State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

ORDER NO. R4-2014-xxx

WASTE DISCHARGE REQUIREMENTS AND
WATER RECYCYLING REQUIREMENTS

FOR THE

LEO J. VANDER LANS WATER TREATMENT FACILITY AND THE ALAMITOS BARRIER RECYCLED WATER PROJECT

ISSUED TO

Water Replenishment District of Southern California and
Los Angeles County Department of Public Works

The California Regional Water Quality Control Board, Los Angeles Region (Regional Water Board) finds the following:

I. BACKGROUND

1. The Los Angeles County Department of Public Works (Los Angeles County DPW) and the Orange County Water District (OCWD) co-own and operate the Alamitos Gap Seawater Intrusion Barrier (Barrier). Figure 1 shows the location of the Barrier.

2. Prior to the construction of the Barrier, decades of over-pumping caused the water levels in the Central Groundwater Basin and Orange County Groundwater Basin to drop, resulting in a loss of groundwater from storage and seawater intrusion into the potable aquifers, rendering portions of the basins unsuitable for beneficial use. The Barrier began operations in 1965 and is designed to protect the Central Groundwater Basin and portions of the Orange County Groundwater Basin from seawater intrusion through the creation of a pressure ridge by injection of fresh water into the Barrier through an alignment of 41 injection wells. These wells are located approximately two miles inland from the mouth of the San Gabriel River at the Los Angeles/Orange County boundary. The pressure ridge created by the Barrier prevents seawater from passing the Barrier and entering further into the groundwater basins. The injected water flows inland, providing needed replenishment water to the groundwater basins. The failure to maintain an effective seawater intrusion barrier would cause serious water quality degradation in drinking water aquifers in southeastern Los Angeles County and southwestern Orange County, and the potential loss of this water resource.

3. There are seven groundwater-bearing units defined in the vicinity of the Barrier, including from shallowest to deepest the Recent Aquifer, Zones C, B, A, and I, the Main Aquifer (also known as the Silverado Aquifer), and the Lower Main Aquifer (also known as the Sunnyside Aquifer or Lower San Pedro Aquifer). The geological

cross-section for these aquifers is illustrated in Figure 2. Due to geologic conditions, seawater intrusion has a direct pathway into the Recent Aquifer and the C, B, A, and I Zones. The deeper Main and Lower Main aquifers are protected from intrusion by the Seal Beach Fault and overlying low-permeability layers.

4. The Water Replenishment District of Southern California (WRD) manages the Central and West Coast Groundwater Basins. WRD owns and manages the Leo J. Vander Lans Water Treatment Facility (Vander Lans WTF or Facility) in the City of Long Beach and is the purveyor of recycled water produced by the Facility that is injected into the Barrier. Figure 3 shows the location of the Facility. Prior to 2005, only potable water was injected into the Barrier. Since October 2005, the Facility has produced up to 3 million gallons per day (mgd) of high quality advanced-treated recycled water that is injected into the Barrier in combination with potable water pursuant to Regional Water Board Order No. R4-2005-0061. The program of producing and delivering advanced treated recycled water to the Barrier is known as the Alamitos Barrier Recycled Water Project (Project).

5. Together, WRD and Los Angeles County DPW (collectively referred to as Dischargers or Project Sponsors) propose to produce up to 8 mgd of advanced treated recycled water for injection into the Barrier to replace the potable water currently used.

6. The Los Angeles County Sanitation District (County Sanitation District) owns and operates the Long Beach Water Reclamation Plant (Long Beach WRP), which produces disinfected tertiary recycled water that is the source water for advanced treatment at the Facility. To meet the needs for additional source water at the expanded Facility, disinfected tertiary recycled water from the Los Coyotes Water Reclamation Plant (Los Coyotes WRP), also owned and operated by the County Sanitation District, may be used to supplement the existing supply from the Long Beach WRP. The City owns the rights to the recycled water produced at the Long Beach WRP and Los Coyotes WRP.

II. PURPOSE OF ORDER

7. The treatment of recycled water at the Vander Lans WTF and injection into the Barrier were previously permitted under Order R4-2005-0061 (2005 Order), issued by the Regional Water Board on September 1, 2005, as amended by WQ-2006-0001 issued by the State Water Board on April 5, 2006.

8. The Alamitos Barrier straddles the border between the jurisdictional areas of the Los Angeles Regional Water Board and the Santa Ana Regional Water Board. In a February 8, 2004 letter to the Santa Ana Regional Water Board, the Los Angeles Regional Water Board requested the lead on permitting the Project. This request was granted by the Santa Ana Regional Water Board in a letter dated July 30, 2004.

9. On October 23, 2012, the Project Sponsors submitted a Report of Waste Discharge requesting amendment of the Waste Discharge Requirements and Water Recycling Requirements (WDRs/WRRs) to reflect a proposal to expand the Facility and increase the volume of recycled water injected into the Barrier. The Regional Water Board found the Report of Waste Discharge to be complete on November 6, 2012.

10. On October 23, 2012, the Project Sponsors submitted an amended Title 22 Engineering Report for the expansion of the Facility to the Regional Water Board and the California Department of Public Health (CDPH). The Engineering Report was later revised in response to comments received from CDPH. A final version was submitted on March 29, 2013, for review by CDPH and the Regional Water Board, and was approved by CDPH on April 4, 2013. On June 26, 2013, CDPH held a public hearing to consider findings of fact regarding the planned Facility expansion and conditions to be imposed on the Project to ensure protection of public health. There were no objections voiced concerning the Project at the public hearing. CDPH submitted to the Regional Water Board the Findings of Fact and Conditions for the Project adopted by CDPH on July 12, 2013. The CDPH found that the Project will not degrade the quality of the water in the receiving aquifers as a source of domestic water supply provided that all of the conditions are met.

11. The Findings of Fact adopted by CDPH pertaining to the Project on July 12, 2013, see Attachment 1, are incorporated by reference into the findings of this Order. Some findings are repeated in this Order for clarity and information.

III. ALAMITOS BARRIER RECYCLED WATER PROJECT

12. The Vander Lans WTF is located at 7380 East Willow Street, Long Beach, adjacent to the Long Beach WRP and between the San Gabriel River and Coyote Creek (Figure 3).

13. Description of Tertiary Treatment at Long Beach and Los Coyotes WRPs.

    a. The primary source water for the expanded Vander Lans WTF is disinfected tertiary recycled water from the Long Beach WRP. The production of tertiary recycled water at the Long Beach WRP is regulated by WRR Order No. 97-07206 and WDR Order R4-2007-0047.

    b. In the future, disinfected tertiary effluent may also be supplied to the Vander Lans WTF by the Los Coyotes WRP, which is regulated separately under WRR Order No. 97-07204 and WDR Order R4-2007-0048.

    c. The County Sanitation District maintains a comprehensive industrial and pretreatment control program approved by the United States Environmental Protection Agency (USEPA) for control of waste discharges from industrial and commercial sources into its wastewater collection system.

    d. Treatment at the Long Beach and Los Coyotes WRPs is very similar, and consists of primary sedimentation, activated sludge biological treatment with nitrification and denitrification, secondary sedimentation, inert media filtration, and chlorine disinfection treatment processes. The design capacity of the Long Beach WRP is 25 mgd. The design capacity of the Los Coyotes WRP is 37 mgd.

14. The current treatment train at Vander Lans WTF consists of microfiltration (MF) to reduce the turbidity and silt density of the feed water; reverse osmosis (RO) to remove additional salts, minerals, metal ions, organic compounds and

microorganisms; ultraviolet irradiation (UV) to provide disinfection and N-Nitrosodimethylamine (NDMA) reduction; decarbonation; pH adjustment; corrosivity stabilization; and, blending with potable water. WRD has developed an operating plan for the Vander Lans WTF which will be updated prior to operation of the expanded Facility.

15. The Project Sponsors seek to change the quantity of the recycled water injected at the Barrier from approximately 50 percent recycled water and 50 percent diluent water to 100 percent recycled water. The percentage of recycled water will be calculated based on the running monthly average recycled water contribution for the preceding period of 120 months during periods when less than 100% recycled water is discharged. The total amount of water injected into the aquifers will not change (up to 8 mgd). To maintain the quality of the injected water, the expanded Vander Lans WTF will include treatment enhancements. The expanded Facility is designed to produce approximately 8,960 acre-feet of recycled water per year (AFY), which is equivalent to 8 mgd. The treatment approach and technology used at the expanded Facility is depicted in Figure 4 and described in additional detail in CDPH's Findings of Fact.

16. The Vander Lans WTF was designed to accommodate future expansion to produce up to 8 mgd of advanced treated recycled water. Prior to the commissioning of the future expanded facility in the fall of 2014, WRD plans to conduct a series of startup tests from approximately April to August 2014. Duration of the individual tests will vary from days to weeks, and the Advanced Water Treatment Facility (AWTF) will operate between 3 to 8 mgd intermittently during the startup testing. The treatment level provided during the startup testing will consist of the treatment train described above as required by Order No. R4-2005-061 with the addition of hydrogen peroxide immediately upstream and UV to create an advanced oxidation process, which will oxidize 1,4-dioxane and other organic chemicals.

17. The treatment approach and technology used at the expanded Facility to produce advanced treated recycled water is depicted in Figure 4 and will consist of the following:

    a. Influent Equalization (EQ): If tertiary effluent from the Los Coyotes WRP is used as influent to the Vander Lans WTF, the flow will be equalized in the influent EQ basin and pump-fed to the Primary Micro Filtration (MF) system. (Pumping is not required when disinfected tertiary effluent from the Long Beach WRP is used as influent to the Vander Lans WTF since the effluent from Long Beach WRP effluent has 60 to 100 pounds per square inch (psi) of pressure.)

    b. Micro Filtration (MF):

        i. MF Pretreatment Chemical Addition: If tertiary effluent before chlorination from the Los Coyotes WRP is used for the Vander Lans WTF influent, then chloramination (using sodium hypochlorite and aqueous ammonia) may be added to the equalized flow to control bio-fouling of the MF and RO membranes. Additional chemical addition before MF filtration is unnecessary and will not be used if the Facility uses tertiary effluent from the Long Beach WRP only.

ii. Primary MF Automatic Strainers: Subsequently, the flows will be fed into three (two duty and one standby) automatic self-cleaning 500-micron strainers to protect the downstream MF membranes from damage and/or fouling from large particles. The backwash waste from the Primary MF automatic strainers may be discharged to either the backwash waste (BWW) equalization basin or the Facility waste EQ basin.

iii. Primary MF System: From the strainers, the flow will be fed into six 100-module MF skids. The MF system consists of pressurized MF units with hollow fiber, polyvinylidine fluoride membranes having a maximum pore size of 0.1 micron. The MF system is designed to produce 8.1 mgd. The MF filtrate will be stored in a break tank and the MF Units will be periodically backwashed to clean the membranes.

iv. Backwash Treatment (BWT): The BWW flows from the Primary MF automatic strainers and Primary MF system will be equalized in the BWW EQ Basin and pumped to dissolved air floatation (DAF) system for treatment. Ferric chloride is utilized as a coagulant injected upstream of the DAF system. DAF effluent flow will be equalized in the DAF Effluent EQ Basin and pumped to the BWT MF system, which consists of four 25-module MF skids. Similar to the Primary MF system, the BWT MF automatic strainer is provided upstream of the BWT MF membranes to protect the BWT MF membranes from damage and/or fouling from large particles. One automatic strainer will be provided as a duty unit, and one manual basket strainer will be provided as a standby. The Primary MF effluent and the BWT MF effluent will be mixed and discharged into the existing MF Filtrate Tank (or Break Tank as shown in Figure 4).

c. Reverse Osmosis (RO): Stored MF filtrate will be pumped from the MF Filtrate Tank to the RO system, which will consist of two 2-stage RO trains in parallel and three (two duty and one standby) third stage RO Trains. To control scaling and to protect the RO membranes, the pretreatment (consisting of addition of sulfuric acid for pH control, the addition of a threshold inhibitor; and cartridge filters) is provided both upstream of the two 2-stage RO trains and also immediately upstream of the third stage RO process. The RO process will produce approximately 8.0 mgd and includes a high pressure feed pump and pressure vessels. Each pressure vessel will contain high rejection thin film composite polyamide membrane elements. The entire RO system is designed for an overall 92 percent recovery rate. Permeate from the RO system will be fed to the advanced oxidation process (AOP). Concentrated brine from the RO system will be discharged directly to CSDLAC's County Sanitation District's Joint Outfall System sewer system.

d. Ultra Violet/Advanced Oxidation Process (UV/AOP): The UV/AOP at the Vander Lans WTF will consist of ultra violet irradiation (UV) with hydrogen peroxide addition upstream of the UV trains. The UV/AOP is used to disinfect RO permeate and destroy some constituents of emerging concern (CECs) that pass through RO membranes due to their low molecular weight and low ionic charge, notably NDMA and, 1,4-dioxane. The UV system exceeds the

requirements delineated in the "Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse" (August 2012) published by the National Water Research Institute (NWRI). The UV system consists of the existing (pre-expansion) system as well as an add-on system. The existing UV system consists of nine 30AL50 Trojan UVPhox™ reactors that employ low-pressure, high-output technology, with each reactor containing 30 lamps, utilized in a tower arrangement with three reactors per level over three levels. The expansion will add two new trains of three stacked D72AL75 Trojan UVPhox™ reactor chambers, where the third reactor chamber in each train is redundant and includes only one (1) 72-lamp reactor zone. There are two reactor chambers in each UV vessel. The third vessel only utilizes one of the reactors. No waste will be generated. The total nominal capacity of the existing UV system is 8.0 mgd. At this flow rate and UV transmittance of 95 percent, the delivered UV dosage from the proposed system is estimated to exceed 300 millijoule per square centimeter (mJ/cm^2).

e. Decarbonation: Following UV/AOP treatment, the water will pass through a decarbonator to reduce carbon dioxide, increase pH, and stabilize the product water.

f. Post-Treatment Systems (pH Adjustment/Corrosivity Stabilization/ Disinfection): Caustic soda (sodium hydroxide) will be added to the water to increase pH, and calcium chloride will be added to reduce the potential for minerals to be leached from the cement lining used in the transmission pipeline. In order to maintain a certain threshold of total chlorine residuals required by the Los Angeles County DPW to prevent bio-fouling and clogging of the injection wells, sodium hypochlorite and aqueous ammonia will be added to the product water to maintain the required level of total chorine residuals. The levels of sodium hypochlorite and aqueous ammonia to be added will be fine-tuned to effectively manage potential formation of disinfection byproducts.

18. The Facility may bypass or discharge partially-treated or treated water to a trunk sewer leading to the County Sanitation District's Joint Water Pollution Control Plant in Carson.

IV. RECYCLED WATER INJECTION SYSTEM

19. The transmission of the advanced treated recycled water from the Facility will not change as a result of the expansion. Currently, the advanced treated recycled water is pumped westward along Willow Street to the Blend Station where it mixes with imported water before being conveyed two miles to the distribution header. From the header, the advanced treated recycled water is injected into the Barrier. The alignment of injection wells extends westward along 7th Street from Margo Avenue to the San Gabriel River, where it turns towards the south along the Los Alamitos Channel (see Figure 1 for the well alignment). Two types of injection wells were constructed at the Barrier: nested and composite. Nested wells are constructed with a single casing, but can inject water into different aquifers separated by grout seals. The composite type injection wells are comprised of casings similar to the nested casings, except that they are screened in multiple aquifer zones without grout seals

between them. The injection wells include 41 wells of which 16 are single injection wells, injecting only into either the A or I aquifers; 19 are dual injection wells, injecting separately into the A/I or C/B aquifers; and seven wells are composite wells that inject simultaneously into the C/B/A/I aquifers. Distances between injection wells vary from approximately 50 feet to 1,200 feet, for a total span of approximately 1.2 miles.

20. The OCWD is in the planning stages to construct eight additional injection well locations (20 separate casings) to better control seawater intrusion into the Orange County Groundwater Basin. Total injection rates for the eight new wells are anticipated to be approximately 1,011 AFY. The location, design, and injection rates of these new wells were included in the updated modeling studies for the amended Engineering Report to predict travel time and movement of the injected water after their construction. Project Sponsors will provide the location and design for any new injection wells to CDPH and the Regional Water Board in accordance with the requirements specified in this Order.

V. GROUNDWATER STUDIES

21. The April 15, 2011, *Addendum to the Five-year Engineering Report for the Barrier* contained a technical memorandum from INTERA, reviewing the ability of the Project Sponsors' groundwater model to predict the fate and transport of the recycled water through the aquifers. Between 2006 and 2010, the water in Zones C, B, A and I compared favorably to aquifer conditions predicted using the numerical flow and transport model, with a transmissivity-weighting scheme. Particle tracking simulations were used to confirm the modeled and observed break-through analysis for recycled water concentrations at the monitoring wells. Figure 1 is a map showing the injection well locations. Figure 2 is a cross section for that map delineating the aquifer zones. For the Engineering Report, the INTERA model was updated to include the Facility expansion plans and the 8 new injection wells that will be constructed by OCWD to improve Barrier performance. The model was used to update calculations and predictions of future recycled water fate and transport in the aquifers based on groundwater conditions after the expanded Facility and the new wells are in operation.

