CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2007-0048

WASTE DISCHARGE REQUIREMENTS
FOR
CONTRA COSTA WATER AUTHORITY AND CONTRA COSTA WATER DISTRICT
RANDALL BOLD WATER TREATMENT PLANT AND
BRENTWOOD WATER TREATMENT PLANT
CONTRA COSTA COUNTY

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

1. Contra Costa Water Authority, a Joint Powers Authority comprised of the Contra Costa Water District and Diablo Water District submitted a Report of Waste Discharge (RWD), dated 2 February 2005, to apply for Waste Discharge Requirements (WDRs) for the existing Randall Bold Water Treatment Plant (WTP) and the planned Brentwood WTP. Additional information to complete the RWD was received on 31 May 2005, 23 January 2006, and 28 December 2006.

2. The Randall Bold WTP, which is owned by the Contra Costa Water Authority, is at 3760 Neroly Road in Oakley, as shown on Attachment A, which is attached hereto and made part of the Order by reference. The WTP is in Section 34, T2N, R1E, MDB&M, and comprises Assessor's Parcel No. 053-071-028. Contra Costa Water District operates the WTP.

3. The Randall Bold WTP has been in operation since 1992, and is designed to treat up to 40 million gallons of water per day. Current peak day demand is approximately 25 million gallons per day (mgd), and average annual demand is approximately 10 mgd. The discharge of waste at this facility was authorized under a waiver of WDRs, issued on 25 April 1991. The waiver was based on Regional Water Board Resolution No. 82-036, which expired on 1 January 2003.

4. The Contra Costa Water Authority and Contra Costa Water District (hereafter "Dischargers") plan to modify the Randall Bold facility and to construct a new WTP at the same site to serve the City of Brentwood, as shown on Attachment B, which is attached hereto and made part of the Order by reference.

Existing Facility and Discharge

5. Raw water from the Sacramento-San Joaquin Delta is pumped to the Randall Bold WTP from Old River and Rock Slough via the Contra Costa Canal for treatment prior to distribution as a public water supply. During periods of low salinity, raw water is stored in Los Vaqueros Reservoir. This stored water is supplied to the Contra Costa Canal and blended with raw water from the Delta intakes as needed. The following table summarizes raw water characterization data provided in the RWD for one sample obtained from the Contra Costa Canal on 5 January 2004.

Constituent/Parameter	Result (mg/L except as noted)
Aluminum	0.14
Arsenic	.0034
Bromide	0.2
Chloride	65.3
Chromium	.0024
Copper	0.011
Iron	0.222
Manganese	0.0097
Sodium	44.8
Nitrate	2.78
Hardness, total	108
Alkalinity, total	80
Specific Conductance	450 umhos/cm
Total Coliform	100 CFU/100 mL
Fecal Coliform	1 CFU/100 mL
Enterococci	7 CFU/100 mL

6. The Randall Bold WTP currently provides treatment by pre-ozonation, coagulation with aluminum sulfate and cationic polymer, flocculation, filtration through granular activated carbon and sand, post-ozonation, chloramination, fluoridation, and pH adjustment. Attachment C, which is attached hereto and made part of the Order by reference, depicts a simplified process schematic.

7. Periodic filter backwashing generates dilute alum sludge (filter wash water). The filters produce approximately 190 pounds of dry solids per million gallons of treated water. The filter wash water is discharged to three lagoons (Lagoons 1, 2, and 3) for settling/decanting and evapoconcentration to a solids content of 30 to 40 percent. Decant water is returned to the head of the WTP where it is blended with incoming raw water.

8. The RWD characterized the chemical composition of the filter wash water discharged to the filter wash water lagoons as summarized below.

Constituent/Parameter	Analytical Result (ug/L except as noted)		Applicable Water Quality Limit [1] (ug/L except as noted)
	Total	Dissolved	
pH, std. units	7.5	--	6.5 to 8.4
Alkalinity, total	85	--	NA
Dissolved Solids, mg/L	--	220	450

Constituent/Parameter	Analytical Result (ug/L except as noted) Total	Dissolved	Applicable Water Quality Limit [1] (ug/L except as noted)
Arsenic	7.0	**2.0**	0.004
Boron, mg/L	0.20	--	0.70
Cadmium	1.0	**1.0**	0.07
Chromium	10	10	50
Copper	19	5	170
Iron	2,700	50	300
Lead	5	**5**	2.0
Manganese	200	**120**	0.50
Mercury	0.4	0.4	1.2
Nickel	10	10	12
Silver	10	10	85
Zinc	50	50	2,000
Bromide, mg/L	0.1	--	NA
Chloride, mg/L	45	--	106
Fluoride, mg/L	0.20	--	1.0
Orthophosphate, mg/L	6	--	NA
Sodium, mg/L	39	--	69
Sulfate, mg/L	69	--	250

-- Not applicable; constituents are considered completely soluble.

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.

The analytical results above indicate that the waste may exceed applicable water quality limits for arsenic, cadmium, lead, and manganese.

9. Dried solids removed from the filter wash water lagoons are currently disposed of off-site by land application to farmland owned by Ironhouse Sanitary District (ISD). This disposal is specifically allowed in ISD's waste discharge requirements. The same land is used for reclamation of ISD's treated effluent.

10. The RWD characterized the chemical composition of the dewatered solids sent to ISD, as summarized below.

Constituent/Parameter	Analytical Result	
	Total (mg/kg except as noted)	Soluble (mg/L)
Arsenic	20	<0.02 [1]
Cadmium	<1	<0.01 [1]
Chromium	14	<0.05 [1]
Copper	57	<0.05 [1]
Lead	<5	<0.05 [1]
Mercury	<0.01	<0.01 [1]
Molybdenum	<5	<0.05 [1]
Nickel	16	<0.05 [1]
Selenium	<1	<0.02 [1]
Zinc	28	<0.05 [1]
Solids	32%	130 [2]

[1] Based on the Waste Extraction Test (WET) using deionized water as the extractant.

[2] Total dissolved solids.

