ATTACHMENT B: INFORMATION SHEET

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD CENTRAL VALLEY REGION

GENERAL WASTE DISCHARGE REQUIREMENTS
ORDER NO. R5-2026-0023

FOR

LAND DISCHARGES FROM DOMESTIC WASTEWATER TREATMENT SYSTEMS WITH FLOWS GREATER THAN 0.1 MILLION GALLONS PER DAY

Table of Contents

I. INTRODUCTION

The purpose of this Information Sheet is to supplement and provide supporting details for Central Valley Regional Water Quality Control Board (Central Valley Water Board) Order R5-2026-0023, *Waste Discharge Requirements General Order for Domestic Wastewater Treatment Systems With Flows Greater than 0.1 Million Gallons per Day* (General Order). The General Order incorporates this Information Sheet as additional findings.

The purpose of the General Order is to establish general waste discharge requirements (WDRs) for large domestic wastewater treatment plants (WWTPs) in California’s Central Valley that treat flows greater than 0.1 million gallons per day (gpd) (100,000 gpd) and discharge treated wastewater to land. At present, there are approximately 200 existing large WWTPs in the Central Valley region with similar characteristics, constituents, and treatment standards. The General Order provides a uniform and streamlined regulatory framework for these types of facilities.

This Information Sheet contains supplemental facts and discussion in support of the General Order’s requirements, including but not limited to:

1. A summary of key concepts such as wastewater characteristics, treatment technologies, and disposal practices that influence compliance and water quality protection.
2. Rationale for effluent limitations, setbacks, monitoring obligations, and best practicable treatment and control (BPTC) measures.
3. Outline of applicable requirements for wastewater treatment, disposal, and monitoring, as well as setback variance processes, recycled water feasibility evaluations, and groundwater protection measures.

Appendix A of this document provides information for the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) Salt and Nitrate Control Programs. CV-SALTS is a comprehensive program aimed at addressing salt accumulation in the Central Valley's groundwater and surface water resources and nitrate accumulation in groundwater. This initiative involves a collaborative effort among various stakeholders, including regulatory agencies, water users, environmental groups, and agricultural interests, to develop and implement sustainable management practices that ensure the long-term viability of the region's water beneficial uses, water quality, and agricultural productivity.

II. DEFINITIONS

Average or Mean

The mean is equal to the sum of all the values in the data set divided by the number of values in the data set.

Average (7-day)

Calculated as the average concentration of the results for the last seven calendar days. If only one sample is collected within a seven-day period, that sample becomes the seven-day average.

Average (Monthly)

Calculated as the arithmetic mean of measurements recorded during a calendar month. If only one sample is collected in a calendar month, then that sample measurement is the monthly average.

Average (Monthly Average Flow)

Calculated by summing the total daily flows (in millions of gallons) for the entire month and dividing by the number of days in the month, which results in the average daily flow for that month (in MGD).

5-Day Biochemical Oxygen Demand (BOD_5)

Measures the amount of oxygen microorganisms use to decompose organic matter in water over five days at 20°C, indicating the level of organic pollution; it's crucial for assessing wastewater quality, treatment plant efficiency, and potential harm to aquatic life, as high BOD_5 depletes dissolved oxygen.

Biosolids

Sludge that has undergone enough treatment and testing to qualify for reuse pursuant to the USEPA Part 503 Biosolids Rule (40 C.F.R. § 503)

Bypass

The intentional or accidental diversion of the waste stream from any portion of the treatment processes at a WWTP, where wastewater is untreated or partially treated (wastewater diverted into an alternate treatment train that provides equivalent treatment is not considered a bypass).

Composite Sample

For a time-based composite: the combination of no fewer than eight-four individual samples obtained over the specified sampling period. The

facility-specific monitoring and reporting program order (MRP) will specify whether composite samples must be flow- or time-proportioned.
Composite Samples can also be a combination of equal portions of samples from multiple sources.

Daily Maximum Limit

The highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in mass units, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean of the pollutant measurements over the day.

Disinfected Secondary-2.2 Recycled Water

Defined under Title 22, section 60301.220, as oxidized and disinfected wastewater meeting strict bacteriological standards, specifically a 7-day median total coliform of less than or equal to 2.2 most probable number per 100 mL (MPN/100mL) and a maximum of 23 MPN/100 mL in one sample within 30 days.

Disinfected Secondary-23 Recycled Water

Defined under Title 22, section 60301.225, as oxidized and disinfected wastewater meeting specific bacteriological standards, specifically a 7-day median total coliform of less than or equal 23 MPN/100 mL and a maximum of 240 MPN/100 mL in one sample within 30 days.