22. The closest active domestic well to the Barrier is SB-LEI (State Well No. 05S/12W-01A03) owned and operated by the City of Seal Beach and is located approximately 4,840 feet to the east of the Barrier. Tracer studies and groundwater models determined that recycled water will travel underground for approximately 4.3 years before reaching SB-LEI in the I-Zone. Because of the tracer studies and modeling work previously done for the Project, a new tracer study will not be required for the Facility expansion.

23. Drinking water standards have not been exceeded at the nearest drinking water well, Seal Beach well SB-LEI as a result of the injection project, as shown by the Title 22 drinking water reports. However, recycled water is thought to have reached the well since injection began in 2005. The SB-LEI well is perforated in both Zone I, which is recharged at the Barrier, and the Main Aquifer, which contains no recycled water. As a result, it is possible that changes to water quality from recycled water contributions have not been detected because of dilution from deeper horizons.

24. The 2005 Order required collection of monitoring data before the start of injection of recycled water into the Barrier, and annual assessment of data collected thereafter. Of 230 constituents measured at ten monitoring wells, most stayed constant or improved in comparison to background groundwater quality information collected in 2005 and 2006. Aquifer concentrations of arsenic and selenium increased, from non-detect to a maximum of 22 mg/L (which is above the MCL of 10 mg/L) and from non-detect to a maximum of 61 mg/L (which is above the MCL of 50 mg/L), respectively. Chloride, total dissolved solids (TDS), and manganese all showed variations above and below background levels as water quality was restored with the prevention of sea water intrusion. Odor and total coliform appear at levels above background in the deepest aquifer receiving injected water in monitoring wells located a year of travel time from the Barrier. In addition, n-Nitrosodimethylamine (NDMA) concentrations rose in the wells at the Barrier after injection of recycled water began.

Table 1 – INCREASES IN GROUNDWATER CONCENTRATION MEANS

Constituents (MCLs or other standard)	Units	2012	2011	2010	2005 or 2006 Background
3 month travel time in Recent aquifer					
Arsenic (10)	µg/L	17	22	16	ND
Selenium (50)	µg/L	61	53	35	ND
Chloride (500)	mg/L	7025	6275	5475	5407
TDS[1] (1,000)	mg/L	13500	13000	9925	13350
3 month travel time in C-Zone					
Manganese (50)	µg/L	101	108	97	94
Odor(3)	TON	11	2	3	4
3 month travel time in B-Zone					
Manganese (50)	µg/L	62	62	61	68
Odor(3)	TON	3	2	1	4
Total Coliform(1.1)[2]	MPN/100mL	ND-1.1	ND	ND	ND
3 month travel time in I-Zone					
Odor	TON	14	3	3	5
1 year travel time in C Zone					
Manganese (50)	µg/L	101	113	98	95
Odor(3)	TON	3	2	3	7
1 year travel time in B Zone					
Manganese (50)	µg/L	63	66	63	77
Odor	TON	3	2	3	6
1 year travel time in I Zone					
Odor(3)	TON	3	2	1	4
Total Coliform(1.1)	MPN/100mL	ND-1.1	ND	ND	ND

25. Based on the review of the recycled water monitoring data for the past five years (2009-2013), the highest concentration detected in recycled water for chloride ,TDS, manganese, and odor are 28 milligrams per liter (mg/L), 110 mg/L, 2.7 micrograms per liter (µg/L) and 4 threshold odor number (TON), respectively. Arsenic and

[1] Total dissolved solids.
[2] Basin Plan limit is 1.1 MPN/100 mL.

selenium have not been detected in the recycled water injected at the Barrier.

VI. REGULATION OF RECYCLED WATER

26. State authority to oversee recycled water use is shared by CDPH, the State Water Board, and the Regional Water Boards. CDPH[3] is the agency with the primary responsibility for establishing water recycling criteria under Title 22 of the Code of Regulations to protect the health of the public using the groundwater basins as a source of potable water. The State Water Board and Regional Water Boards are responsible for issuing waste discharge requirements and water reclamation requirements for water that is used or proposed to be used as recycled water.

27. The State Water Board adopted Resolution No. 77-1, *Policy with Respect to Water Reclamation in California*, which includes principles that encourage and recommend funding for water recycling and its use in water-short areas of the state. On September 26, 1988, the Regional Water Board also adopted Resolution No. 88-012, which encourages the beneficial use of recycled wastewater and supports water recycling projects.

28. The State Water Board adopted the Recycled Water Policy (State Water Board Resolution No. 2009-0011) on February 3, 2009, and amended the Policy on January 22, 2013. The purpose of the Recycled Water Policy is to protect groundwater resources and to increase the beneficial use of recycled water from municipal wastewater sources in a manner consistent with state and federal water quality laws and regulations. The Recycled Water Policy describes the respective authority of CDPH and the Regional Water Boards as follows:

> *Regional Water Boards shall appropriately rely on the expertise of CDPH for the establishment of permit conditions needed to protect human health.* (section 5.b)
>
> *Nothing in this paragraph shall be construed to limit the authority of a Regional Water Board to protect designated beneficial uses, provided that any proposed limitations for the protection of public health may only be imposed following regular consultation by the Regional Water Board with CDPH, consistent with State Water Board Orders WQ 2005-0007 and 2006-0001.* (section 8.c)
>
> *Nothing in this Policy shall be construed to prevent a Regional Water Board from imposing additional requirements for a proposed recharge project that has a substantial adverse effect on the fate and transport of a contaminant plume or changes the geochemistry of an aquifer thereby causing dissolution of constituents, such as arsenic, from the geologic formation into groundwater.* (section 8.d)

[3] Any successor agency to CDPH's responsibilities to oversee groundwater replenishment with recycled water in aquifers designated as sources of drinking water shall be substituted in place of every reference to CDPH in the conditions and requirements of this Order, and in the findings of this Order where appropriate.

In addition, the Policy notes the continuing obligation of the Regional Water Boards to comply with the state's anti-degradation policy, Resolution No. 68-16:

> *The State Water Board adopted Resolution No. 68-16 as a policy statement to implement the legislature's intent that waters of the state shall be regulated to achieve the highest water quality consistent with the maximum benefit to the people of the state.* (section 9.a)

29. A 1996 Memorandum of Agreement (MOA) between CDPH and the State Water Board on behalf of itself and the Regional Water Boards allocates the primary areas of responsibility and authority between these agencies regarding the use of recycled water. The MOA provides methods and mechanisms necessary to ensure ongoing and continuous future coordination of activities relative to the use of recycled water in California. This Order includes requirements consistent with the MOA.

30. Section 13523(a) of the Water Code provides that a Regional Water Board, after consulting with and receiving recommendations from CDPH, and after any necessary hearing, shall, if it determines such action to be necessary to protect the health, safety, or welfare of the public, prescribe WRRs for water that is used or proposed to be used as recycled water. Pursuant to Water Code section 13523, the Regional Water Board has consulted with CDPH and received its recommendations. On June 26, 2013, CDPH held a public hearing to consider the proposed expansion of the Vander Lans WTF and use of recycled water for the Barrier. On July 12, 2013, CDPH transmitted to the Regional Water Board its Findings of Fact and Conditions concerning the expansion of the Vander Lans WTF.

31. Section 13540 of the Water Code requires that recycled water may only be injected into an aquifer used as a source of domestic water supply if CDPH finds the recharge will not degrade the quality of the receiving aquifer as a source of water supply for domestic purposes. In its Findings of Facts and Conditions, CDPH determined that "provided that WRD meets all of the above conditions and findings of fact, the Department [CDPH] finds that the ABRWP [Barrier Project] can provide injection recharge water that will not degrade groundwater basins as a source of water supply for domestic purposes."

32. Section 13523(b) of the Water Code provides that reclamation requirements shall be established in conformance with the uniform statewide recycling criteria established pursuant to Water Code section 13521. Section 13562 of the Water Code requires CDPH to adopt uniform water recycling criteria for indirect potable reuse for groundwater recharge. CDPH has developed draft Recycling Criteria for Groundwater Recharge Reuse (Draft GWRR) (latest version is dated June 26, 2013). The requirements of the Draft GWRR for virus reduction and response retention time – the time recycled water must be retained underground between recharge and extraction to allow a project sponsor ample time to identify treatment failures and implement appropriate actions to protect public health – are addressed in additional detail in CDPH's Findings of Fact.

VII. OTHER APPLICABLE PLANS, POLICIES AND REGULATIONS

33. The Regional Water Board adopted a revised Water Quality Control Plan for the Los

Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) on June 13, 1994, as amended by various Regional Water Board resolutions. The Basin Plan designates beneficial uses for surface and groundwater; establishes narrative and numeric water quality objectives that must be attained or maintained to protect the designated (existing and potential) beneficial uses and to conform with the state's antidegradation policy; and includes implementation provisions, programs, and policies to protect all waters in the region. In addition, the Basin Plan incorporates all applicable State Water Board and Regional Water Board plans and policies and other pertinent water quality policies and regulations.

34. The Basin Plan incorporates the California Code of Regulations (CCR) Title22 primary Maximum Contaminant Levels (MCLs) by reference. This incorporation is prospective, including future changes to the incorporated provisions as the changes take effect. Groundwater designated for use as domestic or municipal supply shall not contain concentrations of chemicals constituents and radionuclides in excess of the MCLs. The Basin Plan also specifies that ground waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses, so this Order incorporates all secondary MCLs based on aesthetic and organoleptic standards.

35. The Basin Plan contains water quality objectives for the Central Groundwater Basin, which is the receiving water affected by the injection of recycled water at the Barrier. The beneficial uses of the Central Groundwater Basin are as follows:

Table 2 - Beneficial Uses of Groundwater

Receiving Water Name	Beneficial Use(s)
Los Angeles Coastal Plain (Central Basin); Department of Water Resources (DWR) Basin No. 4-11.04)	Confined Aquifer Existing Beneficial Uses: Municipal and domestic water supply (MUN); industrial service supply (IND); industrial process supply (PROC); and agricultural supply (AGR).

36. The mineral water quality objectives for these groundwater basins are:

Table 3 - Water Quality Objectives for Groundwater

DWR Basin No.	Basin	Objectives (mg/L)			
		TDS	Sulfate	Chloride	Boron
4-11.04	Central Basin Confined aquifers	700	250	150	1.0

37. Pursuant to California Water Code (Water Code) section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes. This Order promotes that policy by requiring injected water to meet MCLs

designed to protect public health and ensure that water is safe for domestic use.

38. Pursuant to Water Code section 13263(g), discharges of waste into waters of the state are privileges, not rights. Nothing in this Order creates a vested right to continue the discharge. Water Code section 13263 authorizes the Regional Water Board to issue waste discharge requirements that implement any relevant water quality control plan.

39. This Order includes limits on quantities, rates, and concentrations of chemical, physical, biological, and other constituents in the advanced treated recycled water that is injected into groundwater. This Regional Board terms these limits "effluent limitations" when included in waste discharge requirements for discharges to waters of the State. In this application, the term "effluent" means "something that flows out"[4] and is not limited to treated wastewater. The advanced treated recycled water produced by the Vander Lans WTF is effluent by this definition. The effluent limitations in this Order are not "effluent limitations" as defined by the Clean Water Act and related federal regulations because they do not apply to discharges to waters of the United States.[5] The effluent limitations in this Order are not enforceable under Chapter 5.5 of the Water Code, including section 13385, subdivisions (h) and (i), but are enforceable under other applicable sections of the Water Code, including but not limited to section 13350.

40. A goal of the Recycled Water Policy (State Water Board Resolution No. 2009-0011) is to increase the beneficial use of recycled water from municipal wastewater sources in a manner consistent with state and federal water quality laws and regulations. The Policy directs the Regional Water Quality Control Boards to collaborate with generators of municipal wastewater and interested parties in the development of salt and nutrient management plans (SNMPs) to manage the loading of salts and nutrients to groundwater basins in a manner that is protective of beneficial uses, thereby supporting the sustainable use of local waters. The Water Replenishment District and other participants have generated a hydrology model to calculate the nutrient concentrations in the Central Basin due to the use of recycled water for recharge through injection and spreading. The model predicts that the Vander Lans Facility can inject water with 10 mg/L total nitrogen at the Alamitos Barrier for several decades before consuming 10% of the assimilative capacity for the entire sub-basin. While the local water quality is expected to increase from the sub-basin background concentrations of 1.1 mg/L, the overall water quality in the Central Basin is not expected to increase above the Basin Plan groundwater, surface water and drinking water limits of 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen or 10 mg/L nitrate-nitrogen or 1 mg/L nitrite-nitrogen. The model has been described in public meetings and reviewed by the Regional Board staff, but full

[4] See, e.g., Webster's Third New International Dictionary (1986).
[5] Section 502(11) of the Clean Water Act defines "effluent limitation" as "any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance." 40 C.F.R. section 122.2 defines "effluent limitation" as "any restriction imposed by the Director on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean." (internal quotation marks omitted).

consideration of the SNMP as a reference in, or as an amendment to, the Basin Plan (in a hearing before the Regional Water Board) is not expected before 2015. However, guidance in the Recycled Water Policy and current drought conditions support the immediate use of recycled water in place of potable water sources where consistent with public health and safety. This Order allows the immediate use of recycled water while requiring groundwater monitoring to confirm the model predictions, i.e. to demonstrate that recharge with recycled water impacts the drinking water resources as predicted by the SNMP.

41. CDPH established a notification level of 10 nanogram per liter (ng/L) for NDMA in drinking water sources at which concentration a responsible water agency is required to notify the public. CDPH established a reporting level of 300 ng/L for NDMA, at which concentration a responsible water agency is required to stop drinking water delivery. At this time, CDPH has not established a Maximum Contaminant Level (MCL) for NDMA. NDMA is identified by the Regional Water Board as a constituent of concern because it is created by the disinfection process and has a known cancer risk. Further, NDMA has been identified by the State Water Board in the Recycled Water Policy as a chemical of emerging concern which should be sampled in recycled water used for groundwater replenishment through injection because of the human health risks. In May 2008, recycled water from the Vander Lans WTF containing high levels of NDMA with a maximum concentration of 445 ng/L, was injected into groundwater at the Alamitos Barrier. The resulting subsurface plume is calculated to have arrived at the nearest drinking water well in 2012, where the concentration was reduced through dilution from the main aquifer before delivery. WRD reports that operations were changed at the Facility to prevent a recurrence. Although no MCL has been established for NDMA, the Regional Water Board and CDPH agree that the Vander Lans WTF must prevent similar concentrations of NDMA from entering the groundwater

42. Section 13267(b) of the Water Code states, in part:

> *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 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 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 reports 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.*

Section 13267(d) of the Water Code states, in part:

> *[A] regional board may require any person, including a person subject to waste discharge requirements under section 13263, who is*

> *discharging, or who proposes to discharge, wastes or fluid into an injection well, to furnish the state board or regional board with a complete report on the condition and operation of the facility or injection well, or any other information that may be reasonably required to determine whether the injection well could affect the quality of the waters of the state.*

43. The need for the technical and monitoring reports required by this Order, including the Monitoring and Reporting Program, are based on the Report of Waste Discharge (ROWD) and Engineering Report; the CDPH Finding of Facts and Conditions; the California Environmental Quality Act (CEQA) Initial Study; and other information in the Regional Water Board's files for the Facility. The technical and monitoring reports are necessary to assure compliance with these waste discharge requirements and water recycling requirements. The burden, including costs, of providing the technical reports required by this Order bears a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.

44. On October 28, 1968, the State Water Board adopted Resolution No. 68-16*, Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16), establishing an antidegradation policy for the State Water Board and Regional Water Boards. This Order is consistent with Resolution No. 68-16.

    Compliance with the requirements of this Order is expected to prevent the degradation of high quality waters. To ensure that no degradation is occurring, the Project Sponsors are required by the MRP to submit a technical report after start-up testing of the expanded facility is completed and to regularly monitor the advanced treated recycled water and the receiving groundwater in proximity to the injection wells. If the information in these technical and monitoring reports indicates that the provisions in this Order are not sufficient to prevent degradation of the groundwater, the Regional Board may reopen these WRRs/WDRs to add additional terms and conditions.

