

**State of California**  
**California Regional Water Quality Control Board**  
**Santa Ana Region**

3737 Main Street, Suite 500, Riverside, California 92501-3348  
Phone (951) 782-4130 - FAX (951) 781-6288- TDD (951) 782-3221  
<http://www.waterboards.ca.gov/santaana>

Order No. R8-2019-0007

Amending Order No. R8-2004-0002, as amended by Order No. R8-2008-0058, Order  
No. R8-2014-0054, and Order No. R8-2016-0051  
Producer/User Water Recycling Requirements  
For  
Orange County Water District  
Interim Water Factory 21 and Groundwater Replenishment System  
Groundwater Recharge and Reuse at  
Talbert Gap Seawater Intrusion Barrier and Kraemer/Miller Recharge Basins  
Orange County

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Board), finds that:

1. On March 12, 2004, the Regional Board adopted Order No. R8-2004-0002 (hereinafter Order), prescribing Producer/User Water Recycling Requirements for the Orange County Water District's (hereinafter OCWD or producer) Interim Water Factory 21 and Groundwater Replenishment System (GWRS) for groundwater recharge and reuse of recycled water at the Talbert Gap Seawater Intrusion Barrier and at Kraemer/Miller Recharge Basins, as well as serving non-potable water customers, in Orange County. On July 18, 2008, the Regional Board adopted Order No. R8-2008-0058, which amended the Order to modify findings and provisions regarding tracer studies and monitoring wells associated with GWRS. Also, on December 12, 2014, the Regional Board adopted Order No. R8-2014-0054, which amended the Order to add the Miraloma Basin as an approved site for spreading recycled water and authorized the production of up to 100 million gallons per day (MGD) of highly treated recycled water for groundwater replenishment purposes. In addition, on July 29, 2016, the Regional Board adopted Order No. R8-2016-0051, which amended the Order to allow the producer to use the La Palma recharge basin for recycled water spreading operations and update the Anaheim Forebay boundaries in accordance with the requirements included in the Water Recycling Criteria for Indirect Potable Reuse, Groundwater Replenishment, Subsurface Application included in Title 22 of the California Code of Regulations (CCR) Division 4, Chapter 3, Article 5.2.
2. OCWD operated Interim Water Factory 21 until it was secured and demolished in 2006. OCWD began operations of GWRS in 2008 with a design capacity 70 MGD. In July 2012, OCWD started spreading recycled water, for groundwater recharge, in the newly constructed Miraloma Basin. Recycled water service to two non-potable water customers, the City of Anaheim Power Plant and the

Anaheim Regional Transportation Intermodal Center, began in 2011 and 2014. In April 2015 OCWD began operation of the Demonstration Mid-Basin Injection (DMBI) Project, which consists of one injection well (MBI-1) and two monitoring wells. In May 2015 OCWD completed the construction of its initial expansion and added 30 MGD of treatment capacity to its advanced water purification facility (AWPF) and began operating at its expanded recycled water production capacity of 100 MGD. GWRS' components include the AWPF, the Talbert Gap Seawater Intrusion Barrier, Kraemer/Miller/Miraloma/La Palma Recharge Basins, the DMBI Project, and two non-potable water customers. The permitted design production capacity of the AWPF is 100 MGD. The AWPF currently produces a monthly average of 97 MGD of recycled water for direct aquifer injection and recharge at OCWD's spreading basins located at the Anaheim Forebay.

