

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LOS ANGELES REGION**

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**ORDER R4-2020-XXXX  
FILE NO. 08-070**

**WASTE DISCHARGE REQUIREMENTS  
AND  
WATER RECLAMATION REQUIREMENTS**

**CITY OF OXNARD**

**GROUNDWATER RECHARGE, ENHANCEMENT, AND TREATMENT (GREAT) PROGRAM  
AQUIFER STORAGE AND RECOVERY (ASR) AND  
NON-POTABLE REUSE**

The following entity is subject Waste Discharge Requirements (WDRs) and Water Reclamation Requirements (WRRs) set forth in this Order:

**TABLE 1. PERMITTEE INFORMATION**

<b>Permittee</b>	City of Oxnard (Project Sponsor, Permittee, or City)
<b>Name of Facility</b>	Oxnard Advanced Water Purification Facility (AWPF)
<b>Facility Address</b>	5700 South Perkins Road Oxnard, CA 93033 Ventura County

**TABLE 2. ADMINISTRATIVE INFORMATION**

This Order was adopted and shall become effective on:	April 09, 2020
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I, Renee Purdy, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, Los Angeles Region (Regional Water Board), on the date indicated above.

Renee Purdy, Executive Officer

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

**I. BACKGROUND INFORMATION**

**A. Project Sponsor**

Oxnard is located on the coast of southern California halfway between Los Angeles and Santa Barbara. The City of Oxnard (Project Sponsor or City) is the primary purveyor of recycled water within the city and currently distributes the recycled water for irrigation, industrial, and recreational uses. The Project Sponsor intends to also use the recycled water for indirect potable reuse (subsurface application via aquifer storage and recovery) after the adoption of this Order.

**B. GREAT Program**

To ensure future reliable and affordable supply of high-quality water, the City of Oxnard has developed the Groundwater Recovery, Enhancement, and Treatment (GREAT) program. The objectives of the GREAT program include increased reliability of the water supply, reduced costs of the water supply, improved dependability of water supply in accommodating existing needs and meeting planned growth and associated water demand, and enhanced stewardship of local water supply through recycling and reusing a substantial portion of the region's wastewater. There are six main components of the GREAT program:

1. A recycled water delivery system that distributes recycled water to agricultural users, golf courses, and an industrial customer.
2. Aquifer Storage and Recovery (ASR), which is intended to help alleviate groundwater overdraft conditions and associated water quality problems, potentially including seawater intrusion. This component will also allow for seasonal storage of the potable water supplies to maximize use of the existing potable water distribution system.
3. A Regional Desalter, which consists of membrane filters to remove dissolved minerals from groundwater to reduce the levels of nitrates and total dissolved solids in the groundwater basin.
4. Blending Station No. 5, which provides improved water supply infrastructure reliability, water quality, and hydraulic efficiencies. This component will also assist in meeting peak hour and firefighting water supply demands.
5. A concentrate collection system from the regional brine dischargers to avoid discharge of high salinity concentrate into the Project Sponsor's sanitary sewer system and the Oxnard Wastewater Treatment Plant (OWTP).
6. A Permeate Delivery System to convey permeate from the regional desalter to industrial users.

The GREAT program is being implemented in two phases. The first phase of the GREAT program is complete. The treatment facilities for the first phase are now in operation for non-potable water reuse. The second phase of the GREAT program will increase the treatment capacity of the Advanced Water Purification Facility (AWPF) to 12.5 million gallons per day (mgd). The treatment capacity may be further



increased to 18.75 mgd in the future; however, any increase above 6.25 mgd would require an amendment of this Order. The second phase of the AWPf is not being pursued at this time; however, the Project Sponsor intends to implement the ASR component after the adoption of this Order to expand opportunities for use of the advanced treated recycled water.

### **C. Facility and Project Description**

The Project Sponsor is the owner and operator of the Oxnard Wastewater Treatment Plant (OWTP), a secondary wastewater treatment plant located at 6001 South Perkins Road, Oxnard, California, with a dry-weather design treatment capacity of 31.7 mgd and an average daily flow of 20 to 22 mgd. The OWTP serves a population of approximately 249,000 in the City of Oxnard, the City of Port Hueneme, the United States Naval Bases in Ventura County, and some unincorporated areas of Ventura County. The City of Port Hueneme and the United States Navy operate separate collection systems, but both discharge to the OWTP. Influent flow to the OWTP consists of domestic, commercial, and industrial wastewater. The treatment system at the OWTP consists of bar screening, aerated grit removal, primary sedimentation, biofiltration, activated sludge, secondary sedimentation, flow equalization, chlorine disinfection, and dechlorination. The Project Sponsor operates an approved industrial pretreatment program in accordance with Section 403 of Title 40 of the Code of Federal Regulation (40 CFR § 403). Permitted industrial dischargers are subject to national pretreatment standards, categorical pretreatment standards, and local limits. Secondary effluent from the OWTP is either conveyed to the Project Sponsor's AWPf or conveyed to the Pacific Ocean under National Pollutant Discharge Elimination System (NPDES) Permit No. CA0054097.

The Project Sponsor diverts up to 8 mgd of the secondary-treated wastewater from the OWTP to the Project Sponsor's AWPf, located adjacent to the OWTP at 5700 South Perkins Road, Oxnard, California. (See Attachment B1 for a map of the project area.) The AWPf produces up to approximately 6.25 mgd of recycled water that is currently being used for non-potable uses such as agricultural and landscape irrigation, and industrial uses. (See Attachment B2 for a map of the distribution area.) The Project Sponsor plans to continue serving these non-potable recycled water customers while also operating an ASR project. The AWPf also produces approximately 1.75 mgd of brine waste that comingles with the remaining secondary-treated wastewater from the OWTP (that was not diverted for further treatment). This combined waste stream is conveyed to the ocean for disposal. The Project Sponsor also operates on-site artificial wetlands using both brine and advanced-treated recycled water. This was part of a study that the Project Sponsor was working on with the Bureau of Reclamation to determine if artificial wetlands are effective in treating brine. The water used in this project is directed back to the headworks for further treatment.

The AWPf treats the secondary-treated effluent from the OWTP by microfiltration (MF), reverse osmosis (RO), and advanced oxidation with ultraviolet light and hydrogen peroxide (UV/AOP) as depicted in Attachment C and as described below:

**Microfiltration (MF)** - The MF system is an outside-in MF system (PALL Microza). The MF is used to remove microbial and molecular contaminants, including turbidity, *Giardia*, and *Cryptosporidium* using a low-pressure filtration system. Upstream of the RO, this system mitigates RO membrane fouling by reducing the number of particulates and larger colloids. MF also reduces the concentration of bacteria, particularly those that become associated with particulates. There are six treatment trains in parallel in the MF room with capacity for an additional six trains. One of the six trains can be out of service and the MF system will still maintain an acceptable water quality. The feed water to the MF is monitored for oxidation reduction potential, temperature, turbidity, and chlorine residual. The MF filtrate (RO feed) is monitored for oxidation reduction potential, pH, electrical conductivity (EC), temperature, turbidity, chlorine residual, and pressure.

**Reverse Osmosis (RO)** - RO units are furnished by H2O Innovation and installed with Hydranautics ESPA2 membrane elements. The RO units are housed in their own room, with two identical skids running in parallel with individual production capacities of 3.125 mgd. Space for three additional RO skids of 6.25 mgd each is built into the room for possible future needs. The RO system is monitored using online EC monitored at the MF filtrate (RO feed) and several places on the RO discharge: Stage 1, 2, and 3, total flow, and concentrate. These EC monitoring locations are on both trains. Currently there is no online total organic carbon (TOC) metering of the MF filtrate or RO permeate. The Project Sponsor intends to install TOC monitors on the RO feed and RO permeate prior to operations, which will be used to attain a higher Log Reduction Value (LRV).

**Ultraviolet Light and Advanced Oxidation Process (UV/AOP)** - Three Trojan UVPhox D72AL75 reactors are installed to provide additional treatment of the RO permeate via AOP. These reactors operate with low-pressure, high-output (LPHO) lamps, with an operational UV dose of approximately 500 millijoules per centimeter squared ( $\text{mJ}/\text{cm}^2$ ) and less than 6 milligrams per liter ( $\text{mg}/\text{L}$ ) dose of hydrogen peroxide ( $\text{H}_2\text{O}_2$ ). These three reactors each have two banks, for a total of six banks of UV lamps. According to the Engineering Report for the Groundwater Replenishment Reuse Project (GRRP), five of those banks are "duty" and the sixth bank is redundant. Like the MF and RO systems, there is room to expand this UV system to meet future needs.

**Post-Treatment Systems** - The post-treatment systems include decarbonator towers and liquid lime injection downstream of the UV/AOP process. Following UV/AOP, the water quality is projected to be corrosive, with a Langlier Saturation Index (LSI) in the range of -3.3 to -2.5 and high concentrations of carbon dioxide (up to 50  $\text{mg}/\text{L}$ ). Due to the aggressive nature of the treated water from the UV/AOP, the water needs to be stabilized by removing carbon dioxide and adding lime. In order to remove carbon dioxide, water is distributed over media packed in the decarbonator towers. Air flow through the media strips the carbon dioxide and other volatile compounds. Liquid lime is then dosed to add calcium and alkalinity, thereby increasing pH.

**Chemical Systems** - Membrane cleaning systems, water stabilization, and treatment involve chemical usage. Chemicals for this project are split into continuously fed chemicals and batch cleaning chemicals. Continuously fed chemicals are flow paced and include hydrogen peroxide, sulfuric acid, threshold inhibitor, and liquid lime. Batch cleaning chemicals include sodium hypochlorite, sodium hydroxide, citric acid, and sodium bisulfite.

#### **D. Permit History**

1. The Regional Water Board issued WDRs/WRRs in Order No. R4-2008-0083 to the Project Sponsor for the non-potable reuse phase of the GREAT Program on October 02, 2008. That Order permitted the Project Sponsor to produce and distribute treated recycled water from the AWPf.
2. At the request of the Ventura County Farm Bureau, on April 14, 2011 the Regional Water Board adopted Order No. R4-2011-0079, amending Order No. R4-2008-0083, to clarify the requirements for use of recycled water by adding the requirement that any irrigation runoff must be authorized under a conditional waiver of WDRs for irrigated lands or other order issued by the Regional Water Board.
3. On July 09, 2015 the Regional Water Board adopted Order No. R4-2011-0079-A01, amending Order No. R4-2011-0079, and also adopted an amended Monitoring and Reporting Program. This amendment permitted the temporary use of the Calleguas Regional Salinity Management Pipeline (RSMP) to deliver the recycled water produced at the AWPf to the Pleasant Valley County Water District (PVCWD). The deadline to discontinue the temporary use of the RSMP was July 09, 2017.
4. On April 05, 2017 the Project Sponsor requested an extension of the deadline to discontinue the temporary use of the RSMP because the design for the permanent piping from the AWPf to the Pleasant Valley distribution piping was only 90% complete. On June 01, 2017, the Regional Water Board adopted Order No. R4-2011-0079-A02, extending the deadline to discontinue the temporary use of the RSMP to July 09, 2019.
5. On November 29, 2018 the Project Sponsor requested another extension of the deadline due to uncontrollable delays in construction of the permanent pipeline to PVCWD. These delays related to securing easements for the pipeline from private parties, which necessitated several redesigns for the pipeline alignment. The Project Sponsor also identified anticipated delays in procurement of piping materials based on recent industry experience. On April 11, 2019, the Regional Water Board adopted Order No. R4-2011-0079-A03, extending the deadline to discontinue the temporary use of the RSMP to December 31, 2020.

#### **E. Calleguas Municipal Water District Regional Salinity Management Pipeline**

The Calleguas Municipal Water District owns and operates a salinity management pipeline to convey brine to the Pacific Ocean from a number of water treatment plants in the region. The RSMP infrastructure has been built but is currently underutilized. As requested by PVCWD and the City of Oxnard, the existing permit was modified to allow the use of the RSMP to convey recycled water from the AWPf

to the PVCWD irrigation distribution system. This Order permits supplying water from the AWPf transmission piping to the PVCWD irrigation distribution system via the temporary use of the RSMP until December 31, 2020.

#### **F. Aquifer Storage and Recovery (ASR)**

The ASR component of the GREAT program consists of injecting advanced treated recycled water from the AWPf into the Santa Clara River Valley (Oxnard) groundwater basin for 3 to 6 months, holding the water in the aquifer for at least 3.1 months, and then withdrawing the water from the same wells for potable and/or non-potable reuse. ASR utilizes the storage capacity of the discrete aquifer units in the Oxnard groundwater basin as, essentially, individual storage tanks. This is because the aquifers are effectively isolated from each other by natural confining clay layers. Theoretically, one aquifer can be filled without affecting wells that are competently constructed in other aquifer zones. This natural condition allows for multiple wells to be operated on the same site with a rotating schedule which allows discrete recharge, storage, and recovery from separate aquifer zones.

The ASR component of the GREAT program will be implemented in three phases.

Phase 1 of the ASR component includes construction of one demonstration ASR well, pump, piping, and appurtenances located at Campus Park and three monitoring wells. Phase 1 will also consist of construction of a tie-in from the Ventura Road Recycled Water Backbone Pipeline to the ASR Well at Campus Park, temporary well facilities for demonstration testing, and a pipeline to convey water from Campus Park to Blending Station 1/6.

Phase 2 of the ASR component consists of expanding the Project Sponsor's AWPf to produce 12.5 mgd of advanced treated recycled water, construction of four duty and four standby ASR wells, associated pumps, piping, and appurtenances located at the Project Sponsor's Campus Park and Blending Station 1/6, and its associated monitoring wells.

Phase 3 of the ASR component will further expand the Project Sponsor's AWPf to produce 18.75 mgd of advanced treated recycled water and require construction of six duty and three standby ASR wells, associated pumps, piping and appurtenances located at the Project Sponsor's Blending Station 1/6 and Blending Station 3, and associated monitoring wells.

The Project Sponsor has constructed one demonstration ASR injection well and three monitoring wells in the City's Campus Park (Phase 1). The injection well is located approximately five miles north of the AWPf, extends 580 feet below ground, and is sized to inject up to 2,000 gallons per minute (gpm) from the AWPf. After the necessary holding time within the Lower Aquifer System (LAS), the well will extract water at flows up to 3,000 gpm. The Campus Park location is ideal because the injection and monitoring wells can all be constructed on the City's property. In addition, injected water will be hydraulically isolated from nearby potable wells because injection will occur in the LAS whereas the nearby potable wells are all within the Upper Aquifer System (UAS). The closest potable well to the Phase 1 ASR injection well is located nearly a mile to the east and is owned by the City. Phases 2 and 3 of the ASR component of the GREAT program are anticipated to be

constructed in the future and are not permitted under this Order. The Project Sponsor must submit an updated Engineering Report approved by the State Water Resources Control Board Division of Drinking Water (DDW) and a Report of Waste Discharge requesting an amendment to this Order to permit subsequent phases of this project.

### **G. ASR Project Facilities**

In 2017, the Project Sponsor initiated a Groundwater Replenishment Reuse Project (GRRP) for recycled water as part of its GREAT program. This GRRP consists of using ASR to inject recycled water into the groundwater and currently includes ASR Well No. 1 at the Campus Park Wellfield location, along with three monitoring wells (Figure 1).

#### **1. ASR Well**

The demonstration ASR well is on the periphery of the future park property and positioned to allow the additional ASR wells to be constructed (Figure 1). The ASR wells will be operated to eliminate cross connections between the injected advanced treated recycled water and the extracted well water. Removable spools at the injection end and the extraction end of the well will be used to prevent any potential cross connection. The spool will be removed on the extraction end when injecting recycled water and the spool will be removed from the injection end when extracting well water. Both spools will be removed for a 3.1-month response retention time.

#### **2. Monitoring Wells Associated with Subsurface Application**

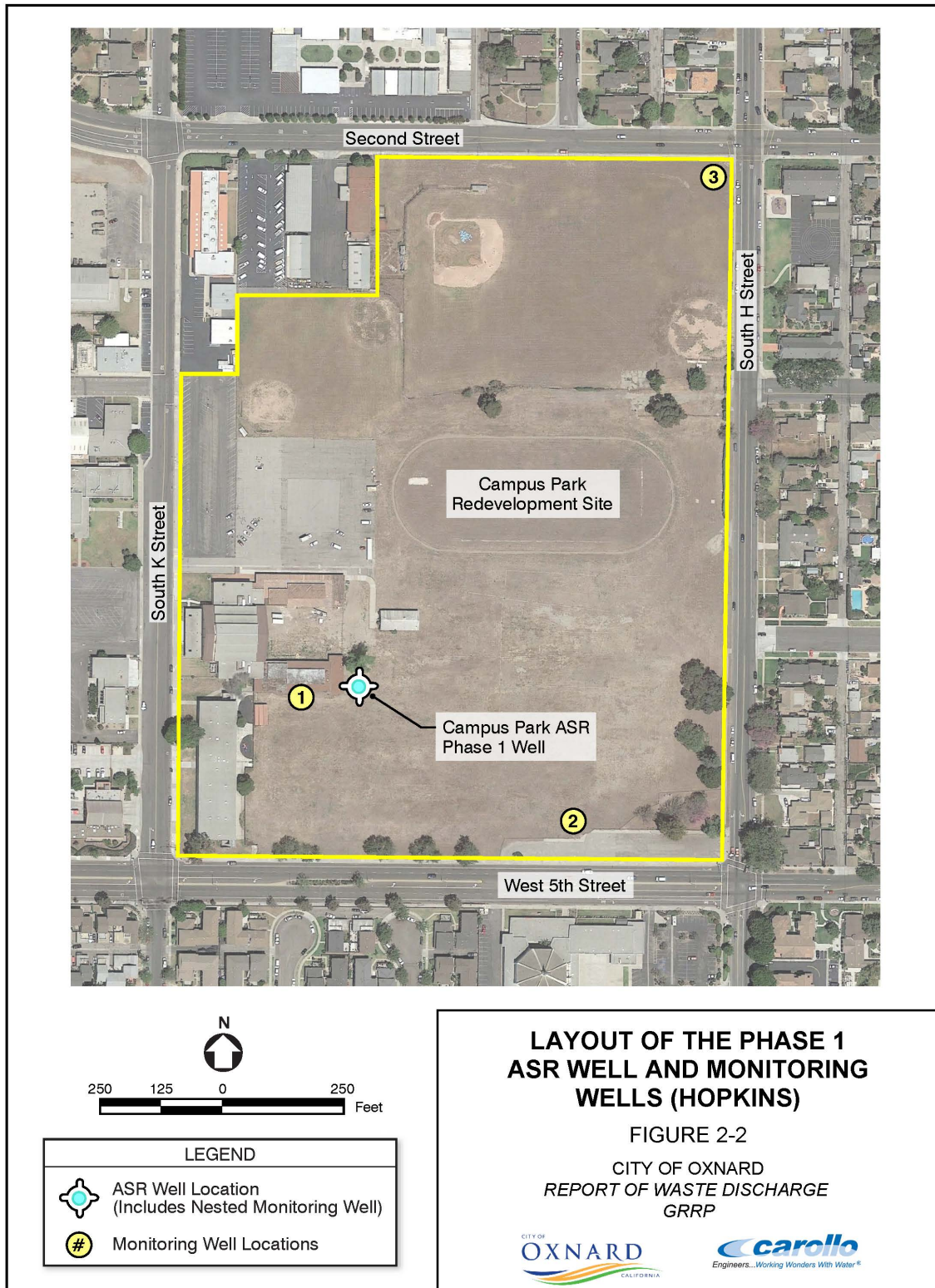
The monitoring well locations are designed to be far enough apart to collect water levels that will define the site specific groundwater gradient, be close enough to comply with the applicable monitoring well requirements for GRRP permitting, including a travel time of greater than 2 weeks and less than 6 months, utilize the Project Sponsor-owned parcel, and minimize impacts to airport operations and future park development (Figure 1). The three monitoring wells will define the groundwater gradient in the aquifer. The location of Monitoring Well No. 2 is between the ASR well and the Project Sponsor's municipal supply Well No. 20. The differential well spacing will generate data through tracer testing to confirm the displacement rate of native groundwater. It is anticipated that a recharge bubble will be observed within 2 weeks in Monitoring Well No. 1, within 60 days at Monitoring Well No. 2, and within 90 days at Monitoring Well No. 3. A tracer study will be conducted to validate the groundwater travel time, which will be initiated once recycled water is injected into the groundwater basin.

#### **3. Existing Production Wells**

The Campus Park site is located within the city where all potable water is provided by the Project Sponsor's municipal supply system. The nearest production well to the project is a domestic well located approximately 2,000 feet southeast of the site that is used for off-site irrigation. The next closest production wells are domestic wells located to the northwest of the site, they are all located in the UAS, and supply residential uses. As required by 22 CCR § 60320.200(b),

the Project Sponsor will implement steps to provide an alternative source of drinking water supply to all users of a producing drinking water well if DDW determines that the Project Sponsor's GRRP results in a producing drinking water well that violates a California or federal drinking water standard; has been degraded to the degree that is no longer a safe source of drinking water; or receives water that fails to meet section 60320.208.

**FIGURE 1. ASR AND MONITORING WELL LOCATIONS**



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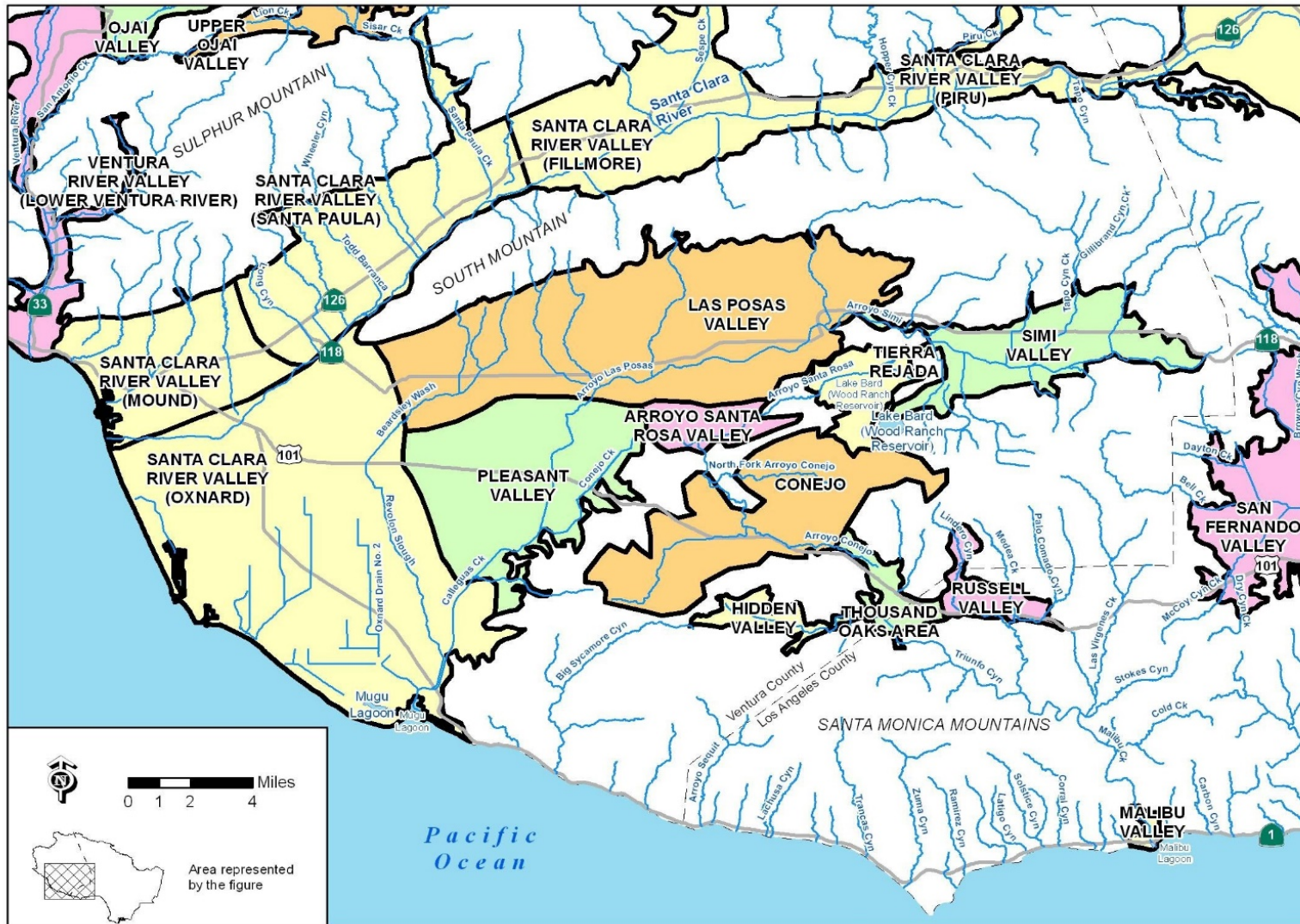
## **II. GROUNDWATER BASIN**

### **A. Description of Santa Clara River Valley (Oxnard) Groundwater Basin**

1. The GREAT program is in the Santa Clara River Valley (Oxnard) Groundwater Basin (Figure 2). The subsurface geology that controls groundwater flow in the project area includes two geologic units: the Holocene and Late Pleistocene alluvium and the San Pedro Formation. The Holocene and Late Pleistocene alluvium unit is comprised of largely unconsolidated sedimentary deposits and includes all older and recent alluvium deposits. These shallower units are coarser grained in the vicinity of the Santa Clara River and form the Oxnard and Mugu Aquifers that comprise the Upper Aquifer System (UAS) in the groundwater basin. The San Pedro Formation consists of consolidated marine and nonmarine clay, silt, sand, and gravel deposits that comprise the Hueneme and Fox Canyon Aquifers, which are designated as the Lower Aquifer System (LAS). The low permeability materials underlying the San Pedro Formation are generally considered as non-water-bearing and effectively define the base of fresh water. The aquifers are illustrated in cross section in Figure 3 and the area marked “Campus Park” corresponds to the area in the aerial map in Figure 2.
2. The LAS groundwater is protected from the overlying land uses by the extensive silt and clay layers that confine the Hueneme and Fox Canyon Aquifer zones in the LAS. The geology beneath the project well site is discretely separated by clay layers that are laterally continuous and appear as marker beds in other well logs. The significance of the highly confined conditions that result from the discretely layered LAS is that wells located in close lateral proximity (50 feet apart) but producing from different aquifer layers are not hydraulically connected to each other.
3. The Project Sponsor selected the Campus Park Location to avoid the potential of having wells that could be impacted by the project regardless of the flow direction. In addition, the well facilities were designed to utilize aquifer zones where there are no potable water wells within one mile of the site that produce groundwater from the discrete aquifer zones used for recharge of recycled water.

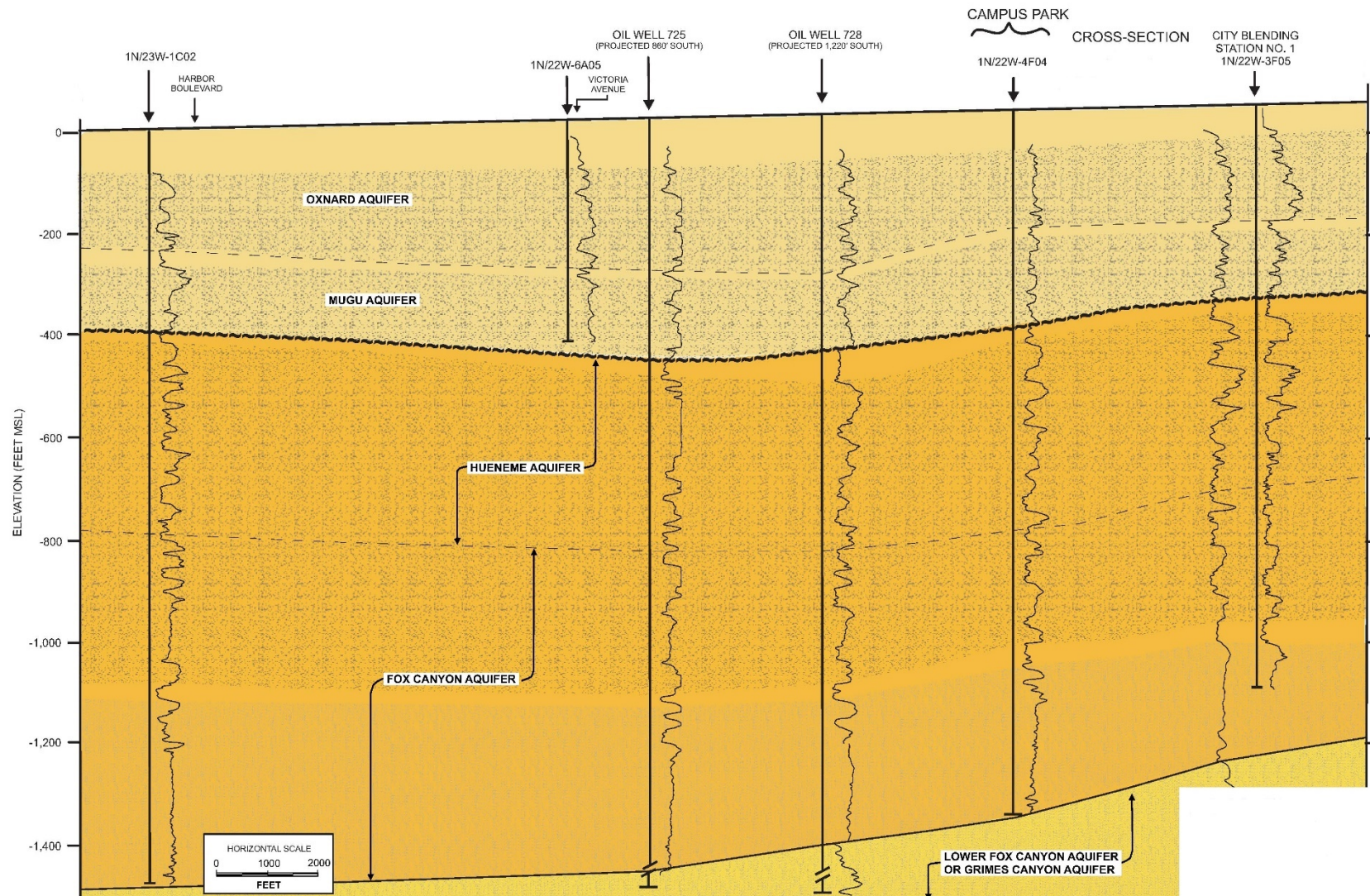


**FIGURE 2. SANTA CLARA RIVER VALLEY (OXNARD) AND SURROUNDING BASINS**





**FIGURE 3. SANTA CLARA RIVER VALLEY (OXNARD) AQUIFERS**



### **III. HISTORICAL GROUNDWATER QUALITY**

The Oxnard Plain has experienced impaired groundwater quality in the southern and coastal regions of the aquifer with high chloride concentrations since at least the early 1930s. Highly saline waters are present in the confined UAS and LAS as well as the shallow unconfined aquifer typically referred to as the “perched” aquifer. The aquifer zones that will be used for replenishment in the LAS are generally of calcium sulfate chemical character of fair to poor quality with TDS concentrations in the range of 900 to 1,300 mg/L and sulfate concentrations ranging from 400 to 650 mg/L. Water quality degradation has been occurring in the over-drafted basin and results from poorer quality groundwater seeping out of the fine-grained silt and clay layers that are interbedded with the sand and gravel aquifer zones along with seawater intrusion. Overall, the concentrations of TDS, chloride, and nitrate have been decreasing in many wells in the UAS, while the concentrations of nitrate show increasing trends in several wells in the LAS. These historical data indicate that the storage of the proposed recycled water will improve the general mineral quality of groundwater in the LAS and the water quality injected into the aquifer can be controlled to be comparable with native groundwater through mixing with potable supplies at blending stations to avoid degradation. In addition, as noted in Finding I.F, the recycled water will be injected into the LAS and is therefore not expected to impact the UAS.