11. After reviewing comments from interested parties provided during the October 2006 public comment period, Regional Water Board staff requested that the Discharger resample the dewatered solids using Title 22 test methods. Four samples of the dewatered solids were collected and analyzed in December 2006. The analytical results were provided in a 28 December 2006 report, and are summarized below.

Constituent, units	Soluble Threshold Limit	Sample No. 1	Sample No. 2	Sample No. 3	Sample No. 4
Antimony, mg/l	15	<3.0	<3.0	<3.0	<3.0
Arsenic, mg/l	5.0	0.320	0.500	0.760	0.57
Barium, mg/l	100	0.780	1.1	1.4	1.0
Beryllium, mg/l	0.75	< .10	< .10	< .10	< .10
Cadmium, mg/l	1.0	< .25	< .25	< .25	< .25
Chromium (III), mg/l	5	<.50	< .50	< .50	< .50
Cobalt, mg/l	80	<1.0	<1.0	<1.0	<1.0
Copper, mg/l	25	0.790	0.790	1.1	0.770
Lead, mg/l	2	< .15	< .15	< .15	< .15
Mercury, mg/l	0.2	< .02	< .02	< .02	< .02
Molybdenum, mg/l	350	<1.0	<1.0	<1.0	<1.0
Nickel, mg/l	20	<1.0	<1.0	<1.0	<1.0
Selenium, mg/l	1.0	< .25	< .25	< .25	< .25
Silver, mg/l	5	< .25	< .25	< .25	< .25
Thallium, mg/l	7.0	< .25	< .25	< .25	< .25
Vanadium, mg/l	24	0.410	0.690	0.730	0.660
Zinc, mg/l	250	<1.0	<1.0	<1.0	<1.0

Based on the sampling results, the dried solids do not exceed the Title 22 threshold limits for the 17 metals that were analyzed.

12. The three existing Randall Bold WTP filter backwash lagoons provide sufficient capacity for up to 25 mgd of treated water production. Each lagoon is excavated below grade to provide a six-foot total depth with a four-foot operating depth and a minimum of two feet of freeboard. Each is equipped with a 1,500 gallon-per-minute (gpm) decant pump, which can be used to prevent overflow as necessary. Lagoon design data are summarized below.

Lagoon ID	Surface Area (sq. ft.)	Volumetric Capacity (million gallons)
Lagoon 1	51,000	1.05
Lagoon 2	51,000	1.30
Lagoon 3	87,000	1.85

13. The lagoons are lined with 10 inches of soil cement on the 3:1 interior side slopes. The estimated percolation rate is 3.9 inches per day.

Proposed Changes in the Discharge

14. The Dischargers plan to modify the WTP and construct another WTP at the site in phases over the next three years as follows:

    a. Randall Bold WTP Sedimentation Basin Project;

    b. Randall Bold WTP Solids Lagoon Project; and

    c. New Brentwood WTP Project.

    The proposed new waste lagoons associated with these projects are depicted on Attachment B.

15. The Randall Bold WTP Sedimentation Basin Project will involve construction of two new flocculation and sedimentation basins and conversion of the existing WTP from direct filtration to conventional settling before filtration. This will allow the WTP to produce up to 40 mgd of treated water.

16. The Randall Bold WTP Solids Lagoon Project involves construction of two new lined sedimentation basins. Lagoons 4 and 5 will also be capable of serving as backwash lagoons if necessary. Three additional solids lagoons are planned, but will be constructed later. Like the existing lagoons, each lagoon will be excavated below grade to provide a six-foot total depth with a four-foot operating depth and a minimum of two feet of freeboard. The lagoons will be lined with a minimum of six inches of soil

cement on the sides and a minimum of 10 inches of soil cement on the bottom. The lagoons will have 3:1 interior side slopes and will be equipped with a 1,500 gpm decant pump to control water levels. Design data for Lagoons 4 and 5 are summarized below.

Lagoon ID	Surface Area (sq. ft.)	Volumetric Capacity (million gallons)
Lagoon 4	60,000	1.7
Lagoon 5	40,000	1.06

Dried solids from these lagoons will also be disposed of at the ISD reclamation site.

17. Filter backwash from the Randall Bold WTP will continue to be discharged to Lagoons 1, 2, and 3. Lagoons 4 and 5 will receive both filter backwash and sedimentation basin solids as needed.

18. A new Brentwood WTP is under design, and will be operated by the Contra Costa Water District (CCWD) to serve the City of Brentwood. The new WTP will be constructed next to the Randal Bold WTP and will employ the same treatment technologies as the upgraded Randall Bold WTP. Initially, it will treat up to 12 mgd. CCWD will then add an additional foot of Granular Activated Carbon and re-rate the plant for 15 mgd and it may ultimately be expanded to treat 30 mgd, depending on demand.

19. The Brentwood WTP will eventually include up to six new filter backwash lagoons for settling/decanting and evapoconcentration. Decant water will be returned to the head of the Brentwood WTP. The solids stream from the Brentwood WTP will initially be discharged to Lagoons 4 and 5. As demand grows, the Brentwood WTP will utilize the additional solids lagoons described above.

20. Because the raw water supply for the Brentwood WTP is the same as that for the Randall Bold WTP, the chemical character of the solids and lagoon decant water are expected to be similar.

21. The RWD included a water balance that demonstrates adequate waste storage and disposal capacity during the 100-year, 365-day precipitation event. Excess water in the lagoons can be recycled through the WTPs as needed to maintain sufficient freeboard to prevent spills.

22. The Dischargers are considering lining all lagoons (existing, new, and future lagoons).

Site-Specific Conditions

23. The site is along the northeastern flank of the Mt. Diablo foothills at an elevation of approximately 90 feet above mean sea level (MSL). Site drainage is generally eastward towards Marsh Creek, which drains to Big Break.

24. Based on a soil boring log included in the RWD, surface soils at the site consist primarily of sands and silty sands to a depth of approximately 15 feet below ground surface (bgs). The sands are underlain by interbedded layers of clay and silt mixtures with varying amounts of sand to a depth of 50 feet or more. Cone penetrometer tests conducted at the site in November 2005 indicated similar stratigraphy to that described in the earlier soil boring to a depth of approximately 90 feet.