3. The Groundwater Replenishment Reuse Project (GRRP) regulations were adopted by the California Department of Public Health (CDPH) and became effective on June 18, 2014. As of July 1, 2014, the State Water Resources Control Board's (SWRCB's) Division of Drinking Water (DDW) succeeded CDPH in the development and implementation of drinking water and recycled water related regulations.
4. In a report entitled, "Title 22 Engineering Report, Mid-Basin Injection Supplement, for the Groundwater Replenishment System" dated September 4, 2018, OCWD proposed to construct four new injection wells (MBI-2, MBI-3, MBI-4, and MBI-5) and two new monitoring wells (SAR-12 and SAR-13) at Centennial Park, in the City of Santa Ana, for the injection of 6 to 10 MGD of purified recycled water into the Principal aquifer of the Orange County Groundwater Management Zone (OCGWMZ); these new facilities serve as an extension of the existing DMBI project and will collectively operate as the Mid-Basin Injection (MBI) Project. The September 2018 report supplements the previously approved "Title 22 Engineering Report for the Groundwater Replenishment System" dated May 2011 and the "Title 22 Engineering Report Supplement for the Groundwater Replenishment System" dated March 2014. The purpose of the proposed MBI Project's wells is to: 1) Raise groundwater levels in nearby drinking water wells; 2) Reduce upwelling colored groundwater from the underlying Deep Aquifer; 3) Reduce groundwater flow gradients associated with seawater intrusion; 4) relieve stress from the existing Talbert Seawater Intrusion Barrier; and 5) Provide additional recharge capacity to support the planned final GWRS expansion.

In addition, OCWD proposes to install two new downgradient groundwater monitoring wells (SAR-12 and SAR-13) and to comply with Title 22 Water Recycling Criteria, specifically with the GRRP regulations. OCWD included in their Title 22 Engineering Report supplement pertinent supporting information for Regional Board's and DDW's staff review. OCWD proposed a 3-month response retention time, an 8-month primary subsurface travel time boundary where new drinking water wells cannot be constructed, and a 10-month secondary subsurface travel time boundary where the construction of new drinking water wells is controlled and requires the conduction of studies to assess the potential

impact of the proposed well on the primary boundary. The proposed boundaries were derived by OCWD staff through a groundwater modeling analysis. OCWD proposes to conduct a groundwater intrinsic tracer study to confirm the underground travel time. The primary and secondary boundaries may be modified based on the results from the proposed tracer study.

5. On August 30, 2018, DDW held a public hearing with regards to the proposed OCWD GWRS' MBI Project. In a letter dated September 18, 2018, DDW conditionally approved OCWD GWRS' MBI Project and recommended to this Regional Board the amendment of the Order to incorporate the conditions included in their September 18, 2018 letter. It is appropriate to modify Order No. R8-2004-0002 to allow the producer to operate the MBI Project for recycled water injection operations, update the secondary boundary for the Talbert Gap Barrier and the primary boundary for the Kraemer/Miller/Miraloma/La Palma Recharge Basins (which was initially modified by amendment Order No. R8-2016-0051), and further update the Order by including pathogen reduction and other requirements in accordance with the requirements included in the Water Recycling Criteria pursuant to Title 22, Division 4, Chapter 3 of the California Code of Regulations (CCRs).
6. In compliance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.), OCWD prepared an Environmental Impact Report (EIR) for the MBI Project entitled, "Environmental Impact Report/Environmental Assessment (EIR/EA) for the Mid Basin Centennial Park Injection Well Project." The EIR/EA was certified and approved by the OCWD Board of Directors on April 20, 2016. The EIR/EA identified no significant adverse impact to water quality as a result of the use of recycled water in the MBI Project. Regional Board staff reviewed the EIR/EA and independently determined that the project would not have a significant adverse water quality impact on the OCGWMZ.
7. The Regional Board has notified the producer and other interested agencies and persons of its intent to amend the producer/user water recycling requirements set forth in Order No. R8-2004-0002 and has provided them with an opportunity to submit their written views and recommendations.
8. The Regional Board, in a public meeting, heard and considered all comments pertaining to this amendment to the water recycling requirements.

**IT IS HEREBY ORDERED** that Order No. R8-2004-0002 be amended as follows:

1. Order No. R8-2004-0002, Finding 12., page 5 - Add the following at the end of the finding:

On September 4, 2018, OCWD submitted to the California State Water Resources Control Board's Division of Drinking Water a Title 22 Engineering Report Supplement (Report Supplement) for GWRS, which included a proposal to formally build and operate the Mid-Basin Injection

(MBI) Project in the City of Santa Ana's Centennial Park area for the injection of recycled water in to the Principal aquifer system of the Orange County Groundwater Management Zone. OCWD proposed to install four new injection wells and two groundwater monitoring wells. Also, the Report Supplement contained a proposal to operate the MBI Project with a 3-month response retention time and a model-derived 8-month primary boundary and a 10-month secondary boundary to be confirmed via an intrinsic tracer study. The primary and secondary boundaries of the MBI Project may be modified based on the results from the proposed tracer study.