A groundwater sample was collected from the ASR well and each monitoring well (MW-1S, MW-1M, MW-1D, MW-2, and MW-3) on June 1, 2017 and analyzed for Title 22 drinking water constituents and applicable Basin Plan water quality objectives. The test results indicate that the groundwater currently meets the water quality objectives in the Basin Plan for groundwaters in the Santa Clara River Valley (Oxnard) for TDS, chloride, sulfate, boron, nitrate, nitrite, and nitrate plus nitrite.

### **IV. PURPOSE OF ORDER**

- A. In November 2015, the Project Sponsor filed a report of waste discharge (ROWD) and applied for WDRs and WRRs to permit a demonstration ASR well that will inject advanced recycled water into the Oxnard Plain groundwater basin. Supplemental information was requested on November 07, 2017 and received on December 28, 2018. The application was deemed complete on January 31, 2019. A site visit was conducted on September 04, 2019, to observe operations and collect additional data to develop permit limitations and requirements for waste discharge.
- B. The Project Sponsor plans to inject advanced treated recycled water produced at the AWPf into the demonstration ASR well in addition to using the water for nonpotable uses. This Order was developed to establish the requirements for the treatment process of the AWPf, to establish requirements for injecting recycled water into the demonstration ASR well, and to update requirements for using the recycled water for nonpotable uses. The Title 22 Engineering Report for the nonpotable uses was conditionally accepted in 2008 and the California Department of Public Health’s requirements were incorporated into the current permit and into this Order.
- D. On April 21, 2016 the Project Sponsor submitted a draft Title 22 Engineering Report for the ASR project to the Regional Water Board and DDW. The draft Engineering Report focused primarily on the first phase of the GRRP and how the proposed injection of the AWPf’s advanced treated recycled water would comply with the

applicable regulations regarding water quality and groundwater recharge using recycled water. An updated Engineering Report was submitted in March 2017, and conditionally approved by the Regional Water Board on February 17, 2017. A public hearing on the ASR Title 22 Engineering Report was held on June 14, 2018, by the Project Sponsor in collaboration with DDW. DDW issued a conditional acceptance letter of the Engineering Report on May 17, 2019, including recommendations to the Regional Water Board to consider when developing the permit. DDW's recommendations are incorporated into this Order.

## **V. REGULATION OF RECYCLED WATER**

- A. State authority to oversee recycled water use is shared by the State Water Board, including DDW, and the Regional Water Boards. Prior to July 1, 2014, the California Department of Public Health (CDPH) housed the state's drinking water program. As of July 1, 2014, the Governor transferred the drinking water programs from CDPH to the State Water Board. DDW has primary responsibility for establishing water recycling criteria under Title 22 of the California Code of Regulations (CCR) to protect the health of the public using the groundwater basins as a source of potable water. The State Water Board and the Regional Water Boards are responsible for issuing waste discharge requirements (WDRs) and water recycling requirements (WRRs) for water that is used or proposed to be used as recycled water.
- B. On January 6, 1977, 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.
- C. The State Water Board adopted the Water Quality Control Policy for Recycled Water (Recycled Water Policy, State Water Board Resolution No. 2009-0011) on February 3, 2009 and amended the Policy on January 22, 2013 (State Water Board Resolution No. 2013-0003). The Recycled Water Policy was further amended on December 11, 2018 (State Water Board Resolution No. 2018-0057). The latest amendment was approved by the Office of Administrative Law (OAL) on April 08, 2019. In part, 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. This Order includes requirements consistent with the Recycled Water Policy.
- D. In section 4 of the Recycled Water Policy, the State and Regional Water Boards are described with jurisdiction over the use and regulation of recycled water. The State Water Board:
  - establishes general policies governing the permitting of recycled water projects,
  - develops uniform water recycling criteria appropriate to particular uses of water and processes,

- approves wastewater change petitions filed by wastewater dischargers for recycled water projects that have the potential to decrease flow in any portion of a water course such as a river or stream,
- adopts statewide orders for the permitting of recycled water projects,
- reviews and approves Title 22 engineering reports for recycled water use, and
- allocates and disperses funding for recycled water projects consistent with its roles of protecting water quality, public health, and sustaining water supplies.

The State Water Board also exercises general oversight of recycled water projects, including review of Regional Water Board permitting practices.

The regional water boards issue permits that include requirements needed to protect water quality, human health, and the environment consistent with State and Regional Water Quality Control plans, policies, and applicable law. The regional water boards also fully use their authority to encourage the use of recycled water.

- E. A goal of the Recycled Water Policy 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 Recycled Water Policy directs the Regional Water Boards to collaborate with generators of municipal wastewater and interested parties in the development of Salt and Nutrient Management Plans (SNMPs) to manage loadings 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 Project Sponsor is the lead agency for the Oxnard Plain and Pleasant Valley SNMP, which includes analysis of the Oxnard Forebay, Oxnard Plain, and Pleasant Valley Basins. The Project Sponsor developed a Draft Salt and Nutrient Management Plan (SNMP) but it has not yet been acted on by the Regional Water Board due to the need for additional information. The Project Sponsor intends on including the additional information necessary in the SNMP in the Groundwater Sustainability Plans for both basins, which were submitted to the California Department of Water Resources in January 2020.
- F. On June 18, 2014 DDW adopted the final water recycling criteria for Groundwater Replenishment Reuse Projects (GRRPs). Requirements consistent with these regulations are incorporated into this Order.
- G. CWC section 13523(a) provides that a Regional Water Board, after consulting with and receiving recommendations from DDW, 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. On June 14, 2018, the Project Sponsor in collaboration with DDW, held a public hearing to consider the ASR component of the GREAT program to inject advanced treated recycled water into the local groundwater using the ASR well. On May 17, 2019, DDW transmitted to the Regional Water Board a conditional approval letter with recommendations concerning Phase 1 of the GREAT ASR project (production of 6.25 mgd from the AWPf and one ASR well). A copy of the letter is provided in Attachment F.

H. Section 13540 of the CWC provides that recycled water may be injected by a well into a water-bearing stratum, provided that (1) the Regional Water Board finds that water quality considerations do not preclude controlled recharge of the stratum by direct injection, and (2) DDW, following a public hearing, finds that the proposed recharge will not degrade the quality of water in the receiving aquifer as a source of water supply for domestic purposes. As described above, DDW conducted the requisite hearing on June 14, 2018 and received no public comments. DDW issued a conditional acceptance letter for the project on May 17, 2019, thereby concluding that the recharge will not degrade receiving water quality, provided that the conditions specified in the conditional acceptance letter are met.

**VI. OTHER APPLICABLE PLANS, POLICIES, AND REGULATIONS**

- A. The Water Quality Control Plan for the Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) designates beneficial uses for surface and groundwater; establishes narrative and numeric water quality objectives that must be attained or maintained to protect existing and designated 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.
- B. The Basin Plan incorporates the primary Maximum Contaminant Levels (MCLs) in Title 22 of the California Code of Regulations (22 CCR) 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 chemical constituents and radionuclides in excess of the MCLs. The Basin Plan also specifies that groundwaters shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
- C. The Basin Plan contains water quality objectives for groundwater in the Santa Clara River Valley (Oxnard) Basin. The beneficial uses of the Santa Clara River Valley (Oxnard) Basin are as follows:

**TABLE 3. GROUNDWATER BENEFICIAL USES**

DWR Basin No.	Beneficial Use(s)
Santa Clara River Valley (Oxnard) DWR Basin No. 4-4.02	Existing Beneficial Uses: Municipal and Domestic Water Supply (MUN); industrial service supply (IND); industrial process supply (PROC); and agricultural supply (AGR).

D. The limitations contained in this Order are intended to protect these uses and maintain water quality in this subbasin. Since MUN is a beneficial use, limitations are based on primary and secondary drinking water MCLs in the Domestic Water Quality and Monitoring Regulations, 22 CCR, chapter 15, as well as Basin Plan objectives. These limitations are necessary to ensure the protection of public health and the use of the groundwater basin for domestic supply.



E. The water quality objectives of the groundwater in the Santa Clara River Valley (Oxnard) are:

**TABLE 4. GROUNDWATER QUALITY OBJECTIVES**

Basin	DWR Basin No.	Total Dissolved Solids (TDS)	Sulfate	Chloride	Boron
Santa Clara River Valley (Oxnard Plain) Oxnard Forebay	4-4.02	1200	600	150	1.0
Santa Clara River Valley (Oxnard Plain) Confined Aquifers	4-4.02	1200	600	150	1.0
Santa Clara River Valley (Oxnard Plain) Unconfined and Perched Aquifers	4-4.02	3000	1000	500	---

F. Pursuant to CWC 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.

G. Pursuant to CWC 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.

H. This Order includes limits on quantities, rates, and concentrations of chemical, physical, biological, and other constituents in the advanced treated recycled water that is used for injecting into the groundwater aquifer.

I. DDW has established Notification Levels (NLs) for constituents in drinking water that warrant notification. NLs are established as precautionary measures for contaminants that may be considered candidates for establishment of MCLs but have not yet undergone or completed the regulatory standard process prescribed for the development of MCLs and are not drinking water standards. A list of these constituents and their current associated NLs is provided in Table E-11 of the MRP and Attachment G, respectively. A response level is the concentration of a contaminant in drinking water delivered for human consumption at which DDW recommends that additional steps beyond notification be taken to reduce public exposure to the contaminant. For example, NDMA includes an NL of 10 ng/L and a response level of 300 ng/L.

J. CWC section 13267 authorizes the Regional Water Board to require technical and monitoring reports. The attached MRP establishes monitoring and reporting requirements to implement federal and state requirements and the Recycled Water Policy.

K. 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.”

- L. Section 13267(d) of the Water Code states, in part, “The state board or 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.”
- M. The need for the technical and monitoring reports required by this Order, including the MRP, are based on the Report of Waste Discharge (ROWD) and Engineering Report; the recommendations from DDW; and other information in the Regional Water Board’s files for the facility. The technical and monitoring reports are necessary to ensure compliance with these WDRs and WRRs. 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.
- I. On October 28, 1968, the State Water Board adopted Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California* (Resolution 68-16), establishing the Antidegradation Policy for the State Water Board and Regional Water Boards. Resolution 68-16 requires that, whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality must be maintained. Resolution 68-16 only allows change in the existing high quality if it has been demonstrated to the Water Board that the change is consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses of such water, and will not result in water quality less than that prescribed in the policies. Resolution 68-16 further requires that discharges meet WDRs which will result in the best practicable treatment or control of the discharge necessary to assure that (a) pollution or nuisance will not occur and (b) the highest water quality consistent with the maximum benefit to the people of the State will be maintained. The Regional Water Board’s Basin Plan incorporates, by reference, the Antidegradation Policy.
- J. This Order is consistent with Resolution No. 68-16 and meets the antidegradation requirements of the Recycled Water Policy; and it is consistent with the draft SNMP for the Santa Clara River Valley (Oxnard) Groundwater Basin. As discussed in section III of this Order, the Santa Clara River Valley (Oxnard) Groundwater Basin has concentrations of salts and nitrogen compounds greater than the water quality



objectives in portions of the basin. The UAS tends to exhibit higher salt and nitrogen compound concentrations than the LAS. This phase of the ASR is not expected to impact the UAS because the recycled water will be injected into the higher quality LAS. Although the groundwater quality in parts of the basin exceed the groundwater objectives, groundwater quality in the LAS was measured in the project area located in Campus Park in 2017 and 2018, and the water quality met the water quality objectives in the Basin Plan for TDS, chloride, sulfate, boron, and nitrate. TDS concentrations from the monitoring wells and the ASR well ranged between 710 and 1,000 mg/L (WQO = 1200 mg/L), chloride ranged between 38 and 50 mg/L (WQO = 150 mg/L), sulfate ranged between 341 and 464 mg/L (WQO = 600 mg/L), boron ranged between 0.6 and 0.7 mg/L (WQO = 1.0 mg/L), and nitrate ranged between <0.5 and 13 mg/L as nitrate (WQO = 45 mg/L). This groundwater quality data suggests that the groundwater in the project area is high quality and therefore the project may not use up more than 10% of the available assimilative capacity of the groundwater basin.

- K. Performance testing for the AWPf with AOP was conducted in 2016 and the concentrations of salts and nitrogen compounds were all below their respective WQOs and the concentrations present in the groundwater basin except for boron (TDS = 64 mg/L, chloride = 17 mg/L, sulfate = 0.55 mg/L, boron = 0.77 mg/L, and nitrate as nitrate = 0.12 mg/L). Since the concentrations of TDS, chloride, sulfate, and nitrate in the advanced-treated recycled water are all below the concentrations of these constituents in the groundwater basin, the advanced-treated recycled water will not use any of the available assimilative capacity of the groundwater basin for these constituents, and the recycled water is expected to improve the water quality of the LAS.
- L. The concentration of boron in the advanced-treated recycled water is below the water quality objective for boron in the groundwater basin, but it exceeds the concentration of boron currently present in the groundwater basin. This Order requires the advanced-treated recycled water produced at the AWPf to meet all drinking water MCLs and NLs in the California Code of Regulations for the protection of human health and the MUN beneficial use of the groundwater basin. The advanced-treated recycled water is also currently used for irrigation and is not expected to impact the AGR beneficial uses when injected into the groundwater basin because the advanced-treated recycled water has lower salt concentrations than imported water. Any increase in the boron concentration in the groundwater basin is to the maximum benefit of the people of the state because the advanced-treated recycled water is required to meet the NL for boron for the protection of human health and the water will reduce the need for imported water. The advanced-treated recycled water must also meet the Basin Plan water quality objective for boron, so injection of the advanced-treated recycled water to the groundwater basin will not result in water quality less than prescribed in the applicable policies.
- M. Groundwater recharge with recycled water for later extraction and use in accordance with the Recycled Water Policy, the Basin Plan, and State water quality laws, is to the benefit of the people of the state of California. The Regional Water Board finds that, based on the information and monitoring data described above, any change in the existing quality of the groundwater basin as a result of the groundwater recharge

allowed by this Order will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not cause an exceedance of applicable water quality standards for the basin. In fact, water quality data indicate that the concentrations of salts and nitrogen compounds in the recycled water that will be injected into the groundwater basin are lower than the groundwater quality objectives for the Oxnard Plain and lower than the drinking water MCLs. As described in the findings herein, the Project Sponsor is implementing the best practicable treatment or control of the recycled water to be injected for groundwater recharge. Compliance with this Order will protect present and anticipated beneficial uses of the groundwater, ensure attainment of water quality prescribed in applicable policies, and avoid any conditions of pollution or nuisance.

## VII. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) AND NOTIFICATION

- A. The City of Oxnard prepared and certified the following documents in compliance with the CEQA (Public Resources Code Section 21000, et seq.):
1. "Final Groundwater Recovery, Enhancement and Treatment (GREAT) Program Environmental Impact Report," State Clearinghouse No. 2003011045, prepared by CH2Mhill for the City of Oxnard in May 2004. The project consists of upgrades to the OWTP to achieve water recycling and construction of a backbone recycled water distribution system.
  2. "Addendum to Final GREAT Program EIR: Aquifer Storage Recovery Demonstration (Pilot) Well at Campus Park," State Clearinghouse No. 2003011045, was prepared by SitesPacific, Inc. for the City of Oxnard on December 15, 2015. The project consists of the construction of an advanced water treatment facility, an injection well, and three monitoring wells to treat tertiary treated recycled water from the OWTP for aquifer storage and recovery.
  3. On July 15, 2019 the City of Oxnard released for public review the *Draft Programmatic Environmental Impact Report* (Draft PEIR, State Clearinghouse No. 2016071078) to provide the public and responsible agencies with information about the potential environmental effects of the Project Sponsor's proposed Public Works Integrated Master Plan (PWIMP). The Project Sponsor is the lead agency under CEQA and has principal responsibility for approving the PWIMP. Some comments received on the Draft PEIR resulted in changes, but none of the changes required recirculation of the Draft PEIR as defined in Section 15088.5(a) of the State CEQA Guidelines. The Final PEIR was approved by the Project Sponsor's Planning Commission in October 2019 and is awaiting city council approval expected in spring of 2020.

The Regional Water Board, as a responsible agency under CEQA, finds that all environmental effects have been identified for project activities that it is required to approve, and that the Project will not have significant adverse impacts on the environment provided that the mitigation presented in the final EIR/EIS, Addendum, and PEIR is carried out, and the Project is operated consistent with the conditions in this Order. In adopting this Order, the Regional Water Board has eliminated or substantially lessened the less-than-significant effects on water quality, and therefore approves the project.

- B. Pursuant to CWC Section 13320, any aggrieved party may seek review of this Order by filing a petition with the State Water Board in accordance with Title 23 CCR, sections 2050-2068. The State Water Board must receive the petition by 5:00 p.m., 30 days after adoption 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 the Regional Water Board's website ([http://waterboards.ca.gov/public\\_notices/petitions/water\\_quality](http://waterboards.ca.gov/public_notices/petitions/water_quality)).
- C. The Regional Water Board has notified the Project Sponsor, 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. R4-2008-0083, and its associated amendments and MRP, are hereby 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 CWC (commencing with section 13000) and regulations and guidelines adopted thereunder, and 22 CCR, division 4, chapter 3, the Project Sponsor shall comply with the requirements in this Order.

#### **VIII. INFLUENT SPECIFICATIONS**

The influent to the AWPf shall be secondary-treated effluent from the OWTP as described in this Order and shall always be adequately oxidized where the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

#### **IX. RECYCLED WATER TREATMENT SPECIFICATIONS**

Treatment of the recycled water for nonpotable uses and for direct injection into a groundwater basin shall be as described in the findings of this Order and as described in DDW's conditional approval letter issued on May 17, 2019 (Refer to Attachment F).

#### **X. RECYCLED WATER DISCHARGE LIMITATIONS**

Refer to Section XI of this Order for additional information concerning the limitations for turbidity, constituents with primary MCLs, constituents with secondary MCLs, constituents with notification levels, pathogenic organisms, total organic carbon, nitrogen compounds, and radioactivity.

##### **A. Nonpotable Uses**

The advanced treated recycled water used for nonpotable uses such as irrigation and industrial uses shall not contain constituents in excess of the following limitations, with compliance measured at Monitoring Location EFF-001 as described in the MRP, Attachment E.

**TABLE 5. DISCHARGE LIMITATIONS NONPOTABLE USES**

Parameter	Units	Average Monthly	7-day Median	Maximum Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Oil and Grease	mg/L	10	---	---	15	---	---
Turbidity <sup>1</sup>	NTU	---	---	---	0.2	---	0.5
pH	standard units	---	---	---	---	6.5	8.5
Total coliform <sup>2</sup>	MPN/100 mL or CFU/100 mL	23	2.2	---	---	---	240
Total Dissolved Solids	mg/L	---	---	---	700	---	---
Sulfate	mg/L	---	---	---	300	---	---
Chloride	mg/L	---	---	---	150	---	---
Boron	mg/L	---	---	---	1.0	---	---
Total Nitrogen	mg/L	---	---	---	10	---	---

**B. Subsurface Application**

The advanced treated recycled water used for subsurface application shall not contain constituents in excess of the following limitations in Tables 6 and 7, with compliance measured at Monitoring Location EFF-001 as described in the MRP, Attachment E.

**TABLE 6. DISCHARGE LIMITATIONS SUBSURFACE APPLICATION**

Parameter	Units	Average Monthly	Average Weekly	Maximum Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Turbidity <sup>3</sup>	NTU	---	---	---	0.2	---	0.5
pH	standard units	---	---	---	---	6.5	8.5
Total coliform	MPN or CFU/100 mL	---	---	1.1	---	---	---
Total Dissolved Solids	mg/L	---	---	---	700	---	---
Sulfate	mg/L	---	---	---	300	---	---
Chloride	mg/L	---	---	---	150	---	---

<sup>1</sup> The turbidity of filtered wastewater shall not exceed any of the following: 1) An average of 2 NTU within a 24-hour period, 2) 5 NTU more than 5% of the time within a 24-hour period, and 3) 10 NTU at any time.

<sup>2</sup> The median concentration of total coliform bacteria measured in the disinfected effluent shall not exceed 2.2 MPN per 100 milliliters using the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed 23 MPN per 100 milliliters in more than one sample in a 30-day period. No sample shall exceed 240 MPN total coliform per 100 milliliters.

<sup>3</sup> The turbidity of the treated effluent shall not exceed any of the following: (a) 0.2 NTU more than 5 percent of the time (72 minutes) within a 24-hour period; and (b) 0.5 NTU at any time.

Parameter	Units	Average Monthly	Average Weekly	Maximum Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Boron	mg/L	---	---	---	1.0	---	---
Total Nitrogen	mg/L	---	10	---	---	---	---
Nitrate + Nitrite (as Nitrogen)	mg/L	10	---	---	---	---	---
Nitrate (as Nitrogen)	mg/L	10	---	---	---	---	---
Nitrite (as Nitrogen)	mg/L	1	---	---	---	---	---
Lead	mg/L	0.015	---	---	---	---	---
Copper	mg/L	1.0	---	---	---	---	---
Total Organic Carbon (TOC)	mg/L	0.5	---	---	---	---	---

**TABLE 7. DISCHARGE LIMITATIONS PATHOGENIC MICROORGANISM CONTROL**

Parameter	Units	Limitation <sup>4</sup>
Enteric virus	log reduction	12
<i>Giardia</i> cyst	log reduction	10
<i>Cryptosporidium</i> oocyst	log reduction	10

**C. Other Applicable Discharge Limitations for Nonpotable Use and Indirect Potable Reuse**

The advanced treated recycled water (sampled at EFF-001) shall meet all primary and secondary MCLs and other limitations specified in the Drinking Water Quality and Monitoring Requirements in 22 CCR, chapter 15. The Project Sponsor shall maintain an updated list of pollutants with primary and secondary MCLs; monitor these pollutants; and ensure that treated recycled water does not exceed any primary or secondary MCL. The list of pollutants with primary and secondary MCLs and their corresponding limitations as of the adoption of this Order are listed in Tables 8 through 13. See Section I.P. and I.Q. of the MRP for accelerated monitoring and notification procedures.

**Table 8. Discharge Limitations Inorganics - Primary MCLs**

Constituents	Units	Running 4-Week Average
Aluminum	mg/L	1
Antimony	mg/L	0.006
Arsenic	mg/L	0.010
Asbestos (for fibers exceeding 10 µm in length)	million fibers per liter (MFL)	7 <sup>5</sup>
Barium	mg/L	1
Beryllium	mg/L	0.004
Cadmium	mg/L	0.005

<sup>4</sup> Compliance shall be determined in accordance with 22 CCR § 60320.208 and the approved Operation Optimization Plan (OOP). See MRP Section I.U.

<sup>5</sup> If four consecutive quarterly results for asbestos are below the detection limit in Table 64432-A of Title 22 for asbestos, monitoring for asbestos may be reduced to one sample every three years. Quarterly monitoring shall resume if asbestos is detected.

Constituents	Units	Running 4-Week Average
Total Chromium	mg/L	0.05
Cyanide	mg/L	0.15
Fluoride	mg/L	2.0
Mercury	mg/L	0.002
Nickel	mg/L	0.1
Perchlorate	mg/L	0.006
Selenium	mg/L	0.05
Thallium	mg/L	0.002

**TABLE 9. DISCHARGE LIMITATIONS VOLATILE ORGANIC CHEMICALS (VOCS) - PRIMARY MCLS**

Constituents	Units	Running 4-Week Average
Benzene	mg/L	0.001
Carbon Tetrachloride	mg/L	0.0005
1,2-Dichlorobenzene	mg/L	0.6
1,4-Dichlorobenzene	mg/L	0.005
1,1-Dichloroethane	mg/L	0.005
1,2-Dichloroethane (1,2-DCA)	mg/L	0.0005
1,1-Dichloroethylene (1,1-DCE)	mg/L	0.006
cis-1,2-Dichloroethylene	mg/L	0.006
trans-1,2-Dichloroethylene	mg/L	0.01
Dichloromethane	mg/L	0.005
1,2-Dichloropropane	mg/L	0.005
1,3-Dichloropropene	mg/L	0.0005
Ethylbenzene	mg/L	0.3
Methyl-tert-butyl-ether (MTBE)	mg/L	0.013
Monochlorobenzene	mg/L	0.07
Styrene	mg/L	0.1
1,1,2,2-Tetrachloroethane	mg/L	0.001
Tetrachloroethylene (PCE)	mg/L	0.005
Toluene	mg/L	0.15
1,2,4-Trichlorobenzene	mg/L	0.005
1,1,1-Trichloroethane	mg/L	0.200
1,1,2-Trichloroethane	mg/L	0.005
Trichloroethylene (TCE)	mg/L	0.005
Trichlorofluoromethane	mg/L	0.15
1,1,2-Trichloro-1,2,2-Trifluoroethane	mg/L	1.2
Vinyl Chloride	mg/L	0.0005
Xylenes (m,p)	mg/L	1.750 <sup>6</sup>

**TABLE 10. DISCHARGE LIMITATIONS SYNTHETIC ORGANIC CHEMICALS (SOCS) - PRIMARY MCLS**

Constituents	Units	Running 4-Week Average
Alachlor	mg/L	0.002
Atrazine	mg/L	0.001
Bentazon	mg/L	0.018

<sup>6</sup> The MCL is for either a single isomer or the sum of the isomers.

Constituents	Units	Running 4-Week Average
Benzo(a)pyrene	mg/L	0.0002
Carbofuran	mg/L	0.018
Chlordane	mg/L	0.0001
2,4-Dichlorophenoxyacetic acid (2,4-D)	mg/L	0.07
Dalapon	mg/L	0.2
1,2-Dibromo-3-chloropropane (DBCP)	mg/L	0.0002
Di(2-ethylhexyl)adipate	mg/L	0.4
Di(2-ethylhexyl)phthalate (DEHP)	mg/L	0.004
Dinoseb	mg/L	0.007
Diquat	mg/L	0.02
Endothall	mg/L	0.1
Endrin	mg/L	0.002
Ethylene Dibromide (EDB)	mg/L	0.00005
Glyphosate	mg/L	0.7
Heptachlor	mg/L	0.00001
Heptachlor epoxide	mg/L	0.00001
Hexachlorobenzene	mg/L	0.001
Hexachlorocyclopentadiene	mg/L	0.05
Gamma BHC (Lindane)	mg/L	0.0002
Methoxychlor	mg/L	0.03
Molinate	mg/L	0.02
Oxamyl	mg/L	0.05
Pentachlorophenol	mg/L	0.001
Picloram	mg/L	0.5
Polychlorinated Biphenyls (PCBs)	mg/L	0.0005
Simazine	mg/L	0.004
Thiobencarb	mg/L	0.07
Toxaphene	mg/L	0.003
1,2,3-Trichloropropane	mg/L	0.000005
2,3,7,8-TCDD (Dioxin)	mg/L	3 x 10 <sup>-8</sup>
2,4,5-TP (Silvex)	mg/L	0.05

**TABLE 11. DISCHARGE LIMITATIONS DISINFECTION BYPRODUCTS - PRIMARY MCLS**

Constituents	Units	Running 4-Week Average
Total Trihalomethanes (TTHMs) <ul style="list-style-type: none"> <li>• Bromodichloromethane</li> <li>• Bromoform</li> <li>• Chloroform</li> <li>• Dibromochloromethane</li> </ul>	mg/L	0.080
Haloacetic acid (five) (HAA5) <ul style="list-style-type: none"> <li>• Monochloroacetic acid</li> <li>• Dichloroacetic acid</li> <li>• Trichloroacetic acid</li> <li>• Monobromoacetic acid</li> <li>• Dibromoacetic acid</li> </ul>	mg/L	0.060
Bromate	mg/L	0.010
Chlorite	mg/L	1.0

**TABLE 12. DISCHARGE LIMITATIONS RADIONUCLIDES - PRIMARY MCLS**

Constituents	Units	Running 4-Week Average
Combined Radium-226 and Radium-228	pCi/L	5
Gross Alpha particle activity (excluding radon and uranium)	pCi/L	15
Uranium	pCi/L	20
Beta/photon emitters	millirem/yr	4
Strontium-90	pCi/L	8
Tritium	pCi/L	20,000

**TABLE 13. DISCHARGE LIMITATIONS CONSTITUENTS - SECONDARY MCLS**

Constituents	Units	Running Annual Average
Aluminum	mg/L	0.2
Color	Apparent Color Unit (ACU)	15
Foaming agents (MBAS)	mg/L	0.5
Iron	mg/L	0.3
Manganese	mg/L	0.05
Methyl-tert-butyl ether (MTBE)	mg/L	0.005
Odor Threshold	Threshold Odor Number (TON)	3
Silver	mg/L	0.1
Thiobencarb	mg/L	0.001
Zinc	mg/L	5.0
Total Dissolved Solids	mg/L	1000
Chloride	mg/L	500
Sulfate	mg/L	500

**XI. RATIONALE FOR DISCHARGE LIMITATIONS**

**A. Turbidity**

Turbidity is an expression of the optical property that causes light to be scattered in water due to particulate matter such as clay, silt, organic matter, and microscopic organisms. The turbidity discharge limitations are based on the definition of filtered wastewater in 22 CCR § 60301.320(b).