    This Order requires the best practicable treatment or control necessary to assure that a pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained. This Order requires the advanced treated recycled water to meet all drinking water standards and prohibits injection of water that would cause violation of any water quality objective within the aquifer, or operation of the wells in a matter that causes a condition of pollution or nuisance. This Order conforms with the directives of the State Water Board's Recycled Water Policy, the purpose of which is to increase the use of recycled water from municipal wastewater sources in a manner that complies with state and federal water quality laws

VIII. CEQA AND NOTIFICATION

45. The Project Sponsors prepared an Initial Study for a proposed project to inject 100 percent recycled wastewater into the Alamitos Barrier, with WRD serving as the lead agency. Based on the Initial Study, WRD determined that the proposed project would not have a significant impact on the environment. On March 9, 2012, WRD issued a revised Notice of Intent to adopt a Negative Declaration for the proposed

project. The Notice of Intent was posted on the WRD website and in the Long Beach Press Telegram, with mailings to interested parties, and circulation through the State Clearinghouse (#20120205) and the Los Angeles County Clerk's Office. The 30 day public review process ended on April 9, 2012. WRD received and responded to four comments, none of which necessitated changes in the Negative Declaration. The Negative Declaration was adopted by the WRD Board of Directors on April 20, 2012, and the project was approved by the WRD Board of Directors on May 4, 2012. The Negative Declaration was filed with the State Clearinghouse on May 7, 2012. No further comments or objections were received during the subsequent 30 days. An addendum to the Negative Declaration was approved by the WRD Board of Directors on May 14, 2013. The Project has completed the notification and review process required by CEQA. The Regional Water Board is a responsible agency for purposes of CEQA. The Regional Water Board has considered the Initial Study, which did not identify significant environmental effects with respect to water quality.

46. Any person aggrieved by this action may petition the State Water Resources Control Board (State Water Board) to review the action in accordance with Water Code section 13320 and California Code of Regulations, Title 23, section 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the internet at: http://waterboards.ca.gov/public_notices/petitions/water_quality
Or will be provided upon request.

47. The Regional Water Board has notified the Project Sponsors and interested agencies and persons of its intent to issue this Order for the production and use of recycled water and has provided them with an opportunity to submit written comments. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to these WDRs/WRRs.

THEREFORE, IT IS HEREBY ORDERED that Order No. R4-2005-0061, with MRP No. CI-8956, is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations and guidelines adopted thereunder, and California Code of Regulations Title 22, division 4, chapter 3, the Project Sponsors shall comply with the requirements in this Order. This action in no way prevents the Los Angeles Regional Water Board from taking enforcement action for past violations of the previous Order.

I. PRETREATMENT SPECIFICATIONS

1. WRD shall maintain a legal agreement with the County Sanitation District that requires a comprehensive industrial pretreatment and pollutant source control program at the Long Beach WRP and Los Coyotes WRP, implemented to prevent contaminants that might adversely impact the quality of the reclaimed water being produced by the Vander Lans WTF from entering the sewer system. The program

shall be in place at the time recycled water from the particular facility is used as source water for the Vander Lans WTF. At a minimum the program shall include:

a. An assessment of the fate of CDPH and Regional Water Board-specified contaminants through the wastewater and recycled municipal wastewater treatment systems;
b. Contaminant source investigations and contaminant monitoring that focus on CDPH and Regional Water Board-specified contaminants;
c. An outreach program to industrial, commercial, and residential communities within the portions of the sewage collection agency's service area that flows into the water recycling facility subsequently supplying the Barrier, for the purpose of managing and minimizing the discharge of contaminants at the source;
d. A current inventory of contaminants identified pursuant to this section, including new contaminants resulting from new sources or changes to existing sources, that may be discharged into the wastewater collection system.

2. The influent to the Vander Lans WTF shall be tertiary treated effluent as described in the Title 22 Engineering Report and shall at all times be adequately oxidized. Upon a determination that the influent to the Vander Lans WTF exceeds the following limits, the Project Sponsors shall submit a technical report to the Regional Water Board within 90 days documenting the exceedances and response actions taken to maintain performance of the treatment facilities and compliance with the requirements in this Order:

a. 15 mg/L monthly[1] average Biochemical Oxygen Demand value (BOD_5 20°C), determined monthly using the average of the analytical results of all 24-hour composite samples taken at least weekly during the month.

b. 15 mg/L monthly average Total Suspended Solids (TSS) concentration, determined monthly using the average of the analytical results of all 24-hour composite samples taken daily during the month.

II. RECYCLED WATER TREATMENT SPECIFICATIONS

1. Treatment of the recycled water shall be as described in the Findings of this Order and the Findings of Fact and Conditions issued by CDPH.

2. The recycled water shall be, at all times, adequately oxidized, filtered, disinfected, and subject to organics removal by RO and UV/AOP treatment. There shall be no bypassing of any treatment process, except for decarbonation and caustic soda addition, which provide pH adjustment as required for stabilization.

3. The turbidity of the RO feed water after the MF treatment shall not exceed 0.2 NTU more than 5 percent of the time in any 24-hour period, and shall not exceed 0.5 NTU at any time. Whenever the turbidity limit is exceeded, the Vander Lans WTF will be

[1] "Monthly" is a calendar period that is not necessarily 30 days.

shut down and the injection of recycled water will be suspended until such time that the cause of the high turbidity condition has been identified and corrected.

4. The advanced treatment process at the Vander Lans WTF will include RO and an UV/AOP that, at a minimum, meet the following standards. The RO membrane shall comply with ASTM method D4194-03 (2008), which achieves a minimum rejection of sodium chloride of no less than 99.0 percent and an average (nominal) rejection of sodium chloride of no less than 99.2 percent under the following conditions:

   a. Recovery: 15 percent.
   b. Influent pH: between 6.5 and 8.0.
   c. Sodium chloride rejection is based on three or more successive measurements, after flushing and following at least 30 minutes of operation having demonstrated that rejection has stabilized.
   d. An influent sodium chloride concentration of no greater than 2,000 mg/L.
   e. During the first 20-weeks of full-scale operation the membrane produces a permeate with no more than 5 percent of the sample results having TOC concentration greater than 0.25 mg/L, as verified through monitoring no less frequent than weekly.

5. The advanced treated process must result in adequate disinfection. The in-stream monitoring of that process shall not indicate UV power level or Hydrogen Peroxide in amounts less than the following:

Table 6 – Vander Lans WTF Recycled Water Minimum Treatment Requirements

Constituent	Unit	Minimum
UV power level	%	TBD[6]
Hydrogen Peroxide	ml/min	TBD
Hydrogen Peroxide	mg/L	TBD

III. EFFLUENT LIMITATIONS

1. The advanced treated recycled water shall not contain constituents in excess of the following limits:

Table 7 –Effluent Limitations

Constituents	Units	Daily Max	Rolling Annual Average[7]	Other
Total Recycled Water Flow	mgd		8[8]	
Total Organic Carbon	mg/L		0.5[9]	

[6] TBD: The CDPH will determine the treatment indicators which result in sufficient deactiviation of viruses after the pilot test is completed and the results evaluated. Values based on the design removal described in the CDPH conditions will be used if the values are not determined within a year of adoption.
[7] Based on quarterly measurement unless otherwise noted. The long averaging period, relative to daily maximum or average monthly compliance periods used for surface water discharges, acknowledges the comparatively slow rate of groundwater movement and mixing before beneficial use.
[8] Based on continuous measurement.
[9] Compliance with 0.5 mg/L based on the 20-week running average of all TOC results and the average of the last four TOC results.

Table 7 –Effluent Limitations				
Constituents	**Units**	**Daily Max**	**Rolling Annual Average[7]**	**Other**
Lead	mg/L		.015	
Copper	mg/L		1	
TDS	mg/L	700		
Chloride	mg/L	150		
Sulfate	mg/L	250		
Boron	mg/L	1.0		
Total Nitrogen[10]	mg/L		10	
Nitrate plus Nitrite as N	mg/L		10	
Nitrate	mg/L		10	
Nitrite	mg/L		1	
Cyanide	µg/L		150	
Enteric virus	Log			TBD
Giardia	Log			TBD
Cryptosporidium	Log			TBD

2. The advanced treated recycled water shall be disinfected such that the 7-day median number of total coliforms shall not exceed 2.2 total coliform bacteria per 100 milliliters (mL), and the number of total coliform organisms shall not exceed 23 total coliform bacteria per 100 mL in more than one sample in any 30-day period prior to injection.

3. The pH of the advanced treated recycled water shall be, at all times, within the range of 6.5 to 8.5 pH units, except during the Vander Lans WTF expansion startup testing, when the pH of the advanced treated recycled water may be within the range of 6 to 9 pH units, under specific and necessary operational conditions as defined by the Project Sponsor, for up to one week.

4. Concentrations of contaminants in the advanced treated recycled water shall not exceed the following MCLs for drinking water:

   a. Primary MCLs specified in California Code of Regulations (CCR), Title 22:

      i. Inorganic chemicals in 22 CCR section 64431, Table 64431-A, except for nitrogen compounds;[11]
      ii. Radionuclides in 22 CCR sections 64442 and 64443, Table 4;[12]
      iii. Regulated organic chemicals in 22 CCR section 64444, Table 64444-A;[13]
      iv. Disinfection byproducts in 22 CCR section 64533, Table 64533-A. [14]

   b. Secondary MCLs specified in 22 CCR section 64449, Tables 64449-A and

[10] Total nitrogen shall be defined as the sum of ammonia, nitrite, nitrate, and organic nitrogen concentrations, expressed as nitrogen. The Project Sponsors shall collect each week, one grab or 24-hour composite samples of the recycled water for total nitrogen, nitrite plus nitrate as nitrogen, nitrate and nitrate and nitrite.
[11] See Table M-6 of this Order.
[12] See Table M-8 of this Order.
[13] See Table M-9 of this Order.
[14] See Table M-10 of this Order.

64449-B.[15] The Corrosivity Index in Table 64449-A is not applicable for 100% recycled water. The Corrosivity Index after adding lime to the recycled water should be within ±0.5 Langelier Saturation Index (LSI).

c. Any new federal or state imposed MCL, upon adoption.

The MCLs shall be incorporated into this Order prospectively, such that revised or new MCLs shall be enforceable limits under this Order upon their adoption. Compliance with primary MCLs shall be determined on the basis of a running annual average, calculated each quarter using the previous four quarters of data. Compliance with secondary MCLs shall be determined annually based on a representative grab sample or the average of samples collected during the year, if more than one. In case of a violation of either primary or secondary MCLs, the Project Sponsors shall notify and submit a report to the Regional Water Board according to the provisions of this Order.

5. The total nitrogen effluent limit of 10 mg/L is higher than the 5 mg/L recycled water specification in the previous Order. The effluent limit of 10 mg/L is consistent with CDPH recommendations as describe in their Findings of Fact and Conditions. The increase in the CDPH recommended total nitrogen concentration from 5 mg/L to 10 mg/L is based on recent information about nitrite in drinking water wells. The increase in the effluent limit is also supported by the minimal overall change in the nitrogen concentrations in the Central Basin due to recycling predicted by the SNMP model described in section VII.3 and under development. The local background concentration of total nitrogen in the coastal pressure zone of the Central Basin averages 1.1 mg/L and the maximum groundwater concentration recorded in monitoring wells adjacent to the Barrier between 2007 and 2010 was 2.6 mg/L. Injection of recycled water with total nitrogen concentrations greater than the background level may change local groundwater conditions.

   Even though the effluent limit has been changed to 10 mg/L to allow more operational flexibility, the Regional Board expects the quality of the groundwater to be optimized (with assistance of the predictive model and confirmatory monitoring) in order to manage any impacts per the SNMP and per antidegradation policy and principles. Additional monitoring, reporting and trend analysis for total nitrogen shall be applied to the monitoring data collected for the Alamitos Barrier Project and contrasted with the water quality changes predicted by model and documented in the first annual report. Should any groundwater monitoring well show an increase in the total nitrogen concentration of 10% over the value predicted by the Project Sponsors in the first annual report, additional studies shall be completed. These may include a diagnosis of the cause of the increased nitrogen discharge and description of the changes recommended to improve the barrier operation, or to update the local Alamitos Barrier model or the SNMP model. If wells continue to show a 10% deviation above the predicted quality for total nitrogen in two annual reports, the Order shall be re-evaluated.

6. The advanced treated recycled water shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect the beneficial

[15] See Table M-7 of this Order.

uses of the receiving groundwater.

7. Compliance with the effluent limitations shall be determined after the injection point for sodium hypochlorite and before injection into the Barrier.

IV. CONDITIONS OF SUCCESSFUL TREATMENT

1. Special Conditions for NDMA: This section of the Order adds additional treatment conditions due to concern about past levels of NDMA discharge and in recognition of the ongoing collaboration between the Project Sponsors and CDPH to maximize the removal of chemicals of emerging concern using the new Advanced Oxidation Process during the implementation of Order R4- 2005-0061-A01 through August 31, 2014. The Project Sponsors have operational choices which should allow the achievement of these treatment conditions. The Vander Lans facility can collect data on influent concentrations, treatment, Advanced Oxidation Process performance, and effluent quality so as to better allocate the product water for injection, or wasting to the sewer and even to temporarily halt operations. Treatment Conditions are used here to identify effluent water quality which might affect beneficial uses or exceed water quality objectives and which might be improved using operational or treatment methods. The constituents are not given an effluent limit due to the lack of an MCL; however, the Project Sponsors are directed to describe the reasons for poor results and provide a schedule for completion of corrective actions, allowing iterative treatment modifications in recognition of the value of such investigations in the long term management of chemicals of emerging concern and disinfection byproducts. Historically, sufficient groundwater supplies existed to dilute temporary or local water quality exceedances. In an abundance of caution and because full utilization of all aquifer supplies is being implemented, treatment conditions are used for this recycled water injection project to ensure ongoing improvements in recycled water use and protect future supplies without reliance on dilution.

   Successful operation of the facility is conditional upon attainment of discharge concentrations of NDMA no greater than 10 ng/L. This concentration has been met in 70% of the highly treated recycled water produced by the current treatment practices at the Facility. Five quarterly values higher than 10 ng/L were reported in the earliest half of the reporting period, between 2007 and 2009. The new Advanced Oxidation Treatment Process implemented with this permit is expected to further reduce the NDMA load discharged. After start-up testing is completed, the Order may be reopened to establish a new treatment condition or effluent limit, if appropriate, as described in section VII.6.

   Notification of NDMA concentrations above the reporting limit are required, as specified in CDPH's Finding of Fact and Conditions. If the result of a sample of the advanced treated recycled water is greater than 10 ng/L for NDMA, within 72 hours of knowledge of the result, the Project Sponsors shall collect another sample as confirmation. If the average of the initial and confirmation sample is greater than 10 ng/L, or a confirmation sample is not collected and analyzed, the Project Sponsors shall initiate weekly monitoring for NDMA until the running four-week average is less than 10 ng/L. If the running four-week average is greater than 10 ng/L, the Project Sponsors shall describe the reasons for the results and provide a schedule for completion of corrective actions in the next quarterly report submitted to the Regional

Board, with a copy provided to CDPH. If the running four-week average is greater than 10 ng/L for sixteen consecutive weeks, the Project Sponsors shall notify CDPH and the Regional Board within 48 hours of knowledge of the exceedance and, if directed by CDPH or the Regional Board, suspend injection of the advanced treated recycled water.

Upon an exceedance of 10 ng/L for NDMA in quarterly monitoring samples from groundwater wells, the Project Sponsors shall notify CDPH and the Regional Board and begin monthly sampling of groundwater. The Project Sponsors shall propose a study which shall be completed within a year. During the completion and approval of the study, the Project Sponsors will continue monthly groundwater sampling for NDMA.

2. California Department of Public Health Conditions

After a public hearing on June 26, 2013, CDPH finalized and issued its Findings of Fact and Conditions on July 12, 2013, which is attached. CDPH found that, provided that the Project Proponents meet all of the conditions and findings of fact, the Facility can provide injection recharge water that will not degrade the groundwater basins as a source of water supply for domestic purposes. The Conditions are incorporated herein by this reference and are enforceable requirements of this Order.

V. GENERAL REQUIREMENTS

1. Recycled water shall not be used for direct human consumption or for the processing of food or drink intended for human consumption.

2. Bypass, discharge, or delivery to the use area of inadequately treated recycled water, at any time, is prohibited.

3. The Facility and injection wells shall be adequately protected from inundation and damage by storm flows.

4. Recycled water use or disposal shall not result in earth movement in geologically unstable areas.

5. Odors of sewage origin shall not be perceivable at any time outside the boundary of the Facility.

6. The Project Sponsors shall, at all times, properly operate and maintain all treatment facilities and control systems (and related appurtenances) which are installed or used by the Project Sponsors to achieve compliance with the conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls (including appropriate quality assurance procedures).

7. A copy of these requirements shall be maintained at the Facility so as to be available at all times to operating personnel.

8. Supervisors and operators of this advanced water treatment plant shall possess a

certificate of appropriate grade as specified in CCR Title 23, Division 3, Chapter 26.

9. For any material change or proposed change in character, location, or volume of recycled water, or its uses, the Project Sponsors shall submit at least 120 days prior to the proposed change an engineering report or addendum to the existing engineering report to the Regional Water Board and CDPH (pursuant to Water Code Division 7, Chapter 7, Article 4, section 13522.5 and CCR Title 22, Division 4, Chapter 3, Article 7, section 60323) for approval. The Engineering Report shall be prepared by a qualified engineer registered in California.

VI. ADDITIONAL PROVISIONS

1. Injection of the advanced treated recycled water shall not cause or contribute to an exceedance of water quality objectives in the Central Basin.