25. The site is not within the 100-year floodplain.

26. The average annual precipitation in the vicinity of the facility is approximately 13 inches and the 100-year total annual precipitation is 29 inches.

27. The reference evapotranspiration rate (ET_0) for the area is approximately 56 inches per year.

Groundwater Considerations

28. Three samples of groundwater were obtained from a cone penetrometer exploration conducted in November 2005 (see Attachment B for the locations). Analytical data from upgradient and downgradient samples indicate that the existing lagoons may have an influence on underlying groundwater.

Constituent/ Parameter	Units	CPT-3 upgradient	CPT-3R[2] upgradient	CPT-4 downgradient	waste-water
pH	Std.	7.8	--	8.54	7.5
Hardness	mg/L	990	1,100	120	85
Alkalinity as $CaCO_3$	mg/L	240	--	131	45
TDS	mg/L	2,070	--	282	220
Total chloramines	mg/L	<0.04	--	<0.04	--
Total trihalomethanes	ug/L	<0.5	--	<0.5	--
Chloride	mg/L	350	--	61	45
Copper	ug/L	--	0.55	0.55	**5**
Fluoride	mg/L	0.28	--	0.65	0.20

Constituent/ Parameter	Units	CPT-3 upgradient	CPT-3R[2] upgradient	CPT-4 downgradient	waste-water
Sulfate	mg/L	930	--	72	69
Arsenic	ug/L	--	0.69	4.6	**2.0**
Boron	ug/L	--	590	170	0.20
Cadmium	ug/L	--	<0.25	<0.25	**1.0**
Calcium	mg/L	--	260	34	18
Chromium	ug/L	--	0.61	1.9	**10**
Iron	ug/L	--	<20	<20	**50**
Lead	ug/L	--	<0.5	<0.5	**5**
Magnesium	mg/L	--	96	9.4	9.2
Manganese	ug/L	--	320	<20	120
Mercury	ug/L	--	0.068	0.055	**0.4**
Nickel	ug/L	--	9.6	0.74	10
Potassium	mg/L	--	7.3	4.5	2.0
Silver	ug/L	--	<0.19	<0.19	**10**
Sodium	mg/L	--	170	59	39
Zinc	ug/L	--	<5	<5	**50**

[1] Based on topography.

[2] This sample location was co-located with CPT-3 after initial sampling to obtain a new sample for metals analysis.

Although these data are very limited, the cone penetrometer exploration analytical results indicate that shallow groundwater upgradient of the facility is significantly more saline than the settled solids and filter backwash water discharged to the lagoons. Concentrations of hardness, alkalinity, TDS, chloride, nitrate, sulfate, boron, calcium, magnesium, manganese, potassium and sodium in upgradient groundwater appear to be much higher than the corresponding concentrations in the waste discharged to the lagoons. However, concentrations of dissolved arsenic, cadmium, chromium, copper, iron, lead, mercury, silver, and zinc in the waste appear to exceed upgradient groundwater quality, indicating that the discharge poses some threat to groundwater quality from these constituents.

The data also indicate that downgradient groundwater quality is generally much less saline than upgradient groundwater quality. The existing lagoons have lined soil cement sidewalls and native soil bottoms that allow percolation, so it is not clear whether the decrease in downgradient salinity constituents is due to dilution from

lagoon leakage. Downgradient groundwater concentrations of arsenic and chromium exceed upgradient concentrations, indicating potential degradation from the existing lagoons. As stated above, the data are not sufficient to determine whether degradation has occurred, but they indicate that there is a potential for groundwater degradation. Therefore, it is appropriate for this Order to establish interim Groundwater Limitations and require groundwater monitoring and determination of background groundwater quality to determine final Groundwater Limitations.

Basin Plan, Beneficial Uses, and Regulatory Considerations

29. 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.

30. Surface water drainage is to Marsh Creek, which is tributary to Big Break in the Sacramento San Joaquin Delta. The beneficial uses of the Sacramento San Joaquin Delta are municipal and domestic supply; agricultural supply; industrial 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.

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

32. 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.

33. 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.

34. 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.

35. 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

36. 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.

37. 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

38. 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).

39. 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

40. The WTPs provides treatment and control of the discharge that incorporates:
    a. Technology for treatment to drinking water standards; and
    b. Waste containment ponds with soil cement sidewalls and native soil bottoms.

41. 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. This Order contains 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 groundwater limitations and other requirements to comply with Resolution No. 68-16.

Other

42. The State Water Resources Control 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. The RWD did not specify whether storm water is discharged from the industrial portion of the facility. Therefore, it appropriate for this Order to require that the Dischargers 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 facilities.

43. 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."

44. The technical reports required by this Order and the attached Monitoring and Reporting Program No. R5-2007-0048 are necessary to assure compliance with these waste discharge requirements. The Dischargers operate the facilities that discharge the waste subject to this Order.

45. 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.

46. 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 WTPs 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.

47. 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.

48. On 21 April 2004, Contra Costa Water District, as lead agency, determined that the action to modify the Randall Bold WTP is exempt from CEQA. Based on the information presented above, the expansion project, when conducted in compliance with this Order, should not cause adverse environmental impacts.

49. On 14 June 2005, the City of Brentwood adopted the Final Environmental Impact Report for the City of Brentwood Surface Water Treatment Facility, Phase II Project. Potential for localized sediment or pollutant release during construction was mitigated to less than significant by implementation of Best Management Practices to control discharge of construction-related pollutants to surface waters and spill prevention and control programs. The Regional Water Board concurs with the City's findings.

50. 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.

51. 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

52. 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.

53. The Dischargers 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.

54. 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 Contra Costa Water Authority and Contra Costa Water District, their 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 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. 7, 9, and 14 through 19, inclusive, are prohibited.