**B. Total Coliform**

Total coliform bacteria are used to indicate the likelihood of pathogenic bacteria in groundwater. The total coliform discharge limitations in this Order for nonpotable uses are based on the definition of disinfected tertiary recycled water in 22 CCR § 60301.230 and the discharge limitations for total coliform in this Order for subsurface application are based on the regional objectives for groundwaters with MUN beneficial use in the Basin Plan.



### **C. TDS, Chloride, Sulfate, and Boron**

Human activities and land use practices can influence inorganic constituents in ground waters. Abnormally high levels of inorganic constituents (such as TDS, chloride, sulfate, and boron) can impair and preclude beneficial uses. The discharge limitations for TDS, chloride, sulfate, and boron in Table 5 were carried over from the previous permit to prevent backsliding and these limitations were incorporated into Table 6 and 13 because the concentrations are consistent with the secondary MCL “Consumer Acceptance Contaminant Level Ranges” in 22 CCR § 64449 (for TDS, chloride, and sulfate) and the notification level for boron. In addition, the limitations for chloride and boron are equivalent to the numeric mineral water quality objectives for the Santa Clara River Valley (Oxnard) Groundwater Basin in the Basin Plan in Table 3-13 of the Basin Plan.

### **D. Nitrogen Compounds**

High nitrate levels in drinking water can cause health problems in humans. Infants are particularly sensitive and can develop methemoglobinemia (blue-baby syndrome). Human activities and land use practices can also influence the nitrogen concentration in groundwaters. The discharge limitations in this Order for nitrate, nitrite, and the sum of nitrate and nitrite are based on the regional objectives for groundwater in the Basin Plan and the MCLs for nitrate, nitrite, and the sum of nitrate and nitrite in 22 CCR § 64431. The discharge limitation for total nitrogen is based on 22 CCR § 60320.210 for subsurface application and on the regional objectives for groundwater in the Basin Plan for nonpotable uses.

### **E. Lead and Copper**

The discharge limitation for copper is based on its secondary MCL included in 22 CCR § 64449. The discharge limitation for lead is based on its action level in 22 CCR § 64678.

### **F. Total Organic Carbon**

Total organic carbon provides a medium for the formation of disinfection byproducts such as trihalomethanes and haloacetic acids. Drinking water containing these byproducts in excess of their corresponding MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of cancer. The discharge limitation for total organic carbon is based on 22 CCR § 60320.218(b).

### **G. Pathogenic Microorganism Control**

The discharge limitations for pathogenic microorganisms are based on 22 CCR § 60320.208.

### **H. Constituents with Primary and Secondary MCLs**

Chemical constituents in excessive amounts in drinking water are harmful to human health. The Basin Plan prohibits the discharge of concentrations of chemical constituents and radionuclides in excess of their corresponding MCLs. The discharge limitations for constituents with primary and secondary MCLs are therefore based on the Basin Plan and 22 CCR § 64431, 64444, 64449, 64442, and 64533.

## **XII. GENERAL REQUIREMENTS**

- A. Advanced treated recycled water shall not be used for direct human consumption, except for small quantities used for public education purposes, or for the direct processing of food or drink intended for human consumption. However, the Project Sponsor cannot serve treated recycled water for demonstration purposes to more than 25 people daily for at least 60 days out of the year (Health and Safety Code (H&SC), Section 116275(h) and 22 CCR § 64400). In addition, the treated recycled water cannot be bottled and distributed unless it meets the requirements stated the H&SC, Section 111070.5 and the WC, Section 13570.
- B. As stated in the Engineering Report, the advanced treated recycled water injected into the aquifer shall be retained underground for a minimum of 3.1 months prior to being withdrawn at a domestic supply well. Any change in the minimum retention time of 3.1 months must be proposed to DDW for review and acceptance.
- C. Bypass, discharge, or delivery to the use area of inadequately treated recycled water, at any time, is prohibited.
- D. The recycled water system shall be adequately protected from inundation and damage by storm flows.
- E. Adequate freeboard and/or protection shall be maintained in any recycled water storage tanks, process tanks, and impoundments to ensure direct rainfall will not cause overtopping.
- F. Advanced treated recycled water use or disposal shall not result in earth movement in geologically unstable areas.
- G. The OWTP and AWPf shall not be the source of pollution or nuisance at any time outside the boundary of the facility, including odors that unreasonably affect beneficial uses, odors injurious to health, or odors offensive to the senses of members of a community.
- H. Wastewater treatment and use of recycled water shall not result in problems caused by breeding of mosquitoes, gnats, midges, or other pests.
- I. The use of recycled water shall not impart tastes, odors, color, foaming, or other objectionable characteristics to the receiving groundwater.
- J. Recycled water shall not contain any substance in concentrations toxic to human, animal, or plant life.
- K. Odors of sewage origin shall not be perceivable beyond the limits of the property owned or controlled by the Project Sponsor and/or recycled water user.
- L. The Project Sponsor shall always properly operate and maintain all treatment facilities and control systems (and related appurtenances) which are installed or used by the Project Sponsor 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).
- M. A copy of these requirements shall always be maintained at the OWTP AWPf and be available to operating personnel.

- N. The Project Sponsor shall furnish each purveyor and user of recycled water a copy of these requirements and ensure the requirements are maintained at the purveyor's and user's facilities so the requirements are always available to operating personnel.
- O. Supervisors and operators of this advanced water treatment facility shall possess a certificate of appropriate grade as specified in 23 CCR § 3680.
- P. For any material change or proposed change in character, location, or volume of recycled water, or its uses, the Project Sponsor 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 DDW (pursuant to CWC division 7, chapter 7, article 4, section 13522.5 and 22 CCR § 60323) for approval. The engineering report shall be prepared by a qualified engineer registered in California.
- Q. If the Project Sponsor chooses to use one or more wastewater chemicals in lieu of TOC, the Project sponsor shall obtain approval from DDW as required in 22 CCR § 60320.218.

**R. Climate Change Effects Vulnerability Assessment and Mitigation Plan.**

On March 07, 2017 the State Water Board adopted Resolution No. 2017-0012 recognizing the challenges posed by climate change that require a proactive approach in all State Water Board actions, including drinking water regulation, water quality protection, and financial assistance. The resolution lays the foundation for a response to climate change that is integrated into all State Water Board actions by providing direction to the State Water Board divisions and encouraging coordination with the regional water boards. In response to Resolution 2017-0012, the Regional Water Board adopted Resolution No. R18-004, "A Resolution to Prioritize Actions to Adapt to and Mitigate the Impacts of Climate Change on the Los Angeles Region's Water Resources and Associated Beneficial Uses" on May 10, 2018. The resolution summarizes the steps taken so far to address the impacts of climate change within the Regional Water Board's programs and lists a series of steps to move forward. These include the identification of potential regulatory adaptation and mitigation measures that could be implemented on a short-term and long-term basis by each of the Regional Water Board's programs to take into account, and assist in mitigating where possible, the effects of climate change on water resources and associated beneficial uses. This Order contains provisions to require planning and actions to address climate change impacts in accordance with both the State and Regional Water Board resolutions.

The Project Sponsor shall consider the impacts of climate change as they affect the operation of the OWTP, the AWPf, the collection system, and the recycled water distribution system due to flooding, wildfire, or other climate-related changes. The Project Sponsor shall develop a Climate Change Effects Vulnerability Assessment and Mitigation Plan (Climate Change Plan) to assess and manage climate change-related effects that may impact the wastewater treatment facility's operation, water supplies, its collection system, and water quality, including any projected changes to the influent water temperature and pollutant concentrations, and beneficial uses. For facilities that discharge to the ocean, including desalination plants, the Climate

Change Plan shall include the impacts from sea level rise. The Climate Change Plan is due 12 months after the adoption of this Order.

### **XIII. SPECIFICATIONS FOR USE OF RECYCLED WATER**

- A. The treated water from the AWPf may be used for the following nonpotable uses:
1. Surface irrigation in the following areas:
    - a. Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop;
    - b. Parks and playgrounds;
    - c. School yards;
    - d. Residential and freeway landscaping;
    - e. Unrestricted access golf courses;
    - f. Other allowable irrigation applications specified in 22 CCR provided approval from DDW and the Regional Water Board Executive Officer prior to delivery;
    - g. Industrial or commercial cooling tower;
    - h. Industrial boiler feed; and
    - i. Recreational impoundments.
  2. The treated water from the AWPf may be used for indirect potable reuse in compliance with 22 CCR Article 5.2.
  3. The recycled water shall not be used for any other uses than those specified above unless an engineering report has been submitted for those uses and has been approved in writing by the Executive Officer and DDW.
  4. Recycled water shall not be used for direct human consumption or for the processing of food or drink intended for human consumption.
  5. The delivery of recycled water to end users shall be subject to DDW approval and/or its delegated local agency.
  6. A dual-plumbed system may be used to deliver recycled water to end users. The detailed dual-plumbed system requirements are included in Section XV of this Order.

### **XIV. USE AREA REQUIREMENTS**

Use area is an area of recycled water use with defined boundaries, which may contain one or more facilities where recycled water is used. The Project Sponsor shall ensure that all users of recycled water comply with the following:

- A. All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public no less than 4 inches high by 8 inches wide that include the following wording, "RECYCLED WATER – DO NOT DRINK." Each sign shall display an international symbol to alert people who do not read English.

- B. All recycled water pipelines and valves shall be installed with purple identification tape or purple polyethylene vinyl wraps according to the American Water Works Association (AWWA) California-Nevada Section.
- C. No physical connection shall be made or allowed to exist between any recycled water piping and any piping conveying potable water, except as allowed under 17 CCR § 7604.
- D. The portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibbs. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access.
- E. Recycled water use shall not result in earth movement in geologically unstable areas.
- F. No impoundment or storage ponds containing disinfected recycled water shall occur within 100 feet of any domestic water wells, potable water reservoirs, and streams used as sources of water supply.
- G. Whenever a cooling system uses recycled water in conjunction with an air conditioning facility and utilizes a cooling tower or otherwise creates a mist that could contact employees or members of the public, the cooling system shall comply with the following:
  - 1. A drift eliminator shall be used whenever the cooling system is in operation.
  - 2. Chlorine or another biocide shall be used to treat the cooling system recirculating water to minimize the growth of *Legionella* and other microorganisms.
- H. No recycled water irrigation areas shall be located within 50 feet of any domestic supply well unless all the following conditions have been met:
  - 1. A geological investigation demonstrates that an aquitard exists at the well between the uppermost aquifer being drawn from and the ground surface;
  - 2. The well contains an annular seal that extends from the surface into the aquitard;
  - 3. The well is housed to prevent any recycled water spray from contacting the wellhead facilities;
  - 4. The ground surface immediately around the wellhead is contoured to allow surface water to drain away from the wellhead;
  - 5. The owner of the well approves of the elimination of the buffer zone requirement.
- I. No irrigation shall take place within 50 feet of any reservoir or stream used as a source of domestic drinking water.
- J. Recycled water shall be applied at agronomic rates. Special precautions must be taken to prevent clogging of spray nozzles, prevent over watering, and to minimize the production of runoff. Pipelines shall be maintained to prevent leakage.
- K. Any irrigation runoff shall be confined to the recycled water use area and shall not be allowed to escape as surface flow, unless the runoff does not pose a public health threat and is authorized under an NPDES permit, Waste Discharge Requirements, a

Conditional Waiver of Waste Discharge Requirements for Irrigated Lands, or other orders issued by the State or Regional Water Board. For the purpose of this requirement, however, minor amounts of irrigation return water from peripheral areas shall not be considered a violation of this Order.

- L. Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities, and shall not contact any drinking water fountain and public present. Drinking water fountains must be equipped with hoods or covers.
- M. Recycled water shall not be used for irrigation during periods of rainfall and/or runoff.
- N. Recycled water use shall be limited to times when the public is not present.
- O. All above-ground irrigation appurtenances need to be marked appropriately.
- P. The area using recycled water shall be inspected annually by the Project Sponsor.
- Q. Supervisors shall be appointed for the recycled water use areas and their staff shall be trained on the hazards of working with recycled water and periodically retrained.
- R. The Project Sponsor shall maintain User Agreements and Ordinances with the potential agricultural, industrial, and recreational users of recycled water. Copies of the User Agreements and Ordinances shall be provided to the Regional Water Board and DDW for review within 90 days of the effective date of this Order.
- S. If the recycled water system lateral pipelines are located along the property lines of homeowners, there may be a potential for cross connections. A buffer zone between the recycled water lines and the property owners is necessary. If the Project Sponsor cannot maintain adequate control of the recycled water system pipelines, the pipelines need to be relocated or a physical barrier needs to be installed to prevent cross connections, and the Project Sponsor shall implement a public outreach program to inform the public.

**XV. SPECIFICATIONS AND REQUIREMENTS FOR DUAL-PLUMBED SYSTEMS**

- A. The public water supply shall not be used as a backup or supplemental source of water for a dual-plumbed recycled water system unless the connection between the two systems is protected by an air gap separation that complies with the requirements of 17 CCR § 7602(a) and 17 CCR § 7603(a), and that such a connection has been approved by DDW and/or its delegated local agency.
- B. The Project Sponsor shall not deliver recycled water to a facility using a dual-plumbed system unless the report of recycled water use, required pursuant to CWC section 13522.5, meets the requirements set forth in this Order, and has been submitted and approved by DDW and/or its delegated local agency. The Project Sponsor shall submit a copy of the DDW approval letter to the Regional Water Board with the aforementioned report within 30 days following approval.
- C. The report of recycled water use, submitted pursuant to CWC section 13522.5, shall contain the following information for dual-plumbed systems, in addition to the information required by 22 CCR § 60323 (Engineering Report).
  - 1. A detailed description of the intended use site identifying the following:

- a. The number, location, and type of facilities within the use area proposing to use dual-plumbed systems;
  - b. The average number of persons estimated to be served by each facility;
  - c. The specific boundaries of the proposed use site including a map showing the location of each facility to be served;
  - d. The person or persons responsible for operation of the dual-plumbed system at each facility; and
  - e. The specific use of recycled water at each facility.
2. Plans and specifications describing the following:
- a. Proposed piping system to be used;
  - b. Pipe locations of both the recycled water and potable water systems;
  - c. Type and location of the outlets and plumbing fixtures that will be accessible to the public; and
  - d. The methods and devices to be used to prevent backflow of recycled water into the public water system.
3. The methods to be used by the Project Sponsor to ensure the installation and operation of the dual-plumbed system will not result in cross-connections between the recycled water piping system and the potable water piping system. This item shall include a description of pressure, dye or other test methods to be used to test the system every four years.
4. Prior to the initial operation of the dual-plumbed recycled water system and annually thereafter, the dual-plumbed system within each facility and use site shall be inspected for possible cross connections with the potable water system. The recycled water system shall also be tested for possible cross connections at least once every four years. The testing shall be conducted in accordance with the method described in the report submitted pursuant to 22 CCR § 60314. The inspections and the testing shall be performed by a cross connection control specialist certified by the California-Nevada Section of the AWWA or an organization with equivalent certification requirements. A written report documenting the result of the inspection and testing for the prior year shall be submitted to DDW within 30 days following completion of the inspection or test.
5. The Project Sponsor shall notify DDW of any occurrence of backflow from the dual-plumbed recycled water system into the potable water system within 24 hours of discovery of the incident.
6. Any backflow prevention device installed to protect the public water system serving the dual-plumbed recycled water system shall be inspected and maintained in accordance with 17 CCR § 7605.

## **XVI. DDW SPECIFICATIONS AND REQUIREMENTS**

The Project Sponsor shall comply with the requirements set forth in DDW's recommendation letter to the Regional Water Board dated May 17, 2019, as listed below:

- A. The Project Sponsor shall comply with 22 CCR Article 5.2. Indirect Potable Reuse: Groundwater Replenishment – Subsurface Application. If proposing an alternative to any of the requirements in Article 5.2, the Project Sponsor shall follow the process described in 22 CCR § 60320.230.
- B. The Project Sponsor shall ensure that the entire applied recycled water flow continuously treated with full advanced treatment per the criteria in 22 CCR § 60320.201. The Project Sponsor shall conduct full-scale startup and commissioning testing to demonstrate that advanced treatment at the AWPf complies with 22 CCR § 60320.201.
- C. The Project Sponsor shall operate the AWPf in accordance with 22 CCR § 60320.208, such that the recycled municipal wastewater used for groundwater recharge and replenishment achieves at least 12-log enteric virus reduction, 10-log *Giardia* cyst reduction, and 10-log *Cryptosporidium* oocyst reduction.
- D. The Project Sponsor shall reevaluate the pathogen log reduction value (LRV) credits granted to primary and secondary wastewater treatment in DDW's December 05, 2016 letter (1.9, 0.8, and 1.2 for virus, *Giardia*, and *Cryptosporidium*, respectively), which were based on the research literature available at the time. The Project Sponsor may add additional treatment or validate the primary and secondary wastewater treatment LRV credits claimed. To validate the LRV credits, the Project Sponsor shall conduct a site-specific pathogen study within 5 years from the date of the current engineering report in order to determine the pathogen LRVs achieved at the OWTP under the normal full-scale operating conditions. The protocol and the results of the study must be reviewed by an independent advisory panel or work group of consultants with expertise in wastewater microbiology. Both the testing protocol and the results of the study must be submitted to DDW and Regional Water Board for review, and for DDW approval.
- E. If a pathogen reduction is not met based on the on-going monitoring pursuant to 22 CCR § 60320.208(c), the Project Sponsor shall investigate the cause and initiate corrective actions within 24 hours of becoming aware of the result. The Project Sponsor shall immediately notify DDW and the Regional Water Board if the project fails to meet the pathogen reduction criteria longer than 4 consecutive hours, or more than a total of 8 hours during any 7-day period. Failures of shorter duration must be reported to the Regional Water Board no later than 10 days after the month in which the failure occurred.
- F. In accordance with 22 CCR § 60320.222, the Project Sponsor shall ensure all treatment processes at the AWPf are operated in a manner providing optimal reduction of all chemicals and contaminants.
- G. The Project Sponsor shall operate the AWPf in accordance with the Operation Optimization Plan (OOP), reviewed and accepted by DDW prior to start of operations, pursuant to 22 CCR § 60320.222. The Project Sponsor shall ensure that the OOP is representative of current operations, maintenance, and monitoring and is updated within 30 days of any significant changes to current operations, maintenance, and monitoring. At a minimum, the OOP must identify and describe the operations (including validation of unit processes pathogen log reduction credits per 22 CCR § 60320.208(c)), maintenance (including prevention of cross



connections, bypass treatment, and replacement of membranes), analytical methods (regulated and unregulated chemicals per 22 CCR § 60320.204), monitoring (including process monitoring and instrumentation calibration), and reporting (including compliance, performance monitoring and methodology for the calculation of pathogen log reduction achieved per process). The OOP must include and specify all alarms, setpoints, and triggered actions used in the AWPf. Per 22 CCR § 60320.222, the Project Sponsor shall submit a draft OOP to DDW and the Regional Water Board prior to operations for DDW's review and acceptance. The draft OOP may be amended and finalized after the completion of full-scale startup and commissioning testing. The final OOP must be submitted to DDW no later than 90 days after the completion of startup and commissioning testing. The OOP must always be representative of the current operations, maintenance, and monitoring. The Project Sponsor shall submit an updated OOP for approval per 22 CCR § 60320.222(c).

- I. In accordance with 22 CCR § 60320.204, all laboratory analyses for contaminants having a primary or secondary MCL must be conducted using a drinking water method approved by DDW for the contaminant and conducted by a laboratory accredited by the State Water Board Environmental Laboratory Accreditation Program (ELAP) for the analytical method used. Analyses for chemicals other than those having primary or secondary MCLs must be described in the Project Sponsor's approved OOP.
- J. The Project Sponsor shall adequately staff the AWPf with operators and describe their staffing hours, shifts, and certifications in the OOP. The AWPf operators must have the Advanced Treatment Certification when available, in consultation with DDW and the Regional Water Board.
- K. The Project Sponsor shall ensure that the recycled municipal wastewater used for the project meets the wastewater source control requirements in accordance with 22 CCR § 60320.206.
- L. The initial maximum recycled municipal wastewater contribution (RWC) for this project is 1.0 according to the Engineering Report, which is allowed per 22 CCR § 60320.216.
- M. In accordance with 22 CCR § 60320.218, the produced advanced treated recycled water from the AWPf must be sampled for TOC at least weekly prior to application. The Project Sponsor shall report the weekly TOC results, the 20-week running average of all TOC results, and the average of the last four results which shall not exceed 0.5 mg/L.
- N. The following monitoring and reporting requirements must be included in the OOP and reported to DDW and the Regional Water Board on a regular basis according to 22 CCR requirements.
  1. To demonstrate the pathogen log reduction values (LRVs) granted to microfiltration (MF) units, daily membrane integrity testing (MIT) shall be performed at a minimum. The Project Sponsor shall submit a comprehensive membrane integrity verification program to DDW and the Regional Water Board for review, and for DDW approval. The following apply to the MIT:

- a. The pathogen LRVs for *Giardia* cysts and *Cryptosporidium* oocysts must be calculated and the values recorded after the completion of each MIT. The LRVs must be calculated based on the results of the daily pressure decay testing (PDT).
  - b. The MIT shall have a resolution that is responsive to an integrity breach on the order of 3 microns or less.
  - c. Daily calculations of the LRV shall be based on pressure decay rate (PDR) value with an ending pressure that provides a resolution of 3 microns or less.
  - d. The MIT shall have a sensitivity to verify an LRV greater than or equal to 4.0.
  - e. The results of the daily MIT and calculated LRVs shall be reported monthly.
  - f. If a membrane unit fails MIT, the membrane unit shall be removed from service, repaired, and have acceptable MIT results prior to being placed back into service.
2. The RO process shall be credited pathogen reduction at the AWPf in accordance with the amount demonstrated via online monitoring of surrogate parameters. The Project Sponsor shall continuously monitor electrical conductivity (EC) in the influent and effluent of the RO process. The effluent from each RO train shall be continuously monitored for EC to ensure the integrity of the RO process is maintained. The pathogen LRVs must be calculated daily based on the lowest reduction achieved across the RO trains. The daily average EC reduction achieved across the RO process as well as average and maximum influent and effluent EC measurements must also be reported in the monthly reports due by the 10<sup>th</sup> day of the following month to DDW. The online EC instruments must be calibrated in accordance with the OOP. The Project Sponsor must also describe in the OOP how ongoing performance monitoring will be conducted to indicate when the integrity of the RO process has been compromised.
  3. The Engineering Report states that the Project Sponsor intends to install online TOC meters for RO trains at the AWPf in the future. The OOP shall be updated accordingly at that time and daily pathogen LRVs shall be calculated based on the TOC monitoring.
  4. The Project Sponsor shall monitor the required indicators for constituents of emerging concern (CEC) at the proper locations in accordance with the Recycled Water Policy. This information shall also be included in the OOP.
  5. The Advanced Oxidation Process (AOP) shall be operated as designed and described in the Engineering Report to meet 22 CCR requirements achieving a minimum 0.5-log reduction of 1,4-dioxane and meet all Notification Levels under the normal full-scale operating conditions.
  6. The AOP shall always be continuously monitored for power, UV transmittance (UVT), UV Intensity (UVI), and flow (Q). All measurement instrumentation must be properly calibrated in accordance with the OOP.
  7. The Project Sponsor shall submit to DDW a monthly summary of the calculated NDMA log reduction along with UVI, UVT, power, flow rate, calculated UVI/Q,

calculated hydrogen peroxide dose, and any reactor failure(s). These monthly reports must be submitted to DDW and the Regional Water Board by the 10<sup>th</sup> day of the following month.

8. As described in the Engineering Report, the AOP system installed at the AWPf is controlled by establishing a target NDMA log reduction setpoint which determines the power required to achieve the target log reduction value. The Engineering Report describes an online surrogate (UVI/Q), that has been established based on the previously conducted full-scale testing, that will be used to ensure 0.5-log reduction of 1,4-dioxane and 6-log reduction of pathogenic organisms is continuously achieved. The UVI/Q surrogate will be measured and used to adjust the NDMA log reduction setpoint as needed.
9. The UVI sensor online data must be programmed into the AWPf's supervisory control and data acquisition (SCADA) system for continuous monitoring and calculation of the UVI/Q surrogate parameter, instead of using hand recorded UVI readings. The Project Sponsor shall submit a schedule for achieving the SCADA update and the online monitoring of the UVI/Q surrogate to DDW and the Regional Water Board for approval by DDW prior to the start of operations.
10. Until the SCADA update is completed, the Project Sponsor staff operating the AWPf shall record the UVI readings of all UV reactors and calculate the UVI/Q parameter daily. The 30-day running average value for the calculated UVI/Q must be above 0.018 and the NDMA log reduction setpoint controlling the power to the system, which is set at 1.4, must be increased as needed if the average value of the UVI/Q parameter ever falls below 0.018.
11. The AOP shall be operated with continuous monitoring and built-in automatic reliability features that must trigger automatic diversion of effluent by the following critical alarm setpoints:
  - a. complete UV reactor failure,
  - b. instantaneous flow rate exceeds design flow rate,
  - c. UVT less than 95 percent for more than 15 minutes,
  - d. NDMA log reduction setpoint of less than 1.4, and
  - e. calculated hydrogen peroxide dose less than 6.0 mg/L.
12. At least weekly, the UVT meter shall be inspected and checked against a reference benchtop unit to document accuracy.
13. The duty UVI sensors shall be checked against calibrated UVI sensors monthly and if readings vary by more than 20%, the sensors shall be replaced and calibrated.
14. The Project Sponsor shall monitor water quality parameters to update the AOP radical scavenging demand as specified in the OOP. At a minimum, the Project Sponsor shall consider nitrite, bromide, chloramines, TOC, and alkalinity.
15. The Project Sponsor shall demonstrate to DDW that the monitoring and reliability features, including automatic diversion to waste or retreatment at the AWPf, and

- shutdown capability, during a plant inspection prior to final approval and at any time requested to do so by DDW or by the Regional Water Board.
16. The Project Sponsor shall report monthly “Yes” or “No” for each day as to whether the necessary pathogenic microorganism log reductions (12-logs virus, 10-logs *Giardia* cyst, and 10-logs *Cryptosporidium* oocyst) have been achieved based on the calculation of log reduction achieved daily. The Project Sponsor shall include the daily minimum model predicated 1,4-dioxane and NDMA log reduction. An overall log reduction calculated value shall be provided daily unless the AWPf is offline for a 24-hour period. These monthly reports shall be submitted to DDW and the Regional Water Board by the 10<sup>th</sup> day of the following month.
  17. The Project Sponsor shall monitor the effluent of the AWPf monthly for contaminants having MCLs and NLs as specified in the OOP for the first year of operations. Per 22 CCR § 60320.201(i), the Project Sponsor may request from DDW and the Regional Water Board a reduction in this monitoring after 12 consecutive months of no results exceeding an MCL or NL.
  18. Pursuant to 22 CCR § 60320.201(h), the Project Sponsor shall perform quarterly calculations of the percentage of monitoring results conducted pursuant to 22 CCR § 60320.201(b) and (e) for the RO and AOP processes that did not meet the surrogate and/or operational parameter limits. The Project Sponsor shall report to DDW and the Regional Water Board if the percentage is greater than 10%.
- O. In accordance with 22 CCR 60320.201(a)(2), during the first 20 weeks of operation, the RO permeate must be monitored at least weekly for TOC and concentrations must be no greater than 0.25 mg/L in at least ninety-five percent of samples.
  - P. Within 60 days of completing the initial 12 months of full-scale operation and operational monitoring of the advanced treatment process, the Project Sponsor shall submit reports to DDW and the Regional Water Board that include the components described in 22 CCR §60320.201(f) and (g) based on the ongoing performance monitoring of the RO and the AOP processes.
  - Q. In accordance with 22 CCR § 60320.212, the advanced treated recycled water produced at the AWPf must be sampled quarterly for primary drinking water MCLs (Chapter 15 of 22 CCR, Tables 66431-A, 64442, 64443, 64444-A, and 64533-A) and lead and copper. Monitoring for contaminants with secondary MCLs (Chapter 15 of 22 CCR, Tables 64449-A and B) shall be conducted annually. The results shall be reported to DDW and the Regional Water Board.
  - R. In accordance with 22 CCR § 60320.220, the Project Sponsor shall collect quarterly samples and analyze the advanced treated recycled water for priority pollutants (chemicals listed in 40 CFR § 131.38, “Establishment of numeric criteria for priority toxic pollutants for the State of California,” as may be amended), chemicals having NLs, and any additional chemicals specified by DDW and the Regional Water Board.
  - S. The Project Sponsor shall have no undesired or unintended reversal of flow of water or other liquids, gases, or other substances into the AWPf’s product water lines. Any such undesired or unintended reversal of flow must be reported to the Regional

Water Board and DDW within 24 hours of the Project Sponsor's knowledge of the incident.