2. Start-up Testing: All provisions of this Order shall apply during the start-up testing of the expanded facility. Recycled water which does not, or is not reasonably expected to, attain the limits or conditions specified in this Order shall be wasted through the sewer to the Joint Plant Water Treatment Facility. The Regional Board acknowledges that during the testing process, containment of poor quality water may not be complete, but the Project Sponsors shall document procedures, testing results and monitoring showing a best-faith effort to contain test waters which do not comply with the requirements of this Order.

3. This Order requires additional monitoring, reporting and trend analysis to determine actual localized impacts to groundwater. The Project Sponsors shall use the local Alamitos Barrier model, or other appropriate tool, to predict the change in the total nitrogen concentration at the wells adjacent to the barrier in a manner which is consistent with the long term projections of the SNMP model. The predicted water quality changes will be submitted as part of the first annual report required after adoption of this Order. A 10% change in the water quality sampled at any of groundwater monitoring wells in Table M-20, over that predicted in the Project Sponsors' first annual report and approved by the Executive Officer, shall trigger further analysis to be included in each subsequent annual report. These studies shall include a diagnosis of the cause of the increased nitrogen discharge and description of the changes recommended to improve the barrier operation, or to update the local Alamitos Barrier model or the SNMP model. If wells continue to show a 10% deviation above the predicted quality for total nitrogen in two annual reports, the Order shall be re-evaluated. A reopener clause is provided in section VII

4. Groundwater Well Replacement: Replacement or addition of injection wells to the Alamitos Barrier will not require a report of material change, filing of a new Report of Waste Discharge, or submitting an updated Engineering Report, provided

    a. the additional injection capacity does not violate any requirement in this Order;

    b. at least 30 days prior to installation of an additional well, WRD submits, in writing, the purpose, design, and location of the well to CDPH and the Regional Water Board;

c. the Regional Water Board, in consultation with CDPH, approves the location of the additional well;[16] and

d. within 90 days after the installation or replacement of the well, WRD submits, in writing, the complete geologic and electrical logs and as-built construction diagrams of the injection wells to CDPH and the Regional Water Board.

5. The Project Sponsors shall submit to the Regional Water Board, under penalty of perjury, self-monitoring reports according to the specifications contained in the MRP, as directed by the Executive Officer and signed by a designated responsible party.

6. The Project Sponsors shall notify this Regional Water Board and CDPH by telephone or electronic means within 24 hours of knowledge of any violations of this Order or any adverse conditions as a result of the use of recycled water from this facility; written confirmation shall follow within 5 working days from date of notification. The report shall include, but not be limited to, the following information, as appropriate:

   a. The nature and extent of the violation;

   b. The date and time when the violation started, when compliance was achieved, and when injection was suspended and restored, as applicable;

   c. The duration of the violation;

   d. The cause(s) of the violation;

   e. Any corrective and/or remedial actions that have been taken and/or will be taken with a time schedule for implementation to prevent future violations; and,

   f. Any impact of the violation.

7. This Order does not exempt the Project Sponsors from compliance with any other laws, regulations, or ordinances which may be applicable; it does not legalize the recycling and use facilities; and it leaves unaffected any further constraint on the use of recycled water at certain site(s) that may be contained in other statutes or required by other agencies.

8. This Order does not alleviate the responsibility of the Project Sponsors to obtain other necessary local, state, and federal permits to construct facilities necessary for compliance with this Order; nor does this Order prevent imposition of additional standards, requirements, or conditions by any other regulatory agency.

9. This Order may be modified, revoked and reissued, or terminated for cause, including but not limited to, failure to comply with any condition in this Order; endangerment of human health or environment resulting from the permitted activities

[16] If the Regional Board fails to approve or deny the proposed construction within thirty days, the proposal shall be deemed approved.

in this Order; obtaining this Order by misrepresentation or failure to disclose all relevant facts; or, acquisition of new information that could have justified the application of different conditions if known at the time of Order adoption. The filing of a request by the Project Sponsors for modification, revocation and reissuance, or termination of the Order or a notification of planned changes or anticipated noncompliance does not stay any condition of this Order.

10. The Project Sponsors shall furnish, within a reasonable time, any information the Regional Water Board or CDPH may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. The Project Sponsors shall also furnish the Regional Water Board, upon request, with copies of records required to be kept under this Order for at least three years.

11. In an enforcement action, it shall not be a defense for the Project Sponsors that it would have been necessary to halt or to reduce the permitted activity in order to maintain compliance with this Order. Upon reduction, loss, or failure of the treatment facility, the Project Sponsors shall, to the extent necessary to maintain compliance with this Order, control production or all discharges, or both, until the facility is restored or an alternative method of treatment is provided. This provision applies, for example, when the primary source of power of the treatment facility fails, is reduced, or is lost.

12. This Order includes the attached *Standard Provisions Applicable to Waste Discharge Requirements*. If there is any conflict between the provisions stated in this Order and the Standard Provisions, the provisions stated in this Order shall prevail.

13. This Order includes the attached MRP No. CI-8956. If there is any conflict between provisions stated in the MRP and the Standard Provisions, those provisions stated in the MRP prevail.

VII. REOPENER

1. This Order may be reopened to include the most scientifically relevant and appropriate limitations for this discharge, including a revised Basin Plan limit based on monitoring results, antidegradation studies, or other Board policy, or the application of an attenuation factor based upon an approved site-specific attenuation study.

2. The WDRs/WRRs may be reopened to modify limitations for constituents which show reasonable potential to cause or contribute to an exceedance of a Basin Plan water quality objective or degradation of high quality water, based on additional data.

3. Upon completion and adoption of the Salt and Nutrient Management Plan, or after additional monitoring, reporting and trend analysis documenting changed aquifer conditions, this Order may be reopened to ensure the groundwater is protected in a manner consistent with state and federal water quality laws and regulations. .

4. This Order may be reopened to incorporate any new regulatory requirements for sources of drinking water or injection of recycled water for groundwater recharge to aquifers that are used as a source of drinking water, that are adopted after the

effective date of this Order.

5. This Order may be reopened upon a determination by CDPH that treatment and disinfection of the Vander Lans WTF recycled water is not sufficient to protect human health, or upon completion of startup testing to incorporate operational or water quality limits as necessary, to ensure the inactivation of viruses in the recycled water.

6. This Order may be reopened upon completion of start-up tests for the expanded facility and submission of the test results to the CDPH and the Regional Water Board to include terms and conditions necessary to protect high quality groundwater.

VIII. ENFORCEMENT

The requirements of this Order are subject to enforcement under Water Code sections 13261, 13263, 13264, 13265, 13268, 13350, 13300, 13301, 13304, 13350, and enforcement provisions in Water Code, Division 7, Chapter 7 (Water Reclamation).

IX. EFFECTIVE DATE OF THE ORDER

This Order takes effect upon its adoption.

I, Samuel Unger, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the Regional Water Board, Los Angeles Region on June 5, 2014.