B. Discharge Specifications:

1. The Dischargers shall construct new filter backwash and sedimentation lagoons commensurate with treatment capacity expansion and as needed to ensure adequate capacity to comply with all requirements of this Order.
2. Discharges to the lagoons shall be limited to waste generation associated with the following water treatment capacities:

Randall Bold Water Treatment Plant	40 mgd
Brentwood Water Treatment	30 mgd

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

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

6. The Dischargers shall operate all systems and equipment to maximize treatment of raw water and optimize the quality of the discharge.

7. All conveyance, treatment, storage, and disposal units shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

8. The facility shall have sufficient treatment, storage, and disposal capacity to accommodate allowable wastewater flow and design seasonal precipitation 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.

9. Freeboard in any waste lagoon shall never be less than two feet as measured from the water surface to the lowest point of overflow.

10. On or about **15 October** of each year, available lagoon storage capacity shall at least equal the volume necessary to comply with Discharge Specifications B.8 and B.9.

C. Solids Disposal Requirements:

1. Collected screenings, sludge, and other solids generated at the facility shall be disposed of at the Ironhouse Sanitary District and/or disposed of off-site, 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. when approved by the Executive Officer.

2. Any proposed change in solids use or 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, as determined by an approved well monitoring network, 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	0.5
Mercury	ug/L	1.2
Nickel	ug/L	12
Silver	ug/L	85
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
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 a nuisance or impairs any beneficial use.

E. Provisions:

1. The Dischargers shall submit reports for groundwater monitoring as described below. The reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared as described in Provision E.3:

a. By **1 May 2008**, the Dischargers shall submit a *Monitoring Well Installation Workplan.* The workplan shall describe the proposed installation of groundwater monitoring wells sufficient to characterize groundwater gradient and groundwater quality upgradient and down gradient of all lagoons. The workplan may propose a phased installation plan such that the first phase includes at least three monitoring wells to characterize groundwater upgradient and downgradient of the existing lagoons, and subsequent phases include additional downgradient wells to be constructed shortly after completion of new lagoons. Monitoring wells shall be constructed to yield representative samples from the uppermost layer of the uppermost aquifer and to comply with applicable well standards. The workplan shall be consistent with, and include the items listed in, the first section of Attachment D, which is attached hereto and made part of this Order by reference.

b. By **1 May 2009**, the Dischargers shall submit a *Monitoring Well Installation Report* that describes the installation of groundwater monitoring wells and contains the items found in the second section of Attachment D.

c. By **1 July 2011**, the Dischargers shall submit a *Background Groundwater Quality Study Report*. For each groundwater monitoring parameter/constituent identified in the MRP, the report shall present a summary of all monitoring data and calculation of the concentration in background monitoring well(s). Determination of background quality shall be made using the methods described in Title 27, Section 20415(e)(10), and shall be based on data from at least eight consecutive quarterly (or more frequent) groundwater monitoring events.

2. If the groundwater monitoring results show that the discharge of waste is threatening to cause or has caused groundwater to contain waste constituents in concentrations statistically greater than background water quality, then within 120 days of the request of the Executive Officer, the Dischargers shall submit a *BPTC Evaluation Workplan* that sets forth a scope and schedule for a systematic and comprehensive technical evaluation of each component of the facilities' waste management system to determine best practicable treatment and control for each waste constituent listed in the Groundwater Limitations of this Order. The workplan shall include a preliminary evaluation of each component of the waste management 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.

3. 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. 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 Dischargers shall comply with Monitoring and Reporting Program No. R5-2007-0048, which is a part of this Order, and any revisions thereto as ordered by the Executive Officer.

5. The Dischargers shall use the best practicable treatment and control, including proper operation and maintenance, to comply with this order.

6. The Dischargers 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."

7. The Dischargers 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)."

8. At least 90 days prior to termination or expiration of any lease, contract, or agreement involving the land application areas used to justify the capacity authorized herein and assure compliance with this Order, the Dischargers 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.

9. The Dischargers 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 Dischargers shall state the reasons for noncompliance and shall provide a schedule to come into compliance.

10. The Dischargers shall report promptly to the Regional Water Board any material change or proposed change in the character, location, or volume of the discharge.

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

12. The Dischargers 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.

13. 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.

14. 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 4 May 2007.

_____
PAMELA C. CREEDON, Executive Officer

ALO/GWL/BPK: 5/17/2007

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-0048
FOR
CONTRA COSTA WATER AUTHORITY AND CONTRA COSTA WATER DISTRICT
RANDALL BOLD WATER TREATMENT PLANT AND
BRENTWOOD WATER TREATMENT PLANT
CONTRA COSTA COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring flocculation/sedimentation basin and filter backwash lagoon decant (wastewater), lagoons and basins (ponds), and groundwater. This MRP is issued pursuant to Water Code Section 13267. The Dischargers 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. The Dischargers are jointly responsible for implementing this MRP, and shall submit joint monitoring reports.

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 the MRP.

INFLUENT FLOW MONITORING

The influent shall be monitored continuously for flow to both water treatment plants and reported as daily average flow (mgd) in the monthly report.

WASTEWATER MONITORING

One sample of decant liquid from each pond shall be collected and analyzed as indicated below. Grab samples will be considered representative of the discharge. Wastewater monitoring shall include the following:

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

[1] At a minimum, the following metals shall be included: arsenic, cadmium, chromium, copper, iron, lead, 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 pond 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 Dischargers may report the freeboard monitoring result as “dry”.

SOLIDS MONITORING

The volume of solids removed from the ponds for disposal shall be reported annually. Additionally, solids shall be sampled and analyzed annually for Title 22, Section 66261.24 (A) Table II constituents using Title 22 methods.