- T. The Project Sponsor shall submit a comprehensive cross-connection control program for the AWPf to DDW and the Regional Water Board. The cross-connection control program must be submitted as a standalone document, separate from and prior to the submittal of the OOP. The Project Sponsor shall implement its cross-connection control program and update the program to ensure that the program always representative of the current cross-connection control practices at the AWPf. Revisions to the cross-connection control program for any reason, including changes resulting from inspections, must be done in consultation with an individual with a valid and current Cross-Connection Control program Specialist certification issued by the California-Nevada section of the American Water Works Association.
- U. Prior to initial operation of the AWPf and once every year thereafter, the Project Sponsor shall ensure that potable water, wastewater, recycled water, chemicals, and other waste or non-potable piping systems are inspected for possible cross-connections. Piping systems shall be inspected for possible cross-connections after making any modification to the AWPf plumbing system.
- V. The cross-connection inspections must be performed by an individual with a valid and current Cross-Connection Program Specialist certification issued by the California-Nevada section of the American Water Works Association (AWWA). An individual may pursue the University of Southern California's Training of Cross Connection Control Program Specialists; however, the individual must still attain certification from the AWWA. The Project Sponsor shall submit a written report documenting the result of the initial inspection with the program submitted to DDW. Subsequent inspection results shall be submitted with the annual report to DDW and the Regional Water Board.
- W. The advanced treated recycled water produced by the AWPf shall be retained underground for the minimum duration of 3.1 months as specified in the Engineering Report. Any change in the minimum retention of 3.1 months in the future must be proposed to DDW and the Regional Water Board for review, and for DDW acceptance.
- X. Extraction of the water from the ASR well must follow the cross-connection and cross-contamination prevention measures described in the OOP. The OOP must include detailed drawings of the cross-connection prevention mechanism including the removable spool.
- Y. The applied recycled water injected at the ASR well shall only be extracted, after the required minimum retention time, from the same ASR well which is the only ASR well within the scope of the current phase of the project. The Project Sponsor shall conduct a tracer study to verify that application of the advanced treated recycled water will not impact the nearby drinking water wells. The Project Sponsor shall submit a groundwater tracer test protocol to DDW for review 60 days prior to commencement of the testing for subsurface application of recycled water. The Project Sponsor shall conduct a tracer test and submit a completed tracer study to

DDW and the Regional Water Board. The Project Sponsor shall update the Engineering Report based on results of the tracer study.

- Z. Based on the results of the tracer study, the Project Sponsor shall revise the boundary representing a zone of controlled drinking water well construction and secondary boundary in accordance with 22 CCR § 60320.200(e).
- AA. The Project Sponsor shall, in accordance with 22 CCR § 60320.226 and as specified in the OOP, collect the required samples from the monitoring wells and report the monitoring results.
- BB. The Project Sponsor shall notify DDW and the Regional Water Board and submit the necessary documents for any additional ASR wells to be constructed and utilized in the future. The Project Sponsor must update the Engineering Report accordingly in consultation with DDW and the Regional Water Board.
- CC. If the Project Sponsor has been directed by DDW or the Regional Water Board to suspend subsurface application of recycled water, subsurface application shall not resume until the Project Sponsor has obtained approval from DDW and the Regional Water Board.
- DD. The Project Sponsor shall update the Engineering Report and the OOP to demonstrate compliance with any revisions to the Recycled Water Policy.
- EE. The Project Sponsor shall update the Engineering Report and the OOP to demonstrate compliance with any revisions to DDW's Notification Level list.
- FF. The Project Sponsor shall transfer all water quality monitoring results analyzed by an Environmental Laboratory Accreditation Program (ELAP) certified laboratory to DDW by Electronic Data Transfer (EDT) after the Project Sponsor has been assigned Primary Station Codes (PS-Codes) for compliance monitoring sites.
- GG. In accordance with 22 CCR § 60320.228:
  - 1. The Project Sponsor shall submit the required annual report no later than six months after the end of each calendar year.
  - 2. The Project Sponsor shall update the Engineering Report to address any changes and submit to DDW and the Regional Water Board every 5 years.

## **XVII. DILUENT WATER SPECIFICATIONS**

DDW has approved injection of the advanced treated recycled water to occur without any diluent water, based on the level of treatment provided by the GREAT AWPf.

## **XVIII. ADDITIONAL PROVISIONS**

- A. Injection of the advanced treated recycled water shall not cause or contribute to an exceedance of water quality objectives in the Santa Clara River Valley (Oxnard) Basin.
- B. The Project Sponsor 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.

- C. This Order does not exempt the Project Sponsor 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.
- D. This Order does not alleviate the responsibility of the Project Sponsor 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.
- E. The Project Sponsor shall furnish, within a reasonable time, any information the Regional Water Board or DDW may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. Upon request, the Project Sponsor shall also furnish the Regional Water Board with copies of records required to be kept under this Order for at least three years.
- F. The Project Sponsor shall be responsible to ensure all users of recycled water comply with the specifications and requirements for such use.
- G. In an enforcement action, it shall not be a defense for the Project Sponsor 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 Sponsor 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.
- H. This Order includes the attached Standard Provisions Applicable to Waste Discharge Requirements (Attachment D). If there is any conflict between the provisions stated in this Order and the Standard Provisions, the provisions stated in this Order shall prevail.
- I. This Order includes the attached MRP No. CI-9456. If there is any conflict between provisions stated in the MRP and the Standard Provisions, those provisions stated in the MRP prevail.
- J. The temporary use of the RSMP to deliver recycled water to the farmers of the Oxnard Plain shall expire on December 31, 2020, unless this Order is modified at a future Regional Water Board meeting or unless the Calleguas Municipal Water District, the owner of the RSMP, requests in writing this provision be terminated before the expiration date.

## **XIX. REOPENER**

- A. This Order may be modified, revoked and reissued, or terminated for cause, including but not limited to: (1) failure to comply with any condition in this Order, (2) endangerment of human health or environment resulting from the permitted activities in this Order, (3) obtaining this Order by misrepresentation or failure to disclose all relevant facts, or (4) 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 Sponsor 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.

- B. 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, studies, or other Board policy, or the application of an attenuation factor based upon an approved site-specific attenuation study.
- C. This Order may be reopened to modify limitations for constituents to protect beneficial uses, based on new information not available at the time this Order was adopted.
- D. If 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.
- E. 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.
- F. This Order may be reopened upon a determination by DDW that treatment and disinfection of the AWPf recycled water is not sufficient to protect human health.

## **XX. ENFORCEMENT**

- A. The requirements of this Order are subject to enforcement under Water Code sections 13261, 13263, 13264, 13265, 13268, 13300, 13301, 13304, 13350, and enforcement provisions in Water Code, Division 7, Chapter 7 (Water Reclamation).
- B. The Project Sponsor is subject to the terms and conditions of this Order.

### **XX.I. GROSS BETA/PHOTON EMITTERS COMPLIANCE DETERMINATION**

Compliance with the recycled water discharge limitations for Gross Beta/photon emitters contained in Section X of this Order will be determined as follows:

The monthly average effluent limitation for gross beta/photon is equal to 4 millirem/year with a screening level of 50 picoCuries per liter (pCi/L). Due to naturally occurring Potassium-40, the results of the Potassium-40 gross beta activity may be subtracted from the total gross beta activity to determine if the screening level is exceeded. The Potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentration (in mg/L) by a factor of 0.82 to determine activity from Potassium-40. The Potassium-40 must be analyzed from the same or equivalent sample used for the gross beta analysis. If the gross beta particle activity minus the naturally occurring Potassium-40 beta particle is less than or equal to 50 pCi/L, the facility is in compliance with the effluent limitation and the value shall be reported as <4 millirem/year. If the gross beta particle activity minus the naturally occurring Potassium-40 beta particle exceeds the screening level, the Project Sponsor must have the samples further analyzed for the individual nuclides. The calculation for the sum of the fractions is presented below.



The maximum contaminant level (MCL) for gross beta/photon is equal to 4 millirem per year. A millirem is a dose of energy to the body. USEPA regulates 179 man-made nuclides, and each of them has a concentration of radiation measured in pCi/L, which produces the 4 millirem dose. These concentrations are listed on the table, Derived Concentrations of (pCi/L) of Beta and Photon Emitters in Drinking Water, which shall be used to determine compliance.

## Derived Concentrations (pCi/l) of Beta and Photon Emitters in Drinking Water

Yielding a Dose of 4 mrem/yr to the Total Body or to any Critical Organ as defined in NBS Handbook 69

Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l
H-3	20,000	Ni-65	300	Nb-95	300	Sb-124	60	Nd-147	200	Os-191	600
Be-7	6,000	Cu-64	900	Nb-97	3,000	Sb-125	300	Nd-149	900	Os-191m	9,000
C-14	2,000	Zn-65	300	Mo-99	600	Te-125m	600	Pm-147	600	Os-193	200
F-18	2,000	Zn-69	6,000	Tc-96	300	Te-127	900	Pm-149	100	Ir-190	600
Na-22	400	Zn-69m	200	Tc-96m	30,000	Te-127m	200	Sm-151	1,000	Ir-192	100
Na-24	600	Ga-72	100	Tc-97	6,000	Te-129	2,000	Sm-153	200	Ir-194	90
Si-31	3,000	Ge-71	6,000	Tc-97m	1,000	Te-129m	90	Eu-152	200	Pt-191	300
P-32	30	As-73	1,000	Tc-99	900	Te-131m	200	Eu-154	60	Pt-193	3,000
S-35 inorg	500	As-74	100	Tc-99m	20,000	Te-132	90	Eu-155	600	Pt-193m	3,000
Cl-36	700	As-76	60	Ru-97	1,000	I-126	3	Gd-153	600	Pt-197	300
Cl-38	1,000	As-77	200	Ru-103	200	I-129	1	Gd-159	200	Pt-197m	3,000
K-42	900	Se-75	900	Ru-105	200	I-131	3	Tb-160	100	Au-196	600
Ca-45	10	Br-82	100	Ru-106	30	I-132	90	Dy-165	1,000	Au-198	100
Ca-47	80	Rb-86	600	Rh-103m	30,000	I-133	10	Dy-166	100	Au-199	600
Sc-46	100	Rb-87	300	Rh-105	300	I-134	100	Ho-166	90	Hg-197	900
Sc-47	300	Sr-85 m	20,000	Pd-103	900	I-135	30	Er-169	300	Hg-197m	600
Sc-48	80	Sr-85	900	Pd-109	300	Cs-131	20,000	Er-171	300	Hg-203	60
V-48	90	Sr-89	20	Ag-105	300	Cs-134	80	Tm-170	100	Tl-200	1,000
Cr-51	6,000	Sr-90	8	Ag-110m	90	Cs-134m	20,000	Tm-171	1,000	Tl-201	900
Mn-52	90	Sr-91	200	Ag-111	100	Cs-135	900	Yb-175	300	Tl-202	300
Mn-54	300	Sr-92	200	Cd-109	600	Cs-136	800	Lu-177	300	Tl-204	300
Mn-56	300	Y-90	60	Cd-115	90	Cs-137	200	Hf-181	200	Pb-203	1,000
Fe-55	2,000	Y-91	90	Cd-115m	90	Ba-131	600	Ta-182	100	Bi-206	100
Fe-59	200	Y-91m	9,000	In-113m	3,000	Ba-140	90	W-181	1,000	Bi-207	200
Co-57	1,000	Y-92	200	In-114m	60	La-140	60	W-185	300	Pa-230	600
Co-58	300	Y-93	90	In-115	300	Ce-141	300	W-187	200	Pa-233	300
Co-58m	9000	Zr-93	2,000	In-115m	1,000	Ce-143	100	Re-186	300	Np-239	300
Co-60	100	Zr-95	200	Sn-113	300	Ce-144	30	Re-187	9,000	Pu-241	300
Ni-59	300	Zr-97	60	Sn-125	60	Pr-142	90	Re-188	200	Bk-249	2,000
Ni-63	50	Nb-93m	1,000	Sb-122	90	Pr-143	100	Os-185	200		

The sum of the fraction method is used because each photon emitter targets a different organ of the body, which results in a different magnitude of risk. The sum of the beta and photon emitters shall not exceed 4 millirem/year (40 CFR § 141.66(d)(2)).

Each nuclide has a different concentration that produces 4 millirem dose because different radionuclides have different energy levels. Some nuclides need to be in a higher concentration to give the same 4 millirem dose.

The laboratory shall measure the nuclide concentration in the water and compare this result to the concentration allowed for that nuclide (see table below). The comparison results in a fraction. This is shown in calculation below:

Fraction of the Maximum 4 millirem/year exposure limit

$$= \frac{pCi/L \text{ found in sample (from laboratory results)}}{pCi/L \text{ equivalent from 4 millirem of exposure (from conversion table)}}$$

Each fraction must then be converted to a dose equivalent of 4 millirem/year by multiplying the fraction by 4. The results for each emitter must be summed to determine compliance.

A sample calculation is presented in the table below:

	<b>X</b>	<b>Y</b>	<b>X/Y</b>	<b>4(X/Y)</b>
<b>Emitter</b>	<b>Lab Analysis (pCi/L)</b>	<b>Conversion from table (pCi/4millirem)</b>	<b>Calculate Fraction</b>	<b>Calculate Total (millirem)</b>
Cs-134	5,023	20,000	0.25115	1.0
Cs-137	30	200	0.150	0.6
Sr-90	4	8	0.5	2.0
I-131	2	3	0.7	2.8
Sum of the Fractions	---	---	1.60115	6.4

This example system would be considered in violation of the gross beta/photon effluent limitation if the calculated total millirem = 6.4 millirem, which means that the sum of the annual dose equivalent to the total body, or to any internal organ, exceeds 4 millirem/year.

## ATTACHMENT A - DEFINITIONS

### **Added Tracer**

A non-reactive substance, with measurable characteristics distinctly different from the receiving groundwater, intentionally added to the water applied at a GRRP for the purpose of being a tracer such that the tracer can be readily identified in the groundwater downgradient of the GRRP to determine the underground retention time of the applied water.

### **Advanced Treated Recycled Water**

In this permit, it refers to the treated recycled water produced by the Advanced Water Purification Facility (AWPF).

### **Arithmetic Mean ( $\mu$ )**

Also called the average, is the sum of measured values divided by the number of samples.

### **Average Monthly Effluent Limitation (AMEL)**

The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during the calendar month divided by the number of daily discharges measured during that month.

### **Average Weekly Effluent Limitation (AWEL)**

The highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

### **Coagulated Wastewater**

Oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated upstream from a filter by the addition of suitable floc-forming chemicals.

### **Composite Sample, 24-hour**

An aggregate sample derived from no fewer than eight samples collected at equal time intervals or collected proportional to the flow rate over the compositing period. The aggregate sample shall reflect the average source water quality covering the composite 24-hour sample period.

### **Conventional Treatment**

A treatment chain that utilizes a sedimentation unit process between the coagulation and filtration processes and produces an effluent that meets the definition for disinfected tertiary recycled water.

### **Daily Discharge**

Daily Discharge is defined as either: (1) the total mass of a constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

**Detected, but Not Quantified (DNQ)**

DNQ are those sample results less than the RL, but greater than or equal to the laboratory's MDL. Sample results reported as DNQ are estimated concentrations.

**Diluent Water**

"Diluent Water" means water, meeting the diluent requirements of chapter 3, division 4 of Title 22 of the California Code of Regulations, used for reducing the recycled municipal wastewater contribution over time.

**Disinfected Secondary-2.2**

Recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of coliform organisms does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30-day period.

**Disinfected Tertiary Recycled Water**

A filtered and subsequently disinfected wastewater that meets the following criteria:

- A. The filtered wastewater which has been disinfected by either:
  - 1. A chlorine disinfection process following filtration that provides a contact time (CT, the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or
  - 2. A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.
  - 3. The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30-day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

**Dual-Plumbed System**

A system that utilizes separated piping systems for recycled water and potable water within a facility and where the recycled water is used for either of the following purposes:

- A. To serve plumbing outlets (excluding fire suppression systems) within a building, or
- B. Outdoor landscape irrigation at individual residences.

### **Estimated Chemical Concentration**

The estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

### **Filtered Wastewater**

An oxidized wastewater that meets the criteria in subsection (A) or (B):

- A. Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following:
  - 1. At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in travelling automatic backwash filters; and
  - 2. So that the turbidity of the filtered wastewater does not exceed any of the following:
    - a. An average 2 NTU within a 24-hour period;
    - b. 5 NTU more than 5 percent of the time within a 24-hour period; and
    - c. 10 NTU at any time.
- B. Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:
  - 1. 0.2 NTU more than 5 percent of the time within a 24-hour period; and
  - 2. 0.5 NTU at any time.

### **F-specific bacteriophage MS2**

A strain of a specific type of virus that infects coliform bacteria that is traceable to the American Type Culture Collection (ATCC 15597B1) and is grown on lawns of *E. Coli* (ATCC 15597).

### **Grab Sample**

An individual sample collected during a period not to exceed 15 minutes. Grab samples must be collected during normal peak loading conditions for the parameter of interest, which may or may not occur during hydraulic peaks.

### **Groundwater Replenishment Reuse Project or GRRP**

A project involving the planned use of recycled municipal wastewater that is operated for the purpose of replenishing a groundwater basin designated in the Water Quality Control Plan (as defined in Water Code section 13050(j)) for use as a source of municipal and domestic water supply.

### **Haloacetic Acids, Total**

The sum of monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid.

### **Indicator Compound**

An individual chemical in a GRRP's municipal wastewater that represents the physical, chemical, and biodegradable characteristics of a specific family of trace organic chemicals; is present in concentrations that provide information relative to the environmental fate and

transport of those chemicals; may be used to monitor the efficiency of trace organic compounds removal by treatment processes; and provides an indication of treatment process failure.

**Instantaneous Maximum Effluent Limitation**

The highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

**Instantaneous Minimum Effluent Limitation**

The lowest allowable value for any single sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

**Intrinsic Tracer**

A substance or attribute present in the recharge water at levels different from the receiving groundwater such that the substance in the water applied at the GRRP can be distinctly and sufficiently detected in the groundwater downgradient of the GRRP to determine the underground retention time of the water.

**Maximum Contaminant Level or MCL**

The maximum permissible concentration of a contaminant established pursuant to section 116275(c)(1) and (d) of the Health and Safety Code or established by the United States Environmental Protection Agency (USEPA).

**Median**

The middle measurement in a set of data. The median of a data set is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median =  $X_{(n+1)/2}$ . If n is even, then the median =  $(X_{n/2} + X_{(n/2)+1})/2$  (i.e., the midpoint between the n/2 and n/2+1).

**Method Detection Limit**

MDL is the minimum concentration of a substance that can be reported with 99 percent confidence that the measured concentration is distinguishable from method blank results.

**Minimum Level (ML)**

The concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

**Minimum Reporting Level (MRL)**

The smallest measured concentration of a substance that can be reliably measured by using a given analytical method. It is the “less-than” value reported when an analyte either is not detected or is detected at a concentration less than the MRL.

**Modal Contact Time**

The amount of time elapsed between the time that a tracer, such as salt or dye, is injected into the effluent at the entrance to a chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber.

**Nitrogen, Total**

The sum of ammonia, nitrite, nitrate, and organic nitrogen-containing compounds, expressed as nitrogen.

**Not Detected (ND)**

Sample results which are less than the laboratory's MDL.

**Notification Level or NL**

The concentration of a contaminant established by the Department pursuant to section 116455 of the Health and Safety Code.

**NTU (Nephelometric Turbidity Unit)**

A measurement of turbidity as determined by the ratio of the intensity of light scattered by the sample to the intensity of incident light scattered by the sample to the intensity of incident light as measured by method 2130 B. in Standard Methods for the Examination of Water and Wastewater, 20<sup>th</sup> ed.; Eaton, A.D., Clesceri, L.S., and Greenberg, A.E., Eds; American Public Health Association: Washington, DC, 1995; p.2-8.

**Oxidized Wastewater**

Wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

**Polychlorinated Biphenyls (PCBs)**

The sum of chlorinated biphenyls whose analytical characteristics resemble those of Arochlor-1016, Arochlor-1221, Arochlor-1232, Arochlor-1242, Arochlor-1248, Arochlor-1254, and Arochlor-1260.

**Project Sponsor**

An entity subject to a Regional Water Quality Control Board's (Regional Board's) water recycling requirements for a Groundwater Replenishment Reuse Project (GRRP) and is, in whole or part, responsible for applying to the Regional Board for a permit, obtaining a permit, operation of a GRRP, and complying with the terms and conditions of the permit and the requirements of this Chapter.

**Recharge Water**

Recycled municipal wastewater, or the combination of recycled municipal wastewater and credited diluent water, which is utilized by a GRRP for groundwater replenishment.

**Recycled Municipal Wastewater**

Recycled water that is the effluent from the treatment of wastewater of municipal origin.

**Recycled Municipal Wastewater Contribution or RWC**

The fraction equal to the quantity of recycled municipal wastewater applied at the GRRP divided by the sum of the quantity of recycled municipal wastewater and credited diluent water.

**Running Annual Average**

The arithmetic mean, calculated quarterly, of the monitoring results from the previous four consecutive quarters. If a confirmation sample is collected due to an exceedance of the initial sample, the arithmetic mean of the initial sample and the confirmation sample shall be used as the monitoring result for the quarter. If no sample was collected during a quarter or a result for a quarter is not available, only available data shall be used in the calculation of the running annual average.

**Running Four-Week Average**

The arithmetic mean, calculated weekly, of the monitoring results from the previous four weekly samples. If a confirmation sample is collected due to an exceedance of the initial

sample, the first weekly sample is the arithmetic mean of the initial sample and the confirmation sample.

**Spreading Area**

A natural or constructed impoundment with a depth equal to or less than its widest surface dimension used by a GRRP to replenish a groundwater basin with recharge water infiltrating and percolating through a zone that, in the absence of a GRRP, would be an unsaturated zone.

**Subsurface Application**

The application of recharge water to a groundwater basin(s) by a means other than surface application.

**Surface Application**

The application of recharge water to a spreading area.

**Surrogate Parameter**

A measurable physical or chemical property that has been demonstrated to provide a direct correlation with the concentration of an indicator compound, can be used to monitor the efficiency of trace organic compounds removal by a treatment process, and/or provides an indication of a treatment process failure.

**Total Organic Carbon (TOC)**

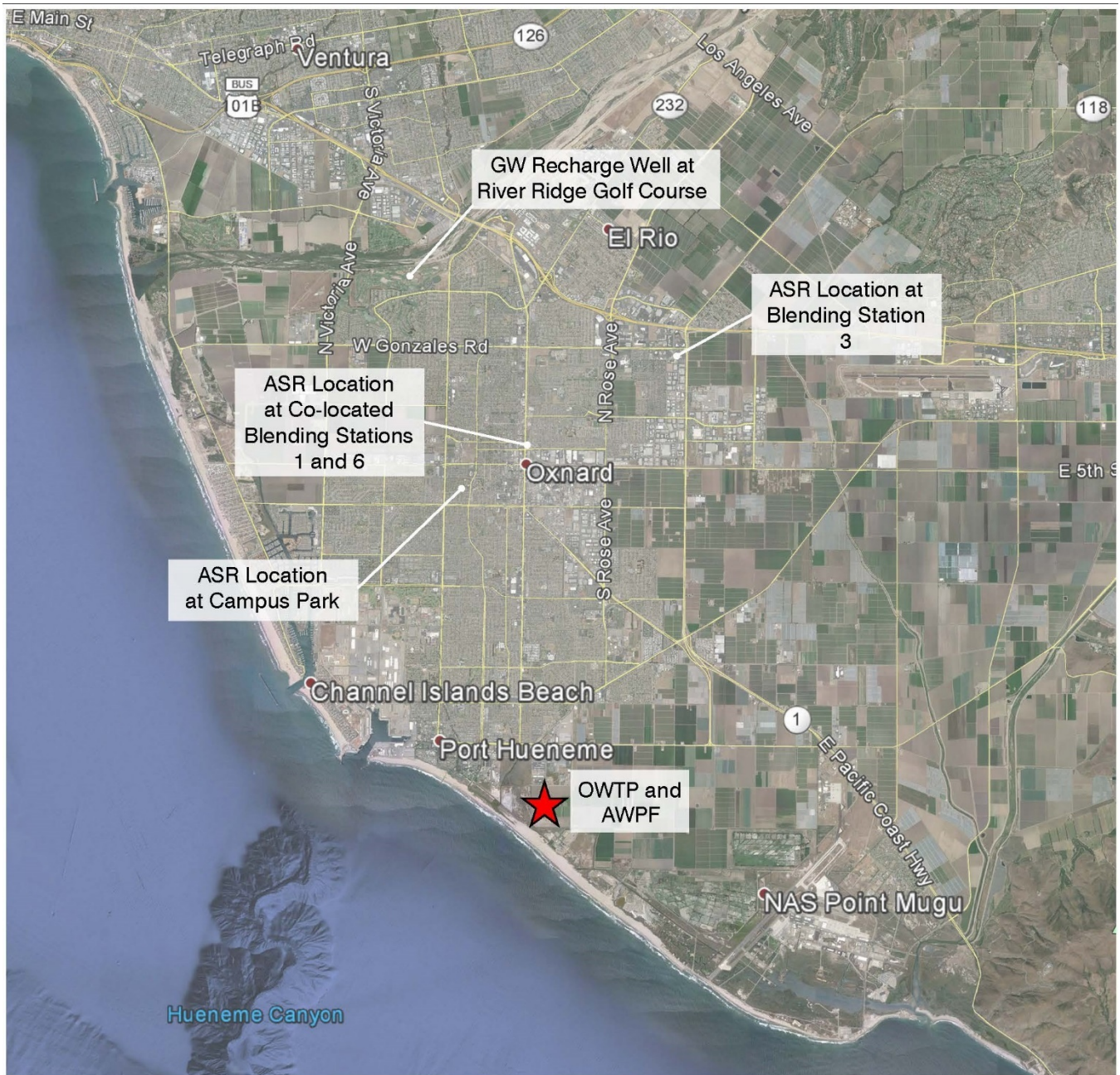
The concentration of organic carbon present in water.

**Trihalomethanes, Total**

The sum of Bromodichloromethane, Bromoform, Chloroform, and Dibromochloromethane.