_____
Samuel Unger, P.E.
Executive Officer

FIGURE 1 – LOCATION OF ALAMITOS SEAWATER INJECTION BARRIER

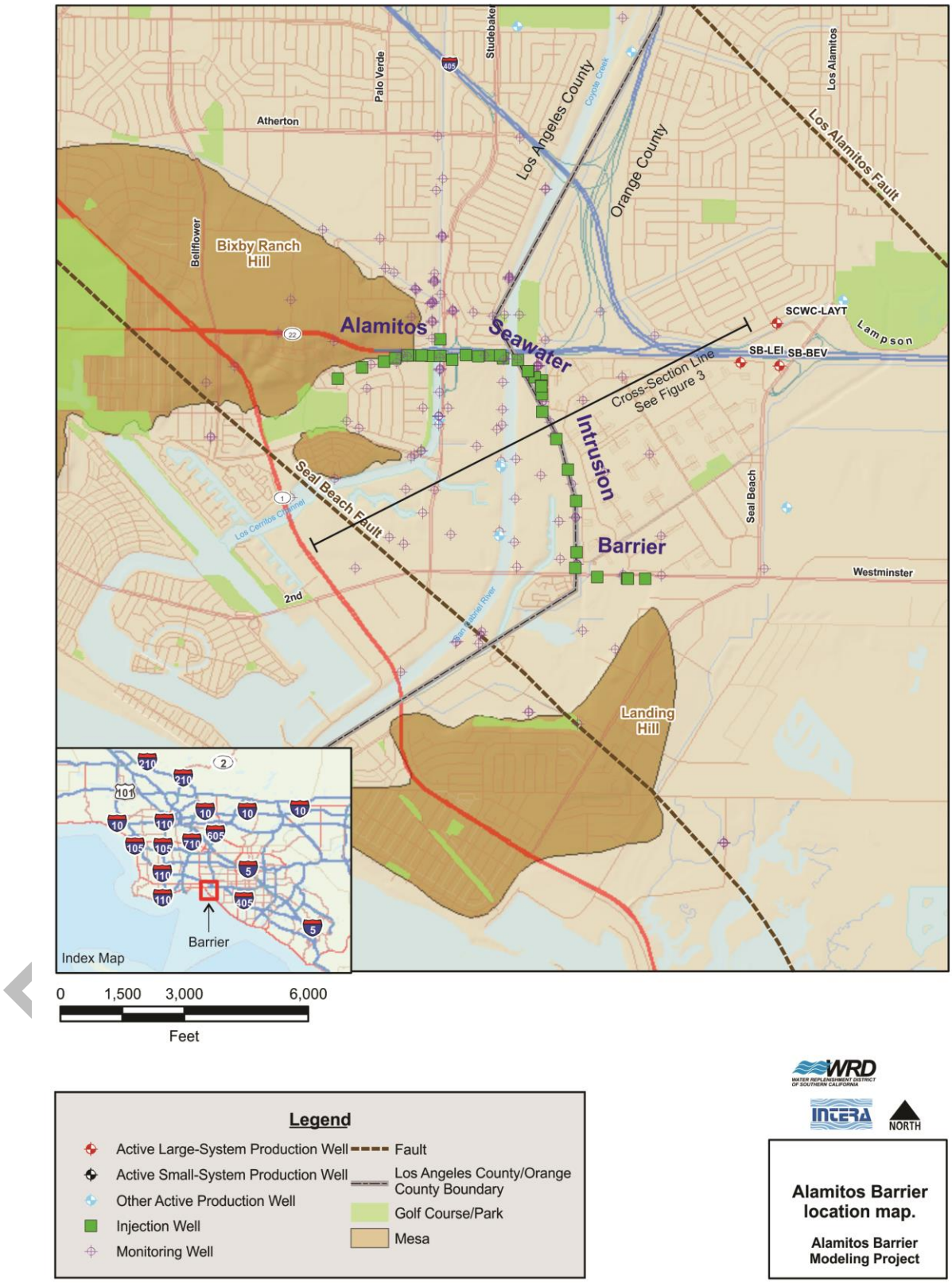


FIGURE 2- CROSS SECTION OF WELL INJECTION FIELD

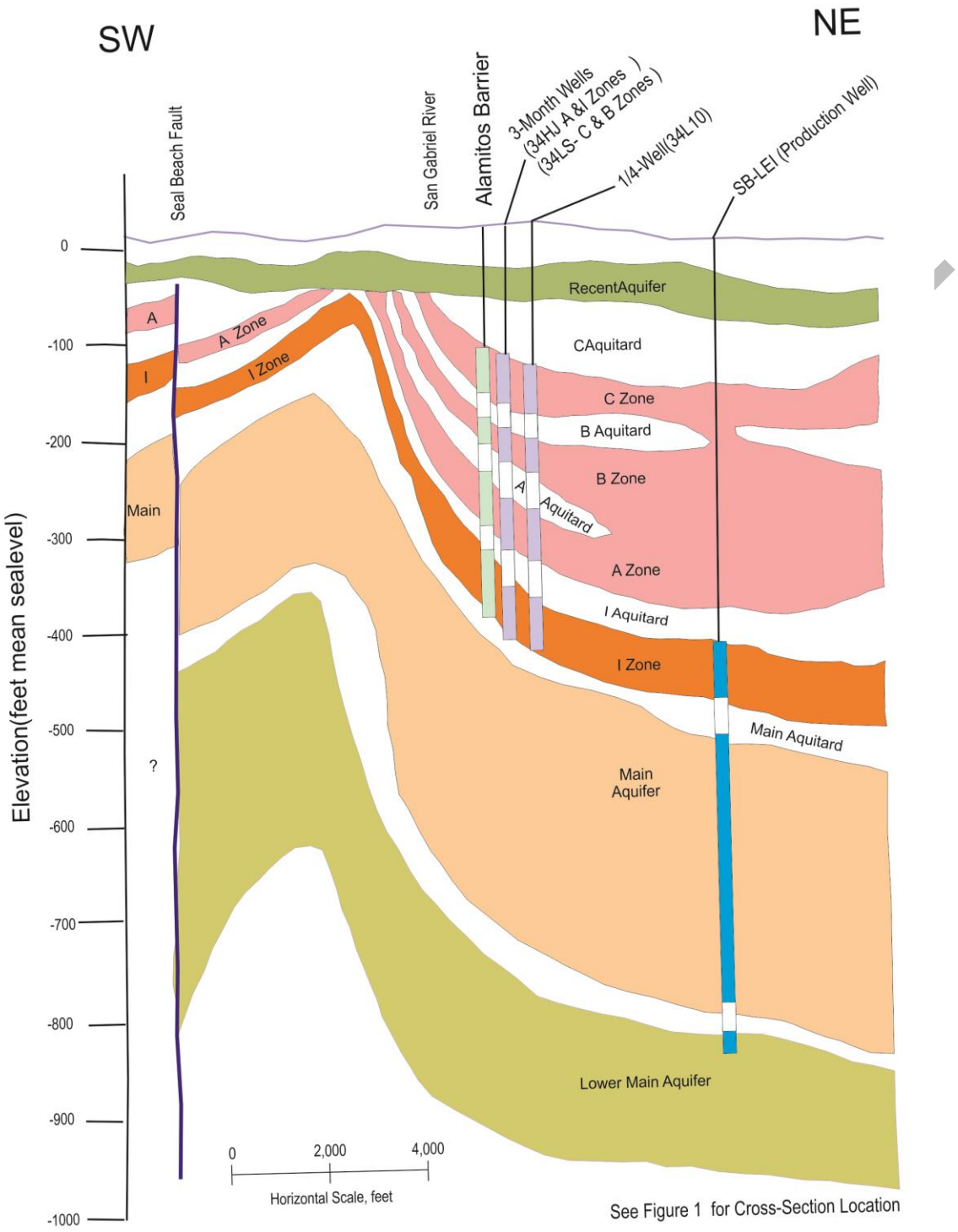


FIGURE 3 – Leo J. Vander Lans Water Treatment Facility

FIGURE 4– PROCESS FLOW DIAGRAM

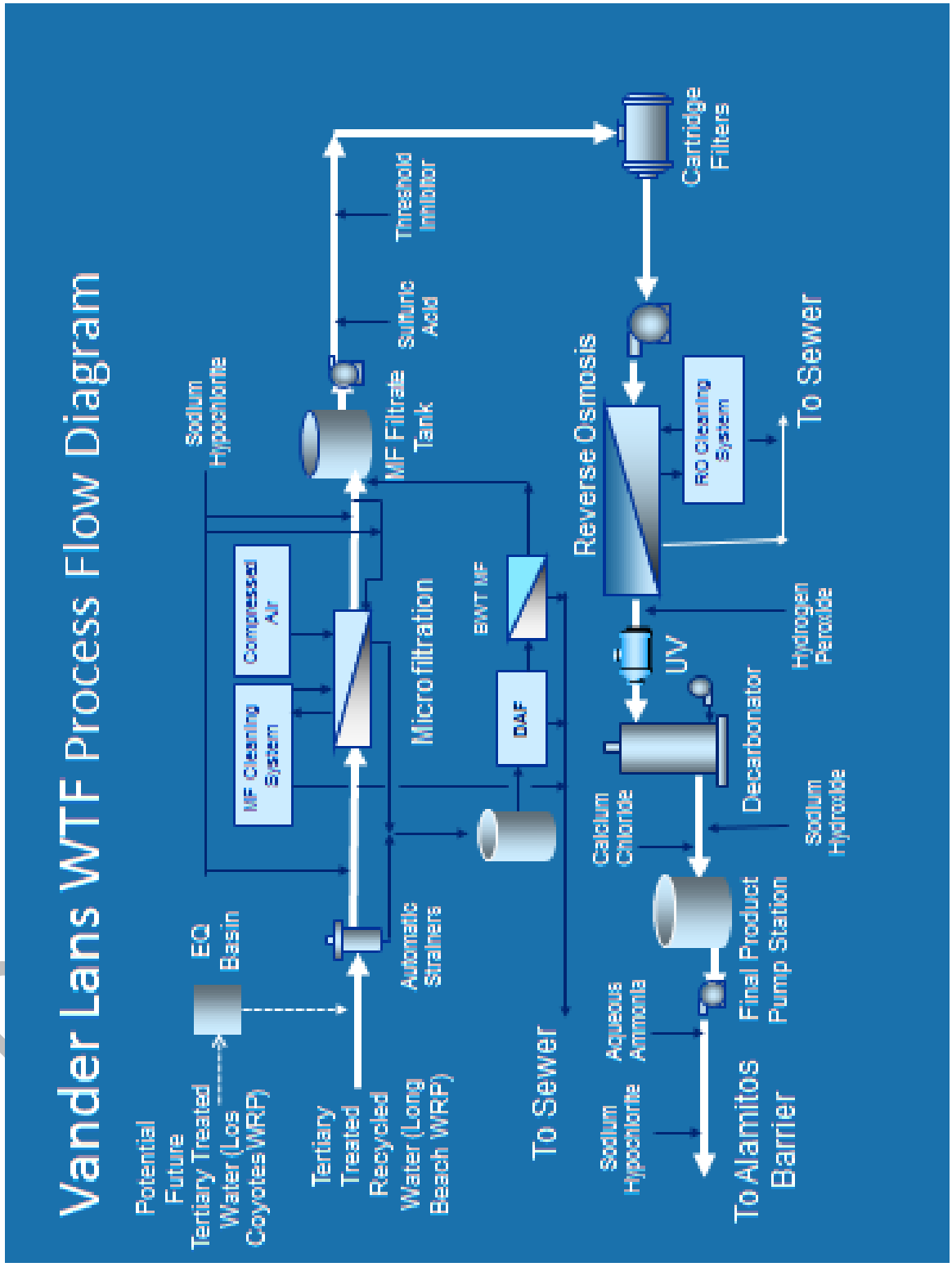


FIGURE 5: SIMULATED RECYCLED WATER FRACTION IN ZONE I

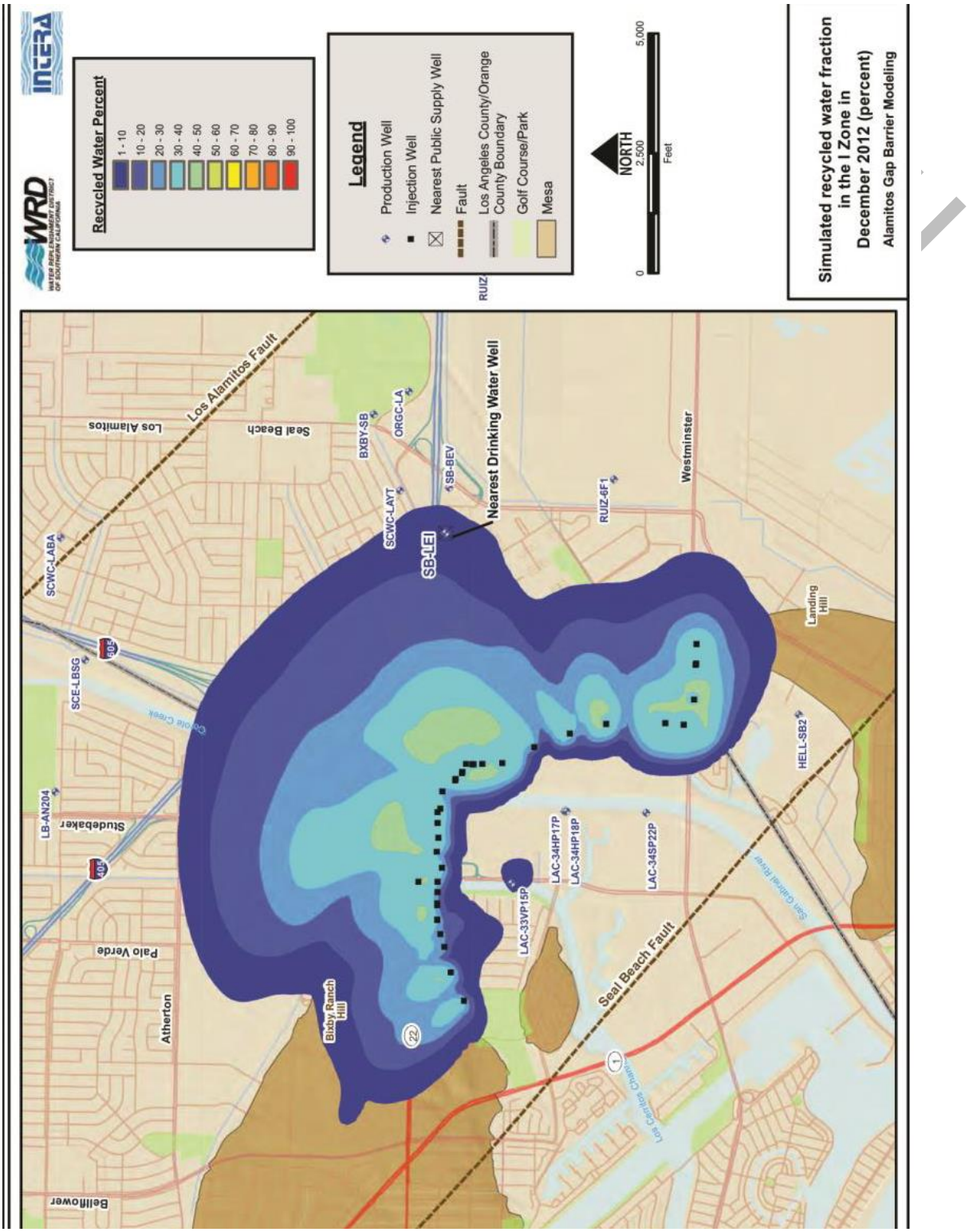
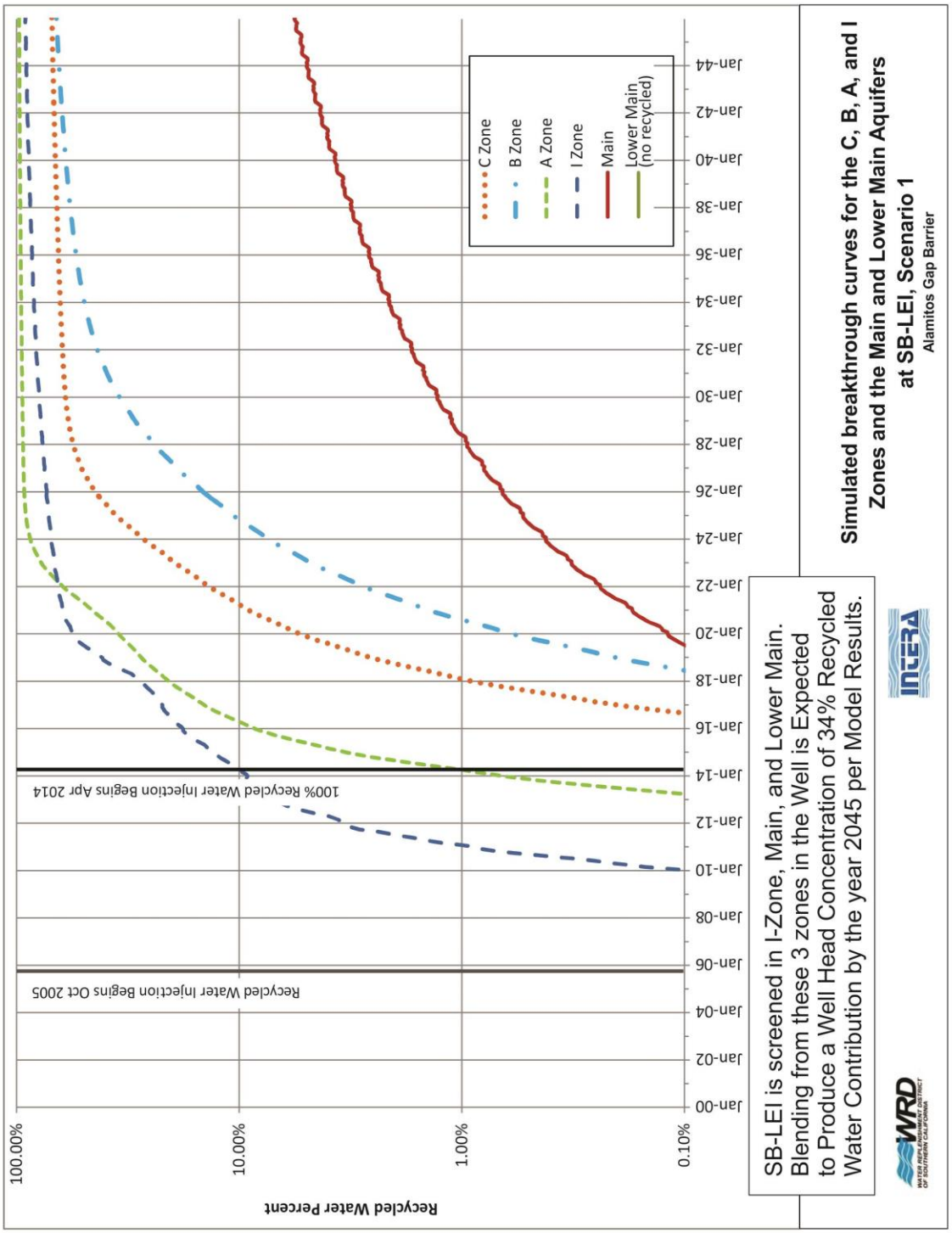


FIGURE 6 – PREDICTED RECYCLED WATER CONCENTRATIONS IN AQUIFERS AT NEAREST DRINKING WATER WELL WITH 100% RECYCLED WATER INJECTION



State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

ORDER NO. R4-2014-XXX

MONITORING AND REPORTING PROGRAM NO. CI-8956
FOR THE
ALAMITOS BARRIER RECYCLED WATER PROJECT
(File No. 93-076)

ISSUED TO

Los Angeles County Department of Public Works
Water Replenishment District of Southern California

The Los Angeles County Department of Public Works (Los Angeles County DPW) and the Water Replenishment District of Southern California (WRD) collectively referred to as Project Sponsors, shall implement this Monitoring and Reporting Program (MRP) on the first of the month following the month this Order was adopted.

I. SUBMITTAL OF REPORTS

1. The Project Sponsors shall submit the required reports, outlined in the following paragraphs, to the State Water Resources Control Board (State Water Board)'s Geotracker database and to the California Department of Public Health (CDPH), Drinking Water Field Operations, Los Angeles Region by the dates indicated:

    a. Quarterly Monitoring: Quarterly Monitoring Reports shall be received by the 15th day of the second month following the end of each quarterly monitoring period according to Table M-1.

Table M1: Quarterly Report Periods and Due Dates	
Reporting Period	**Report Due**
January – March	May 15
April – June	August 15
July – September	November 15
October – December	February 15

The contents of the Geotracker Quarterly Monitoring Report shall include a one page summary of operational concerns that addresses changes in reporting conditions, including influent, effluent, and groundwater monitoring results, since the last report. Where monitoring has been reduced to semi-annually or annually, a similar summary shall be provided for the constituents on the applicable report.

b. Annual Summary: The Annual Summary Report shall be received by April 15 of each year. This Annual Summary Report shall contain a discussion of the previous calendar year's analytical results, as well as graphical and tabular summaries of the monitoring analytical data. The contents of the Geotracker Annual Monitoring Report shall include a one page summary describing additional monitoring, reporting and trend analysis which may be required as described in MRP section III.2.

   Public water systems, owners of small water systems and other actives production wells having downgradient sources potentially affected by the Barrier or within 10 years groundwater travel time from the Barrier shall be notified by direct mail and/or electronic mail of the availability of the annual report.

c. Vander Lans WTF Operation Plan: Prior to startup of the expanded Vander Lans WTF, the Project Sponsors shall submit an Operations Plan to CDPH and the Regional Water Board for approval. After six months of operation of the expanded Leo J. Vander Lans Water Treatment Facility, the Operations Plan shall be updated as necessary and submitted to the Regional Water Board and the CDPH for review and approval.

   i. The Operations Plan shall cover critical operational parameters to include routine testing procedures for the microfiltration (MF), reverse osmosis (RO), and ultraviolet (UV)/advanced oxidation process (AOP) systems, optimization of the UV dose for disinfection and reduction of light-sensitive contaminants, and all treatment processes, maintenance and calibration schedules for all monitoring equipment, process alarm set points, and response procedures for all alarms in each treatment process of the Vander Lans WTF, including criteria for diverting recycled water if water quality requirements are not met, start-up, emergency response and contingency plans. During the first year of operation of the expanded Vander Lans WTF, all treatment processes shall be operated in a manner to provide optimal reduction of microbial, regulated and nonregulated contaminants. Based on this experience and anytime operational changes are made, the Operations Plan shall be updated.

   ii. The Operations Plan shall include staffing levels with applicable certification levels for Facility operations personnel. Significant changes in the operation of any of the treatment processes shall be reported to the CDPH and Regional Water Board. Significant changes in the approved Operations Plan must be approved by the CDPH and the Regional Water Board prior to instituting changes. The Project Sponsors shall be responsible for ensuring that the Operations Plan is, at all times, representative of the current operations, maintenance, and monitoring of the Vander Lans WTF.

d. Five-Year Engineering Report: Project Sponsors shall update the 2013 Title 22 Engineering Report and submit the updated report to the State Water Board's Geotracker and the CDPH five years after the startup of the expanded Vander Lans WTF, and every five years thereafter.

2. All reports to the State Water Board's Geotracker shall reference the Compliance File No. CI-8956. Compliance monitoring reports shall be submitted separately from other technical reports.

3. All reports shall be submitted as a pdf file and uploaded electronically to the State Water Board's Geotracker and provided via email to the CDPH (if the file exceeds 10 MB, either a CD containing the file shall be mailed to CDPH, Attention: CDPH, Drinking Water Field Operations, Los Angeles Region, or a link for downloading an electronic copy of the file shall be provided). Upon request the data shall be provided in excel format

4. By the reporting due dates specified in Table M1, groundwater data shall be uploaded electronically to the State Water Board's Geotracker in an electronic deliverable format specified by the State Water Board. Upon request the data shall be provided in excel format

II. MONITORING REQUIREMENTS

1. Project Sponsors shall monitor the flow and quality of the following according to the manner and frequency specified in this MRP:

    a. Influent to the Vander Lans WTF;

    b. Effluent (Recycled water) from Vander Lans WTF after the injection point for sodium hypochlorite and before injection into the Barrier

    c. If potable water is used, blend of recycled water and diluent water; and,

    d. Receiving groundwater (monitoring wells specified in Table M-18).

    e. For the production well SB-LEI (State Well No. 05S/12W-01A03) nearest to the barrier, the Project Sponsors shall review and evaluate the publicly available Title 22 monitoring data.

    f. The Project Sponsors shall collect and review total nitrogen data from the monitoring wells specified in Table M-18 on a quarterly basis.

2. Monitoring reports shall include, but not limited to, the following:

    a. Analytical results;

    b. Location of each sampling station where representative samples are obtained, including a map, at a scale of 1 inch equals 1,200 feet or less, that clearly identifies the locations of all injection wells, monitoring wells, and production wells;

    c. Analytical test methods used and the corresponding minimum reporting levels (MRLs);

d. Name(s) of the laboratory, which conducted the analyses;

e. Copy of laboratory certifications by the CDPH's Environmental Laboratory Accreditation Program (ELAP);and,

f. Quality assurance and control information, including documentation of chain of custody.

g. Permit limit, MCL or notification level, or recycled water, pretreatment specification or treatment condition.

3. Though not required to be included in the monitoring reports unless specifically requested by the Regional Water Board or the CDPH, the Project Sponsors shall have in place written sampling protocols. For groundwater monitoring, the sampling protocols shall outline the methods and procedures used for measuring water levels; purging wells; collecting samples; decontaminating equipment; containing, preserving, and shipping samples, and maintaining appropriate documentation. Also, the sampling protocols shall include the procedures for handling, storing, testing, and disposing of purge and decontamination waters generated from the sampling events.

4. Where multiple EPA approved methods are available, drinking water (500 series) or waste water (600 series) may be used and as appropriate to protect water quality and beneficial uses.

5. The samples shall be analyzed using analytical methods described in 40 Code of Federal Regulations (CFR) Part 141; or where no methods are specified for a given pollutant, by methods approved by the CDPH, Regional Water Board and/or State Water Board. The Project Sponsors shall select the analytical methods that provide Minimum Reporting Levels (MRLs) lower than the limits prescribed in this Order or as low as possible that will provide reliable data.

6. The Project Sponsors shall instruct its laboratories to establish calibration standards so that the MRLs (or its equivalent if there is a different treatment of samples relative to calibration standards) are the lowest calibration standard. At no time shall analytical data derived from extrapolation beyond the lowest point of the calibration curve be used, except as stated in section III.1.B of this MRP.

7. Upon request by the Project Sponsors, the Regional Water Board, in consultation with the CDPH and the State Water Board Quality Assurance Program, may establish MRLs, in any of the following situations:

a. When the pollutant has no established method under 40 CFR 141;

b. When the method under 40 CFR 141 for the pollutant has a MRL higher than the limit specified in this Order; or

c. When the Project Sponsors agree to use a test method that is more sensitive than those specified in 40 CFR Part 141.