Disinfected Tertiary Recycled Water

Defined under Title 22, section 60301.230, as filtered wastewater that has been disinfected by either:

A chlorine disinfection process following filtration that provides a 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

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 the polio virus may be used for the purposes of the demonstration and meets the bacteriological standards of a 7-day median total coliform bacteria less than or equal to 2.2 MPN/100 mL and a maximum of 23 MPN/100 mL in one sample within 30 days.

Disposal Area

Areas of land where treated wastewater is discharged for the purpose of disposal; this does not include discharges of reclaimed/recycled water.

Disposal Ponds

Disposal ponds include percolation and evaporation ponds.

Domestic Wastewater

Wastewater that is discharged from plumbing fixtures, appliances, and other household devices, including, but not limited to, toilets, bathtubs, showers, laundry facilities, dishwashing facilities, and garbage disposals. Domestic wastewater may include wastewater from commercial buildings, such as office buildings, retail stores, and some restaurants, or from industrial facilities where domestic wastewater is segregated from industrial wastewater. Stormwater that contacts domestic waste, either in a combined sewer or because of a separate stormwater sewer overflow into a sanitary sewer, is considered domestic waste.

Hazardous Substance

Any substance that meets the definition of “hazardous constituent” described in California Code of Regulations, title 22, section 66260.10.

Impoundment

Impoundment refers to treatment ponds, storage ponds, disposal ponds, and land application by controlled flood methods.

Influent

Raw, untreated sewage and liquid waste entering a treatment facility.

Land Application Area

An area for disposal of wastewater via application to land by spray, drip, or controlled flood methods. Ponds are not considered land application areas.

Median

The value below which half the samples (ranked in increasing order) fall. It may be considered the middle value, or the average of two middle values.

Overflow

The intentional or unintentional diversion of flow from the collection and transport systems, including pumping facilities, and from disposal areas.

Percent Removal

% Removal = ((Influent Concentration - Effluent Concentration) / Influent Concentration) * 100.

Recycled Water

Treated domestic wastewater suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource (Wat. Code §13050(n))

Reuse Area

A designated site where treated municipal wastewater that meets the definition of Recycled Water is applied for beneficial purposes, such as irrigation (landscaping, crops) or industrial cooling.

Secondary Treatment

USEPA establishes secondary treatment standards for publicly owned treatment works (POTWs), which are minimum, technology-based requirements for municipal wastewater treatment plants. These standards are reflected in terms of five-day biochemical oxygen demand (BOD5), total suspended solids (TSS) removal, and pH. (See 40 C.F.R. § 133.) Secondary treatment processes include a combination of physical and biological treatment to remove biodegradable organics and suspended solids. Advanced secondary processes can include nutrient removal (e.g., full nitrification and denitrification). Secondary and advanced secondary treatment can occur in fully-enclosed reactors, such as tanks, or in concrete-lined basins of limited areal extent. Examples of contained treatment include aerobic systems (e.g., activated sludge, sequencing batch reactors, extended aeration, membrane biological reactors) and biofiltration systems (e.g., attached growth systems, trickling filters, etc.). Secondary treatment can also occur in ponds (e.g., aerobic, facultative) that discharge seepage over large areas.

Shallow Zone (Nitrate Control Program)

The portion of the aquifer whose areal extent is defined by the boundaries of the discharge area and whose vertical extent is defined by the depth of the shallowest 10% of the domestic water supply wells near the discharge or an equivalent alternative. Note: Central Valley Water Board determinations regarding availability of and allocation of assimilative capacity will be based on ambient water conditions in the Shallow Zone.

Sludge

The solids, residues, and precipitates separated from, or created in, wastewater by the unit processes of a treatment system.

Solid Waste

Waste that must be disposed of in a manner consistent with California Code of Regulations, title 27, subdivision 1 (i.e., sent to a landfill) and which generally cannot be beneficially reused, such as grit and screenings generated during preliminary treatment.

Tertiary Treatment

Tertiary treatment processes include filtration to further reduce biodegradable organics and suspended solids prior to disinfection if required for disposal or reuse.

Title 22 Engineering Report

Report prepared for DDW approval that describes how a recycled water project will comply with the Water Recycling Criteria as required by Water Code section 13552.8 and described in California Code of Regulations, title 22, section 60323.

Upset

An exceptional incident causing noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the discharger. It does not include noncompliance caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

Wastewater System

The collection system, pumping stations, treatment equipment (e.g., bar screens, clarifiers, aerators or other aerobic treatment systems, chlorine contact chambers, activated sludge, sand/media filters, and disinfection systems), treatment ponds, storage ponds, percolation ponds, constructed wetland, land application areas, and other systems associated with the collection, treatment, storage, disposal of wastewater, and solid waste and sludge generated from wastewater treatment.