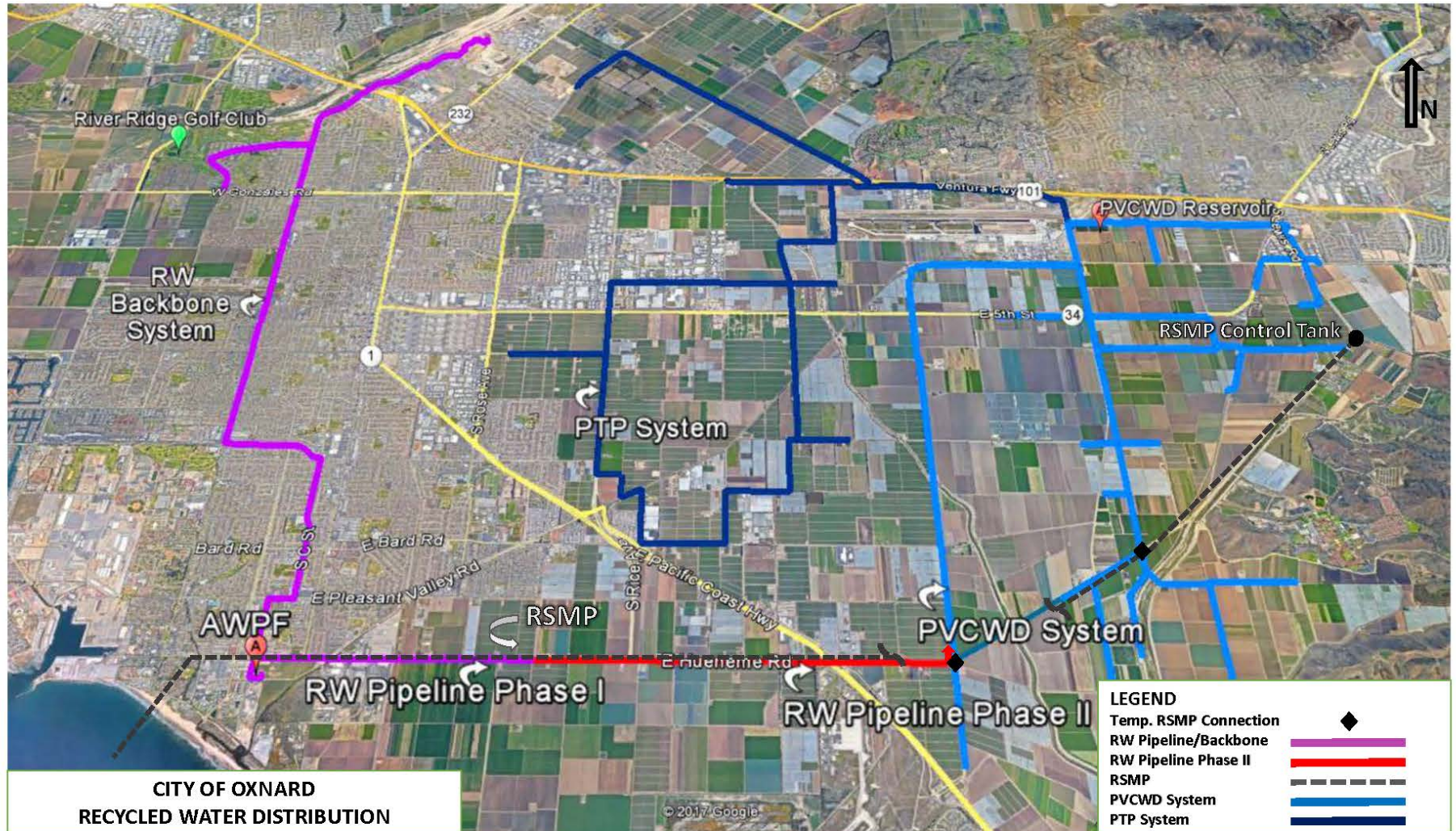


### ATTACHMENT B1 – MAP OF GREAT PROJECT AREA

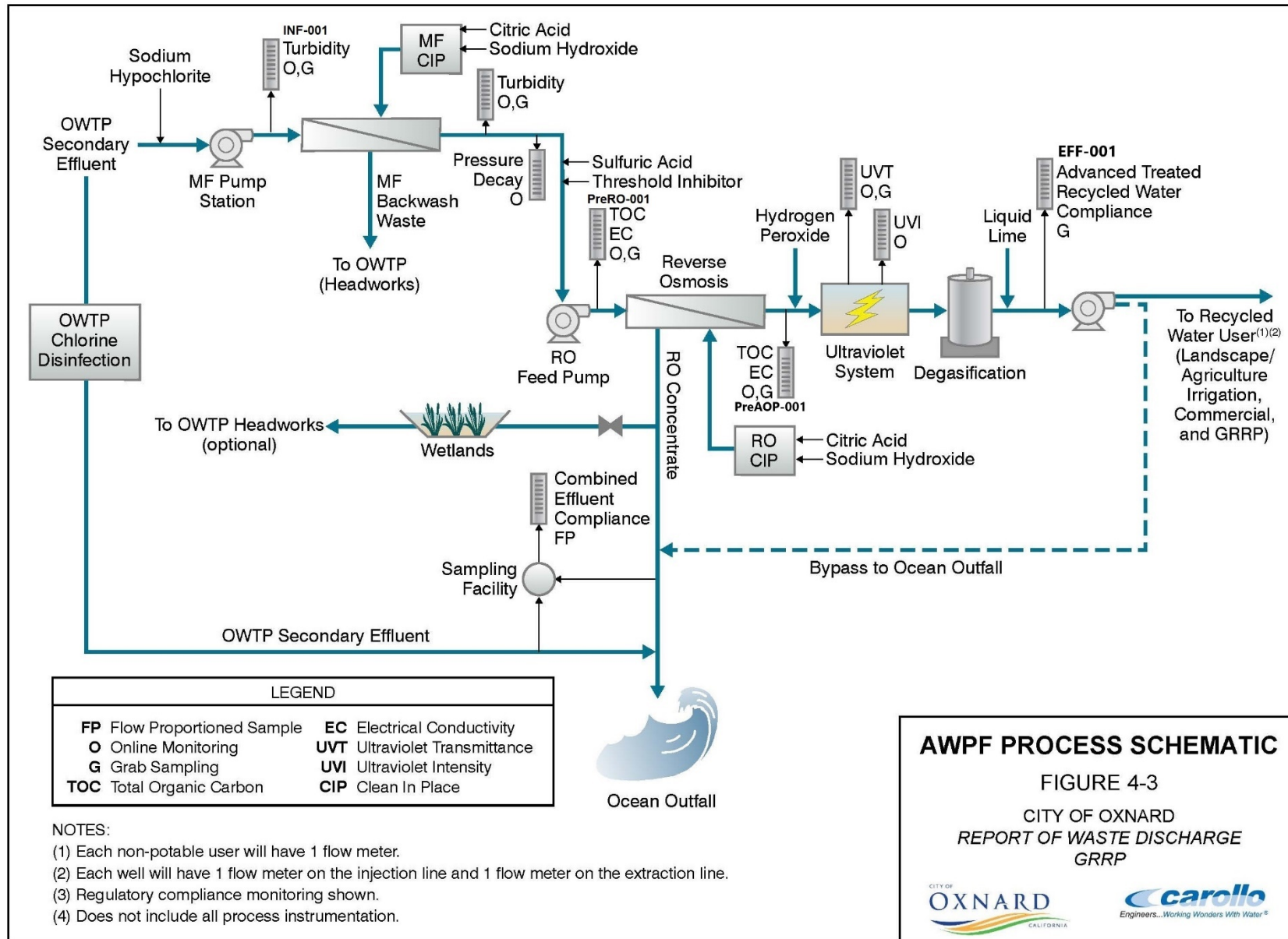




**ATTACHMENT B2 – RECYCLED WATER DISTRIBUTION AREA**



**ATTACHMENT C – GREAT AWPf PROCESS FLOW DIAGRAM**



**AWPF PROCESS SCHEMATIC**  
 FIGURE 4-3  
 CITY OF OXNARD  
 REPORT OF WASTE DISCHARGE  
 GRRP

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## **ATTACHMENT D – STANDARD PROVISIONS**

### **STANDARD PROVISIONS – APPLICABLE TO WASTE DISCHARGE REQUIREMENTS**

#### **A. Duty to Comply**

The Project Sponsor must comply with all conditions of these waste discharge requirements. A responsible party has been designated in the Order for this project and is legally bound to maintain the monitoring program and permit. Violations may result in enforcement actions, including Regional Water Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of these waste discharge requirements by the Regional Water Board. (CWC Sections 13261, 13263, 13265, 13268, 13300, 13301, 13304, 13340, 13350). Failure to comply with any waste discharge requirement, monitoring and reporting requirement, or other order or prohibition issued, reissued or amended by the Regional Water Board or State Water Board is a violation of these waste discharge requirements and the Water Code, which can result in the imposition of civil liability. (CWC Section 13350, subdivision (a).)

#### **B. General Prohibition**

Neither the treatment nor the discharge of waste shall create a pollution, contamination or nuisance, as defined by Section 13050 of the CWC. In addition, the discharge of waste classified as hazardous, as defined in California Code of Regulations, Title 23, Section 2521, subdivision (a) is also prohibited.

#### **C. Availability**

A copy of these waste discharge requirements shall be maintained at the discharge facility and be available at all times to operating personnel. (CWC Section 13263).

#### **D. Change in Ownership**

The Project Sponsor shall notify any succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to the Regional Water Board. The Permittee shall notify the Regional Water Board, in writing, at least 60 days in advance of ownership change and provide a date on which the transfer of this Order's responsibility and coverage will go from the current Discharger to the new discharger. The notification shall include an agreement between the parties to transfer responsibility for compliance with the Order. The agreement shall include an acknowledgement that the existing Discharger is liable for violations up to the transfer date and that the new discharger is liable from the transfer date forward. The succeeding owner or operator shall submit a Report of Waste Discharge that requests an amendment to formally amend the Order to acknowledge the transfer.

#### **E. Change in Discharge**

In the event of a material change in the character, location, or volume of a discharge, the Project Sponsor shall file with this Regional Water Board a new Report of Waste Discharge. (CWC Section 13260, subdivision (c)). A material change includes, but is not limited to, the following:

1. Addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste.
2. Significant change in disposal method, e.g., change from a land disposal to a direct discharge to water, or change in the method of treatment which would significantly alter the characteristics of the waste.
3. Significant change in the disposal area, e.g., moving the discharge to another drainage area, to a different water body, or to a disposal area significantly removed from the original area potentially causing different water quality or nuisance problems.
4. Increase in flow beyond that specified in the waste discharge requirements.
5. Increase in area or depth to be used for solid waste disposal beyond that specified in the waste discharge requirements. (CCR Title 23 Section 2210).

**F. Revision**

These waste discharge requirements are subject to review and revision by the Regional Water Board. (CWC Section 13263).

**G. Notification**

Where a project sponsor becomes aware that it failed to submit any relevant facts in a Report of Waste Discharge or submitted incorrect information in a Report of Waste Discharge or in any report to the Regional Water Board, it shall promptly submit such facts or information. (CWC Sections 13260 and 13267).

**H. Vested Rights**

This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect a Project Sponsor from his liability under Federal, State or local laws, nor do they create a vested right for the Project sponsor to continue the waste discharge. (CWC Section 13263, subdivision (g)).

**I. Severability**

Provisions of these waste discharge requirements are severable. If any provision of these requirements is found invalid, the remainder of these requirements shall not be affected. (CWC Section 921).

**J. Operation and Maintenance**

The Project Sponsor shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Project Sponsor to achieve compliance with 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. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Order. (CWC Section 13263, subdivision (f)).

### **K. Hazardous Releases Requirement**

Except for a discharge which is in compliance with these waste discharge requirements, any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (a) that person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State toxic disaster contingency plan adopted pursuant to Article 3.7 (commencing with Section 8574.7) of Chapter 7 of Division 1 of Title 2 of the Government Code, and immediately notify the State Water Board or the appropriate Regional Water Board of the discharge. This provision does not require reporting of any discharge of less than a reportable quantity as provided for under subdivisions (f) and (g) of Section 13271 of the California Water Code unless the discharge is in violation of a prohibition in the applicable Water Quality Control plan. (CWC Section 13271, subdivision (a)).

### **L. Oil or Petroleum Releases**

Except for a discharge which is in compliance with these waste discharge requirements, any person who without regard to intent or negligence, causes or permits any oil or petroleum product to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any water of the State, shall, as soon as (a) such person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State oil spill contingency plan adopted pursuant to Article 3.5 (commencing with Section 8574.1) of Chapter 7 of Division 1 of Title 2 of the Government Code. This provision does not require reporting of any discharge of less than 42 gallons unless the discharge is also required to be reported pursuant to Section 311 of the Clean Water Act or the discharge is in violation of a prohibition in the applicable Water Quality Control Plan. (CWC Section 13272).

### **M. Entry and Inspection**

The Project Sponsor shall allow the Regional Water Board, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the Project Sponsor's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order.
2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this Order.
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order.

4. Sample or monitor at reasonable times, for the purposes of assuring compliance with this Order, or as otherwise authorized by the California Water Code, any substances or parameters at any location. (CWC Section 13267).
5. Except for material determined to be confidential in accordance with applicable law, all reports prepared in accordance with the terms of this Order shall be available for public inspection at the office of the Los Angeles Regional Water Board. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.

#### **N. Monitoring Program and Devices**

The Project Sponsor shall furnish, under penalty of perjury, technical monitoring program reports; such reports shall be submitted in accordance with specifications prepared by the Executive Officer, which specifications are subject to periodic revisions as may be warranted. (CWC Section 13267).

All monitoring instruments and devices used by the discharge to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year, or more frequently, to ensure continued accuracy of the devices. Annually, the Project Sponsor shall submit to the Executive Officer a written statement, signed by a registered professional engineer, certifying that all flow measurement devices have been calibrated and will reliably achieve the accuracy required.

The analysis of any material required pursuant to Division 7 of the Water Code shall be performed by a laboratory that has accreditation or certification pursuant to Article 3 (commencing with Section 100825) of Chapter 4 of Part 1 of Division 101 of the Health and Safety Code. However, this requirement does not apply to field tests, such as test for color, odor, turbidity, pH, temperature, dissolved oxygen, conductivity, and disinfectant residual chlorine. (California Water Code, Section 13176).

Unless otherwise permitted by the Regional Water Board Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Water Resources Control Board's Division of Drinking Water. All analyses shall be required to be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants" (40 CFR § 136) promulgated by the U.S. Environmental Protection Agency. (CCR Title 23, Section 2230). The Quality Assurance-Quality Control Program must conform to the USEPA Guidelines "Laboratory Documentation Requirements for Data Validation", January 1990, USEPA Region 9) or procedures approved by the Los Angeles Regional Water Quality Control Board.

All quality assurance and quality control (QA/QC) analyses must be run on the same dates when samples were actually analyzed. All QA/QC data shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, and explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where

contaminants are detected in QA/QC samples (e.g., field, trip, or lab blanks); the accompanying sample results shall be appropriately flagged.

The Project Sponsor shall make all QA/QC data available for inspection by Regional Board staff and submit the QA/QC documentation with its respective quarterly report. Proper chain of custody procedures must be followed, and a copy of that documentation shall be submitted with the quarterly report.

**O. Treatment Failure**

In an enforcement action, it shall not be a defense for the Project Sponsor 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 Sponsor 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. (CWC Section 13263(f)).

**P. Discharge to Navigable Waters**

Any person who discharges pollutants or proposes to discharge pollutants to navigable waters of the United States within the jurisdiction of this state or a person who discharges dredged or fill material or proposes to discharge dredged or fill material into navigable waters of the United States within the jurisdiction of this state shall file a report of waste discharge in compliance with the procedures set forth in Water Code section 13260. (California Water Code, Section 13376).

**Q. Endangerment to Health and Environment**

The Project Sponsor shall report any noncompliance which may endanger health or the environment. Any such information shall be provided verbally to the Executive Officer within 24 hours from the time the Project Sponsor becomes aware of the circumstances. A written submission shall also be provided within five days of the time the Project Sponsor becomes aware of the circumstances. The written submission shall contain a description and times, and if the noncompliance has not been corrected; the anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Executive Officer, or an authorized representative, may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. The following occurrence(s) must be reported to the Executive Officer within 24 hours:

1. Any bypass from any portion of the treatment facility.
2. Any discharge of treated or untreated wastewater resulting from sewer line breaks, obstruction, surcharge or any other circumstances.
3. Any treatment plant upset which causes the effluent limitations of this order to be exceeded. (CWC Sections 13263 and 13267).

**R. Maintenance of Records**

The Project Sponsor shall retain records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous



monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Water Board Executive Officer.

Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements.
2. The individual(s) who performed the sampling or measurements.
3. The date(s) analyses were performed.
4. The individual(s) who performed the analyses.
5. The analytical techniques or method used.
6. The results of such analyses.

#### **S. Signatory Requirement**

1. All application reports or information to be submitted to the Executive Officer shall be signed and certified as follows:
  - a. For a corporation – by a principle executive officer or at least the level of vice president.
  - b. For a partnership or sole proprietorship – by a general partner or the proprietor, respectively.
  - c. For a municipality, state, federal or other public agency – by either a principal executive officer or ranking elected official.
2. A duly authorized representative of a person designated in paragraph (a) of this provision may sign documents if:
  - a. The authorization is made in writing by a person described in paragraph (a) of this provision.
  - b. The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity.
  - c. The written authorization is submitted to the Executive Officer.

Any person signing a document under this Section shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (CWC sections 13263, 13267, and 13268).”

**T. Operator Certification**

Supervisors and operators of water recycling treatment plants shall possess a certificate of appropriate grade in accordance with 23 CCR § 3680. State Water Boards may accept experience in lieu of qualification training (23 CCR § 3680). In lieu of a properly certified wastewater treatment plant operator, the State Water Board may approve use of water treatment plant operator of appropriate grade certified by the State Department of Public Health where reclamation is involved. (23 CCR § 3670.2).

## ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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## **ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP), CI-9456**

This Monitoring and Reporting Program is issued by the Regional Water Quality Control Board, Los Angeles Region (Regional Water Board) pursuant to California Water Code (CWC) section 13267(b)(1), which authorizes the Regional Water Board to require the submittal of technical and monitoring reports. It is also issued pursuant to the State Water Board's Recycled Water Policy and Title 22 of the California Code of Regulations (22 CCR) § 60320.200 et seq., which requires monitoring and reporting for recycled water discharges. The reports required by this MRP are necessary to ensure compliance with Waste Discharge Requirements (WDRs) and Water Reclamation Requirements (WRRs) Order No. R4-2020-xxxx for the Advanced Water Purification Facility (AWPF). The Project Sponsor shall implement this MRP on the effective date of this Order. Failure to comply with this MRP could result in the imposition of monetary civil liability pursuant to Division 7 of the California Water Code and other applicable laws.

### **I. GENERAL MONITORING AND REPORTING REQUIREMENTS**

- A. The Project Sponsor shall monitor the following according to the manner and frequency specified in this MRP.
  1. Influent to the Groundwater Recovery and Treatment (GREAT) AWPF.
  2. Feedwater to RO or RO/UVAOP (for Recycled Water Policy CECs and surrogates).
  3. Advanced treated recycled water used for injection.
  4. Receiving groundwater (in monitoring wells MW-1, MW-2 and MW-3) associated with the GREAT Aquifer Storage and Recovery (ASR) well.
- B. Monitoring reports shall include, but are not limited to, the following:
  1. Analytical results.
  2. 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.
  3. Analytical test methods used and the corresponding minimum reporting levels (MRLs).
  4. Name(s) of the laboratory that conducted the analyses.
  5. Copy of laboratory certifications by the State Water Resources Control Board, Division of Drinking Water's (DDW) Environmental Laboratory Accreditation Program (ELAP).
  6. A summary of quality assurance and control (QA/QC) measures, including documentation of chain of custody.
  7. Applicable Maximum Contaminant Levels (MCLs), Notification Levels (NLs), response levels, or DDW conditions or advanced treated recycled water discharge limits.
  8. A summary of noncompliance during the monitoring period.

- C. The Project Sponsor 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.
- D. The Project Sponsor shall notify this Regional Water Board and DDW by telephone or electronic means within 24 hours of knowledge of any violations of this Order that may endanger human health or the environment. Written confirmation shall be submitted within 5 working days from date of notification. The report shall include, but shall not be limited to the following information, as appropriate:
1. The nature and extent of the violation.
  2. The date and time when the violation started, when compliance was achieved, and when injection was suspended and restored, as applicable.
  3. The duration of the violation.
  4. The cause(s) of the violation.
  5. 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.
  6. Any impact of the violation.
- E. Samples shall be analyzed using analytical methods described in Section 141 of Title 40 of the Code of Federal Regulations (40 CFR § 141); or where no methods are specified for a given pollutant, by methods approved by DDW, the Regional Water Board and/or the State Water Board, the Project Sponsor 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.
- F. Analyses for chemicals other than those with primary MCLs and secondary MCLs, the Project Sponsor shall select methods according to the approved OOP based on the following approach:
1. Use the drinking water methods or wastewater methods sufficient to evaluate all water quality objectives and protect all beneficial uses.
  2. Use DDW-recommended methods for unregulated chemicals, if available.
  3. If there is no DDW-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 method.
  4. 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 DDW, use the most sensitive method.
  5. If no approved method is available for a specific chemical, the Project Sponsor's laboratory may develop or use its own methods and should provide the analytical

methods to DDW for review. Those methods may be used until DDW-recommended or USEPA-approved methods are available.

6. If the only method available for a chemical is for wastewater analysis (e.g. a chemical listed as a priority pollutant only), that chemical will be sampled and analyzed using wastewater methods specified in 40 CFR § 136. This approach will be used until a DDW-recommended or EPA-approved drinking water method is available.
  7. For CECs subject to the Recycled Water Policy, monitoring of advanced treated recycled water and tertiary treated recycled water prior to RO/AOP shall use analytical methods selected to achieve the Reporting Limits included in the Recycled Water Policy. Any modifications to the published or certified methods shall be reviewed by DDW and subsequently submitted to the Regional Water Board in an updated quality assurance plan.
- G. Pursuant to 22 CCR § 60320.204, analyses for contaminants having primary or secondary MCLs shall be performed by laboratories approved to perform such analyses by DDW utilizing DDW-approved drinking water methods. Analyses for constituents other than those having primary or secondary MCLs shall be described in the approved Operation Optimization Plan (OOP).
- H. The Project Sponsor 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.
- I. For regulated constituents, the laboratory conducting analyses shall be certified by ELAP or approved by DDW and the Regional Water Board.
- J. Upon request by the Project Sponsor, the Regional Water Board, in consultation with DDW and the State Water Board Quality Assurance Program, may establish MRLs, in any of the following situations:
1. When the pollutant has no established method under 40 CFR §141.
  2. When the method under 40 CFR § 141 for the pollutant has an MRL higher than the limit specified in this Order.
  3. When the Project Sponsor agrees to use a test method that is more sensitive than those specified in 40 CFR § 141.
- K. Samples shall be analyzed within allowable holding time limits as specified in 40 CFR § 141. All QA/QC analyses shall be conducted on the same dates the samples are analyzed. The Project Sponsor shall retain the QA/QC documentation in its files for three years and make available for inspection and/or submit them when requested by the Regional Water Board or DDW. Proper chain of custody procedures shall be followed, and a copy of this documentation shall be submitted with the quarterly report.
- L. Each monitoring report shall contain a separate section titled “Summary of Non-compliance” which discusses the compliance record and the corrective actions taken or planned that may be needed to bring the discharge into full compliance with waste

discharge requirements. This section shall clearly list all non-compliance with discharge requirements as well as all excursions of advanced treated recycled water limitations.

- M. For bacterial analyses, sample dilutions shall be performed so the expected range of values is bracketed (for example, with multiple tube fermentation method or membrane filtration method, 2 to 16,000 per 100 mL for total, fecal coliform, and *E. coli*, at a minimum, and 1 to 1000 per 100 ml for *Enterococcus*). The detection methods used for each analysis shall be reported with the results of the analyses.
- N. Quarterly monitoring shall be performed during the months of February, May, August, and November; semiannual monitoring shall be performed during the months of February and August; and annual monitoring shall be performed during the third quarter (July thru September) of each calendar year. Should there be instances when monitoring could not be conducted during the specified months, the Project Sponsor shall conduct the monitoring as soon as possible and state in the monitoring report the reason monitoring could not be conducted during the specified month. Results of quarterly, semiannual and annual analyses shall be reported in the quarterly monitoring report following the analysis.
- O. For CECs subject to the State Water Board Recycled Water Policy as amended December 11, 2018, analytical methods for laboratory analyses of CECs shall be selected to achieve the Reporting Limits presented in Table 1 of Attachment A of the Recycled Water Policy. The analytical methods shall be based on methods approved by the USEPA, the Standards Methods Committee, the American Society for Testing and Materials International, or other methods that have been validated and approved by the regional water boards or State Water Board for the analytes in the applicable matrix. Any modifications to the published or certified methods shall be included in an updated quality assurance project plan and submitted to the Regional Water Board and State Water Board.
- P. Compliance with Primary MCLs
  - 1. This section applies to recycled water or recharge water only and does not apply to pre-existing conditions such as from background groundwater samples prior to project startup. Compliance with primary MCLs is based on the results of accelerated monitoring.
  - 2. For all pollutants except total nitrogen, nitrate, nitrite, nitrate plus nitrite, perchlorate, asbestos, lead, copper and any other pollutant for which DDW determines should not comply with this section, compliance shall be determined as follows:
    - a. If a result of the monitoring performed exceeds a contaminant's MCL or action level (for lead and copper), the Project Sponsor shall collect another sample within 72 hours of notification of the result and then have it analyzed for the contaminant as confirmation.
    - b. If the average of the initial and confirmation sample exceeds the contaminant's MCL or action level, or the confirmation sample is not collected and analyzed pursuant to this subsection, the Project Sponsor shall notify DDW and the Regional Water Board within 24 hours and initiate weekly

monitoring until four consecutive weekly results are below the contaminant's MCL or action level. If the running four-week average exceeds the contaminant's MCL or action level, the Project Sponsor shall notify DDW and the Regional Water Board within 24 hours and, if directed by DDW or the Regional Water Board, suspend application of the recycled municipal wastewater.

3. For perchlorate, asbestos, lead, copper and any other pollutant for which DDW determines does not need to comply with the requirements in section I.P.2. or I.S. of this Order, compliance shall be determined as follows:
  - a. If a result of the monitoring performed exceeds a contaminant's MCL or action level (for lead and copper), the Project Sponsor shall collect another sample within 72 hours of notification of the result and then have it analyzed for the contaminant as confirmation.
  - b. If the average of the initial and confirmation sample exceeds the contaminant's MCL, or a confirmation sample is not collected and analyzed pursuant to this subsection, the Project Sponsor shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the contaminant's MCL.
  - c. If the running four-week average exceeds the contaminant's MCL, the project sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to DDW and the Regional Water Board no later than 45 days following the quarter in which the exceedance occurred.
  - d. If the running four-week average exceeds the contaminant's MCL for sixteen consecutive weeks, a Project Sponsor shall notify DDW and the Regional Water Board within 48 hours of knowledge of the exceedance and, if directed by DDW or the Regional Water Board, suspend application of the recycled municipal wastewater.

#### Q. Compliance with Secondary MCLs

If the single sample monitoring result from EFF-001 exceeds the contaminant's secondary MCL (or Secondary MCL Upper Limit), the Project Sponsor shall initiate quarterly monitoring of the advanced treated recycled water for the contaminant. In addition, if the running annual average of quarterly-averaged results from EFF-001 exceeds a contaminant's secondary MCL or Secondary MCL Upper Limit, the Project Sponsor shall describe the reason(s) for the exceedance and any corrective actions taken. A report shall be submitted to the Regional Water Board no later than 45 days following the quarter in which the exceedance occurred, with a copy concurrently provided to DDW. The annual monitoring may resume if the running annual average of quarterly results does not exceed a contaminant's secondary MCL or Secondary MCL Upper Limit.

#### R. Notification Levels

1. Each quarter the Project Sponsor shall sample and analyze the advanced treated recycled water at EFF-001 for DDW-specified chemicals having notification levels



(NLs). Refer to Table E-11 and Attachment G for the list of constituents and NLs, respectively.

2. If the result of the monitoring from EFF-001 exceeds an NL, within 72 hours of notification of the result, the Project Sponsor shall collect another sample, and have it analyzed for the contaminant as confirmation. If the average of the initial and confirmation sample from EFF-001 exceeds the contaminant's NL, or a confirmation sample is not collected and analyzed, the Project Sponsor shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the NL.
  - a. If the running four-week average exceeds the contaminant's NL, the Project Sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to DDW and Regional Water Board no later than 45 days following the quarter in which the exceedance occurred.
  - b. If the running four-week average exceeds the contaminant's NL for 16 consecutive weeks, the Project Sponsor shall notify DDW and the Regional Water Board within 48 hours of knowledge of the exceedance.

#### S. Nitrogen Compounds Control

Compliance with the nitrogen compounds requirements of this Order shall be demonstrated in the advanced treated recycled water for subsurface injection at Monitoring Locations EFF-001.

1. Total nitrogen samples shall be analyzed within 72 hours and the results shall be reported to the Project Sponsor within the same 72 hours if the result of any single sample exceeds 10 mg/L.
2. If the average of the results of two consecutive total nitrogen samples exceeds 10 mg/L, the Project Sponsor shall:
  - a. Collect a confirmation sample and notify DDW and the Regional Water Board within 48 hours of being notified by the laboratory.
  - b. Investigate the cause for the exceedances and take actions to reduce the total nitrogen concentrations to ensure continued or future exceedances do not occur.
  - c. Initiate additional monitoring for nitrogen compounds as described in the approved OOP, including locations in the groundwater basin, to identify elevated concentrations and determine whether such elevated concentrations exceed or may lead to an exceedance of a nitrogen based MCL.
3. If the average of the results of four consecutive total nitrogen samples collected at EFF-001 exceeds 10 mg/L, the Project Sponsor shall suspend the subsurface application of the advanced treated recycled water. Subsurface application shall not resume until corrective actions have been taken and at least two consecutive total nitrogen sampling results are less than 10 mg/L.

4. Following DDW and Regional Water Board approval, the Project Sponsor may initiate reduced monitoring frequencies for total nitrogen, nitrate, and nitrite. The Project Sponsor may apply to DDW and the Regional Water Board for reduced monitoring frequencies for total nitrogen, nitrate, and nitrite if, for the most recent 12 months:
  - a. The average of all results did not exceed 5 mg/L total nitrogen.
  - b. The average of a result and its confirmation sample (taken within 24 hours of receipt of the initial result) did not exceed 10 mg/L total nitrogen.
  - c. If the results of reduced monitoring exceed the total nitrogen concentration of 10 mg/L, the Project Sponsor shall revert to the monitoring frequencies for total nitrogen prior to implementation of the reduced frequencies. Reduced frequency monitoring shall not resume unless the requirements in section I.S.4.a. and I.S.4.b. are met.

#### T. Total Organic Carbon

1. If the advanced treated recycled water limitation for total organic carbon (TOC) is exceeded based on a 20-week running average, the Project Sponsor shall:
  - a. Immediately suspend subsurface application of the advanced treated recycled water until at least two consecutive results, three days apart, are less than the limit.
  - b. Notify DDW and the Regional Water Board within seven days of suspending operations.
  - c. Within 60 days, submit a report to DDW and the Regional Water Board describing the reasons for the exceedance and the corrective actions taken to avoid future exceedances. At a minimum the corrective actions shall include a reduction of the recycled water contribution sufficient to comply with the limit, if applicable.
2. If the advanced treated recycled water limitation for TOC is exceeded based on the average of the last four TOC results, the Project Sponsor shall, within 60 days of being notified of the results, submit a report to DDW and the Regional Water Board describing the reasons for the exceedance and the corrective actions taken to avoid future exceedance.

#### U. Pathogenic Organisms

1. The project sponsor shall design and operate the GRRP such that the recycled municipal wastewater used as recharge water for the GRRP receives treatment that achieves at least 12-log enteric virus reduction, 10-log *Giardia* cyst reduction, and 10-log *Cryptosporidium* oocyst reduction. The treatment train shall consist of at least three separate treatment processes. For each pathogen (i.e., virus, *Giardia* cyst, or *Cryptosporidium* oocyst), a separate treatment process may be credited with no more than 6-log reduction, with at least three processes each being credited with no less than 1.0-log reduction.