8. For regulated constituents, the laboratory conducting the analyses shall be certified by ELAP or approved by the CDPH, Regional Water Board, or State Water Board, for a particular pollutant or parameter.

9. Samples shall be analyzed within allowable holding time limits as specified in 40 CFR Part 141. All Quality Assurance/Quality Control (QA/QC) analyses shall be run on the same dates that samples are actually analyzed. The Project Sponsors shall retain the QA/QC documentation in its files for 3 years and make available for inspection and/or submit them when requested by the Regional Water Board or the CDPH. Proper chain of custody procedures shall be followed, and a copy of this documentation shall be submitted with the quarterly report.

10. For all bacterial analyses, sample dilutions shall be performed so the range of values extends from 1 to 800. The detection methods used for each analysis shall be reported with the results of the analyses.

11. Quarterly monitoring for effluent and groundwater shall be performed during the months of February, May, August, and November. Semiannual monitoring for effluent shall be performed during the months of February and August. Semiannual monitoring for groundwater shall be performed during the months of May and November. Should there be instances when monitoring could not be done during these specified months, the Project Sponsors shall conduct the monitoring as soon as it can and state in the monitoring report the reason monitoring could not be conducted during the specified month. Results of quarterly analyses shall be reported in the quarterly monitoring report following the analysis.

12. For unregulated chemical analyses, the Project Sponsors shall select methods according to the following approach:

    a. Use the drinking water methods or waste water method sufficient to evaluate all water quality objectives and protect all beneficial uses;

    b. Use CDPH-recommended methods for unregulated chemicals, if available;

    c. If there is no CDPH-recommended drinking water method for a chemical, and more than a single United States Environmental Protection Agency (USEPA)-approved method is available, use the most sensitive of the USEPA-approved methods;

    d. If there is no USEPA-approved method for a chemical, and more than one method is available from the scientific literature and commercial laboratory, after consultation with CDPH, use the most sensitive method;

    e. If no approved method is available for a specific chemical, the Project Sponsors' laboratory may develop or use its own methods and should provide the analytical methods to CDPH for review. Those methods may be used until CDPH-recommended or USEPA-approved methods are available.

    f. For CECs subject to the State Water Board Recycled Water Policy as

amended January 22, 2013, analytical methods for laboratory analysis of CECs shall be selected to achieve the RLs presented in Table 1 of Attachment A of the Recycled Water Policy. The analytical methods shall be based on methods published by the USEPA, methods certified by the CDPH, or peer review reviewed and published methods that have been reviewed by CDPH, including those published by voluntary consensus standards bodies such as the Standards Methods Committee and the American Society for Testing and Materials International. Any modifications to the published or certified methods shall be reviewed by CDPH and subsequently submitted to the Regional Water Board in an updated quality assurance project plan.

III. REPORTING REQUIREMENTS

1. Quarterly Reports

   a. These reports shall include, at a minimum, the following information:

      i. The volume of the influent, recycled water injected, and if used, potable water injected into the barrier. If no recycled water was injected, or delivered for blending and injection, into the Alamitos Gap Seawater Intrusion Barrier (Barrier) during the quarter/month, the report shall so state.

      ii. The date and time of sampling and analyses.

      iii. All analytical results of samples collected during the monitoring period of the influent, recycled water, groundwater, and if potable water was used, then of the blend of recycled water and potable water injected.

      iv. Records of any operational problems, plant upset and equipment breakdowns or malfunctions, and any diversion(s) of off-specification recycled water and the location(s) of final disposal.

      v. Discussion of compliance, noncompliance, or violation of requirements.

      vi. All corrective or preventive action(s) taken or planned with schedule of implementation, if any.

      vii. Certification by the Project Sponsors that no groundwater for drinking purposes has been pumped from wells within the boundary representing the greatest of the horizontal and vertical distances reflecting 6 months.

      viii. A summary of operational concerns describing changes in reporting conditions, including influent, effluent, and groundwater monitoring results, since the last report.

   b. Verification of compliance with the 20 week running average Total Organic Carbon (TOC) limit, presented in numerical and graphical formats.

   c. Verification of compliance with the UV Power level recycled water minimum

treatment requirements, presented in numerical and graphical formats

d. Verification of compliance with the Hydrogen Peroxide concentration and injection rate, presented in numerical and graphical formats

e. Verification of compliance with the MCLs for drinking water as listed in Order section III.4 and Tables M-6, M-7, M-8, M-9, M-9, M-10, M-11, M-12 and M-13, presented in numerical and graphical formats

f. Monitoring results associated with the evaluation of pathogenic microorganism removal as described in Order section III.2 of this MRP.

g. For the purpose of reporting compliance with numerical limitations, analytical data shall be reported using the following reporting protocols:

   i. Sample results greater than or equal to the MRL must be reported "as measured" by the laboratory (i.e., the measured chemical concentration in the sample); or

   ii. Sample results less than the MRL, but greater than or equal to the laboratory's Minimum Detection Limit (MDL), shall be reported as "Detected, but Not Quantified", "DNQ", or "J". The laboratory shall write the estimated chemical concentration of the sample next to "DNQ" or "J"; or

   iii. Sample results less than the laboratory's MDL shall be reported as "Not-Detected", or ND.

h. If the Project Sponsors sample and perform analyses on any sample more frequently than required in this MRP using approved analytical methods, the results of those analyses shall be included in the report. These results shall be reflected in the calculation of the average used in demonstrating compliance with average effluent, receiving water, etc., limitations.

i. The Regional Water Board or CDPH may request supporting documentation, such as daily logs of operations.

2. Annual Summary Reports shall include, at a minimum, the following information:

a. Tabular and graphical summaries of the monitoring data obtained during the previous calendar year;

b. A summary of compliance status with the applicable monitoring requirements during the previous calendar year;

c. For any non-compliance during the previous calendar year, a description of:

   i. the date, duration, and nature of the violation;

   ii. a summary of any corrective actions and/or suspensions of surface

application of recycled municipal wastewater resulting from a violation; and

iii. if uncorrected, a schedule for and summary of all remedial actions;

d. Any detections of monitored chemicals or contaminants, and any observed trends in the monitoring wells (and if applicable, in diluent water supplies);

e. Information pertaining to the vertical and horizontal migration of the recharge water plume;

f. Title 22 drinking water quality data for the nearest domestic water supply well SB-LEI;

g. A description of any changes in the operation of any unit processes or facilities;

h. the estimated quantity and quality of the recycled municipal wastewater and diluent water to be utilized for the next calendar year;

i. A summary of the measures taken by CSDLAC to comply with wastewater source control program and the effectiveness of the implementation of the measures;

j. A list of the analytical methods used for each test and associated laboratory quality assurance/quality control procedures shall be included. The report shall identify the laboratories used by the Project Sponsors to monitor compliance with this Order, their status of certification, and provide a summary of proficiency test;

k. A list of current operating personnel, their responsibilities, and their corresponding grade of certification; and

l. The Annual Report shall be prepared by a properly qualified engineer registered and licensed in California and experienced in the field of wastewater treatment.

m. A one page summary on additional monitoring, reporting and trend analysis which may be required as described in MRP section IV.5.

3. The existing Operations Plan shall be updated to accurately reflect: the operations of the expanded Vander Lans WTF's, the date the plan was last reviewed, and whether the plan is valid and current.

4. Five-Year Engineering Report: Five years after the startup of the expanded Vander Lans WTF and every five years thereafter, the Project Sponsors shall update the engineering report to address any project changes and submit the report to the Regional Water Board and the CDPH. The Five-Year Engineering Report Update shall include, but not be limited to:

a. Evidence that the requirements associated with retention time have been met (Note: This may be done using past tracer studies.); and

b. A description of any inconsistencies between previous groundwater model predictions and the observed and/or measured values. For this requirement, the Project Sponsors shall summarize the groundwater flow and transport including the injection and extraction operations for the Barrier during the previous five calendar years. This summary shall also use the most current data for the evaluation of the transport of recycled water; such evaluations shall include, at a minimum, the following information:

   i. Total quantity of water injected into each major aquifer, and the proportions of recycled water and diluent water that comprise the total quantity;

   ii. Estimates of the rate and path of flow of the injected water within each major aquifer;

   iii. Projections of the arrival time of the recycled water at the closest extraction well (SB-LEI), and the percent of recycled water at the wellhead.

   iv. Clear presentation on any assumptions and/or calculations used for determining the rates of flow and for projecting arrival times and dilution levels.

   v. A discussion of the underground retention time of recycled water, a numerical model, or other methods used to determine the recycled water contribution to each aquifer.

   vi. A revised flow and transport model to match actual flow patterns observed within the aquifer if the flow paths have significantly changed.

   vii. Revised estimates, if applicable, on hydrogeologic conditions including the retention time and the amount of the recycled water in the aquifers and at the production well field at the end of that calendar year. The revised estimates shall be based upon actual data collected during that year on recharge rates (including recycled water, native water, and portable water), hydrostatic head values, groundwater production rates, basin storage changes, and any other data needed to revise the estimates of the retention time and the amount of the recycled water in the aquifers and at the production well field. Significant differences, and the reasons for such differences, between the estimates presented in the 2013 Engineering Report and subsequently revised estimates, shall be clearly presented. Additionally, the Project Sponsors shall use the most recently available data to predict the retention time of recycled water in the subsurface. An estimate of hydrological conditions at small-system and other active production wells shall also be described.

c. Evaluation of the ability of Project Sponsors to comply with all regulations and provisions over the following five years.

d. The Five-Year Engineering Report shall be prepared by a properly qualified engineer registered and licensed in California and experienced in the field of wastewater treatment.

IV. MONITORING PROGRAMS

1. Pre-Treatment Specifications Monitoring

a. Monitoring is required determine compliance with water quality conditions and standards; and assess Vander Lans WTF performance.

b. The influent sampling station is located before tertiary treated water from Long Beach WRP (and if applicable, from Los Coyotes WRP) enters the MF treatment system of the Vander Lans WTF. Influent samples shall be obtained on the same day that effluent samples are obtained. The date and time of sampling shall be reported with the analytical values determined. Table M-2 constitutes the pretreatment specifications monitoring program.

Table M-2: Pre-Treatment Specifications Monitoring

Constituents	Units	Type of Sample	Minimum Frequency of Analysis
Total flow	mgd	Recorder	Continuous[17]
Total suspended solids (TSS)	mg/L	24-hour comp.	Daily
Biological Oxygen Demand$_5$ 20°C	mg/L	24-hour comp.	Weekly

2. Recycled Water Treatment Specifications

a. Recycled water treatment specifications monitoring is required to:

i. Determine compliance with the Permit conditions;

ii. Identify operational problems and aid in improving facility performance; and,

iii. Provide information on wastewater characteristics and flows for use in interpreting water quality and biological data (see Table M-3).

iv. Determine if effluent limits are attained..

[17] For those constituents that are continuously monitored, the Project Sponsors shall report the monthly minimum and maximum, and daily average values.

Samples shall be collected from the channel downstream of the treatment location, where data collection is most likely to represent performance. Should the need for a change in the sampling station(s) arise in the future, the Project Sponsors shall seek approval of the proposed station by the Executive Officer prior to use.

Table M-3 – Recycled Water Treatment Specifications

Parameter	Unit	Frequency
UV power level	%	TBD[18]
Hydrogen Peroxide	ml/min	TBD
Hydrogen Peroxide	mg/L	TBD

3. Effluent Monitoring

a. Highly treated recycled water monitoring is required to:

i. Determine compliance with the Permit conditions;

ii. Identify operational problems and aid in improving facility performance;

iii. Provide information on wastewater characteristics and flows for use in interpreting water quality and biological data; and

iv. Determine if effluent limits are attained.

Samples shall be collected from the channel downstream of the sodium hypochlorite injection point, with the exception of Chemicals of Emerging Concern (CEC) s and surrogates, whose sampling locations are determined by the State Water Board's Recycled Water Policy, amended on January 22, 2013. The amendment to the Recycled Water Policy Attachment A states that the effluent shall be sampled for the constituents in Table M-4. Should the need for a change in the sampling station(s) arise in the future, the Project Sponsors shall seek approval of the proposed station by the Executive Officer prior to use.

Table M-4 – Sampling of Constituents of Emerging Concern

Parameter	Constituent Group	Reporting Limit (µg/L)
17β-estradiol	Steroid Hormones	.001
Caffeine	Stimulant	.05
NDMA	Disinfection Byproduct	.002
Triclosan	Antimicrobial	.05
DEET	Personal Care Product	.05
Sucralose	Food additive	.1

[18] TBD: The CDPH will determine the treatment indicators and frequency of monitoring that which demonstrate sufficient inactiviation of viruses after the pilot test is completed and the results evaluated. Values based on the design removal described in the CDPH conditions will be used if the values are not determined within a year of adoption.

b. Table M-5 shall constitute the effluent monitoring program.

Table M-5: Effluent Monitoring

Constituent/Parameters	Units	Type of Sample	Minimum Frequency of Analysis[19]
Total recycled water flow	mgd	Recorder	Continuous
pH	pH units	Recorder	Continuous
Total coliform	MPN/100 ml	Grab	Daily
Enteric virus	Log	Calculated	Weekly
Giardia	Log	Calculated	Daily
Cryptosporidium	Log	Calculated	Daily
TOC	mg/L	24-hour comp. or grab	Weekly
BOD_5 20°C	mg/L	24-hour comp.	Weekly
Turbidity	NPU	24-hour comp.	Weekly
Total nitrogen[20]	mg/L	24-hour comp or grab	Weekly
Nitrate-N	mg/L	24-hour comp or grab	Weekly
Nitrite-N	mg/L	24-hour comp or grab	Weekly
Nitrate plus Nitrite	mg/L	24-hour comp or grab	Weekly
Inorganics[21] with primary MCLs	µg/L	Grab	Quarterly
Constituents/parameters with secondary MCL	various	Grab	Quarterly
Fluoride	µg/L	Grab	Quarterly
Radioactivity	pCi/L	Grab	Quarterly
Regulated organic chemicals	µg/L	24-hour comp or grab	Quarterly
Disinfection byproducts	µg/L	24-hour comp or grab	Quarterly
General physical	various	Grab	Quarterly
General minerals	µg/L	Grab	Quarterly
Lead	µg/L	Grab	Quarterly
Copper	µg/L	Grab	Quarterly

[19] For those constituents that are continuously monitored, the Project Sponsors shall report the monthly minimum and maximum, and daily average values.
[20] Total Nitrogen includes nitrate-N, nitrite-N, ammonia-N, and organic-N.
[21] For specific constituents to be monitored and their monitoring frequency, refer to Tables M-5 through M-13.