GROUNDWATER MONITORING

The following program shall begin the 3rd Quarter of 2009. Prior to construction and/or sampling of any groundwater monitoring wells, the Dischargers shall submit plans and specifications to the Board for review and approval. Unless otherwise expressly approved, water supply wells shall not be used as monitoring wells. 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 sampling, the groundwater elevations shall be measured and the wells shall be purged of at least three well volumes until temperature, pH, and electrical conductivity have stabilized. Depth to groundwater shall be measured to the nearest 0.01 feet. Samples shall be collected and analyzed using standard EPA methods. Groundwater monitoring shall include, at a minimum, the following:

Constituent/Parameter	Units	Sample Type	Sampling Frequency [5]	Reporting Frequency
Depth to Groundwater	feet	Measurement	Quarterly	Quarterly
Groundwater Elevation [1]	feet	Calculated	Quarterly	Quarterly
Gradient Magnitude	feet/foot	Calculated	Quarterly	Quarterly
Gradient Direction	degrees	Calculated	Quarterly	Quarterly
pH	pH Units	Grab	Quarterly	Quarterly

Constituent/Parameter	Units	Sample Type	Sampling Frequency [5]	Reporting Frequency
Total Dissolved Solids	mg/L	Grab	Quarterly	Quarterly
Bromodichloromethane	ug/L	Grab	Quarterly	Quarterly
Chloroform	ug/L	Grab	Quarterly	Quarterly
Dibromochloromethane	ug/L	Grab	Quarterly	Quarterly
Total Coliform Organisms	MPN/100 mL	Grab	Quarterly	Quarterly
Dissolved Metals [2, 3]	ug/L	Grab	Quarterly	Quarterly
Standard Minerals [4]	mg/L	Grab	Quarterly	Quarterly

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

2 At a minimum, the following metals shall be included: arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc.

3 Samples shall be filtered through a 0.45-micron filter prior to preservation.

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

5 Groundwater monitoring shall begin the 3rd Quarter of 2009.

REPORTING

In reporting monitoring data, the Dischargers shall arrange the data in tabular form so that the date, sample type (e.g., wastewater, storage pond, reuse areas, 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 wastewater and pond monitoring performed during the month, including all daily, weekly, 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

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

B. Quarterly Monitoring Reports

Beginning with the third Quarter of 2009,the Dischargers shall establish a quarterly groundwater sampling schedule such that samples are obtained approximately every three months. Quarterly monitoring reports shall be submitted to the 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. The Quarterly 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 monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, 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 tends, 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 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 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. The contents of the regular quarterly monitoring report for the fourth quarter of the year;
3. Total annual wastewater flows into the wastewater storage ponds;
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. An annual evaluation of the groundwater quality at the facility.
6. A narrative description of solids disposal practices including required sampling and the volume sent to off site disposal facilities.
7. 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.
8. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.
9. 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 Dischargers have 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 Dischargers shall implement the above monitoring program as of the date of this Order.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

_____
(Date)

ALO/GWL/BPK: 05/17/07

INFORMATION SHEET

ORDER NO. R5-2007-0048
CONTRA COSTA WATER AUTHORITY AND CONTRA COSTA WATER DISTRICT
RANDALL BOLD WATER TREATMENT PLANT AND
BRENTWOOD WATER TREATMENT PLANT
CONTRA COSTA COUNTY

Background

The Contra Costa Water Authority, a Joint Powers Authority, owns the Randall Bold Water Treatment Plant (WTP) in Oakley. Contra Costa Water District operates the WTP, which is designed to treat up to 40 million gallons of water per day. The Dischargers plan to modify the Randall Bold facility and construct a new WTP at the same site to serve the City of Brentwood. The new Brentwood WTP will be owned by the Contra Costa Water District.

The Randall Bold WTP provides treatment by pre-ozonation, coagulation with aluminum sulfate and cationic polymer, flocculation, filtration through granular activated carbon and sand, post-ozonation, chloramination, fluoridation, and pH adjustment. Periodic filter backwashing generates dilute alum sludge (filter wash water). The filter wash water is discharged to lagoons for settling/decanting and evapoconcentration to a solids content of 30 to 40 percent. The three existing Randall Bold WTP filter backwash lagoons are lined with soil cement on the side slopes. Dried solids removed from the filter wash water lagoons are disposed of off-site at the Ironhouse Sanitary District's (ISD) recycling area near the plant and on Jersey Island. The waste in the lagoons has been characterized for ISD and was presented in Finding 20 of WDRs Order No. 5-01-237. The concentrations in the dried solids may exceed applicable water quality limits for dissolved arsenic, cadmium, lead, and manganese before application, however the application of these dried solids is consistent with standard practice 40 CFR Part 503.

The Dischargers plan to modify the Randall Bold WTP. Contra Costa Water District will oversee construction of upgrades at the site in phases over the next three years. The project includes adding two new flocculation and sedimentation basins and two new lined solids lagoons that will allow Randall Bold WTP to produce up to 40 mgd of treated water. Three additional solids lagoons are planned, but will be constructed later.

A new Brentwood WTP is under design, and will be operated by Contra Costa Water District. It will employ the same treatment technologies as the Randall Bold WTP. Initially, it will treat up to 12 mgd, then an additional foot of GAC will be added and the plant will be re-rated for 15 mgd, and it may ultimately be expanded to up to 30 mgd, depending on demand. The Brentwood WTP will include up to six new filter backwash lagoons. The solids stream will be discharged to the new lagoons constructed for the Randall Bold WTP.

Soils at the site consist primarily of sands and silty sands to a depth of approximately 90 feet below ground surface (bgs), and shallow groundwater is encountered at a depth of approximately 44 feet bgs. Based on limited groundwater characterization data, shallow groundwater upgradient of the facility is significantly more saline than the wastes discharged to the lagoons. Specifically, concentrations of hardness, alkalinity, TDS, chloride, nitrate, sulfate,

boron, calcium, magnesium, manganese, potassium and sodium in upgradient groundwater appear to be much higher than the corresponding concentrations in the waste discharged to the lagoons. Based on staff's professional experience with facilities in the area, the high groundwater salinity is likely a naturally occurring phenomenon.