2. For each month retained underground as demonstrated in section I.U.5, the recycled municipal wastewater or recharge water will be credited with 1-log virus reduction.
3. With the exception of log reduction credited pursuant to section I.U.2, a project sponsor shall validate each of the treatment processes used to meet the requirements in section I.U.1. for their log reduction by submitting a report for DDW's review and approval, or by using a challenge test approved by DDW, that provides evidence of the treatment process's ability to reliably and consistently achieve the log reduction. The report and/or challenge test shall be prepared by an engineer licensed in California with at least five years of experience, as a licensed engineer, in wastewater treatment and public water supply, including the evaluation of treatment processes for pathogen control. With the exception of retention time underground, a project sponsor shall propose and include in its Operation Optimization Plan prepared pursuant to 22 CCR § 60320.222, on-going monitoring using the pathogenic microorganism of concern or a microbial, chemical, or physical surrogate parameter(s) that verifies the performance of each treatment process's ability to achieve its credited log reduction.
4. To demonstrate the retention time underground in section I.U.2, a tracer study utilizing an added tracer shall be implemented under hydraulic conditions representative of normal GRRP operations. The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point. The project sponsor shall initiate the tracer study prior to the end of the third month of operation. With DDW approval, an intrinsic tracer may be used in lieu of an added tracer, with no more credit provided than the corresponding virus log reduction in column 2 of Table 60320.208 in 22 CCR § 60320.208.
5. For the purpose of siting a GRRP location during project planning and until a GRRP's project sponsor has met the requirements of section I.U.4, for each month of retention time estimated using the method in column 1 of Table 60320.208 in 22 CCR § 60320.208, the recycled municipal wastewater or recharge water shall be credited with no more than the corresponding virus log reduction in column 2 of Table 60320.208 in 22 CCR § 60320.208.
6. Within 24 hours of becoming aware of an exceedance of the pathogen reduction required in 22 CCR § 60320.208(a) based on monitoring required in subsection (c), the Project Sponsor shall immediately investigate the cause and initiate corrective actions. The Project Sponsor shall immediately notify DDW and the Regional Water Board if the advanced treated recycled water fails to meet the pathogen reduction criteria longer than 4 consecutive hours, or more than a total of 8 hours during any 7-day period. Failure of shorter duration shall be reported to the Regional Water Board and DDW no later than 10 days after the month in which the failure occurred.

**II. DDW MONITORING REQUIREMENTS**

The Project Sponsor shall comply with all monitoring requirements specified in Section XVI of the Order, in accordance with the DDW conditional acceptance letter dated May 17, 2019.

**III. MONITORING REQUIREMENTS**

**A. Monitoring Locations**

The Project Sponsor shall establish the following monitoring locations to demonstrate compliance with the recycled water discharge limitations, and other requirements in this Order. Should the need for a change in the sampling station(s) arise in the future, the Project Sponsor shall seek approval of the proposed station by the Executive Officer prior to use.

**Table E-1. Monitoring Station Locations**

Monitoring Location Name	Monitoring Description Location
INF-001	The influent monitoring location shall be located at the lift pump station to the AWPf where representative samples of influent can be obtained.
EFF-001	The effluent monitoring location shall be located downstream of any in-plant return flows and the final disinfection process where representative samples of the effluent can be obtained.
PreRO-001	The Pre-RO monitoring location shall be located immediately upstream of the RO units.
PreAOP-001	The PreAOP monitoring location shall be located downstream of the RO process and immediately upstream of AOP treatment.
Groundwater Monitoring Wells	Refer to Table E-17.

**B. Influent Monitoring**

1. Influent monitoring is required to determine compliance with water quality conditions and standards and to assess AWPf performance.
2. The Project Sponsor shall monitor the influent to the facility at INF-001 described in Table E-1.
3. In addition to the listed parameters in Table E-2 for influent monitoring, the Project Sponsor shall comply with DDW’s monitoring requirements as described in section XVI of the Order.

The following shall constitute the influent monitoring program:

**Table E-2. Influent Monitoring**

Parameter	Units	Sample Type	Minimum Sampling Frequency
Total flow	mgd	recorder	continuous <sup>1</sup>
Total Volume	Million Gallons	calculated	monthly

**C. Recycled Water Monitoring**

1. Recycled water monitoring is required to determine compliance with the permit conditions: (1) identify operational problems and aid in improving facility performance, and (2) provide information on wastewater characteristics and flows for use in interpreting water quality and biological data.
2. The Project Sponsor shall monitor the advanced treated recycled water used for injection at monitoring location EFF-001. The monitoring location is described in Table E-1. The parameters to be monitored and monitoring frequencies are listed in Tables E-3 to E-12.
3. In addition to the listed parameters in Tables E-3 through E-12 for effluent and any intermediate monitoring, the Project Sponsor shall comply with DDW’s monitoring requirements as listed in Section XVI of the Order.
4. See MRP Sections I.P through I.T for accelerated monitoring and reporting procedures.
5. For those constituents in Tables E-3 through Table E-11 that include a “monthly/quarterly” minimum sampling frequency, the constituent shall be monitored monthly for the first year and the Project Sponsor may request a reduction to quarterly monitoring from DDW and the Regional Water Board Executive Officer if no results exceed an MCL or NL per 22 CCR § 60320.201(i)
6. For total nitrogen, nitrate, nitrite, nitrate+nitrite, and ammonia monitoring, the Project Sponsor may request a reduction in monitoring frequency after the first year of operation. To qualify for reduced monitoring, the average of all results shall not exceed 5 mg/L total nitrogen and the average of a result and its confirmation sample (taken within 24 hours of receipt of the initial result) shall not exceed 10 mg/L total nitrogen.
7. The priority pollutants in Table E-12 shall be monitored quarterly for the first two years of operation and the Project Sponsor may request a reduction to annually monitoring from DDW and the Regional Water Board Executive Officer per 22 CCR § 60320.220.
8. For those pollutants with a continuous minimum monitoring frequency, the monthly minimum and maximum, and daily average values shall be reported.
9. For those pollutants with a daily minimum monitoring frequency, samples shall be collected seven days per week unless otherwise specified.

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<sup>1</sup> For those pollutants with a continuous minimum monitoring frequency, the monthly minimum and maximum, and daily average values shall be reported.

**Table E-3. Advanced Treated Recycled Water Monitoring**

Parameter	Units	Sample Type	Minimum Sampling Frequency
Total Flow recycled water produced	mgd	recorder	continuous
Total Volume Recycled Water Produced	Million Gallons	calculated	monthly
Total Volume Recycled Water delivered to end users	Million Gallons	recorder	monthly
Total Volume Recycled Water delivered to each end user	Million Gallons	recorder	annually
Total Volume discharged to the ocean	Million Gallons	recorder	monthly
Turbidity (after MF and prior to RO)	NTU	recorder	continuous
Settleable solids	mL/L	grab	daily
TSS	mg/L	24-hour composite	weekly
BOD <sub>5</sub> 20°C	mg/L	24-hour composite	weekly
Oil and grease	mg/L	grab	monthly
Total coliform	MPN/100 mL	grab	daily
TOC <sup>2</sup>	mg/L	24-hour composite or grab	weekly
pH	pH units	recorder	continuous
Ammonia	mg/L	24-hour composite or grab	twice/week
Total nitrogen <sup>3</sup>	mg/L	calculated	twice/week
Nitrate-N (as nitrogen)	mg/L	24-hour composite or grab	twice/week
Nitrite-N (as nitrogen)	mg/L	24-hour composite or grab	twice/week
Nitrate plus Nitrite (as nitrogen)	mg/L	24-hour composite or grab	twice/week
Copper	mg/L	24-hour composite or grab	monthly / quarterly
Lead	mg/L	24-hour composite or grab	monthly / quarterly
Chromium VI	mg/L	grab	monthly/quarterly

**Table E-4. Inorganic Chemicals**

Constituent	Units	Sample Type	Minimum Sampling Frequency
Aluminum	mg/L	24-hour composite or grab	monthly / quarterly
Antimony	mg/L	24-hour composite or grab	monthly / quarterly
Arsenic	mg/L	24-hour composite or grab	monthly / quarterly

<sup>2</sup> Monitoring results for advanced treated recycled water shall be reported as a single result and as a 20-week running average of all TOC results and the average of the last four TOC results. The daily average and maximum TOC reading and the percent of time that the TOC is greater than 0.5 mg/L shall be reported. See MRP Section I.T. for additional monitoring requirements.

<sup>3</sup> See MRP Section I.S. for additional monitoring requirements.

Constituent	Units	Sample Type	Minimum Sampling Frequency
Asbestos	MFL	24-hour composite or grab	monthly / quarterly
Barium	mg/L	24-hour composite or grab	monthly / quarterly
Beryllium	mg/L	24-hour composite or grab	monthly / quarterly
Cadmium	mg/L	24-hour composite or grab	monthly / quarterly
Total Chromium	mg/L	24-hour composite or grab	monthly / quarterly
Cyanide	mg/L	grab	monthly / quarterly
Fluoride	mg/L	24-hour composite or grab	monthly / quarterly
Mercury	mg/L	24-hour composite or grab	monthly / quarterly
Nickel	mg/L	24-hour composite or grab	monthly / quarterly
Perchlorate	mg/L	24-hour composite or grab	monthly / quarterly
Selenium	mg/L	24-hour composite or grab	monthly / quarterly
Thallium	mg/L	24-hour composite or grab	monthly / quarterly

**Table E-5. Organic Chemicals (Volatile Organic Chemicals (VOCs))**

Constituent	Units	Sample Type	Minimum Sampling Frequency
Benzene	mg/L	grab	monthly / quarterly
Carbon Tetrachloride	mg/L	grab	monthly / quarterly
1,2-Dichlorobenzene	mg/L	grab	monthly / quarterly
1,4-Dichlorobenzene	mg/L	grab	monthly / quarterly
1,1-Dichloroethane	mg/L	grab	monthly / quarterly
1,2-Dichloroethane (1,2-DCA)	mg/L	grab	monthly / quarterly
1,1-Dichloroethylene (1,1-DCE)	mg/L	grab	monthly / quarterly
cis-1,2-Dichloroethylene	mg/L	grab	monthly / quarterly
trans-1,2-Dichloroethylene	mg/L	grab	monthly / quarterly
Dichloromethane	mg/L	grab	monthly / quarterly
1,2-Dichloropropane	mg/L	grab	monthly / quarterly
1,3-Dichloropropene	mg/L	grab	monthly / quarterly
Ethylbenzene	mg/L	grab	monthly / quarterly
Methyl-tert-butyl-ether (MTBE)	mg/L	grab	monthly / quarterly
Monochlorobenzene	mg/L	grab	monthly / quarterly
Styrene	mg/L	grab	monthly / quarterly
1,1,2,2-Tetrachloroethane	mg/L	grab	monthly / quarterly
Tetrachloroethylene (PCE)	mg/L	grab	monthly / quarterly
Toluene	mg/L	grab	monthly / quarterly

Constituent	Units	Sample Type	Minimum Sampling Frequency
1,2,4-Trichlorobenzene	mg/L	grab	monthly / quarterly
1,1,1-Trichloroethane	mg/L	grab	monthly / quarterly
1,1,2-Trichloroethane	mg/L	grab	monthly / quarterly
Trichloroethylene (TCE)	mg/L	grab	monthly / quarterly
Trichlorofluoromethane	mg/L	grab	monthly / quarterly
1,1,2-Trichloro-1,2,2-Trifluoroethane	mg/L	grab	monthly / quarterly
Vinyl Chloride	mg/L	grab	monthly / quarterly
Xylenes (m,p)	mg/L	grab	monthly / quarterly

**Table E-6. Organic Chemicals (Non-Volatile Synthetic Organic Chemicals (SOCs))**

Constituent	Units	Sample Type	Minimum Sampling Frequency
Alachlor	mg/L	24-hour composite or grab	monthly / quarterly
Atrazine	mg/L	24-hour composite or grab	monthly / quarterly
Bentazon	mg/L	24-hour composite or grab	monthly / quarterly
Benzo(a)pyrene	mg/L	24-hour composite or grab	monthly / quarterly
Carbofuran	mg/L	24-hour composite or grab	monthly / quarterly
Chlordane	mg/L	24-hour composite or grab	monthly / quarterly
2,4-Dichlorophenoxyacetic acid (2,4-D)	mg/L	24-hour composite or grab	monthly / quarterly
Dalapon	mg/L	24-hour composite or grab	monthly / quarterly
1,2-Dibromo-3-chloropropane (DBCP)	mg/L	24-hour composite or grab	monthly / quarterly
Di(2-ethylhexyl)adipate	mg/L	24-hour composite or grab	monthly / quarterly
Di(2-ethylhexyl)phthalate (DEHP)	mg/L	24-hour composite or grab	monthly / quarterly
Dinoseb	mg/L	24-hour composite or grab	monthly / quarterly
Diquat	mg/L	24-hour composite or grab	monthly / quarterly
Endothall	mg/L	24-hour composite or grab	monthly / quarterly
Endrin	mg/L	24-hour composite or grab	monthly / quarterly
Ethylene Dibromide (EDB)	mg/L	24-hour composite or grab	monthly / quarterly
Glyphosate	mg/L	24-hour composite or grab	monthly / quarterly
Heptachlor	mg/L	24-hour composite or grab	monthly / quarterly
Heptachlor epoxide	mg/L	24-hour composite or grab	monthly / quarterly
Hexachlorobenzene	mg/L	24-hour composite or grab	monthly / quarterly
Hexachlorocyclopentadiene	mg/L	24-hour composite or grab	monthly / quarterly
Gamma BHC (Lindane)	mg/L	24-hour composite or grab	monthly / quarterly
Methoxychlor	mg/L	24-hour composite or grab	monthly / quarterly



Constituent	Units	Sample Type	Minimum Sampling Frequency
Molinate	mg/L	24-hour composite or grab	monthly / quarterly
Oxamyl	mg/L	24-hour composite or grab	monthly / quarterly
Pentachlorophenol	mg/L	24-hour composite or grab	monthly / quarterly
Picloram	mg/L	24-hour composite or grab	monthly / quarterly
Polychlorinated Biphenyls (PCBs)	mg/L	24-hour composite or grab	monthly / quarterly
Simazine	mg/L	24-hour composite or grab	monthly / quarterly
Thiobencarb	mg/L	24-hour composite or grab	monthly / quarterly
Toxaphene	mg/L	24-hour composite or grab	monthly / quarterly
1,2,3-Trichloropropane	mg/L	grab	monthly / quarterly
2,3,7,8-TCDD (Dioxin)	mg/L	24-hour composite or grab	monthly / quarterly
2,4,5-TP (Silvex)	mg/L	24-hour composite or grab	monthly / quarterly

**Table E-7. Disinfection Byproducts**

Constituent	Units	Sample Type	Minimum Sampling Frequency
Total trihalomethanes (TTHM)	mg/L	grab	monthly / quarterly
Bromodichloromethane	mg/L	grab	monthly / quarterly
Bromoform	mg/L	grab	monthly / quarterly
Chloroform	mg/L	grab	monthly / quarterly
Dibromochloromethane	mg/L	grab	monthly / quarterly
Haloacetic acids (five) (HAA5)	mg/L	grab	monthly / quarterly
Monochloroacetic Acid	mg/L	grab	monthly / quarterly
Dichloroacetic Acid	mg/L	grab	monthly / quarterly
Trichloroacetic Acid	mg/L	grab	monthly / quarterly
Monobromoacetic Acid	mg/L	grab	monthly / quarterly
Dibromoacetic Acid	mg/L	grab	monthly / quarterly
Bromate	mg/L	grab	monthly / quarterly
Chlorite	mg/L	grab	monthly / quarterly

**Table E-8. Radioactivity**

Constituent	Units	Sample Type	Minimum Sampling Frequency
Combined Radium-226 and Radium-228	pCi/L	24-hour composite or grab	monthly / quarterly
Gross Alpha particle activity (excluding radon and uranium)	pCi/L	24-hour composite or grab	monthly / quarterly

Constituent	Units	Sample Type	Minimum Sampling Frequency
Uranium	pCi/L	24-hour composite or grab	monthly / quarterly
Gross Beta/photon emitters <sup>4</sup>	millirem/yr	24-hour composite or grab	monthly / quarterly
Strontium-90	pCi/L	24-hour composite or grab	monthly / quarterly
Tritium	pCi/L	24-hour composite or grab	monthly / quarterly

**Table E-9. General Physical and General Minerals**

Constituent	Units	Sample Type	Minimum Sampling Frequency
Calcium	µg/L	24-hour composite or grab	quarterly
Potassium	µg/L	24-hour composite or grab	quarterly
Sodium	µg/L	24-hour composite or grab	quarterly
Total hardness	µg/L	24-hour composite or grab	quarterly

**Table E-10. Secondary MCLs**

Constituent	Units	Sample Type	Minimum Sampling Frequency
Color	ACU	24-hour composite or grab	Annually
Foaming agents (MBAS)	mg/L	24-hour composite or grab	Annually
Iron	mg/L	24-hour composite or grab	Annually
Manganese	mg/L	24-hour composite or grab	Annually
Methyl-tert-butyl ether (MTBE)	mg/L	24-hour composite or grab	Annually
Odor - Threshold	TON	24-hour composite or grab	Annually
Silver	mg/L	24-hour composite or grab	Annually
Turbidity	NTU	24-hour composite or grab	Annually
Zinc	mg/L	24-hour composite or grab	Annually
Total Dissolved Solids	mg/L	24-hour composite	quarterly
Sulfate	mg/L	24-hour composite	quarterly
Chloride	mg/L	24-hour composite	quarterly

**Table E-11. Constituents with Notification Levels<sup>5</sup>**

Constituent	Units	Sample Type	Minimum Sampling Frequency
Boron	µg/L	24-hour composite or grab	monthly / quarterly

<sup>4</sup> If the results of testing for all beta and photon emitters is less than or equal to 50 pCi/L, the facility is in compliance and the value shall be reported as <4 millirem/year. If the test results for all beta and photon emitters are greater than 50 pCi/L, the Project Sponsor must have the samples further analyzed for the *individual* nuclides. If the sum of the fractions of the detected nuclides is <4 millirem/year, the facility is in compliance. The procedures for calculating the sum of fractions is presented in the Compliance Determination section of the Order (Section XXI).

<sup>5</sup> This table includes a list of pollutants with notification levels at the time this permit was adopted. The project sponsor shall maintain an updated list of pollutants with notification levels and monitor these pollutants as they are adopted into 22 CCR.

Constituent	Units	Sample Type	Minimum Sampling Frequency
n-butylbenzene	µg/L	grab	monthly / quarterly
sec-butylbenzene	µg/L	grab	monthly / quarterly
tert-butylbenzene	µg/L	grab	monthly / quarterly
Carbon Disulfide	µg/L	grab	monthly / quarterly
Chlorate	µg/L	24-hour composite or grab	monthly / quarterly
2-chlorotoluene	µg/L	grab	monthly / quarterly
4-chlorotoluene	µg/L	grab	monthly / quarterly
Diazinon	µg/L	grab	monthly / quarterly
Dichlorodifluoromethane (Freon 12)	µg/L	grab	monthly / quarterly
1,4-dioxane	µg/L	grab	monthly / quarterly
Ethylene Glycol	µg/L	grab	monthly / quarterly
Formaldehyde	µg/L	grab	monthly / quarterly
HMX	µg/L	24-hour composite or grab	monthly / quarterly
Isopropylbenzene	µg/L	grab	monthly / quarterly
Manganese	µg/L	24-hour composite or grab	monthly / quarterly
Methyl Isobutyl Ketone (MIBK)	µg/L	grab	monthly / quarterly
Naphthalene	µg/L	grab	monthly / quarterly
N-Nitrosodiethylamine (NDEA)	µg/L	24-hour composite or grab	monthly / quarterly
N-Nitrosodimethylamine (NDMA)	µg/L	grab	monthly / quarterly
N-Nitrosodi-n-propylamine (NDPA)	µg/L	24-hour composite or grab	monthly / quarterly
Perfluorooctanoic acid (PFOA)	µg/L	24-hour composite or grab	monthly / quarterly
Perfluorooctanesulfonic acid (PFOS)	µg/L	24-hour composite or grab	monthly / quarterly
Propachlor	µg/L	grab	monthly / quarterly
N-propylbenzene	µg/L	grab	monthly / quarterly
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	µg/L	24-hour composite or grab	monthly / quarterly
Tertiary Butyl Alcohol (TBA)	µg/L	grab	monthly / quarterly
1,2,4-Trimethylbenzene	µg/L	grab	monthly / quarterly
1,3,5-Trimethylbenzene	µg/L	grab	monthly / quarterly
2,4,6-Trinitrotoluene (TNT)	µg/L	grab	monthly / quarterly
Vanadium	µg/L	24-hour composite or grab	monthly / quarterly

**Table E-12. Remaining Priority Toxic Pollutants**

Constituent	Units	Sample Type	Minimum Sampling Frequency
Acenaphthene	µg/L	24-hour composite or grab	quarterly/annually
Acrolein	µg/L	24-hour composite or grab	quarterly/annually
Acrylonitrile	µg/L	grab	quarterly/annually
Benzidine	µg/L	24-hour composite or grab	quarterly/annually
Chlorobenzene	µg/L	grab	quarterly/annually
Hexachloroethane	µg/L	grab	quarterly/annually
Chloroethane	µg/L	grab	quarterly/annually
Bis(2-chloroethyl) ether	µg/L	24-hour composite or grab	quarterly/annually

Constituent	Units	Sample Type	Minimum Sampling Frequency
2-chloroethyl vinyl ether	µg/L	grab	quarterly/annually
2-chloronaphthalene	µg/L	24-hour composite or grab	quarterly/annually
2,4,6-trichlorophenol	µg/L	24-hour composite or grab	quarterly/annually
Parachlorometa cresol	µg/L	24-hour composite or grab	quarterly/annually
2-chlorophenol	µg/L	24-hour composite or grab	quarterly/annually
1,3-dichlorobenzene	µg/L	grab	quarterly/annually
3,3'-dichlorobenzidine	µg/L	24-hour composite or grab	quarterly/annually
2,4-dichlorophenol	µg/L	24-hour composite or grab	quarterly/annually
2,4-dimethylphenol	µg/L	24-hour composite or grab	quarterly/annually
2,4-dinitrotoluene	µg/L	grab	quarterly/annually
2,6-dinitrotoluene	µg/L	grab	quarterly/annually
1,2-diphenylhydrazine	µg/L	24-hour composite or grab	quarterly/annually
Fluoranthene	µg/L	grab	quarterly/annually
4-chlorophenyl phenyl ether	µg/L	24-hour composite or grab	quarterly/annually
4-bromophenyl phenyl ether	µg/L	24-hour composite or grab	quarterly/annually
Bis(2-chloroisopropyl) ether	µg/L	24-hour composite or grab	quarterly/annually
Bis(2-chlorethoxy) methane	µg/L	24-hour composite or grab	quarterly/annually
Methyl chloride (chloromethane)	µg/L	grab	quarterly/annually
Methyl bromide (bromomethane)	µg/L	grab	quarterly/annually
Hexachlorobutadiene	µg/L	grab	quarterly/annually
Isophorone	µg/L	grab	quarterly/annually
Nitrobenzene	µg/L	24-hour composite or grab	quarterly/annually
2-nitrophenol	µg/L	24-hour composite or grab	quarterly/annually
4-nitrophenol	µg/L	24-hour composite or grab	quarterly/annually
2,4-dinitrophenol	µg/L	24-hour composite or grab	quarterly/annually
4,6-dinitro-o-cresol	µg/L	24-hour composite or grab	quarterly/annually
N-nitrosodiphenylamine	µg/L	24-hour composite or grab	quarterly/annually
Phenol	µg/L	24-hour composite or grab	quarterly/annually
Bis(2-ethylhexyl) phthalate	µg/L	grab	quarterly/annually
Butyl benzyl phthalate	µg/L	grab	quarterly/annually
Di-n-butyl phthalate	µg/L	grab	quarterly/annually
Di-n-octyl phthalate	µg/L	grab	quarterly/annually
Diethyl phthalate	µg/L	grab	quarterly/annually
Dimethyl phthalate	µg/L	grab	quarterly/annually
Benzo(a) anthracene	µg/L	grab	quarterly/annually
Benzo(b) fluoranthene	µg/L	grab	quarterly/annually
Benzo(k) fluoranthene	µg/L	grab	quarterly/annually
Chrysene	µg/L	grab	quarterly/annually
Acenaphthylene	µg/L	grab	quarterly/annually
Anthracene	µg/L	grab	quarterly/annually
Benzo(ghi) perylene	µg/L	grab	quarterly/annually
Fluorene	µg/L	grab	quarterly/annually

Constituent	Units	Sample Type	Minimum Sampling Frequency
Phenanthrene	µg/L	grab	quarterly/annually
Dibenzo(a,h)anthracene	µg/L	grab	quarterly/annually
Indeno(1,2,3-c,d) pyrene	µg/L	grab	quarterly/annually
Pyrene	µg/L	grab	quarterly/annually
Aldrin	µg/L	grab	quarterly/annually
Dieldrin	µg/L	grab	quarterly/annually
4,4'-DDT	µg/L	24-hour composite or grab	quarterly/annually
4,4'-DDE	µg/L	24-hour composite or grab	quarterly/annually
4,4'-DDD	µg/L	24-hour composite or grab	quarterly/annually
Alpha-endosulfan	µg/L	grab	quarterly/annually
Beta-endosulfan	µg/L	grab	quarterly/annually
Endosulfan sulfate	µg/L	grab	quarterly/annually
Endrin aldehyde	µg/L	grab	quarterly/annually
Alpha-BHC	µg/L	grab	quarterly/annually
Beta-BHC	µg/L	grab	quarterly/annually
Delta-BHC	µg/L	grab	quarterly/annually

**D. Constituents of Emerging Concern (CECs) Monitoring and Bioanalytical Screening**

1. The following CEC monitoring requirements and Attachment H are consistent with the Recycled Water Policy and DDW's recommendations.
2. Compliance with health-based CECs shall be determined by analyzing samples of the advanced treated recycled water (EFF-001) produced at the AWPf prior to release into the aquifer.
3. Compliance with performance indicator CECs shall be determined by analyzing samples collected prior to treatment by RO (PreRO-001) and following treatment (EFF-001) prior to release into the aquifer. The removal percentages for the performance indicator CECs shall be included in the Annual Summary Report.
4. 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.
5. For groundwater recharge-reuse using subsurface application, the removal percentage shall be determined by comparing recycled water quality before treatment by RO/AOPs and after treatment prior to release to the aquifer.
6. The Project Sponsor shall develop and maintain a Quality Assurance Project Plan (QAPP) for monitoring CECs to ensure the project data are of known, consistent, and documented quality and that the monitoring is consistent with the Recycled Water Policy. The QAPP shall be developed using the Guidance for Quality Assurance Project Plans, EPA QA/G-5 (EPA/240/R-2/009, 2002). The QAPP shall be submitted to the Regional Water Board within 90 days of the adoption of this Order and approved by the Regional Water Board or State Water Board prior to beginning any sampling or analysis. The QAPP shall be updated

and resubmitted to the Regional Water Board for approval when significant changes are made that would affect the overall data quality and use (eg. using a new analytical chemistry laboratory) or at least annually if any changes are made.

7. The Project Sponsor shall submit the quality assurance data specified in the QAPP, including percent recoveries and acceptable recovery ranges for each analyte, to the Regional Water Board with each data set.
8. Laboratories shall use analytical methods that have been validated and approved for the analytes in the applicable matrix and can achieve the reporting limits in Tables E-13 through E-15. This includes methods that have been approved by USEPA, the Standards Methods Committee, the American Society for Testing and Materials International, or other methods that have been validated and approved by the regional water boards or State Water Board for the analytes in the applicable matrix. The QAPP shall include minimum method validation requirements developed by the Regional Water Board in consultation with the State Water Board if proposing to (1) use a method that has not been validated and approved, (2) use a validated and approved method that has been modified, or (3) use a method for an application that is outside the intended use of the method (e.g., different matrix, new analyte).
9. A laboratory providing analyses of CECs and bioanalytical screening must hold a valid certificate of accreditation from the State of California Environmental Laboratory Accreditation Program (ELAP) for the analytical test methods or analytes selected, if such methods or analytes are accredited by ELAP at the time that monitoring is required to begin. If ELAP accreditation for analytical test methods or an analyte becomes available after monitoring is initiated, then the laboratory providing analysis of CECs shall be accredited by ELAP for those methods or analytes within one year of such accreditation becoming available. If ELAP accreditation is unavailable for a method or an analyte, the recycled water producer shall use a laboratory that has been accredited for a similar analytical method, instrumentation, or analyte until ELAP accreditation becomes available, unless otherwise approved by the Regional Water Board or State Water Board for bioanalytical screening tools.
10. The Project Sponsor shall conduct a three-phased monitoring approach for the CEC monitoring parameters in Table E-13 through E-15, which includes an initial assessment monitoring phase, followed by a baseline monitoring phase, and then a standard operation monitoring phase. The Project Sponsor shall conduct these phases in accordance with Attachment H.

**Table E-13. CECs to be Monitored (Subsurface Application)**

Constituent	Relevance/ Indicator Type	Sample Type	Reporting Limit (µg/L)	Prior to RO (PreRO- 001)	Following Treatment Prior to Injection (EFF-001)
1,4-dioxane <sup>6</sup>	Health	grab	0.1	NO	YES
N-Nitrosodimethylamine (NDMA) <sup>7</sup>	Health and Performance	grab	0.002	YES	YES
N-Nitrosomorphine (NMOR)	Health	grab	0.002	NO	YES
Perfluorooctane sulfonate (PFOS)	Health	grab	0.0065	NO	YES
Perfluorooctanoic Acid (PFOA)	Health	grab	0.0051	NO	YES
Sucralose	Performance	grab	0.1	YES	YES
Sulfamethoxazole	Performance	grab	0.01	YES	YES

**Table E-14. Surrogates to be Monitored (Subsurface Application)**

Constituent	Sample Type	Prior to RO	Following Treatment Prior to Injection
Electrical Conductivity	online	YES	YES
Dissolved Organic Carbon	24-hour composite/grab	YES	YES
UV Light Absorbance	online	YES	YES

**Table E-15. Bioanalytical Screening Tools for CECs**

Endpoint Activity	Example Relevant CECs	Reporting Limit (ng/L)	Prior to RO	Following Treatment Prior to Injection
Estrogen Receptor α (ER-α)	Estradiol, bisphenol A, nonylphenol	0.5	NO	YES
Aryl Hydrocarbon receptor (AhR)	Dioxin-like chemicals, polycyclic aromatic hydrocarbons, pesticides	0.5	NO	YES

**E. Regional Salinity Management Pipeline (RSMP) Monitoring**

While using the RSMP, a monitoring location shall be established on the Las Posas temporary piping from the RSMP line to the PVCWD distribution system. The monitoring program for this sampling location is included in Table E-16. If no exceedance of a primary or secondary MCL or Basin Plan objective is observed in quarterly sampling of total nitrogen and other constituents with either a primary or

<sup>6</sup> 1,4-dioxane is required to be monitored monthly and then quarterly if there are no detections for a year of monthly monitoring per table E-11 and section III.C.5. Analytical results from this monitoring may be used to comply with the CEC monitoring requirement.