Constituents with Notification Levels	µg/L	Grab	Varies[33]
Remaining priority pollutants[33]	µg/L	Grab	Annually
Constituents of Emerging Concern (CECs)	ng/L	Grab	Varies

Table M-6: Inorganics with Primary MCLs

Constituents		
Aluminum	Cadmium	Nitrate (as nitrogen)
Antimony	Chromium (Total)	Nitrite (as nitrogen)
Arsenic	Cyanide	Nitrate + Nitrite
Asbestos	Fluoride	Perchlorate
Barium	Mercury	Selenium
Beryllium	Nickel	Thallium

Table M-7: Constituents/parameters with secondary MCLs

Constituents		
Aluminum	Manganese	Thiobencarb
Chloride	Methyl-tert-butyl-ether (MTBE)	Total Dissolved Solids
Color	Odor – Threshold	Turbidity
Copper	Silver	Zinc
Foam Agents (MBAS)	Specific Conductance	
Iron	Sulfate	

Table M-8: Radioactivity

Constituent		
Gross Alpha Particle Activity (Including Radium-226 but Excluding Radon and Uranium)	Combined Radium-226 and Radium-228	Tritium
Gross Beta Particle Activity	Strontium-90	Uranium

Table M-9: Regulated Organics

Constituents

Table M-9: Regulated Organics		
(a) Volatile Organic Chemicals	1,1,1-Trichloroethane	Endothal
Benzene	1,1,2-Trichloroethane	Endrin
Carbon Tetrachloride (CTC)	Trichloroethylene (TCE)	Ethylene Dibromide (EDB)
1,2-Dichlorobenzene	Trichlorofluoromethane	Glyphosate
1,4-Dichlorobenzene	1,1,2-Trichloro-1,2,2-Trifluoroethane	Heptachlor
1,1-Dichloroethane	Vinyl Chloride	Heptachlor Epoxide
1,2-Dichloroethane (1,2-DCA)	Xylenes (m,p)	Hexachlorobenzene
1,1-Dichloroethene (1,1-DCE)	**(b) Non-Volatile synthetic Organic Constituents**	Hexachlorocyclopentadiene
Cis-1,2-Dichloroethylene	Alachlor	Lindane
Trans-1,2-Dichloroethylene	Atrazine	Methoxychlor
Dichloromethane	Bentazon	Molinate
1,2-Dichloropropane	Benzo(a)pyrene	Oxamyl
1,3-Dichloropropene	Carbofuran	Pentachlorophenol
Ethylbenzene	Chlordane	Picloram
Methyl-tert-butyl-ether (MTBE)	Dalapon	Polychlorinated Biphenyls
Monochlorobenzene	1,2-Dibromo-3-chloropropane (DBCP)	Simazine
Styrene	2,4-Dichlorophenoxyacetic acid (2,4-D)	Thiobencarb
1,1,2,2-Tetrachloroethane	Di(2-ethylhexyl)adipate	Toxaphene
Tetrachloroethylene (PCE)	Di(2-ethylhexyl)phthalate	2,3,7,8-TCDD (Dioxin)
Toluene	Dinoseb	2,4,5-TP (Silvex)
1,2,4-Trichlorobenzene	Diquat	

Table M-10: Disinfection Byproducts		
Constituent		
Total Trihalomethanes (TTHM)	**Haloacetic Acid (five) (HAA5)**	Bromate
Bromodichloromethane	Monochloroacetic acid	Chlorite
Bromoform	Dichloroacetic acid	
Chloroform	Trichloroacetic acid	
Dibromochloromethane	Monobromoacetic acid	
	Dibromoacetic acid	

Table M-11: General Physical and General Minerals		
Constituents		
Asbestos	Potassium	Foaming Agents
Calcium	Sodium	Odor
Chloride	Sulfate	Specific Conductance
Copper	Zinc	Total Dissolved Solids
Iron	Color	Total Hardness
Manganese	Corrosivity	

Table M-12: Constituents with Notification Levels			
Constituents	**Units**	**Type of Sample**	**Minimum Frequency of Analysis**
Boron	µg/L	Grab	Quarterly
n-Butylbenzene	µg/L	Grab	Annually
sec-Butylbenzene	µg/L	Grab	Annually
tert-Butylbenzene	µg/L	Grab	Annually
Carbon disulfide	µg/L	Grab	Quarterly
Chlorate	µg/L	Grab	Quarterly
2-Chlorotoluene	µg/L	Grab	Annually
4-Chlorotoluene	µg/L	Grab	Annually
Diazinon	µg/L	Grab	Annually
Dichlorodifluoromethane (Freon 12)	µg/L	Grab	Annually
1,4-Dioxane	µg/L	Grab	Annually
Ethylene glycol	µg/L	Grab	Annually
Formaldehyde	µg/L	Grab	Annually
HMX	µg/L	Grab	Quarterly[22]
Isopropylbenzene	µg/L	Grab	Annually
Manganese	µg/L	Grab	Quarterly
Methyl isobutyl ketone (MIBK)	µg/L	Grab	Annually
Naphthalene	µg/L	Grab	Annually
n-Nitrosodiethyamine (NDEA)	µg/L	Grab	Annually
n-Nitrosodimethylamine (NDMA)	µg/L	Grab	Quarterly[23]
n-Nitrosodi-n-propylamine (NDPA)	µg/L	Grab	Annually
Propachlor	µg/L	Grab	Annually

[22] Monitoring for some constituents has not been fully reviewed by CDPH. The monitoring frequency may be reduced for these or any constituent upon review by CDPH and the Regional Water Board.
[23] Monthly sampling of advanced treated recycled water for the first year. If concentrations exceed 10 ng/L, then weekly monitoring may be required. After a year of sampling without exceeding the conditional concentration, quarterly monitoring may resume. NDMA sampling for CEC requirements may be used to replace effluent monitoring where the sampling frequencies, analysis method, and detection limits coincide. See Table M-17 and Order Section IV.1.

Table M-12: Constituents with Notification Levels			
Constituents	**Units**	**Type of Sample**	**Minimum Frequency of Analysis**
n-Propylbenzene	µg/L	Grab	Annually
RDX	µg/L	Grab	Annually
Tertiary butyl alcohol (TBA)	µg/L	Grab	Quarterly
1,2,3-Trichloropropane (1,2,3-TCP)	µg/L	Grab	Annually
1,2,4-Trimethylbenzene	µg/L	Grab	Annually
1,3,5-Trimethylbenzene	µg/L	Grab	Annually
2,4,6-Trinitrotoluene (TNT)	µg/L	Grab	Quarterly
Vanadium	µg/L	Grab	Annually

Table M-13: Remaining Priority Pollutants		
Constituents		
Pesticides	**Metals**	Di-n-butyl phthalate
Aldrin	Chromium III	Di-n-octyl phthalate
Dieldrin	Chromium VI	Diethyl phthalate
4,4'-DDT	**Base/Neutral Extractables**	Dimethyl phthalate
4,4'-DDE	Acenaphthene	Benzo(a)anthracene
4,4'-DDD	Benzidine	Benzo(a)fluoranthene
Alpha-endosulfan	Hexachloroethane	Benzo(k)fluoranthene
Beta-endosulfan	Bis(2-chloroethyl)ether	Chrysene
Endosulfan sulfate	2-chloronaphthalene	Acenaphthylene
Endrin aldehyde	1,3-dichlorobenzene	Anthracene
Alpha-BHC	3,3'-dichlorobenzidine	1,12-benzoperylene
Beta-BHC	2,4-dinitrotoluene	Fluorene
Delta-BHC	2,6-dinitrotoluene	Phenanthrene
Acid Extractables	1,2-diphenylhydrazine	1,2,5,6-dibenzanthracene
2,4,6-trichlorophenol	Fluoranthene	Indeno(1,2,3-cd)pyrene
P-chloro-m-cresol	4-chlorophenyl phenyl ether	Pyrene
2-chlorophenol	4-bromophenyl phenyl ether	**Volatile Organics**
2,4-dichlorophenol	Bis(2-chloroisopropyl)ether	Acrolein
2,4-dimethylphenol	Bis(2-chloroethoxyl)methane	Acrylonitrile
2-nitrophenol	Hexachlorobutadiene	Chlorobenzene
4-nitrophenol	Isophorone	Chloroethane
2,4-dinitrophenol	Nitrobenzene	1,1-dichloroethylene
4,6-dinitro-o-cresol	N-nitrosodiphenylamine	Methyl chloride

Table M-13: Remaining Priority Pollutants		
Constituents		
Phenol	Bis(2-ethylhexyl)phthalate	Methyl bromide
	Butyl benzyl phthalate	2-chloroethyl vinyl ether

Table M-14: Constituents of Emerging Concern						
Constituent	**Relevance/ Indicator Type**	**Type of Sample**	**Minimum Frequency of Analysis**	**Reporting Limit (µg/L)**	**Monitoring Locations[24]**	
					Prior to RO	**Following treatment prior to well injection**
17β-estradiol	Health	grab	Annually	0.001		X
Caffeine	Health & Performance	grab	Annually	0.05	X	X
NDMA	Health & Performance	grab	Quarterly	0.002	X	X
Triclosan	Health	grab	Annually	0.05		X
DEET	Performance	grab	Annually	0.05	X	X
Sucralose	Performance	grab	Annually	0.1	X	X

Table M-15: Surrogates				
Constituent	**Type of Sample**	**Minimum Frequency**	**Monitoring Locations**	
			Prior to RO Treatment	**Following Treatment prior to Well Injection**
Electrical Conductivity	Online	Continuous[25]	X	X
TOC	24-hour composite	Weekly	X	X

[24] The January 22, 2013 Recycled Water Policy Attachment A makes a distinction between health-based and performance-based CEC indicators for purposes of monitoring locations. For subsurface applications, the health-based CECs are 17β-estradiol, caffeine, NDMA, and triclosan, with monitoring required for final recycled water only. The health-based and performance-based CECs are caffeine, NDMA, DEET, and sucralose, with monitoring required prior to Reverse Osmosis and post- treatment prior to release to the aquifer. Caffeine and NDMA serve both as health-based and performance based indicators

[25] Since monitoring will be continuous using online analyzers, monthly averages for each monitoring location shall be reported in the quarterly compliance monitoring reports.

Consistent with the January 22, 2013 amended Recycled Water Policy, the Project Sponsor may request the removal of specific CECs from the monitoring program if supported by the data.

i. Analytical methods for CECs shall be selected to achieve the reporting limits presented in Table M-14 in accordance with the Recycled Water Policy. The analytical methods shall be based on methods published by the USEPA, methods certified by CDPH, or peer reviewed and published methods that have been reviewed by CDPH. Any modifications to the published or certified methods shall be reviewed and approved by the Regional Water Board and CDPH.

ii. For performance indicator CECs and surrogates, removal percentages shall be reported in addition to the measured concentrations.

[1] The removal percentage shall be calculated based on the following formula:

Removal Percentage = $([X_{in} - X_{out}]/X_{in})*100$
X_{in} = Concentration in recycled water prior to a treatment process
X_{out} = Concentration in recycled water after a treatment process

[2] The removal percentages for the surrogates shall be determined based on the daily averages for electrical conductivity and weekly values for TOC and included in the quarterly compliance monitoring reports.

[3] The removal percentages for the performance indicator CECs shall be included in the Annual Summary Report.

c. Evaluation of Pathogenic Microorganism Removal

For the purposes of evaluating the performance of the following treatment facilities/units with regards to pathogenic microorganism removal, the Project Sponsors shall include the results of the monitoring specified below in its quarterly compliance monitoring reports:

i. Long Beach WRP (and Los Coyotes WRP, if the effluent is used as a source water): For the purpose of demonstrating that the necessary log reductions are achieved at the WRP(s), Project Sponsors shall report the daily average and maximum turbidity, percent of time more than 5 nephelometric turbidity units (NTU), and daily coliform results associated with the WRP(s);

ii. MF (Vander Lans WTF): For each day of operation, the membrane integrity test (MIT) sampling shall be performed, the value, and the daily "Pass" or "Fail" and "Repaired" or "Off-line" results shall be reported;

iii. RO (Vander Lans WTF): Conductivity and TOC shall be continuously measured upstream and downstream of the RO using online analyzers, and for each day of operation, the following shall be reported for both conductivity and TOC - daily minimum, maximum, average, and percent reductions based on daily average values;

iv. AOP (UV and hydrogen peroxide at Vander Lans WTF): For each day of operation, Project Sponsors shall report the calculated daily peroxide dose (based on the peroxide pump speed and bulk feed concentration), percent reduction based on daily average of chloramine (via total residual chlorine) measured upstream and downstream of AOP, and the applied UV power shall be reported. For UV, Project Sponsors shall report the UV system dose (expressed as greater than a certain threshold such as 300 milli-joules/cm^2), UV transmittance (daily minimum, maximum, and average), and UV intensity for each reactor (daily minimum, maximum, and average); and

v. Based on the calculation of log reduction achieved each day by the entire treatment system, Project Sponsors shall report the value and "Yes" or "No" for each day as to whether the necessary log reductions (i.e. 10-logs for *Giardia*, 10-logs for *Cryptosporidium*, and 12-logs for virus) have been attained. An overall log reduction calculation shall be provided only for those days when a portion of the treatment system does not achieve the credits proposed in Table 5-1 of the engineering report.

d. Pilot Test to Demonstrate Oxidation Process

i. The requirements which apply during the Pilot Test are included in R4-2005-0061-A01 adopted on March 6, 2014.

ii. The expanded Vander Lans WTF will include an advanced oxidation system developed in consultation with CDPH and designed to remove consitutents of emerging concern. To demonstrate a sufficient oxidation process has been designed, the GWRRs require project proponents of subsurface application using full advanced treatment to perform a pilot test to demonstrate that the oxidation process will provide a 0.5-log (69 percent) reduction of 1,4-dioxane. To satisfy the requirement, a spiking test shall be conducted during the commissioning phase of the expanded Vander Lans WTF per the testing protocol, which shall be described in a separate technical memo and submitted for CDPH's review and approval. The pilot test shall also confirm the suitability of using chloramine (via total residual chlorine) as the surrogate and/or operational parameter. (Based on the data provided by CSDLAC for the Long Beach WRP's existing recycled water from January 2007 thru June 2011, 1,4-dioxane in the Vander Lans WTF influent averaged at 1.9 µg/L, with a range of 1.5 and 2.6 µg/L. After the full treatment at Vander Lans WTF (including RO and UV but no hydrogen peroxide), 1,4-dioxane was never detected above the MRL of 1 ug/L in Vander Lans WTF's recycled water. Once hydrogen peroxide is added to the treatment train (i.e., post-expansion), greater removal efficiency is anticipated from the use of full AOP).

iii. During the full-scale operation of the oxidation process, continuous online monitoring of chloramine (via total residual chlorine) shall be provided for the recycled water to serve as a surrogate or operational parameter for the purpose of ensuring that the process is operating as designed. Because the influent consists of fully chloraminated water (absent of free chlorine), the total residual chlorine measurements should adequately represent chloramine levels in the recycled water. The treatment system shall also have alarms associated with certain critical points (as fully detailed in section 14 of the 2013 Title 22 Engineering Report for the Vander Lans WTF Expansion) to alert the operators of any potential concerns with the operational performance. Should the results of the pilot test identify an alternate surrogate that is more effective or suitable than chloramine, the Project Sponsors may submit for review and approval by CDPH a request to use the alternate surrogate instead of chloramine.

iv. Each quarter, the Project Sponsors shall tabulate the percent of the quarter's monitoring that did not meet the surrogate limits established to assure proper on-going performance of the RO and UV/AOP. If the value is more than ten percent, within 30 days after the end of the quarter, the Project Sponsors shall:

[1]. Submit a report to the CDPH and Regional Water Board describing the corrective actions planned or taken to reduce the percent to ten percent or less; and

[2]. Consult with the CDPH and, if required, comply with an alternative monitoring plan approved by the CDPH.

v. Within 60 days after completing the initial 12-months of monitoring during the full-scale operation, the Project Sponsors shall submit a report to the CDPH and Regional Water Board that includes:

[1]. The results of chloramine (via total residual chlorine) monitoring performed;

[2]. A description of the efficacy of the chloramine (via total residual chlorine) to reflect the removal differential of 1,4-dioxane; and

[3]. A description of actions taken, or those that would be taken, if the indicator compound removal did not meet the associated design criteria, the continuous surrogate monitoring failed to correspond to the indicator compound removal percentage, or the surrogate and/or operational parameter established was not met.

vi. Within 60 days after completing 12 months of operation of the MF, RO and AOP, the Project Sponsors shall submit a report to the CDPH and Regional Water Board describing the effectiveness of the treatment, process failures, and actions taken in the event the on-going monitoring that process integrity was compromised.

e. Diluent Water Monitoring

i. The Project Sponsors propose to use 100 percent recycled water for injection at the Barrier. However, if this becomes infeasible due to unforeseen circumstances (e.g., insufficient supply of recycled water, treatment issues, etc.), injection of diluent water (i.e., Metropolitan Water District of Southern California's (MWD) potable water) will become necessary in order to prevent seawater intrusion. Pursuant to section 60320.214 of the GWRR, the Project Sponsors are exempted from nitrate and nitrite monitoring in diluent water when using a CDPH-approved drinking water source for diluent water. This exemption is applicable to Project Sponsors since MWD's potable water is a CDPH-approved drinking water source.

ii. Section 60320.214 of the GWRR requires ensuring diluent water does not exceed primary MCLs or NLs and is produced implementing a CDPH-approved water quality monitoring plan for CDPH-specified contaminants to demonstrate compliance with the primary MCLs and NLs.

iii. MWD currently delivers an average of 1.7 billion gallons of water per day to a 5,200-square-mile service area covering parts of Los Angeles, Orange, San Diego, Riverside, San Bernardino and Ventura counties. As part of its operation, MWD performs rigorous monitoring to comply with all necessary drinking water standards. Regular updates of water quality monitoring data are provided to its customers throughout the year to assure delivery of high quality water and to demonstrate regulatory compliance. During the circumstance when diluent water use becomes necessary, the Project Sponsors shall diligently review and track the quality of MWD potable water for compliance with primary MCLs and NLs based on the information provided by MWD's Water Quality Compliance Team.

f. Blended Recycled Water Monitoring

The Project Sponsors propose to use 100 percent recycled water for injection at the Barrier. Should the use of potable water become necessary to supplement the recycled water, monitoring for blended recycled water shall be implemented consistent with the current MRP, as follows:

Table M-16: Blended Recycled Water Monitoring

Constituent	Units	Type of Sample	Minimum Frequency of Analysis
Total Blended Flow	mgd	---	Total monthly
Chlorine residual	mg/L	Grab	Weekly
TDS	mg/L	Grab	Weekly
Sulfate	mg/L	Grab	Weekly

Table M-16: Blended Recycled Water Monitoring			
Constituent	**Units**	**Type of Sample**	**Minimum Frequency of Analysis**
Chloride	mg/L	Grab	Weekly
Boron	mg/L	Grab	Weekly
Total nitrogen [26]	mg/L	Grab	Weekly

4. Treatment Conditions

a. Monitoring of treatment conditions is required to:

i. Determine compliance with the Permit conditions;

ii. Identify operational problems and aid in improving facility performance; and.

iii. Provide information on wastewater characteristics and flows for use in interpreting water quality and biological data.,

Samples from recycled water shall be collected from the channel downstream of the sodium hypochlorite injection and before injection into the groundwater. Sampling described under treatment conditions section IV.1, shall be collected as described below. Should the need for a change in the sampling station(s) arise in the future, the Project Sponsors shall seek approval of the proposed station by the Executive Officer prior to use.