2. Order No. R8-2004-0002, Finding 13., page 5 - Add the following at the end of the finding:

On August 30, 2018, DDW held a public hearing with regards to the proposed OCWD GWRS' MBI Project. In a letter dated September 18, 2018, DDW conditionally approved OCWD's proposal to construct and operate the MBI Project for the injection of recycled water into Principal aquifer system of the Orange County Groundwater Management Zone. Also, DDW accepted the proposed model-derived primary and secondary boundaries and the 3-month response retention time for the MBI Project outlined in the report. Regional Board staff concurred with DDW findings by amending the Order to incorporate DDW's September 18, 2018 approval conditions.

3. Order No. R8-2004-0002, Finding 25., page 8 - Replace Finding 25. as follows:

25. To assure that any pathogenic microorganisms that may be present in the recycled water are effectively inactivated or removed, the DDW has determined that a retention time in the Talbert Gap Barrier area of at least 12 months for the recycled water in the groundwater basin before the water is extracted for drinking purposes is needed. For the MBI Project a model-derived retention time of at least 8 months is required between the injection wells and any drinking water well, however, the 8 months model derived retention time may be modified based on the results from the proposed tracer study. A retention time in the area of the Kraemer/Miller/Miraloma/La Palma Basins of at least 4 months between the Basins and any drinking water wells is needed.

4. Order No. R8-2004-0002, Finding 29., page 9 – Replace Finding 29. as follows:

29. To achieve the inactivation of organisms, it is important that new drinking water wells are constructed outside the primary boundary required to achieve 12 months of retention time from the injection operation at Talbert Gap Barrier. Additionally, new drinking water wells proposed to be constructed after the leading edge of the secondary boundary, defined by the area less than 12 months underground travel time from the injection

operations, must be evaluated through pertinent studies to assess any potential impact that the proposed well might have on the primary boundary.

For the MBI Project, new drinking water wells shall not be constructed within its model-derived primary boundary required to achieve 8 months of retention time downgradient from the injection operation. Furthermore, new drinking water wells proposed to be constructed between the leading edge of the primary boundary and its model-derived secondary boundary, defined by the area less than 10 months underground travel time from the injection operations, must be evaluated through pertinent studies to assess any potential impact that the proposed well might have on the primary boundary. OCWD shall conduct tracer studies to verify that the model-derived primary and secondary boundaries are sufficient to achieve the pathogenic microorganism reductions required by the Title 22 Water Recycling Criteria, specifically with the Groundwater Replenishment Reuse Project regulations. The primary and secondary boundaries of the MBI Project may be modified based on the results from the proposed tracer study.

OCWD adopted a resolution that effectively prevents the construction of new domestic water wells within the Talbert Gap Barrier's and the MBI Project's primary boundaries and control the construction of new domestic water wells that may be located after the leading edge of the Talbert Gap Barrier's secondary boundary and between the primary and the secondary boundaries of the MBI Project. The resolution will be invoked prior to the start of recharge of recycled water from the GWRS. In addition, OCWD will request that the Orange County Well Standards Advisory Board establish criteria to prevent construction of drinking water wells within the Talbert Gap Barrier's and MBI Project's primary boundaries or control the construction of drinking water wells after the leading edge of the secondary boundary of the Talbert Gap Barrier and between the primary and the secondary boundaries of the MBI Project. This Board advises the permitting agencies, Orange County Health Care Agency, City of Fountain Valley, and the City of Santa Ana, on well permitting criteria and will recommend that the recycled water have a retention time of at least 12 months and 8 months underground travel time prior to withdrawal near the Talbert Gap Barrier and the MBI Project, respectively or control the construction of drinking water wells after the leading edge of the Talbert Gap Barrier's secondary boundary and between the primary and the secondary boundaries of the MBI Project. The Board's recommended boundary areas may be modified based on the results of the proposed tracer study at the MBI Project area.