<sup>7</sup> NDMA is required to be monitored monthly and then quarterly if there are no detections for a year of monthly monitoring per table E-11 and section III.C.5. Analytical results from this monitoring may be used to comply with the CEC monitoring requirement prior to injection; however, NDMA is also required to be monitored prior to RO.

secondary MCL, the monitoring frequency for those constituents can be reduced to biannually.

**Table E-16. AWPf-Treated Effluent Monitoring via RSMP**

Constituent	Units	Type of Sample	Minimum Frequency of Analysis
Total Dissolved Solids	mg/L	24-hour composite	Monthly
Chloride	mg/L	24-hour composite	Monthly
Boron	mg/L	24-hour composite	Monthly
Sulfate	mg/L	24-hour composite	Monthly
Total Nitrogen	mg/L	24-hour composite	Monthly
Nitrate	mg/L	24-hour composite	Quarterly
Nitrite	mg/L	24-hour composite	Quarterly
Nitrate + Nitrite	mg/L	24-hour composite	Quarterly
Remaining Inorganics with Primary MCLs except asbestos	mg/L	24-hour composite or grab	Semiannually
Constituents/parameters with Secondary MCLs	mg/L	24-hour composite	Semiannually

**E. Groundwater Monitoring Associated with Subsurface Application (Injection Wells)**

Pursuant to 22 CCR § 60320.226, prior to operating a GRRP, the Project Sponsor is required to site and construct at least two monitoring wells downgradient of the GRRP such that: (1) at least one monitoring well is located no less than two weeks but no more than six months of travel time from the GRRP, and at least 30 days upgradient of the nearest potable well; and (2) in addition, at least one monitoring well is located between the GRRP and the nearest upgradient drinking water well. Furthermore, the Project Sponsor is required to collect groundwater samples independently from each aquifer receiving the recycled water.

The Project Sponsor constructed three monitoring wells, one nested well (MW-1) perforated at three separate depths, and two single completion monitoring wells (MW-2 and MW-3). The individual wells within MW-1 are designated deep (MW-1D), middle (MW-1M), and shallow (MW-1S). Monitoring wells MW-1M, MW-2, and MW-3 are all completed in the same aquifer zones as ASR Well No. 1. These monitoring wells were designed to provide water level and water quality data during demonstration testing. MW-1D and MW-1S are completed in aquifer zones directly below and above the ASR well production zone. Injection of the advanced treated recycled water will occur in the upper most aquifer zones of the Hueneme aquifer in the lower aquifer system.

The Project Sponsor shall monitor the following monitoring wells, associated with subsurface application:

**Table E-17. Groundwater Monitoring Wells**

Well Name	Perforated Interval (feet bgs)	Aquifer
MW-1D	610-700	Hueneme
MW-1M	460-500 and 530 to 565	Hueneme
MW-1S	320-380	Mugu
MW-2	450 to 500 and 525 to 560	Hueneme
MW-3	450 to 500 and 530 to 570	Hueneme



**F. Groundwater Monitoring and Sampling Frequency (Subsurface Applications)**

1. The Project Sponsor shall monitor the quality of groundwater to assess any impact(s) from the recharge of advanced treated recycled water. Representative samples of groundwater shall be collected from the listed monitoring wells in Table E-17.
2. If any of the monitoring results indicate that an MCL has been exceeded or coliforms are present in the monitoring wells at the injection areas as a result of the use of advanced treated recycled water, the Project Sponsor shall notify DDW and the 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. Subsurface application shall be discontinued until corrective actions are taken or a determination is made that ASR well activity was not responsible for the contamination.
3. Per Title 22, Section 60320.220, priority pollutants shall be monitored in the groundwater quarterly for two years and may be reduced to annually following approval from DDW and the Regional Water Board Executive Officer.

**Table E-18. Groundwater Monitoring**

Parameters	Units	Sample Type	Minimum Sampling Frequency
Water level elevation <sup>8</sup>	feet	---	quarterly
TOC	mg/L	grab	quarterly
Total Coliform	MPN/100 mL	grab	quarterly
BOD <sub>5</sub> 20°C	mg/L	grab	annually
Oil and grease	mg/L	grab	annually
Nitrate-N	mg/L	grab	quarterly
Nitrite-N	mg/L	grab	quarterly
Total Nitrogen	mg/L	calculated	quarterly
Total Dissolved Solids	mg/L	grab	quarterly
Sulfate	mg/L	grab	quarterly
Chloride	mg/L	grab	quarterly
Boron	mg/L	grab	quarterly
Odor	TON	grab	quarterly
Color	ACU	grab	quarterly
Total Suspended Solids (TSS)	mg/L	grab	quarterly
Remaining Inorganics with Primary MCLs (Table E-4)	µg/L, MFL	grab	quarterly
Remaining Regulated Organics (Tables E-5 and E-6)	µg/L	grab	quarterly
Remaining Constituents/parameters with Secondary MCLs (Table E-10)	varies	grab	quarterly
Disinfection Byproducts (Table E-7)	µg/L	grab	quarterly

<sup>8</sup> Water level elevations shall be measured to the nearest 0.01 feet and referenced to mean sea level.

Parameters	Units	Sample Type	Minimum Sampling Frequency
Radioactivity (Table E-8)	pCi/L, millirem/year	grab	quarterly
Remaining General Physical and General Minerals (Table E-9)	µg/L	grab	annually
Remaining Constituents with Notification Levels (Table E-11)	µg/L	grab	quarterly
Remaining Priority Pollutants (Table E-12)	µg/L	grab	quarterly/annually

4. If any of the groundwater monitoring results indicates 80% of sum of a nitrate, nitrite, or nitrate plus nitrite MCL has been exceeded, another sample shall be collected for confirmation within 48 hours of receiving the results from the laboratory. If the average of the initial sample and confirmation sample exceeds the MCL, DDW and Regional Water Board shall be notified within 24 hours. Subsurface application shall be discontinued until corrective actions are taken or a determination is made that ASR well activity was not responsible for the contamination.

**G. USE AREA MONITORING**

The Project Sponsor is responsible for ensuring use area data is collected and submitted in the annual report. The following shall be recorded for each user with additional reporting for use areas as appropriate. The frequency of use area inspections shall be based on the complexity and risk of each use area. Use areas may be aggregated to combine acreage for calculation or observation purposes. Use area monitoring shall include:

**Table E-19. Use Area Monitoring**

Parameter	Units	Sample Type	Sampling Frequency	Reporting Frequency
Recycled Water User	---	---	---	Annually
Average Monthly Recycled Water Flow	Gallons Per Day (Gpd)	Meter	Monthly	Annually
Acreage Applied	Acres	Calculated	---	Annually
Application Rate	Inches/Acre/Year	Calculated	---	Annually
Soil Saturation and Ponding	---	Observation	Quarterly	Annually
Nuisance Odors/Vectors	---	Observation	Quarterly	Annually
Discharge Offsite	---	Observation	Quarterly	Annually
Notification Signs	---	Observation	Quarterly	Annually

**IV. REPORTING REQUIREMENTS**

The Project Sponsor shall submit the required reports, outlined in this section, to the State Water Resources Control Board’s (State Water Board) Geotracker database by the specified dates.

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

1. 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).
2. 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.” The laboratory shall write the estimated chemical concentration of the sample next to “DNQ.”
3. Sample results less than the laboratory’s MDL shall be reported as “Not-Detected”, or ND.
4. If the Project Sponsor samples and performs analyses (other than for process/operational control, startup, research, or equipment testing) 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.
5. The Regional Water Board or DDW may request supporting documentation, such as daily logs of operations.
6. All reports shall reference the Compliance File No. CI-9456 and shall be uploaded to the State Water Board’s GeoTracker database under Global ID WDR100000408. Compliance monitoring reports shall be submitted separately from other technical reports.
7. All submittals shall comply with the Electronic Submittal of Information (ESI) requirements by submitting all reports required under the WDRs/WRRs, including groundwater monitoring data, discharge location data, and searchable Portable Document Format. If any file exceeds 10 megabytes then the report shall be uploaded in multiple parts. Upon request, the data shall be provided in excel format.
8. The Project Sponsor shall submit the required annual and 5-year reports as described in 22 CCR § 60320.228.

#### B. Monthly Reports

Monthly monitoring reports shall be submitted to the Regional Water Board and DDW by the 10<sup>th</sup> day of the month following the month of sampling and shall include:

1. The results of daily Membrane Integrity Testing (MIT) and calculated Log Reduction Values (LRVs).
2. The daily average and maximum conductivity readings for the RO effluent, the percent of time that the conductivity is greater than 350 micro-Siemens, and the average reduction in electrical conductivity achieved.
3. Continuous turbidity analytical results for the month for the AWPf advanced treated recycled water (located after MF and before RO) including the daily average, daily maximum, and percent of time the turbidity exceeds 0.2 NTU. The Project Sponsor shall also report if the MF effluent turbidity exceeded 0.5 NTU at any time.

4. Summary of the calculated NDMA log reduction along with Ultraviolet Intensity (UVI), Ultraviolet Transmittance (UVT), power, flowrate (Q), calculated UVI/Q, calculated hydrogen peroxide dose, and any reactor failures.
5. Based on the daily log reduction calculation, report a “Yes” or “No” for each day to indicate if the necessary pathogenic microorganism log reductions (12-logs virus, 10-logs *Giardia* and *Cryptosporidium* oocyst) have been achieved. The daily minimum model predicated 1,4-dioxane and NDMA log reduction shall also be reported. An overall log reduction calculated value must be provided daily unless the AWPf is offline for a 24-hour period.
6. Daily coliform analytical results for AWPf advanced treated recycled water.
7. Summary of the monthly operational parameters for UV and hydrogen peroxide dose.
8. TOC results for the RO influent and effluent including the average and maximum, and the percent of time that the TOC is greater than 0.5 mg/L.

C. Quarterly Reports

1. Quarterly monitoring reports shall be submitted to the Regional Water Board by the 15<sup>th</sup> day of the third month following the end of each quarterly monitoring period.
2. The quarterly reports shall include, at a minimum, the following information:
  - a. A one-page summary of operational concerns that address changes in reporting conditions including influent, AWPf recycled water, and the groundwater monitoring results since the last report.
  - b. Summary of monthly operational parameters for calculated 1,4-Dioxane and NDMA log reduction along with flowrate, UVT, pH and any reactor failure(s).
  - c. Volume of the influent, volume of the advanced treated recycled water injected, and volume of water used for nonpotable uses. If no advanced treated recycled water was injected or reused during the quarter, the report shall so state.
  - d. Date and time of sampling and analyses.
  - e. The analytical method used and the method detection limit for each parameter analyzed.
  - f. All analytical results of samples collected during the monitoring period of the influent, advanced treated recycled water, and groundwater.
  - g. 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.
  - h. Calculations indicating what percent results of the quarter’s monitoring did not meet the surrogate and/or operational parameter limits established to assure proper on-going performance of the RO and AOP processes. If the calculated percent exceeds 10 percent, the Project Sponsor will submit a report to DDW and the Regional Water Board within 45 days of the end of the quarter. The

report will describe corrective actions planned or taken to reduce the percent to less than 10. If necessary, the Project Sponsor shall consult with regulators, and comply with an alternative monitoring plan approved by DDW and Regional Water Board.

- i. Discussion of compliance, noncompliance, or violation of requirements.
  - j. All corrective or preventive action(s) taken or planned with a schedule of implementation, if any.
  - k. Summary of operational concerns describing changes in reporting conditions, including influent, AWWPF advanced treated recycled water, and groundwater monitoring results, since the last report.
  - l. Monitoring results associated with the evaluation of pathogenic microorganism removal as described in this Order.
  - J. Summary of monitoring results, calculations, and analyses for Health-Based CECs, Performance Indicator CECs, and CEC surrogates.
- D. Annual Summary Reports
1. The Annual Summary Report shall be received by April 15 of each year and shall contain a discussion of the previous calendar year's analytical results, as well as graphical and tabular summaries of the monitoring analytical data.
  2. Public water systems, owners of small water systems and other active production wells having down-gradient sources potentially affected by the ASR wells or within 10 years groundwater travel time from the ASR well injection location shall be notified by direct mail and/or electronic mail of the availability of the annual report.
  3. The Annual Summary Report shall include the following information at a minimum:
    - a. The amount of advanced treated recycled water produced by the AWWPF, the amount injected into the ASR well and extracted from the ASR well each year, and the amount distributed for nonpotable reuse.
    - b. Documentation demonstrating the requirements for retention time underground and the distance from the nearest extraction well are being met.
    - c. Tabular and graphical summaries of the monitoring data obtained during the previous calendar year including advanced treated recycled water and groundwater quality data.
    - d. A summary of compliance status with the applicable monitoring requirements during the previous calendar year.
    - e. 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 subsurface application of recycled municipal wastewater resulting from a violation.
      - iii. If uncorrected, a schedule for and summary of all remedial actions.

- f. Any detections of monitored chemicals or contaminants, and any observed trends in the monitoring wells (and if applicable, in diluent water supplies).
  - g. Information regarding the vertical and horizontal migration of the plume from the ASR well.
  - h. Title 22 drinking water quality data for the nearest domestic water supply well.
  - i. A description of any changes in the operation of any unit processes or facilities.
  - j. A description of any anticipated changes, along with an evaluation of the expected impact of the changes on subsequent unit processes.
  - k. An estimated quantity and quality of the advanced treated recycled water to be utilized for the next calendar year.
  - l. A summary of the measures taken to comply with wastewater source control program and the effectiveness of the implementation of the measures.
  - m. 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 Sponsor to monitor compliance with this Order, their status of certification, and provide a summary of their proficiency test.
  - n. A list of current operating personnel, their responsibilities, and their corresponding grade of certification.
  - o. A summary of monitoring reports, and reporting and trend analyses, to describe the changes in water quality and contrast them to background measurements for all constituents exceeding MCLs or where concentration trends increase after the addition of recycled water. Specifically describe studies or investigations made to identify the source, fate, and transport path of constituents which exceed the MCL at the monitoring wells.
  - p. Results of any tracer studies performed throughout the year, if applicable.
  - q. The Annual Summary Report shall be prepared by an engineer licensed in California and experienced in the fields of wastewater treatment and public water supply.
4. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

**Table E-20. Monitoring Periods and Reporting Schedule**

<b>Sampling Frequency</b>	<b>Monitoring Period Begins On...</b>	<b>Monitoring Period</b>	<b>SMR Due Date</b>
Continuous	Permit effective date	All	Submit with monthly report

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Daily	Permit effective date	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with monthly report
Weekly	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday	Submit with monthly report
Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	1 <sup>st</sup> day of calendar month through last day of calendar month	By the 10 <sup>th</sup> day of the month following the month of sampling
Quarterly	Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	May 15 August 15 November 15 February 15
Semiannually	Closest of January 1 or July 1 following (or on) permit effective date	January 1 through June 30 July 1 through December 31	Submit with corresponding quarterly report.
Annually	January 1 following (or on) permit effective date	January 1 through December 31	April 15

5. The Project Sponsor shall conduct startup and commissioning testing that meets the requirement in 22 CCR § 60320.201: Advanced Treatment Criteria. A test protocol must be submitted to the Regional Water Board and DDW for approval prior to commencement of testing.
6. Prior to startup of the ASR, the Project Sponsor shall submit an updated Operation Optimization Plan (OOP) that meets the requirements set forth in 22 CCR § 60320.222 to DDW and the Regional Water Board for approval. The OOP must always be representative of the current operations, maintenance, and monitoring, and must be updated within 30 days of any significant changes to current operations. At a minimum, the Operation Optimization Plan shall identify and describe the operations (including validation of unit processes pathogen log reduction credits per Title 22 Section 60320.208(c)), maintenance (including prevention of cross connections, bypass treatment, and replacement of membranes), analytical methods (regulated and unregulated chemicals per title 22 Section 60320.204), monitoring (including process monitoring and instrumentation calibration) necessary to meet the requirements and the reporting of monitoring results (including compliance, performance monitoring and methodology for the calculation of pathogen log reduction achieved per process). The Operation Optimization Plan shall include the following at a minimum:
  - a. The required monitoring and reporting for all waste streams at the AWPF.

- b. Critical operational parameters to include routine testing procedures for the microfiltration (MF), reverse osmosis (RO), and the 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 AWPf, 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 AWPf, all treatment processes shall be operated in a manner to provide optimal reduction of microbial, regulated and unregulated contaminants. Based on this experience and anytime operational changes are made, the Operation Optimization Plan shall be updated.
  - c. 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 DDW and the Regional Water Board. Significant changes in the approved Operation Optimization Plan must be approved by DDW and the Regional Water Board prior to instituting changes. The Project Sponsor shall be responsible for ensuring that the Operation Optimization Plan is always representative of the current operations, maintenance, and monitoring of the AWPf.
- E. Five-Year Engineering Report:** Pursuant to 22 CCR § 60320.228, every five years from the date of initial approval of the engineering report required pursuant to 22 CCR § 60323, the Project Sponsor shall update the engineering report to address any project changes and submit the report to the Regional Water Board and DDW. The Five-Year Engineering Report Update shall include the following:
1. A description of any inconsistencies between previous groundwater model predictions, if any, and the observed and/or measured values, as well as a description of how subsequent predictions will be accurately determined. The groundwater flow and transport conditions will be summarized for the advanced treated recycled water injection into the ASR well during the previous five calendar years. This summary will also use the most current data for the evaluation of the transport of recycled water; such evaluations will include, at a minimum, the following information:
    - a. The total quantity of advanced treated recycled water injected into each major aquifer.
    - b. Estimates of the rate and path of flow of the injected water within each major aquifer.
    - c. Projections of the arrival time of the recycled water at the closest extraction well (City Well No. 20), and the percent of the advanced treated recycled water at the wellhead.
    - d. Clear presentation on any assumptions and/or calculations used for determining the rates of flow and for projecting arrival times and dilution levels.



- e. 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.
- f. A revised flow and transport model to match actual flow patterns observed within the aquifer if the flow paths have significantly changed.
- g. Revised estimates, if applicable, on hydrogeologic conditions, including the retention time and the amount of the advanced treated recycled water in the aquifers and at the nearest potable well at the end of that calendar year. The revised estimates will be based upon actual data collected during that year on recharge rates (including advanced treated recycled water, native water, and if applicable, any other diluent water), hydrostatic head values, groundwater extraction rates, basin storage changes, and any other data needed to revise the estimate of the retention time and the amount of the advanced treated recycled water in the aquifers and at the nearest potable well. Significant differences and the reasons for such differences between the estimates presented in the approved Engineering Report and subsequently revised estimates, will be clearly presented. The most recently available data will be utilized to predict the retention time of advanced treated recycled water in the subsurface.
- h. Evaluation of the ability of the Project Sponsor to comply with all regulations and provisions over the following five years.
- i. 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.

#### F. CEC Phased Monitoring Reports

After the completion of each CEC monitoring phase, the Project Sponsor shall submit a final report including a summary of all monitoring data collected, calculations performed, an assessment of the data, and the recommended monitoring frequency for the following phase. Since the phases for bioanalytical screening tools differs in length from the phases for health-based and performance indicator CECs, two separate CEC monitoring reports shall be submitted for each phase, one for health-based and performance indicator CECs, and another for bioanalytical screening tools. The final report for each phase shall be submitted to the Regional Water Board within 90 days of receiving the results of the final sample collected for that phase.

#### G. Climate Change Vulnerability Assessment and Management Plan

The Project Sponsor shall develop a Climate Change Effects Vulnerability Assessment and Management Plan (Climate Change Plan) and submit the Climate Change Plan to the Regional Water Board for the Executive Officer's approval no later than 12 months after the adoption of this Order. The Climate Change plan shall include an assessment of short-term and long-term vulnerabilities of the OWTP, AWP, all treatment systems, the collection system, recycled water distribution system, outfalls, and operations for predicted impacts in order to ensure that the facility operations are not disrupted, compliance with permit conditions is achieved,

and receiving waters are not adversely impacted by discharges. Control measures shall include, but are not limited to, emergency procedures, contingency plans, alarm/notification systems, training, backup power and equipment, and the need for planned mitigation measures to ameliorate climate-induced impacts including, but not limited to changing influent and receiving water quality conditions, as well as the impact of rising sea level (where applicable), wildfires, storm surges, and back-to-back severe storms that are expected to become more frequent.

**V. CERTIFICATION STATEMENT**

Each report shall contain the following declaration:

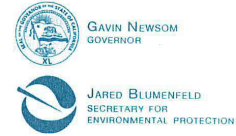
“I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry 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 fine and imprisonment.

Executed on the \_\_\_\_\_ day of \_\_\_\_\_ at \_\_\_\_\_.

\_\_\_\_\_ (Signature)

\_\_\_\_\_ (Title)

## ATTACHMENT F – DDW CONDITIONAL ACCEPTANCE LETTER



**State Water Resources Control Board**  
Division of Drinking Water

May 17, 2019

Deborah J. Smith, Executive Officer  
Regional Water Quality Control Board  
Los Angeles Region  
320 W. 4th Street, Suite 200  
Los Angeles, CA 90013

**CONDITIONAL ACCEPTANCE LETTER FOR THE CITY OF OXNARD GROUNDWATER RECHARGE ENHANCEMENT AND TREATMENT PROGRAM (5690003-701)**

Dear Ms. Smith,

This letter transmits the State Water Resources Control Board, Division of Drinking Water (Division) conditional acceptance of the City of Oxnard's (City) Engineering Report dated December 2018, for the Groundwater Recharge Enhancement and Treatment Program (Project).

The City is the sponsor for a Groundwater Replenishment Reuse Project (GRRP) which is subject to the requirements of Title 22 Code of Regulations, Division 4, Chapter 3, Article 5.2. Indirect Potable Reuse: Groundwater Replenishment – Subsurface Application, Sections 60320.200 through 60320.230. The Project includes full advanced treatment of effluent from Oxnard Wastewater Treatment Plant (OWTP) at the City's Advanced Water Purification Facility (AWPF). The advanced treated recycled water will be used for groundwater recharge through multiple aquifer storage and recovery (ASR) wells in three phases. This letter is only addressing Phase 1 of the Project which is for production of 6.25 million gallons per day (MGD) of advanced treated recycled water and application of one ASR well located at the Campus Park location in City of Oxnard. The same ASR well is planned to be used both for injection of advanced treated recycled water and extraction of the water after the required minimum amount of retention time. The City must submit plans for any future phases of the project to the Division for review and approval prior to operation of those phases.

Pursuant to California Water Recycling Criteria, Title 22 Section 60320.202, the City held a public hearing for the Project on June 14, 2018 and allowed a period of 60 days for receiving public comments. The City received no public comments by the end of the public comment period as described in the Engineering Report.

The Division recommends the Los Angeles Regional Water Quality Control Board (Regional Water Board) include the following conditions in the permit for the Project's compliance with Division's Title 22 requirements:

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

1350 Front Street, Room 2050, San Diego, CA 92101 | [www.waterboards.ca.gov](http://www.waterboards.ca.gov)



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1. The City must comply with Article 5.2. Indirect Potable Reuse: Groundwater Replenishment – Subsurface Application of California Code of Regulations, Title 22. If proposing an alternative to any of the requirements in Article 5.2, the City must follow the process described in Title 22 Section 60320.230
2. The City must ensure that the entire applied recycled water flow is continuously treated with full advanced treatment per the criteria in Section 60320.201. The City must conduct full-scale startup and commissioning testing to demonstrate that the advanced treatment at AWPf is in compliance with Section 60320.201.
3. The City must operate the AWPf in accordance with Title 22 Section 60320.208, such that the recycled municipal wastewater used for groundwater recharge and replenishment achieves at least 12-log enteric virus reduction, 10-log Giardia cyst reduction, and 10-log Cryptosporidium oocyst reduction.
4. The Division finds that the pathogen log reduction value (LRV) credits granted to primary and secondary wastewater treatment in the Division's December 5, 2016 letter (1.9, 0.8, and 1.2 for virus, Giardia, and Cryptosporidium, respectively), which were based on the research literature available at the time (Rose, 2004), need to be re-evaluated. The City may add additional treatment or validate the primary and secondary wastewater treatment LRV credits claimed. To validate the LRV credits, the City must conduct a site-specific pathogen study within 5 years from the date of the current engineering report in order to determine the pathogen LRVs achieved at the OWTP under the normal full-scale operating conditions. The protocol and the results of the study must be reviewed by an independent advisory panel or workgroup of consultants with expertise in wastewater microbiology. Both the testing protocol and the results of the study must be submitted to the Division for review and approval.
5. If a pathogen reduction is not met based on the on-going monitoring pursuant to subsection (c) of Title 22 Section 60320.208, within 24 hours of being aware, the City must immediately investigate the cause and initiate corrective actions. The City must immediately notify the Division and the Regional Water Board if the Project fails to meet the pathogen reduction criteria longer than 4 consecutive hours, or more than a total of 8 hours during any 7-day period. Failures of shorter duration must be reported to the Regional Water Board by the District no later than 10 days after the month in which the failure occurred.
6. In accordance with Title 22 Section 60320.222, The City must ensure all treatment processes at AWPf are operated in a manner providing optimal reduction of all chemicals and contaminants.
7. The City must operate the AWPf in accordance with the Operation Optimization Plan (OOP), reviewed and accepted by the Division prior to start of operations, pursuant to Title 22 Section 60320.222. The City must ensure that the OOP is representative of the current operations, maintenance, and monitoring and is updated within 30 days after any significant changes to current operations, maintenance, and monitoring. At a minimum, the OOP must identify and describe the operations (including validation of unit processes pathogen log reduction credits per Title 22 Section 60320.208(c)), maintenance (including prevention of cross connections, by-pass treatment, and replacement of membranes), analytical methods (regulated and unregulated chemicals per title 22 Section 60320.204), monitoring (including process monitoring and instrumentation calibration), and reporting (including compliance,

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performance monitoring and methodology for the calculation of pathogen log reduction achieved per process). Per Title 22 Section 60320.222, the City must submit a draft OOP prior to operations for the Division's review and acceptance. The draft OOP may be amended and finalized after the completion of full-scale startup and commissioning testing. The final OOP must be submitted to the Division no later than 90 days after completion of startup and commissioning testing. The OOP, at all times, must be representative of the current operations, maintenance, and monitoring. The City must submit for approval an updated OOP per Title 22 Section 60320.222(c).

8. The OOP must include and specify all of the alarms, setpoints, and triggered actions used in the AWWP.
9. In accordance with Title 22 Section 60320.204, all laboratory analyses for contaminants having a primary or secondary maximum contaminant level (MCL) must be conducted using a drinking water method approved by the Division for the contaminant and by a laboratory accredited by the State Board Environmental Laboratory Accreditation Program (ELAP) for the analytical method used. Analyses for chemicals other than those having primary or secondary MCLs must be described in the City's approved OOP.
10. The City must adequately staff the AWWP with operators, and describe their staffing hours, shifts, and certifications in the OOP. The AWWP operators must have the Advanced Treatment Certification when available, in consultation with the Division and the Regional Water Board.
11. The City must ensure that the recycled municipal wastewater used for the project meets the wastewater source control requirements in accordance with Title 22 Section 60320.206.
12. The initial maximum recycled municipal wastewater contribution (RWC) for this project is 1.0 according to the Engineering Report which is allowed per Title 22 Section 60320.216.
13. In accordance with Title 22 Section 60320.218, the produced advanced treated recycled water from AWWP must be sampled for total organic carbon (TOC) at least weekly prior to application. The City must report the weekly TOC results. The City must also report the 20-week running average of all TOC results, and the average of the last four results which shall not exceed 0.5 mg/L.
14. The following monitoring and reporting requirements must be included in the OOP and reported to the Division and the Regional Water Board on a regular basis according to Title 22 requirements.
  - a) To demonstrate the pathogen log reduction values (LRVs) granted to microfiltration (MF) units, membrane integrity testing (MIT) must be performed at minimum on a daily basis. The City must submit a comprehensive membrane integrity verification program to the Division for review and approval. The following apply to the MIT:
    - i. The pathogen LRVs for Giardia cysts and Cryptosporidium oocysts must be calculated and the values recorded after the completion of each MIT. The LRVs must be calculated based on the results of the daily pressure decay testing (PDT).