However, concentrations of dissolved arsenic, cadmium, chromium, copper, iron, lead, mercury, silver, and zinc in the waste appear to exceed upgradient groundwater quality, indicating that the discharge poses some threat to groundwater quality from these constituents. The data also indicate that downgradient groundwater quality is generally much less saline than upgradient groundwater quality. The existing lagoons have sides lined with soil cement and native soil bottoms that are allowed to percolate, so it is not clear whether the decrease in downgradient salinity constituents is due to dilution from lagoon leakage. Downgradient groundwater concentrations of arsenic and chromium exceed upgradient concentrations, indicating potential degradation from the existing lagoons.

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 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 Dischargers to provide technical information for the Regional Water 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 Water Board must comply with CWC section 13263 in setting appropriate conditions. The Regional Water 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 Water 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.

The current and proposed treatment and control practices may not represent sufficient best practicable treatment and control (BPTC) to comply with Resolution No. 68-16. Reasonable time is necessary to gather specific information about the WTP site to make informed, appropriate, long-term decisions. This proposed Order, therefore, establishes interim groundwater limitations to assure protection of the 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.

Groundwater Limitations

As described in Finding 28, the limited groundwater quality information provided in the RWD indicates that shallow groundwater upgradient of the facility is significantly more saline than the waste discharged to the lagoons. However, concentrations of certain dissolved metals in the waste appear to exceed upgradient groundwater quality, indicating that the discharge poses some threat to groundwater quality. Downgradient groundwater concentrations of arsenic and chromium exceed upgradient concentrations, indicating potential degradation from the existing lagoons. The data are not sufficient to determine whether degradation has occurred, but they indicate that there is a potential for groundwater degradation. Therefore, although it is not possible to establish final groundwater limitations at this time, it is appropriate for this Order to establish interim groundwater limitations and require groundwater monitoring and determination of background groundwater quality to support determination of final groundwater limitations.

The interim groundwater limitations of the proposed Order are generally limited to those constituents known to be present in the waste, and which appear to be present in concentrations similar to, or higher than, the apparent background groundwater quality. 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	0.3	MUN [1]	Secondary MCL [5]
Lead	ug/L	2	MUN [1]	California Public Health Goal [10]
Manganese	ug/L	0.05	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 6.5 to 8.4	MUN [1] AGR [2]	USEPA Secondary MCL [8] 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 WTPs exceeds the most stringent water quality limits for total dissolved solids, chloride, sulfate, arsenic, boron, manganese, and sodium. If groundwater monitoring and determination of background concentrations support this empirical observation, then 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). Despite the apparent poor quality of upgradient groundwater, the waste discharged to the lagoons contains some constituents at concentrations that exceed apparent background groundwater quality: dissolved arsenic, cadmium, chromium, copper, iron, lead, mercury, silver, and zinc. If groundwater monitoring 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.

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, the lagoons will have low-permeability liners and the site is underlain by approximately 40 feet of fine-grained soil. 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

The Dischargers shall conduct groundwater monitoring beneath the facility. Provision E.1. requires that the Dischargers submit a *Monitoring Well Installation Workplan*, install groundwater monitoring wells, and complete a statistical evaluation of background groundwater quality. This work is necessary to support determination of appropriate final groundwater limitations and to allow verification of compliance with those limitations.

Groundwater Monitoring Requirements

Beginning with the 3rd Quarter 2009, the Monitoring and Reporting Program requires that the Dischargers monitor shallow groundwater quarterly to determine the site-specific gradient and concentrations of all constituents for which interim groundwater limitations have been established. This requirement is standard for all discharges that pose a threat to groundwater quality.

The Dischargers are required to evaluate potential groundwater degradation each year based on statistical analysis and comparison of concentrations in upgradient and downgradient monitoring wells. If it is determined that groundwater has been degraded, the Dischargers will be required to evaluate and implement BPTC measures for each treatment, storage, and disposal component of the system. Completion of these tasks will ensure that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved.

Discharge Specifications B.1 and B.2

It is not practical to prescribe a flow limit for the wastewater discharged from the WTPs, because the amount of water treated (and therefore the amount of wastewater generated) will vary significantly throughout the year. The RWD identified specific final water treatment capacities for the two WTPs and the specific waste containment lagoons needed to manage the waste based on those capacities. Therefore, Discharge Specification B.1 requires that the Dischargers construct new filter backwash and sedimentation lagoons commensurate with treatment capacity expansion and as needed to ensure adequate capacity to prevent spills outside of the lagoons. The water balance provided in the RWD indicates that this should be sufficient to ensure adequate waste storage and disposal capacity. Additional protection from

spills is provided by the lagoon decant pumps, which allow the Dischargers to lower lagoon freeboard by pumping any excess water back into the water treatment process.

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. Therefore, Discharge Specification B.2 requires that the Dischargers limit the volume of water treated at each facility to the ultimate capacity envisioned in the environmental review documents.

Other Discharge Specifications

The waste lagoons will be excavated completely below the surrounding grade, so there is no potential for berm failure to cause a spill. The lagoons are designed to provide three feet of freeboard, but Discharge Specification B.9 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.