5. Order No. R8-2004-0002, page 9 - Replace Finding 30. as follows:

30. It is important that new drinking water wells are constructed outside the primary boundary required to achieve 4 months of retention time downgradient from the spreading operation at Kraemer/Miller/Miraloma/La Palma Basins for inactivation of microorganisms. Also, new drinking water wells proposed to be constructed at the leading edge of the secondary

boundary defined by the area with less than 4 months underground travel time from Kraemer/Miller/Miraloma/La Palma Basins must be evaluated through pertinent studies to assess any potential impact that the proposed well might have on the primary boundary. OCWD adopted a resolution that effectively prevents the use of groundwater for drinking water purposes within the primary boundary to avoid the construction of new domestic water wells within this area of spreading basins and control the construction of new domestic water wells that may be located at the leading edge of the secondary boundary. OCWD's resolution will be invoked and in place prior to the start of recharge of recycled water from the GWRS. In addition, OCWD will request that the Orange County Well Standards Advisory Board establish criteria to prevent construction of drinking water wells in the primary boundary or control the construction of drinking water wells at the leading edge of the secondary boundary. The Well Standards Advisory Board advises the permitting agencies, Orange County Health Care Agency and the City of Anaheim, on well permitting criteria and will recommend that the recycled water have a retention time of at least 4 months underground prior to withdrawal near Kraemer/Miller/Miraloma/La Palma Basins.

6. Order No. R8-2004-0002, Recycled Water Quality Specifications, page 11 - Replace Section A.1. as follows:
  1. The producer shall comply with Division 4, Chapter 3, Article 5.2 – Indirect Potable Reuse: Groundwater Replenishment – Subsurface Application, §60320.200 through §60320.228 of Title 22 of the California Code of Regulations. The recycled water<sup>5</sup> used for injection and/or recharge shall not contain constituent concentrations in excess of the limits specified in Tables I, II, III and IV below:
7. Order No. R8-2004-0002, Diluent Water Quality Specifications, page 17 – add Sections C.3. as follows:
  3. For the Mid-Basin Injection Project, the initial maximum Recycled Water Contribution can be 100%, which means that the injection of diluent water is not required.
8. Order No. R8-2004-0002, Buffer Zone Specifications in Recharged Groundwater Basins, page 19 - Replace Sections F.1. through F.4. as follows:
  1. At the Talbert Gap Barrier, the recycled water shall be retained in the groundwater basin for a minimum of 12 months prior to being withdrawn at a domestic water supply well. For the Mid-Basin Injection Project, the recycled water shall be retained in the groundwater basin for a minimum of 8 months, based on the model-derived primary boundary or a minimum period based on a tracer study that determines the primary boundary, prior to being withdrawn at a domestic water supply well and the producer shall complete the following tasks:

- a. Submit a groundwater tracer test protocol for DDW review 60 days prior to commencement of the testing for subsurface application of recycled water.
  - b. Conduct a tracer test and submit a completed tracer study to DDW. The producer shall update the Engineering Report, including but not limited to, the zone of controlled drinking water well construction and secondary boundary, based on results of the tracer study.
  - c. Update, if necessary, the local-scale groundwater model based on geological information obtained from the MBI Project's construction of monitoring and injection wells.
  - d. Update the Engineering Report for any additional injection wells for the MBI Project in consultation and with the approval of Regional Board and DDW.
2. At the Talbert Gap Barrier and the Mid-Basin Injection Project, no domestic drinking water wells shall be allowed within a primary boundary defined by the area with 12 months underground travel time from the Talbert Gap Barrier and 8 months underground travel time from the Mid-Basin Injection Project. For the Talbert Gap Barrier the secondary boundary is defined by the area with less than 12 months underground travel time from the injection operations and for the MBI Project, the secondary boundary is 10 months underground travel time. In addition, new drinking water wells proposed to be constructed after the leading edge of the Talbert Gap Barrier's secondary boundary and between the primary and secondary boundaries of the Mid-Basin Injection Project must be evaluated through pertinent studies to assess any potential impact that the proposed well might have on the primary boundary. For the MBI Project the primary and secondary boundary may be modified based on the results from the tracer study. The producer shall notify DDW and the Regional Board if a new or replacement potable water well(s) is to be constructed within the secondary boundary.
  3. At the Kraemer/Miller/Miraloma/La Palma Basins, the recycled water shall be retained in the groundwater basin for a minimum of 4 months prior to being withdrawn at a domestic water supply well. A numerical model, tracer, or other method shall be used to determine the underground retention time and recycled water contribution to each aquifer. If a tracer is used, the tracer shall be determined prior to start-up.
  4. At the Kraemer/Miller/Miraloma/La Palma Basins, no domestic drinking water wells shall be allowed within a primary boundary defined by the area meeting 4 months underground travel time from Kraemer/Miller/Miraloma/La Palma Basins. Any new drinking water well proposed to be constructed after the leading edge of the secondary boundary defined by the area less than 4 months underground travel time from Kraemer/Miller/Miraloma/La