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- ii. The MIT must have a resolution that is responsive to an integrity breach on the order of 3 microns ( $\mu\text{m}$ ) or less.
  - iii. Daily calculations of the LRV must be based on a pressure decay rate (PDR) value with an ending pressure that provides a resolution of 3  $\mu\text{m}$  or less.
  - iv. The MIT must have a sensitivity to verify an LRV greater than or equal to 4.0.
  - v. The results of the daily MIT and calculated LRVs must be reported monthly.
  - vi. If a membrane unit fails MIT, the membrane unit must be removed from service, repaired, and have acceptable MIT results prior to being placed back into service.
- b) The reverse osmosis (RO) process must be credited pathogen reduction at the AWPf in accordance with the amount demonstrated via online monitoring of surrogate parameters. The City must monitor influent and effluent of the RO process continuously for electrical conductivity (EC). The effluent from each RO train must be continuously monitored for EC to ensure the integrity of the RO process is maintained. The pathogen LRVs must be calculated daily based on the lowest reduction achieved across the RO trains. The daily average EC reduction achieved across the RO process as well as average and maximum influent and effluent EC measurements must also be reported in the monthly reports due by the 10<sup>th</sup> day of the following month to the Division. The online EC instruments must be calibrated in accordance with the OOP. The City must also describe in the OOP how ongoing performance monitoring will be conducted to indicate when the integrity of the RO process has been compromised.
- c) The Engineering Report states that the City intends to install online TOC meters for RO trains at the AWPf in the future. The OOP must be updated accordingly at that time and daily pathogen LRVs be calculated based on the TOC monitoring.
- d) The City must monitor the required indicators for constituents of emerging concern (CEC) at the proper locations in accordance with the State Water Board Recycled Water Policy. This information must also be included in the OOP.
- e) The advanced oxidation process (AOP) must be operated as designed and described in the Engineering Report to meet Title 22 requirements achieving a minimum 0.5-log reduction of 1,4-dioxane and meet all Notification Levels (NLs) under the normal full-scale operating conditions.
- f) Power, UV transmittance (UVT), UV intensity (UVI), and flow (Q) must be continuously monitored for the AOP at all times. All measurement instrumentation must be properly calibrated in accordance with the OOP.
- g) The City must submit a monthly summary to the Division of the calculated NDMA log reduction along with UVI, UVT, power, flowrate, calculated UVI/Q, calculated hydrogen peroxide dose, and any reactor failure(s). These monthly reports must be submitted to the Division by the 10<sup>th</sup> day of the following month.

- h) As described in the Engineering Report, the AOP system installed at AWPf is controlled via establishing a target N-Nitrosodimethylamine (NDMA) log reduction setpoint which determines the power required to achieve the target log reduction value. The Engineering Report describes that an online surrogate (UVI/Q) has been established based on the previously conducted full-scale testing, that will be used to ensure 0.5-log reduction of 1,4-dioxane and 6-log reduction of pathogenic microorganisms are continuously achieved. UVI/Q surrogate will be measured and used to adjust the NDMA log reduction setpoint as needed.
- i) The UVI sensor online data must be programmed into the AWPf's supervisory control and data acquisition (SCADA) system for continuous monitoring and calculation of UVI/Q surrogate parameter, instead of using hand recorded UVI readings. The City must, prior to start of operations, submit to the Division for approval a schedule for achieving this SCADA update and the online monitoring of UVI/Q surrogate.
- j) Until the SCADA update is completed, the City staff operating the AWPf must record the UVI readings of all UV reactors and calculate the UVI/Q parameter daily. The 30-day running average value for the calculated UVI/Q must be above 0.018 and the NDMA log reduction setpoint controlling the power to the system, which is set at 1.4, must be increased as needed if the average value of the UVI/Q parameter ever falls below 0.018.
- k) The AOP must be operated with continuous monitoring and built-in automatic reliability features that must trigger automatic diversion of effluent by the following critical alarm setpoints.
  - i. Complete UV reactor failure.
  - ii. Instantaneous flowrate exceeds design flowrate.
  - iii. UVT less than 95 percent for more than 15 minutes
  - iv. NDMA log reduction setpoint of less than 1.4
  - v. Calculated hydrogen peroxide dose of less than 6.0 mg/L
- l) At least weekly, the UVT meter must be inspected and checked against a reference bench-top unit to document accuracy.
- m) The duty UVI sensors must be checked against calibrated UVI sensors monthly and if readings vary by more than 20%, they must be replaced and calibrated.
- n) The City must monitor water quality parameters to update AOP radical scavenging demand as specified in OOP. At a minimum, the City must consider Nitrite, Bromide, Chloramines, TOC, and Alkalinity.
- o) The monitoring and reliability features, including automatic diversion to waste or re-treatment at the AWPf, and shutdown capability, must be demonstrated to the Division during a plant inspection prior to final approval and at any time requested to do so by the Division or by the Regional Water Board.
- p) Based on the calculation of log reduction achieved daily, on a monthly basis the city must report a "Yes" or "No" for each day as to whether the necessary pathogenic microorganism log reductions (12-logs virus, 10-logs for Giardia cyst and



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Cryptosporidium oocyst) have been achieved. The City must include the daily minimum model predicated 1,4-Dioxane and NDMA log reduction. An overall log reduction calculated value must be provided daily unless the AWPf is offline (24-hour period). These monthly reports must be submitted to the Division by the 10<sup>th</sup> day of the following month.

- q) The City must monitor the effluent of the AWPf monthly for contaminants having MCLs and NLs as specified in the OOP for the first year of operations. Per Title 22 Section 60320.201(i), the City may request, from the Division and the Regional Water Board, a reduction in this monitoring after 12 consecutive months of monitoring.
  - r) Each quarter, pursuant to Title 22 Section 60320.201(h), the City must perform calculations of the percentage of monitoring results conducted pursuant to Title 22 Sections 60320.201 (b) and (e) for the RO and AOP processes that did not meet the surrogate and/or operational parameter limits. The City must report to the Division and the Regional Water Board if the percentage is greater than 10%.
15. In accordance with Title 22 Section 60320.201(a)(2), during the first 20 weeks of operation, the RO permeate must be monitored at least weekly for TOC and concentrations must be no greater than 0.25 mg/L in at least ninety-five percent of the samples.
  16. Within 60 days after completing the initial 12 months of full-scale operation and operational monitoring of the advanced treatment process, the City must submit reports to the Division and the Regional Water Board that include components described in in Title 22 Sections 60320.201(f) and (g) based on the on-going performance monitoring of the RO and the AOP processes.
  17. In accordance with Title 22 Section 60320.212, the advanced treated recycled water produced at the AWPf must be sampled quarterly for primary drinking water MCLs (Tables 66431-A, 64442, 64443, 64444-A and 64533-A of Chapter 15 of Title 22) and lead and copper. Monitoring for contaminants with secondary MCLs (Tables 64449-A and B of Chapter 15 of Title 22) must be conducted annually. The results must be reported to the Division and the Regional Water Board.
  18. In accordance with Title 22 Section 60320.220, each quarter, the City must sample and analyze the advanced treated recycled water for priority toxic pollutants (chemicals listed in 40 CFR section 131.38, "Establishment of numeric criteria for priority toxic pollutants for the State of California, as may be amended), chemicals having NLs, and any additional chemicals specified by the Division. The results must be reported to the Division and the Regional Water Board.
  19. The City must have no undesired or unintended reversal of flow of water or other liquids, gases, or other substances into the AWPf's product water lines. Any such undesired or unintended reversal of flow must be reported to the Division within 24 hours of the City's knowledge of the incident.
  20. The City must submit a comprehensive cross-connection control program for the AWPf to the Division and the Regional Water Board. The cross-connection control program must be submitted as a standalone document, separate from and prior to the submittal of the OOP. The City must implement its cross-connection control program and update the program to



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ensure that the program is, at all times, representative of the current cross-connection control practices at the AWPf. Revisions to the cross-connection control program for any reason, including changes resulting from inspections, must be done in consultation with an individual with a valid and current Cross-Connection Control Program Specialist certification issued by the California-Nevada section of the American Water Works Association.

21. Prior to the initial operation of the AWPf and once every year thereafter, the City must ensure that potable water, wastewater, recycled water, chemical, and other waste or non-potable piping systems are inspected for possible cross-connections. Piping systems must be inspected for possible cross-connections after any modification to the AWPf plumbing system are made.
22. The cross-connection inspections must be performed by an individual with a valid and current Cross-Connection Control Program Specialist certification issued by the California-Nevada section of the American Water Works Association. The City must include written report documenting the result of the initial inspection with the program submitted to the Division. Subsequent inspection results must be submitted with the annual report to the Division.
23. The advanced treated recycled water produced by AWPf must be retained underground for the minimum duration of 3.1 months as specified in the Engineering Report. Any change in the minimum retention time of 3.1 months in the future must be proposed to the Division for review and acceptance.
24. The extraction of the water from ASR well must follow the cross-connection and cross-contamination prevention measures described in the OOP. The OOP must include detailed drawings of the cross-contamination prevention mechanism including the removable spool.
25. The applied recycled water injected at the ASR well must only be extracted, after the required minimum retention time, from the same ASR well which is the only ASR well within the scope of the current first phase of the project. The City must conduct a tracer study to verify that application of the advanced treated recycled water will not impact the nearby drinking water wells. The City must submit a groundwater tracer test protocol for the Division review 60 days prior to commencement of the testing for subsurface application of recycled water. The City must conduct a tracer test and submit a completed tracer study to the Division. The City must update the Engineering Report based on results of the tracer study.
26. Based on the results of the tracer study, the City must revise the boundary representing a zone of controlled drinking water well construction and secondary boundary in accordance with Title 22 Section 60320.200(e).
27. The City must, in accordance with Title 22 Section 60320.226 and as specified in the OOP, collect the required samples from the monitoring wells and report the monitoring results.
28. The City must notify the Division and the Regional Water Board and submit necessary documents for any additional ASR wells to be constructed and utilized in the future. The City must update the Engineering Report accordingly in consultation with the Division and the Regional Water Board.

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29. If the City has been directed by the Division or Regional Water Board to suspend subsurface application of recycled water, subsurface application must not resume until the City has obtained approval from the Division and the Regional Water Board.
30. The City must update the Engineering Report and the OOP to demonstrate compliance with any revisions to the Recycled Water Policy.
31. The City must update the Engineering Report and the OOP to demonstrate compliance with any revisions to the Division Notification Level list.
32. The City must transfer all water quality monitoring results analyzed by an Environmental Laboratory Accreditation Program (ELAP) certified laboratory to the Division by Electronic Data Transfer (EDT) after the District has been assigned Primary Station Codes (PS-Codes) for compliance monitoring sites.
33. In accordance with Title 22 Section 60320.228:
  - a) The City must submit the required annual report no later than six months after the end of each calendar year.
  - b) The City must update the Engineering Report to address any changes and submit to the Division every five years.

If you have any questions regarding this letter, please contact Saeedreza Hafeznezami at (818) 551-2972 or via email at [Saeedreza.Hafeznezami@waterboards.ca.gov](mailto:Saeedreza.Hafeznezami@waterboards.ca.gov) or me via email at [Randy.Barnard@waterboards.ca.gov](mailto:Randy.Barnard@waterboards.ca.gov).

Sincerely,



Randy Barnard, P.E.  
Recycled Water Unit Chief  
Recycled Water Unit  
Division of Drinking Water  
State Water Resources Control Board  
1350 Front St., Rm. 2050  
San Diego, CA 92101

Cc: Brian Bernados, DDW (via email)  
Jeff Densmore, DDW (via email)  
Jeff O'Keefe, DDW (via email)  
Kurt Souza, DDW (via email)  
Cris Morris, Los Angeles-Regional Water Board (via email)  
Jeong-Hee Lim, Los Angeles-Regional Water Board (via email)  
Raul Medina, Los Angeles-Regional Water Board (via email)

**ATTACHMENT G – POLLUTANTS WITH NOTIFICATION LEVELS**

The following is a list of pollutants with notification levels at the time this permit was adopted. The project sponsor shall maintain an updated list of pollutants with notification levels and monitor these pollutants as they are adopted into the California Code of Regulations.

Constituents	Units	Notification Level (NLs)
Boron	mg/L	1
n-Butylbenzene	mg/L	0.26
sec-Butylbenzene	mg/L	0.26
tert-Butylbenzene	mg/L	0.26
Carbon disulfide	mg/L	0.16
Chlorate	mg/L	0.8
2-Chlorotoluene	mg/L	0.14
4-Chlorotoluene	mg/L	0.14
Diazinon	mg/L	0.0012
Dichlorodifluoromethane (Freon 12)	mg/L	1
1,4-Dioxane	mg/L	0.001
Ethylene glycol	mg/L	14
Formaldehyde	mg/L	0.1
Octahydro—1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	mg/L	0.35
Isopropylbenzene	mg/L	0.77
Manganese	mg/L	0.5
Methyl isobutyl ketone (MIBK)	mg/L	0.12
Naphthalene	mg/L	0.017
n-Nitrosodiethylamine (NDEA)	mg/L	0.00001
n-Nitrosodimethylamine (NDMA)	mg/L	0.00001
n-Nitrosodi-n-propylamine (NDPA)	mg/L	0.00001
Perfluorooctanoic acid (PFOA)	mg/L	0.0000051
Perfluorooctanesulfonic acid (PFOS)	mg/L	0.0000065
Propachlor	mg/L	0.09
n-Propylbenzene	mg/L	0.26
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	mg/L	0.0003
Tertiary butyl alcohol (TBA)	mg/L	0.012
1,2,4-Trimethylbenzene	mg/L	0.33
1,3,5-Trimethylbenzene	mg/L	0.33
2,4,6-Trinitrotoluene (TNT)	mg/L	0.001
Vanadium	mg/L	0.05

## **ATTACHMENT H – CEC PHASED MONITORING REQUIREMENTS**

The Project Sponsor shall conduct a three-phased monitoring approach for the CEC monitoring parameters required in this Order. This approach includes an initial assessment monitoring phase, a baseline monitoring phase, and a standard operation monitoring phase. The purpose of phased monitoring is to allow the Regional Water Board to review monitoring results for the CEC monitoring required in this Order at each phase and to refine the specific monitoring requirements based on the monitoring results and findings of the previous phase. Each CEC monitoring phase is described in detail below.

The Project Sponsor may submit existing CEC monitoring data for the health-based CECs and performance indicator CECs, surrogates for CECs, and bioanalytical screening tools from the Facility permitted under this Order to satisfy the requirements of the initial assessment or baseline monitoring phase. If the Regional Water Board, in consultation with the State Water Board, determines the existing CEC monitoring data meet the intent of the initial assessment phase, the Regional Water Board may allow the Project Sponsor to initiate the baseline monitoring phase. If the Regional Water Board, in consultation with the State Water Board, determines the existing CEC monitoring data meet the intent of the baseline monitoring phase, the Regional Water Board may allow the Project Sponsor to initiate the standard operation monitoring phase.

### **I. Initial Assessment Monitoring Phase**

The monitoring requirements for the initial assessment phase applies to this facility because this is a new project where the recycled water will be used for direct groundwater injection.

The purpose of the initial assessment phase is to: (1) identify the occurrence of health-based CECs, performance indicator CECs, and surrogates in recycled water for groundwater recharge or reservoir augmentation; (2) determine treatment effectiveness; (3) define the project-specific performance indicator CECs and surrogates to monitor during the baseline monitoring phase; (4) specify the expected removal percentages for performance indicator CECs and surrogates; and (5) gather bioactivity data for ER- $\alpha$  and AhR bioanalytical screening tools to determine the range of responses for the bioassays for standardized water quality monitoring.

The Project Sponsor shall monitor for the constituents in Tables E-13, E-14, and E-15 of the Order consistent with the initial assessment phase requirements. Following completion of the initial assessment monitoring phase, the Project Sponsor shall submit the data to the Regional Water Board for evaluation and determination of the appropriate monitoring requirements for the baseline monitoring phase.

### **A. Monitoring for Health-Based CECs, Performance Indicator CECs and Surrogates**

1. The Project Sponsor shall conduct an initial assessment monitoring phase consistent with Table 1 of this attachment for one year for each of the health-based CECs and performance indicator CECs listed in Table E-13 of the Order and project specific surrogates identified in Table E-14 of the Order or other surrogates proposed by the Project Sponsor (and approved by the Executive Officer) that are indicative of CEC removal through individual unit processes.
2. The Project Sponsor shall evaluate data from performance indicator CECs and surrogates and prepare an updated Table 2 of this attachment with expected (rather

than example) removal percentages for the Facility and submit to the Regional Water Board with the initial assessment monitoring data.

3. Following each sampling event, the Project Sponsor shall evaluate monitoring results for health-based CECs using the direction in section IV.B. of this attachment and implement appropriate response actions. The Project Sponsor shall also evaluate monitoring results for surrogates and evaluate the suitability of the surrogates.

**B. Monitoring for Bioanalytical Screening Tools**

1. The Project Sponsor shall conduct an initial assessment monitoring phase consistent with Table 1 of this attachment for three years for each of the bioanalytical screening tools listed in Table E-15 of the Order.
2. Following each sampling event, the Project Sponsor shall evaluate monitoring results for bioanalytical screening tools. The Project Sponsor may elect to follow the response actions for bioanalytical screening tools using the direction in section IV.B. of this attachment, but implementation of the response actions during the initial assessment monitoring phase is not required.

**Table 1. Monitoring Phase Requirements: Subsurface Application**

Constituent	Initial Assessment Monitoring Frequency	Baseline Monitoring Frequency	Standard Operation Monitoring Frequency	Monitoring Location
Health-Based CECs: Refer to Table E-13	Quarterly	Semiannually	Semiannually or Annually	Following treatment prior to release to the aquifer. (EFF-001)
Performance Indicator CECs <sup>1</sup> : Refer to Table E-13	Monthly	Monthly or Quarterly	Monthly or Quarterly	1. Prior to RO treatment <sup>2</sup> (PreRO-001) 2. Following treatment prior to release to the aquifer (EFF-001) 3. Following RO and prior to AOP treatment (PreAOP-001)

<sup>1</sup> Monitoring requirements for Performance Indicator CECs is based on additional requirements DDW submitted to the Regional Water Board in a letter dated February 12, 2020.

<sup>2</sup> If the Project Sponsor can demonstrate that the RO unit will not substantially remove a CEC, the Project Sponsor may request to monitor for that CEC prior to the AOP, instead of prior to the RO unit.

Constituent	Initial Assessment Monitoring Frequency	Baseline Monitoring Frequency	Standard Operation Monitoring Frequency	Monitoring Location
Surrogates: Refer to Table E-14.	Continuous for online analyzers and weekly for DOC	Continuous for online analyzers and weekly for DOC	Continuous for online analyzers and weekly for DOC	1. Prior to RO treatment <sup>3</sup> (PreRO-001) 2. Following treatment prior to release to the aquifer (EFF-001)
Bioanalytical Screening Tools: Refer to Table E-15	Quarterly	Quarterly	Semiannually or Annually	Following treatment prior to release to the aquifer. (EFF-001)

**II. Baseline Monitoring Phase**

The Project Sponsor shall initiate the baseline monitoring phase upon completion of the initial assessment phase or upon receiving approval from the Regional Water Board to proceed with this phase given the existing data for the Facility meet the intent of the initial assessment phase.

The purpose of the baseline monitoring phase is to: (1) gather occurrence data for health-based CECs; (2) evaluate performance indicator CECs and surrogates and determine treatment effectiveness; (3) gather bioactivity data for ER-α and AhR bioanalytical screening tools and pilot test the framework for response actions; and (4) assess the list of health-based CECs, performance indicator CECs, surrogates, and bioanalytical screening tools and identify an appropriate list of constituents to monitor the removal of CECs and treatment system performance in the standard operation monitoring phase of the Facility.

**A. Monitoring for Health-Based CECs, Performance Indicator CECs, and Surrogates**

1. The Project Sponsor shall conduct a baseline monitoring phase consistent with Table 1 of this attachment for three years for each of the health-based CECs in Table E-13 of the Order, and performance-based CECs and surrogates identified by the Regional Water Board.
2. Performance indicator CECs and surrogates that exhibited reduction by unit processes and/or provided an indication of operational performance shall be selected for monitoring in the baseline monitoring phase. Surrogates not reduced through a unit process are not good indicators of the unit’s intended performance. For example, soil aquifer treatment may not effectively lower electrical conductivity. Therefore, electrical conductivity may not be a good surrogate for soil aquifer treatment.
3. If a performance indicator CEC listed in Table E-13 of the Order is not a good indicator of CEC removal, the Project Sponsor shall propose an alternative performance indicator CEC to monitor that is representative of the constituent group. This performance indicator CEC shall be subject to approval by the Regional Water Board.

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<sup>3</sup> If the Project Sponsor can demonstrate that the RO unit will not substantially remove a CEC, the Project Sponsor may request to monitor for that CEC prior to the AOP, instead of prior to the RO unit.

4. The Project Sponsor shall evaluate data from performance indicator CECs and surrogates and prepare an updated Table 2 with the expected (rather than example) removal percentages for the Facility and submit to the Regional Water Board with the baseline monitoring data.
5. Following each sampling event, the Project Sponsor shall evaluate monitoring results for health-based CECs using the direction in section IV.B. of this attachment and implement appropriate response actions.

#### **B. Monitoring for Bioanalytical Screening Tools**

1. The Project Sponsor shall conduct a baseline monitoring phase consistent with Table 1 of this attachment for one year for each of the bioanalytical screening tools listed in Table E-15 of the Order.
2. Following each sampling event, the Project Sponsor shall evaluate monitoring results for bioanalytical screening tools using the direction in section IV.B. of this attachment and implement appropriate response actions.

### **III. Standard Operation Monitoring Phase**

The Project Sponsor shall initiate the standard operation monitoring phase upon completion of the baseline monitoring phase or upon receiving approval from the Regional Water Board to proceed with this phase given the existing data for the Facility.

The purpose of the standard operation monitoring phase is to monitor CECs under standard operating conditions at the Facility. In this phase, the Regional Water Board in consultation with the State Water Board will identify a list of health-based CECs, performance-based CECs, surrogates, and bioanalytical screening tools to monitor based on the Facility's data from the first two monitoring phases.

#### **A. Monitoring for Health-Based CECs, Performance Indicator CECs, and Surrogates**

1. For the standard operation monitoring phase, the Project Sponsor shall conduct the monitoring requirements in Table 1 of this attachment while the facility is operating.
2. The Project Sponsor may request removal of a health-based CEC from the required monitoring list if the monitoring results meet the conditions of the minimum threshold level presented in Table 3.
3. Performance indicator CECs and surrogates that exhibited reduction by a unit process and/or provided an indication of operational performance shall be selected for monitoring of standard operations. If a performance indicator CEC is not a good indicator, the Project Sponsor shall propose an alternative performance indicator CEC representative of the constituent group to monitor. This performance indicator CEC shall be subject to approval by the Regional Water Board.
4. Monitoring for health-based CECs and performance indicator CECs shall be conducted on a semiannual basis, unless the project demonstrates consistency in treatment effectiveness in removal of CECs, treatment operational performance, and appropriate recycled water quality. These projects may be monitored for health-based CECs and performance indicator CECs on an annual basis.

5. Following each sampling event, the Project Sponsor shall evaluate monitoring results for health-based CECs using the direction in section IV.B. of this attachment and implement appropriate response actions.
6. If evaluation of monitoring results indicates a concern, such as finding a health-based CEC above the thresholds described in Table 2 of this attachment or a decline in removal of a performance indicator CEC from the performance levels established during the initial and baseline monitoring phases, the Regional Water Board may require more frequent monitoring to further evaluate the effectiveness of the treatment process. Additional actions may also be warranted, which may include, but are not limited to, resampling to confirm a result, additional monitoring, implementation of a source identification program, toxicological studies, engineering removal studies, and/or modification of facility operation.

### **B. Monitoring for Bioanalytical Screening Tools**

1. The Regional Water Board may remove a bioanalytical screening tool from the required monitoring list if monitoring results meet the conditions of the minimum threshold level presented in Table 5 of this attachment.
2. Following each sampling event where bioassay monitoring is required, the Project Sponsor shall evaluate monitoring results for bioanalytical screening tools using the direction in section IV.B. of this attachment and implement appropriate response actions.
3. Semiannual monitoring for bioanalytical screening tools shall be conducted, unless the project demonstrates consistency in treatment effectiveness in removal of CECs, treatment operational performance, and appropriate recycled water quality. These projects may be monitored for CECs and with bioanalytical screening tools on an annual basis. Monitoring frequencies for CECs and surrogates for standard operation monitoring are specified in Table 1 of this attachment.

## **IV. Evaluation of CECs, Surrogates, and Bioanalytical Screening Tool Monitoring Results**

This section describes the approaches for evaluating treatment process performance and health-based CEC and bioanalytical screening tool monitoring results. Monitoring results for performance indicator CECs and surrogates shall be used to evaluate the operational performance of a treatment process and the effectiveness of a treatment process in removing CECs. For evaluation of health-based CEC and bioanalytical screening tool monitoring results, a multi-tiered approach of thresholds and corresponding response actions is specified in section IV.B. and IV.C. of this attachment, respectively. The evaluation of monitoring results shall be included in monitoring reports submitted to the Regional Water Board.

### **A. Evaluation of Performance Indicator CEC and Surrogate Results**

1. The effectiveness of a treatment process to remove CECs shall be evaluated by determining the removal percentages for performance indicator CECs and surrogates. The removal percentage is the difference in the concentration of a compound in recycled water prior to and after a treatment process (e.g., soil aquifer treatment or RO followed by AOPs), divided by the concentration prior to the treatment process and multiplied by 100.



$$\text{Removal Percentage} = ([X_{in} - X_{out}] / X_{in}) (100)$$

X<sub>in</sub> - Concentration in recycled water prior to a treatment process

X<sub>out</sub> - Concentration in recycled water after a treatment process

During the initial assessment, the recycled water producer shall monitor performance to determine removal percentages for performance indicator CECs and surrogates. The removal percentages shall be confirmed during the baseline monitoring phase. One example of removal percentages for each application scenario and their associated processes (i.e., soil aquifer treatment or RO/AOPs) is presented in Table 2 of this attachment. The established removal percentages for each project shall be used to evaluate treatment effectiveness and operational performance.

- For groundwater recharge using subsurface application, the removal percentage shall be determined by comparing the CEC monitoring parameters before treatment by RO/AOP and after treatment prior to release into the aquifer.

**B. Evaluation of Health-based CEC Results**

The Project Sponsor shall evaluate the health-based CEC monitoring results. To determine the appropriate response actions, the Project Sponsor shall compare measured environmental concentrations (MECs) to their respective monitoring trigger levels (MTLs) listed in Table 2 of this attachment to determine MEC/MTL ratios. The Project Sponsor shall compare the calculated MEC/MTL ratios to the thresholds specified in Table 3 and implement the response actions corresponding to the threshold.

**Table 2. Monitoring Trigger Levels and Example Removal Percentages**

Constituent/ Parameter	Relevance/ Indicator Type/ Surrogate	Monitoring Trigger Level (µg/L)	Example Removal Percentages
1,4-dioxane	Health	1	---
NDMA	Health & Performance	0.010	25-50, >80
NMOR	Health	0.012	---
PFOS	Health	0.013	---
PFOA	Health	0.014	---
Sucralose	Performance	---	>90
Sulfamethoxazole	Performance	---	>90
Electrical Conductivity	Surrogate	---	>90
DOC	Surrogate	---	>90
UV Absorbance	Surrogate	---	>50

**Table 3. MEC/MTL Thresholds and Response Actions for Health-Based CECs**

MEC/MTL Threshold	Response Action
If greater than 75 percent of the MEC/MTL ratio results for a CEC are less than or equal to 0.1 during the baseline monitoring phase and/or subsequent monitoring	A) After completion of the baseline monitoring phase, consider requesting removal of the CEC from the monitoring program.
If MEC/MTL ratio is greater than 0.1 and less than or equal to 1	B) Continue to monitor.

MEC/MTL Threshold	Response Action
If MEC/MTL ratio is greater than 1 and less than or equal to 10	C) Check the data and continue to monitor.
If MEC/MTL ratio is greater than 10 and less than or equal to 100	D) Check the data, resample within 72 hours of notification of the result and analyze to confirm CEC result. Continue to monitor.
If MEC/MTL ratio is greater than 100	E) Check the data, resample within 72 hours of notification of the result and analyze to confirm CEC result. Continue to monitor. Contact the Regional Water Board and DDW discuss additional actions.  (Additional actions may include, but are not limited to, additional monitoring, toxicological studies, engineering removal studies, modification of facility operation, implementation of a source identification program, and monitoring at additional locations.)

**C. Evaluation of Bioanalytical Screening Tool Results**

The Project Sponsor shall evaluate bioanalytical assay monitoring results. During the baseline monitoring phase and standard operation monitoring phase, the Project Sponsor shall determine the appropriate response actions. The Project Sponsor shall compare bioanalytical equivalent concentrations (BEQs) to their respective MTLs listed in Table 4 of this attachment to determine BEQ/MTL ratios. The Project Sponsor shall compare the calculated BEQ/MTL ratios to the thresholds presented in Table 5 of this attachment and implement the response actions corresponding to the threshold.

**Table 4. Required Equivalency Agonists and Monitoring Trigger Levels for Bioanalytical Screening Tools**

Constituent/ Parameter	Equivalency Agonist	Monitoring Trigger Level (ng/L)
Estrogen Receptor- $\alpha$	17-beta-estradiol	3.5
Aryl Hydrocarbon receptor (AhR)	2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)	0.5

**Table 5. BEQ/MTL Thresholds and Response Actions for Bioanalytical Screening Tools**

BEQ/MTL Threshold	Response Action
If BEQ/MTL ratio is consistently less than or equal to 0.15 for ER- $\alpha$ or 1.0 for AhR	A) After completion of the baseline monitoring phase, consider decreasing monitoring frequency or requesting removal of the endpoint from the monitoring program.
If BEQ/MTL ratio is greater than 0.15 and less than or equal to 10 for ER- $\alpha$ or greater than 1.0 and less than or equal to 10 for AhR	B) Continue to monitor.
If BEQ/MTL ratio is greater than 10 and less than or equal to 1000	C) Check the data, resample within 72 hours of notification of the result and analyze to confirm bioassay result.

<b>BEQ/MTL Threshold</b>	<b>Response Action</b>
	<p>Continue to monitor.</p> <p>Contact the Regional Water Board and DDW to discuss additional actions, which may include, but are not limited to, targeted analytical chemistry monitoring, increased frequency of bioassay monitoring, and implementation of a source identification program.</p>
<p>If BEQ/MTL ratio is greater than 1000</p>	<p>D) Check the data, resample within 72 hours of notification of the result and analyze to confirm bioassay result.</p> <p>Continue to monitor.</p> <p>Contact the Regional Water Board and DDW to discuss additional actions, which may include, but are not limited to, targeted and/or non-targeted analytical chemistry monitoring, increased frequency of bioassay monitoring, toxicological studies, engineering removal studies, modification of facility operation, implementation of a source identification program, and monitoring at additional locations.</p>