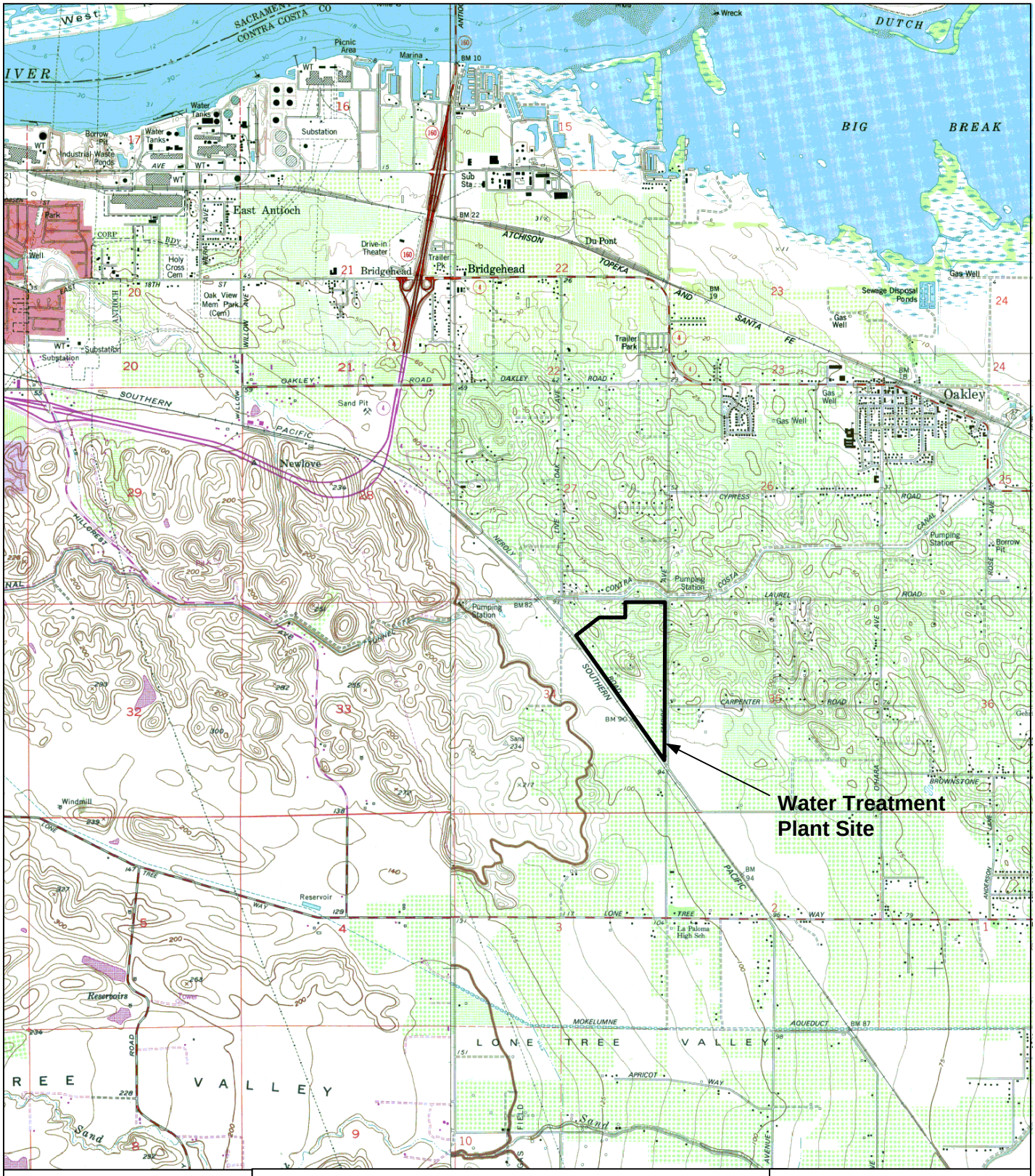
Other Monitoring Requirements

The proposed Order requires wastewater monitoring and pond monitoring. In order to adequately characterize the waste, the Dischargers are required to monitor for constituents previously detected in the waste as well as other metals not previously monitored. 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 Dischargers 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 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.

ATTACHMENT A



Drawing Reference:
USGS 7.5 minute quad.
Brentwood, CA

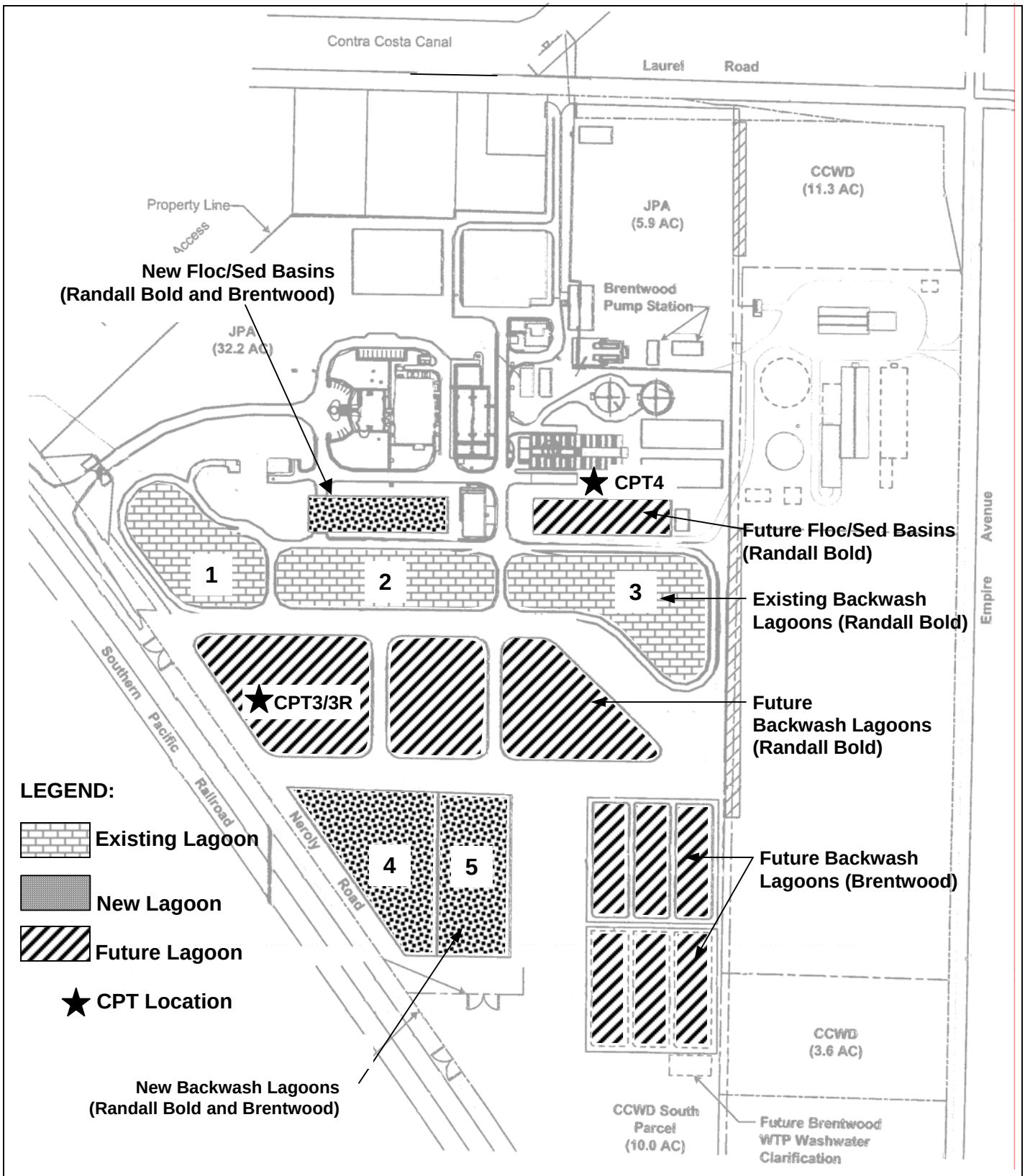
VICINITY MAP
CONTRA COSTA WATER AUTHORITY AND
CONTRA COSTA WATER DISTRICT
RANDALL BOLD WTP AND BRENTWOOD WTP
CONTRA COSTA COUNTY

