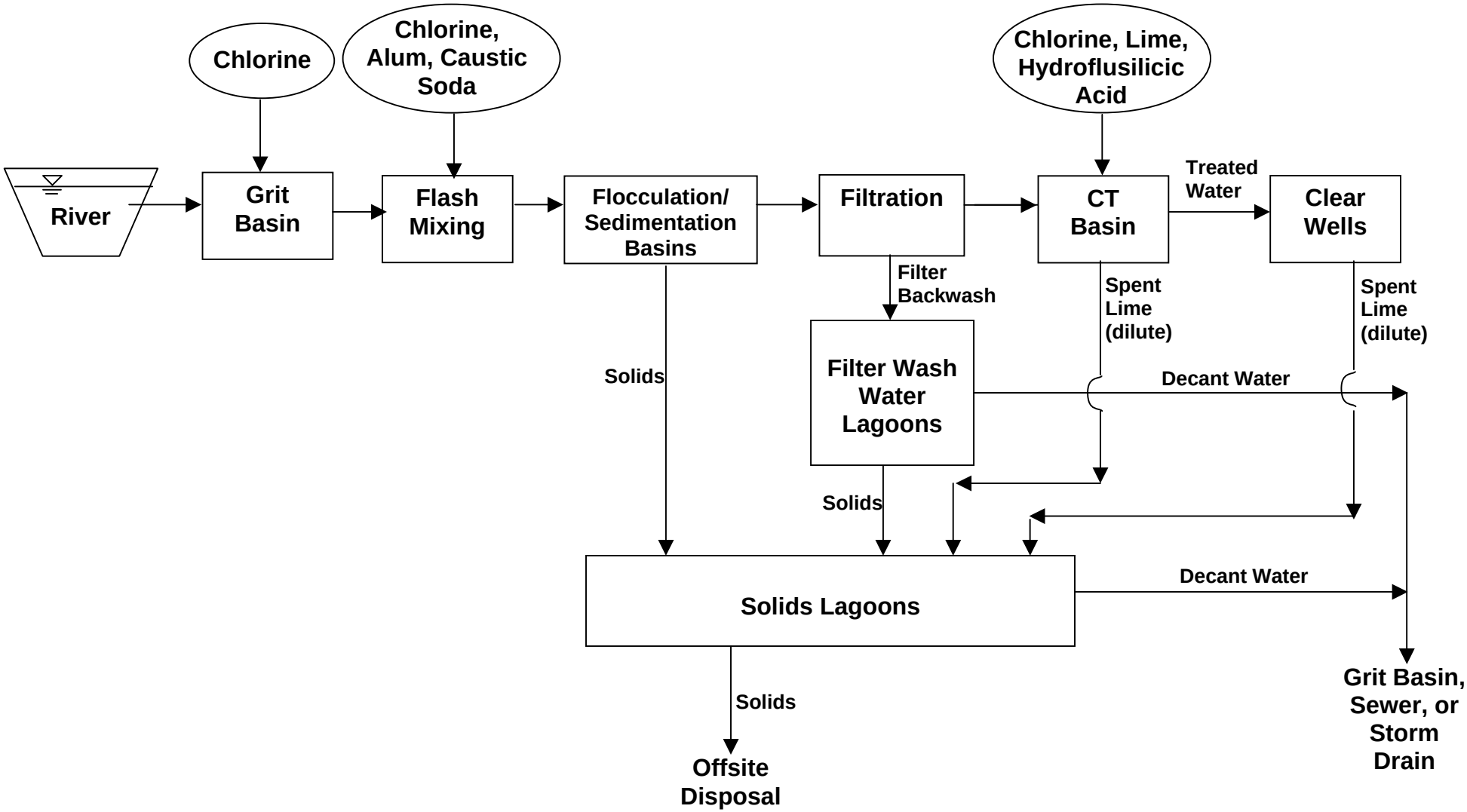
SITE PLAN
CITY OF SACRAMENTO UTILITIES DEPARTMENT
SACRAMENTO RIVER WATER TREATMENT PLANT
SACRAMENTO COUNTY

ORDER NO. R5-2007-0086

N

Scale: 1" = Approx. 240'

ATTACHMENT C



Drawing Reference: Report of Waste Discharge July 2005	**PROCESS SCHEMATIC** CITY OF SACRAMENTO UTILITIES DEPARTMENT SACRAMENTO RIVER WTP SACRAMENTO COUNTY ORDER NO. R5-2007-0086	**LEGEND** Existing Process/Structure