Table M-17 – Treatment Conditions		
Parameter	**Unit**	**Frequency**
N- Nitrosodimethylamine (NDMA)[27]	µg/L	Monthly for the first year, and then quarterly. Weekly or monthly if treatment conditions are exceeded**.**

If a sample of the advanced treated recycled water is greater than 10 ng/L for NDMA, within 72 hours of knowledge of the result, the Project Sponsors shall collect another sample as confirmation. If the average of the initial and confirmation sample is greater than 10 ng/L, or a confirmation sample is not collected and analyzed, the Project Sponsors shall initiate weekly monitoring for

[26] Total nitrogen shall be defined as the sum of ammonia, nitrite, nitrate, and organic nitrogen concentrations, expressed as nitrogen. Consistent with the recycled water monitoring, weekly total nitrogen monitoring is required. Since this table refers to MCLs and the Order states that the list should remain consistent with the most recent regulations, any redefinitions of MCL should be reflected in a change in the monitoring requirements

.[28] Water level elevations shall be measured to the nearest 0.01 feet, and referenced to mean sea level.

NDMA until the running four-week average is less than 10 ng/L. If the running four-week average is greater than 10 ng/L, the Project Sponsors shall describe the reasons for the results and provide a schedule for completion of corrective actions in the next quarterly report submitted to the Regional Board, with a copy provided to CDPH. If the running four-week average is greater than 10 ng/L for sixteen consecutive weeks, the Project Sponsors shall notify CDPH and the Regional Board within 48 hours of knowledge of the exceedance and, if directed by CDPH or the Regional Board, suspend injection of the advanced treated recycled water.

5. Groundwater Monitoring

The Project Sponsors shall monitor the quality of groundwater to assess any impact(s) from the recharge of recycled water. Representative samples of groundwater shall be collected from major aquifers, from the shallowest to the deepest, including the Recent Zone, Zone C, Zone B, Zone A, Zone I, and the Main Aquifer. Table M-18 and M-19 sets forth the minimum constituents and parameters for monitoring groundwater quality in Los Angeles County Flood Control District monitoring wells (LACFCD Well Nos. 503BF, 503BE, 502BW, 502BX, 502AK, 502AL, 502AM, and 502AN).

The Project Sponsors shall implement the following groundwater monitoring program as described in Tables M-20. Some constituents may be eligible for reduced monitoring due to the consistent historic lack of detection, upon approval by the Executive Officer.

If any of the monitoring results indicate that an MCL has been exceeded or coliforms are present in the monitoring wells at the Alamitos Barrier, the Project Sponsors shall notify the CDPH and Regional Water Board within 72 hours of receiving the results and make note of any positive finding in the next monitoring report submitted to the Regional Water Board.

Upon an exceedance of 10 ng/L for NDMA in monitoring samples in groundwater wells 502BW, 502Bx, 503BF or 503 BE, and within 30 days, the Project Sponsors shall notify CDPH and the Regional Board and begin monthly sampling of groundwater. The Project Sponsors shall propose a study for approval by the Executive Officer, which will identify the sources of the NDMA, and propose specific operational or facility changes to prevent a recurrence. After approval, the study shall be completed within no more than a year. During the completion and approval of the study, the Project Sponsors will continue monthly groundwater sampling for NDMA.

Additional monitoring, reporting and trend analysis for total nitrogen shall be applied to the monitoring data collected for the Alamitos Barrier Project and contrasted with the water quality changes predicted by model and documented in the first annual report. Should any groundwater monitoring well show an increase in the total nitrogen concentration of 10% over the value predicted by the Project Sponsors in the first annual report, additional studies shall be completed. These may include a diagnosis of the cause of the increased nitrogen discharge and description of the changes recommended to improve the barrier operation, or to update the local Alamitos Barrier model or the SNMP model. If wells continue to

show a 10% deviation above the predicted quality for total nitrogen in two annual reports, the Order shall be re-evaluated.

CDPH allowed a reduction in groundwater monitoring frequency from quarterly to semi-annual or annual based upon performance between 2007 and 2012, when the recycled water injection volume was 50% or less. The modified groundwater monitoring frequency approved by CDPH shall be maintained for each well until 6 months before the arrival of recycled water is anticipated by modeling estimates. At that time, the Project Sponsors shall begin the quarterly monitoring for all constituents listed in Table M-20. After four quarters of sampling, a discussion of the findings in the annual report and the absence of upexpected results, the Project Sponsors may resume the monitoring frequency approved by CDPH in 2007.

Table M-18 Groundwater Monitoring Wells

Project No.	Well No.	WRD Monitoring Well ID	Top of Well Casing (TOWC) Elevation (ft. above mean sea level)	Perforated Interval (ft. below TOWC)	Aquifer	Well Use
34L'1	503P	100254	10.2	15 – 25	Recent	Background
34L'1	503M	100253	10.5	610 – 620	Main	Background
34LS	503BF	100258	7	136 – 181	C-Zone	3-Month
34LS	503BE	100257	7	191 – 216	B-Zone	3-Month
34HJ	502BX	100242	9.4	314 – 344	A-Zone	3-Month
34HJ	502BW	100243	9.5	400 – 440	I-Zone	3-Month
34L10	502AK	100252	5.6	165 – 185	C-Zone	¼ Distance
34L10	502AL	100251	5.6	225 – 260	B-Zone	¼ Distance
34L10	502AM	100250	5.6	311 – 365	A-Zone	¼ Distance
34L10	502AN	100249	5.6	405 – 450	I-Zone	¼ Distance

Table M-19: Groundwater Monitoring[29]

Constituents/Parameters	Units	Type of Sample	Minimum Frequency of Analysis
Water level elevation[28]	feet	---	Quarterly
Chlorine residual	mg/L	Grab	Quarterly
TOC	mg/L	Grab	Quarterly
Total coliform	MPN/100ml	Grab	Quarterly
BOD_5 20°C	mg/L	Grab	Semiannually[29]

[28] Water level elevations shall be measured to the nearest 0.01 feet, and referenced to mean sea level.

Table M-19: Groundwater Monitoring[29]

Constituents/Parameters	Units	Type of Sample	Minimum Frequency of Analysis
Oil and grease	mg/L	Grab	Quarterly
Total nitrogen	mg/L	Grab	Quarterly
TSS	mg/L	Grab	Semiannually
Turbidity	NTU	Grab	Quarterly
Inorganics with primary MCLs	µg/L	Grab	Quarterly
Constituents/parameters with secondary MCLs	---	Grab	Quarterly
Fluoride	µg/L	Grab	Quarterly
Radioactivity	pci/L	Grab	Quarterly or Semiannually
Regulated organics	µg/L	Grab	Quarterly or Semiannually
Disinfection byproducts (DBPs)	µg/L	Grab	Quarterly
General physical		Grab	Quarterly
General minerals	µg/L	Grab	Quarterly
Chemicals with NLs	µg/L	Grab	Quarterly or Annually
N-Nitrosopyrrolidine	µg/L	Grab	Annually
Remaining priority pollutants	µg/L	Grab	Annually

[29] CDPH allowed a reduction in groundwater monitoring frequency based upon the performance between 2007 and 2012, when the recycled water injection volume was 50% or less. The modified groundwater monitoring frequency approved by CDPH is included in this table, and shall be maintained for each well until 6 months before the arrival of recycled water is anticipated by modeling estimates. At that time, the Project Sponsors shall begin the quarterly monitoring of all those constituents listed in Table M-20. After four quarters of sampling and confirmation that the results are not unexpected, the Project Sponsors may resume the monitoring frequency approved by CDPH in 2007.

Table M-20: Monitoring Frequency[29]

Constituent	Frequency									
	Well 100242	**Well 100243**	**Well 100249**	**Well 100250**	**Well 100251**	**Well 100252**	**Well 100253**	**Well 100254**	**Well 100257**	**Well 100258**
Total Suspended Solids (TSS)	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly
Turbidity	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly
Radioactivity										
Gross Alpha Particle Activity (including Radium-226 but excluding radon and uranium)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Gross Beta Particle Activity	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Qtrly	Semi Annual
Radium-226	Semi Annual	Semi Annual	Qtrly	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Radium-226 & Radium-228 (Combined)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Qtrly
Radium-228	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Strontium-90	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Tritium	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual*	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Uranium	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Organic Chemicals										
(a) Volatile Organic Chemicals										
1,1,1-Trichloroethane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,1,2,2-Tetrachloroethane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,1,2-Trichloro-1,2,2-Trifluoroethane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,1,2-Trichloroethane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,1-Dichloroethane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,1-Dichloroethene (1,1 DCE)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual

Table M-20: Monitoring Frequency[29]

Constituent	Frequency									
1,2,4-Trichlorobenzene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,2-Dichlorobenzene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,2-Dichloroethane (1,2 DCA)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,2-Dichloropropane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,3-Dichloropropene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
1,4-Dichlorobenzene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Benzene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Carbon Tetrachloride (CTC)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
cis-1,2-Dichloroethylene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Dichloromethane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Ethylbenzene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Methyl-tert-butyl-ether (MTBE)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Monochlorobenzene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Styrene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Tetrachloroethylene (PCE)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Toluene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
trans-1,2-Dichloroethylene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Trichloroethylene (TCE)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Trichlorofluoro-methane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Vinyl Chloride	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Qtrly	Qtrly	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Xylenes (m, p)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
(b) non-volatile synthetic organic chemical										

Table M-20: Monitoring Frequency[29]

Constituent	Frequency									
1,2-Dibromo-3-Chloropropane (DBCP)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
2,3,7,8-TCDD (Dioxin)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
2,4,5-TP (Silvex)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
2,4-Dichlorophenoxyacetic acid (2,4-D)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Alachlor	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Atrazine	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Bentazon	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Benzo (a) pyrene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Carbofuran	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Chlordane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Dalapon	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Di (2-ethylhexyl) adipate	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Di (2-ethylhexyl) phthalate	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Annual	Semi Annual	Semi Annual	Semi Annual
Dinoseb	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Diquat	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Endothal	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Endrin	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Ethylene Dibromide (EDB)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Glyphosate	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Heptachlor	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Heptachlor Epoxide	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Hexachlorobenzene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual

Table M-20: Monitoring Frequency[29]

Constituent	Frequency									
Hexachlorocyclo-pentadiene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Lindane (Gamma BHC)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Methoxychlor	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Molinate	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Oxamyl	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
PCB 1016	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
PCB 1221	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
PCB 1232	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
PCB 1242	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
PCB 1248	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
PCB 1254	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
PCB 1260	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Pentachlorophenol	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Annual ***	Semi Annual	Semi Annual	Semi Annual
Picloram	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Simazine	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Thiobencarb	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Toxaphene	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Disinfection Byproducts										
Bromate	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Bromodichloro-methane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Bromoform	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Chlorite	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Quarterly	Semi Annual	Semi Annual
Chloroform	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual

Table M-20: Monitoring Frequency[29]

Constituent	Frequency									
Dibromoacetic Acid	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Dibromochloro-methane	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Dichloroacetic Acid	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Haloacetic Acid (Five) (HAA5)	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Monobromoacetic Acid	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Monochloroacetic Acid	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Total Trihalomethanes	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Trichloroacetic Acid	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Chemicals with Notification Levels										
1,2,3-Trichloropropane (1,2,3 TCP)	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
1,2,4-Trimethylbenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
1,3,5-Trimethylbenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
1,4-Dioxane	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2-Chlorotoluene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2,4,6-Trinitrotoluene (TNT)	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly
4-Chlorotoluene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Boron	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly
Carbon Disulfide	Annual	Annual	Annual	Annual	Annual	Semi Annual	Annual	Annual	Annual	Annual
Chlorate	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Diazinon	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Dichlorodifluoro-methane (Freon 12)	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Ethylene Glycol	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Formaldehyde	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
HMX	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly
Isopropylbenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual

Table M-20: Monitoring Frequency[29]

Constituent	Frequency									
Manganese	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual	Semi Annual
Methyl-isobutyl-keytone (MIBK)	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Naphthalene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
n-Butylbenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
n-Nitrosodiethyl-amine (NDEA)	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
n-Nitrosodimethylamine (NDMA)	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly
n-Nitrosodi-n-propylamine (NDPA)	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
n-Propylbenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Propachlor	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
RDX	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly	Qtrly
sec-Butlybenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
tert-Butylbenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Tertiary-butyl-alcohol (TBA)	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Vanadium	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Remaining Priority Pollutants										
Pesticides										
4,4,4'-DDD	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
4,4,4'-DDE	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
4,4,4-DDT	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Aldrin	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Alpha BHC	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Alpha Endosulfan	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Beta BHC	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Beta Endosulfan	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Chromium III	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Chromium VI	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Delta BHC	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Dieldrin	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Endosulfan Sulfate	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Endrin Aldehyde	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Acid Extractables										

Table M-20: Monitoring Frequency[29]

Constituent	Frequency									
2,4,6-Trichlorophenol	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2,4-Dichlorophenol	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2,4-Dimethylphenol	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2,4-Dinitrophenol	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2-Chlorophenol	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2-Nitrophenol	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
4,6-Dinitro-o-Cresol (2-Methly-4,6-Dinitrophenol)	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
4-Nitrophenol	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
p-Chloro-m-Cresol (3-Methyl-4-Chlorophenol)	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Phenol	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Base/Neutral Extractables										
1,12-Benzoperylene ((Benzo(g,h,i)-perylene))	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
1,2,5,6-Dibenzanthracene ((Dibenzo(a,h) anthracene))	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
1,2-Diphenylhydrazine	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
1,3-Dichlorobenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2,4-Dinitrotoluene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2,6-Dinitrotoluene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2-Chloronaphthalene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
3,3'-Dichlorobenzidine	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
4-Bromophenyl phenyl ether	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
4-Chlorophenyl phenyl ether	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Acenaphthene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Acenaphthylene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Anthracene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual

Table M-20: Monitoring Frequency[29]

Constituent	Frequency									
Benzidine	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Benzo(a)anthracene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Benzo(b)fluoranthene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Benzo(k)fluoranthene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Bis(2-chloroethoxyl)-methane	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Bis(2-chloroethyl)ether	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Bis(2-chloroisopropyl)ether	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Butyl benzyl phthalate	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Chrysene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Di(2-ethylhexyl) phthlate	Annual	Annual	Annual	Annual	Annual	Annual	Semi-annual	Annual	Annual	Annual
Dimethyl phthalate	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Di-n-butyl phthalate	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Di-n-octyl phthalate	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Fluoranthene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Fluorene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Hexachlorobutadiene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Hexachloroethane	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Indeno(1,2,3-cd) pyrene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Isophorone	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Nitrobenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
n-Nitrosodi-n-propylamine	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
n-Nitrosodiphenylamine	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Phenanthrene	Annual	Annual	Annual	Annual	Annual	Annual	Semi-Annual	Annual	Annual	Annual
Pyrene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Volatile Organics										

Table M-20: Monitoring Frequency[29]										
Constituent	**Frequency**									
1,1-Dichloroethylene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
2-Chloroethyl vinyl ether	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Acrolein	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Acrylonitrile	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Chlorobenzene	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Chloroethane	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Methyl bromide	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Methyl chloride	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual

Table M-21 – Total Nitrogen Sampling at Seal Beach LEI-1 and the three other closest drinking water		
Parameter	**Unit**	**Frequency**
Total Nitrogen	µmg/L	Quarterly

V. START-UP TESTING

During any startup testing after pilot testing and before commissioning, the AWTF expansion team shall (1) test all equipment signals, alarms, output devices, and communication devices to be certain that they are operating correctly; and (2) test all mechanical systems to verify that the facility can accept and satisfactorily treat recycled water at the new design capacity of 8 mgd.

Over the course of the startup testing, monitoring and reporting shall continue to be performed pursuant to the requirements of the MRP. The results of the startup testing shall be reported to the Regional Board and CDPH upon completion of the tests. The effluent limits, prohibitions and provisions of the permit shall continue to apply. Discharge which does not, or is not reasonably expected to, attain the limits or conditions specified in this Order shall be wasted through the sewer to the Joint Plant Water Treatment Facility. The Regional Board acknowledges that during the testing process, containment of poor quality water may not be complete, but the project sponsors shall document procedures, testing results and monitoring showing a best-faith effort to contain test waters which do not comply with the requirements of this Order

VI. CERTIFICATION STATEMENT

Each report shall contain the following declaration[30]:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a find and imprisonment.

Executed on the _____day of _____at _____

_____ (Signature)

_____ (Title)"

VII. OTHER MONITORING REQUIREMENTS

The list of parameters and monitoring frequencies may be adjusted by the Executive Officer if the Project Sponsor makes a request and the Executive Officer determines that the modification is adequately supported by statistical trends of monitoring data submitted.

[30] The Project Sponsors shall submit written documentation identifying the responsible party who certifies the perjury document.