ORDER NO. R5-2007-0048

N

Scale: 1” = Approx. 3,400’

ATTACHMENT B



Drawing Reference:
Report of Waste Discharge
Addendum
May 2005

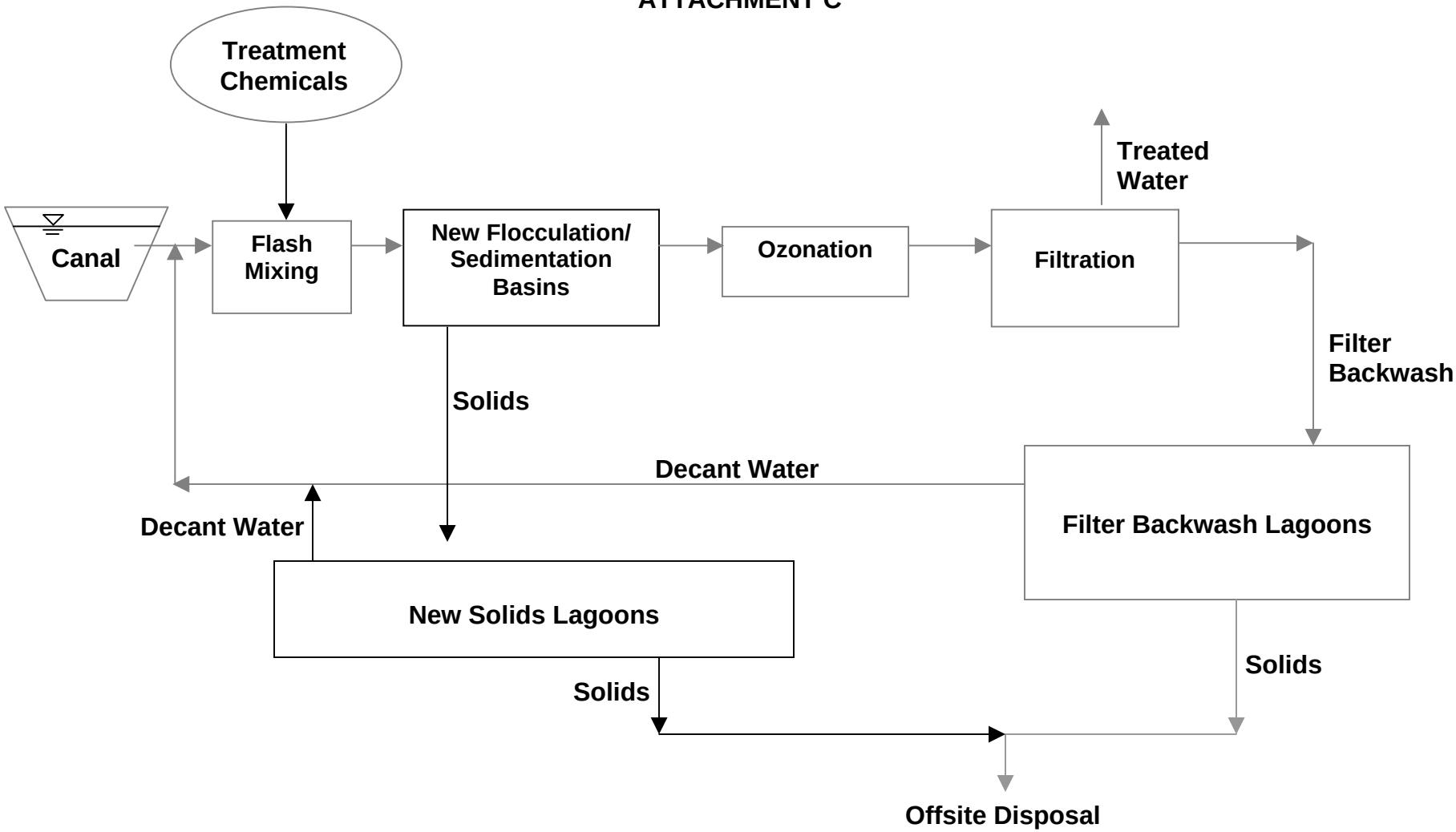
SITE PLAN
CONTRA COSTA WATER AUTHORITY AND
CONTRA COSTA WATER DISTRICT
RANDALL BOLD WTP AND BRENTWOOD WTP
CONTRA COSTA COUNTY

ORDER NO. R5-2007-0048

N

No Scale

ATTACHMENT C



Drawing Reference: Report of Waste Discharge December 2004	**PROCESS SCHEMATIC** CONTRA COSTA WATER AUTHORITY AND CONTRA COSTA WATER DISTRICT RANDALL BOLD WTP AND BRENTWOOD WTP CONTRA COSTA COUNTY ORDER NO. R5-2007-0048	**LEGEND** **Existing Process/Structure** **Proposed (New) Process/Structure**

ATTACHMENT D

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
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