Palma Basins shall be evaluated through pertinent studies to assess any potential impact that the proposed well might have on the primary boundary.

9. Order No. R8-2004-0002, Operations, Maintenance and Monitoring/Reporting Requirements, page 19 and 20 – Replace Section G.1., Section G.1.a., and Section G.1.b. as follows:

1. OOP:

OCWD shall operate the GWRS in accordance with the approved Operation Optimization Plan (hereinafter OOP), which was formerly known as the operations, maintenance and monitoring plan (OMMP) and any reference to the OMMP is equivalent to the OOP. The producer shall 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 shall identify and describe the operations (including validation of unit processes per §60320.208(c)), maintenance (including prevention of cross connections, bypass treatment, and replacement of membranes), analytical methods (regulated and unregulated chemicals), monitoring (including process monitoring and instrumentation calibration), and reporting (including compliance, performance monitoring and methodology for the calculation of log reduction achieved per process). Per §60320.222, the District shall submit a draft OOP prior to operations for DDW's review and approval. The District shall submit for approval an updated OOP per §60320.222(c). This GWRS OOP shall include the operation and maintenance manual specified in Provision 14. Section J, below.

The OOP shall cover critical operational parameters and shall include routine testing procedures for all treatment processes (MF, RO, and AOP systems, optimization of the hydrogen peroxide dose, UV dose for disinfection), maintenance and calibration schedules for all monitoring equipment, process alarm set points, and response procedures for alarms in each treatment process of the AWTF, including criteria for diverting recycled water if water quality requirements are not met, start-up, peak flow and emergency discharges to the Santa Ana River<sup>13</sup>, and emergency response and contingency plans. The OOP shall include staffing levels with applicable certifications levels for AWTF operations personnel. Significant changes in the operation of any of the treatment processes shall be reported to the DDW and Regional Board. Significant changes in the approved OOP must be approved by the DDW and Regional Board prior to instituting changes. The District shall update the Engineering Report and the OOP to demonstrate compliance with any revisions to the Recycled Water Policy and to DDW's Notification Level and primary maximum contamination levels list.

10. Order No. R8-2004-0002, Operations, Maintenance and Monitoring/Reporting Requirements, page 22 – Add Section G.6.c. as follows:



- c. If the producer has been directed by the DDW or the Regional Board to suspend subsurface application shall not resume until the Producer has obtained DDW and Regional Board approval.
11. Order No. R8-2004-0002, Operations, Maintenance and Monitoring/Reporting Requirements, page 22 – Add Section G.7. and Section G.7.a through c. as follows:
    7. Pathogen Reduction Requirements:
      - a. The producer shall operate GWRS such that the recycled municipal wastewater used as recharge water receives treatment that achieves at least 12-log enteric virus reduction, 10-log Giardia cyst reduction, and 10-log Cryptosporidium oocyst reduction. For each pathogen (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.
      - b. For each month retained underground as demonstrated in accordance with §60320.208(e), the recycled municipal wastewater will be credited with 1-log virus reduction.
      - c. Each treatment process used to meet the pathogen reduction requirements shall be validated for its log reduction by on-going monitoring conducted pursuant to the Operations Plan to verify the performance of each treatment process on a daily basis, with the results reported monthly.
      - d. If the pathogen reduction in §60320.208(a) is not met based on the on-going monitoring required pursuant to subsection (c), within 24 hours of being aware, the producer shall immediately investigate the cause and initiate corrective actions. The producer shall immediately notify the DDW and Regional Board if the producer 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 shall be reported to the Regional Board by the producer no later than 10 days after the month in which the failure occurred.
  12. Order No. R8-2004-0002, Provisions, page 25 – Replace Section J.8. as follows:
    8. The producer shall adopt a resolution that effectively prevents the use of groundwater for drinking water purposes within the area required to achieve 12 months underground retention time from the Talbert Gap Barrier, 8 months underground travel time (primary boundary) from the MBI Project, and within the primary boundary area to achieve 4 months retention time from the Kraemer/Miller/Miraloma/La Palma Basins. The primary boundary

of the MBI Project may be adjusted based on the results from the tracer study. The resolution shall be invoked prior to the start of injection or spreading of recycled water from the GWRS.

13. Order No. R8-2004-0002, Provisions, page 26 – Replace Section J.15. as follows:
  15. The producer's wastewater treatment plant shall be supervised and operated by persons possessing certificates of appropriate grade pursuant to Title 23, Division 3, Chapter 26 of the California Code of Regulations. In addition, the producer shall operate the AWTF with staff that possess Advance Treatment Certification when available and in consultation with DDW and the Regional Water Board. The producer shall describe operator staffing hours, shifts, and certification classes in the OOP.
14. Monitoring and Reporting Program (M&RP) No. R8-2004-0002, Recycled Water Monitoring, Section I.C.5., page 7 – Replace Talbert Gap Barrier with Talbert Gap Barrier/Mid-Basin Injection Project.
15. M&RP No. R8-2004-0002, Reporting Requirements, pages 11 and 12 – Replace Section II.B.2.e. and Section II.B.2.f. as follows:
  - e. A summary discussion on whether domestic drinking water wells extracted water within the primary boundary defined by the area achieving 12 months underground travel time from the Talbert Gap Barrier or 8 months underground travel time from the Mid-Basin Injection Project as confirmed by and adjusted by the tracer study, including the actions/measures that were undertaken to prevent reoccurrence. If there were none, a statement to that effect shall be written.
  - f. A summary discussion on whether domestic drinking water wells extracted water within the primary boundary defined by the area achieving 4 months underground travel time from Kraemer/Miller/Miraloma/La Palma Basins, including the actions/measures that were undertaken to prevent reoccurrence. If there were none, a statement to that effect shall be written.
16. M&RP No. R8-2004-0002, General Monitoring and Reporting Requirements, Sections II.D.3., page 12 – Add the following at the end of the section:

At any time during the term of this permit, the State Water Resources Control Board (State Board) or this Regional Board may notify the producer to electronically submit Self-Monitoring Reports (SMRs) using the State Board's California Integrated Water Quality System (CIWQS) Program Web site: <http://www.waterboards.ca.gov/ciwqs/index.html> or GeoTracker. In addition, the producer may be required in the future to 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 producer

has been assigned Primary Station Codes (PS-Codes) for compliance monitoring sites. Until such notification is given, the producer shall submit SMRs through our Paperless Office (ECM – Electronic Content Management) system via email transmittal to [santaana@waterboards.ca.gov](mailto:santaana@waterboards.ca.gov) and to DDW. For this purpose, convert SMRs, all regulatory documents, and correspondence to a searchable (OCR) Portable Document Format (PDF). The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

17. All other conditions and requirements of Order No. R8-2004-0002, as amended by Order No. 2008-0058, Order No. R8-2014-0054, and Order No. R8-2016-0051 (except for modifications applied in this amendment) shall remain unchanged.

I, Hope A. Smythe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on March 22, 2019.



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Hope A. Smythe  
Executive Officer