III. REGULATORY BACKGROUND

General Order

The General Order is designed to provide a simplified permitting pathway for large domestic wastewater treatment facilities (those that receive more than 0.1 MGD flows), which do not qualify for coverage under any existing WDRs general orders. Domestic wastewater facilities with flows less than 100,000 gpd that discharge to land may be eligible for permitting through the State Water Resources Control Board Order WQ 2014-0153-DWQ, *General Waste Discharge Requirements for Small Domestic Wastewater Treatment Systems* (https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2014/wqo2014_0153_dwq.pdf), and those with flows less than 10,000 gpd may qualify for permitting through a local agency under the State Water Board's *Water Quality Control Policy For Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems* (OWTS Policy).

Operator Certification Requirements

In accordance with California Code of Regulations, title 23 (Title 23), section 3680, General Order Requirement IV.A.6 requires that enrolled WWTPs be supervised and operated by persons possessing wastewater treatment operator certifications of the appropriate grades based on WWTP treatment process and design capacity, as described in Title 23 section 3675 and outlined below:

1. **Class I** – *Primary treatment* with ≤ 1.0 million gallons per day (mgd) design flow, **and** *conventional treatment ponds* regardless of size (e.g., facultative or aerated lagoons).
2. **Class II** – *Primary treatment* > 1.0–5.0 mgd; *biofiltration* ≤ 1.0 mgd; *modified treatment ponds* of any flow.
3. **Class III** – *Primary* > 5.0–20.0 mgd; *biofiltration* > 1.0–10.0 mgd; *activated sludge* ≤ 5.0 mgd; sequencing batch reactor (*SBR)* ≤ 1.0 mgd; *tertiary* ≤ 1.0 mgd.
4. **Class IV** – *Primary* > 20.0 mgd; *biofiltration* > 10.0–30.0 mgd; *activated sludge* > 5.0–20.0 mgd; *SBR* > 1.0–10.0 mgd; *tertiary* > 1.0–10.0 mgd;
5. **Class V** – *Biofiltration* > 30.0 mgd; *activated sludge* > 20.0 mgd; *SBR* > 10.0 mgd; *tertiary* > 10.0 mgd.

Title 23 section 3680, subdivision (a), specifies the following minimum operator certification grades for the Chief Plant Operator and Designated Operator in Charge for each class of WWTP as outlined in Table 1 below:

Table 1: Operator Certification Requirements

Wastewater Treatment Plant Classification	***Minimum Grade Level of Chief Plant Operator***	***Minimum Grade Level of Designated Operator-in-Charge***
I	I	I
II	II	I
III	III	II
IV	IV	III
V	V	III

Additionally, Title 23 section 3680, subdivision (c), requires that all operators must hold at least a Grade I certificate, a provisional operator certificate, or a valid operator-in-training certificate, and at Class IV/V plants, at least 50 percent of the operators must hold valid operator or operator-in-training certificates at the Grade II level or higher.

Pretreatment Requirements

Pretreatment programs are required for Large WWTPs that treat or are designed to treat an average dry weather flow of 5 million gpd (Title 23, § 2233, subd. (a)), and may be necessary for some facilities with lower flows to prevent the introduction of pollutants/wastes that will interfere with the operation of the treatment works, pass through the treatment system, reduce opportunities to recycle and reuse domestic wastewater and sludge, or expose employees to hazardous chemicals. The General Order contains pretreatment program requirements for Large WWTPs, including requirements to report all significant industrial users (SIUs) and Categorical Industrial Users (CIUs) to the EPA and Water Board. The following documents from the U.S. EPA provide additional guidance on the development and implementation of a pretreatment program that is compliant with the General Order.

- For a comprehensive audit checklist for control authorities to assess pretreatment programs use, U.S. Environmental Protection Agency. (2010). *Control Authority Pretreatment Audit Checklist and Instructions* (EPA 833-B-10-001). (https://www.epa.gov/system/files/documents/2021-07/final_pca_checklist_and_instructions_-feb2010.pdf)
- For comprehensive guidance on how to develop, implement, and maintain an effective pretreatment program that implements requirements equivalent to

those established by 40 CFR Part 403 use, U.S. Environmental Protection Agency. (1999). *Introduction to the National Pretreatment Program* (EPA 833-B-98-002). (https://www.epa.gov/sites/default/files/2015-10/documents/owm0003.pdf)

- For guidance to assist WWPTs in implementing their industrial users (IUs) inspection and sampling programs use, U.S. Environmental Protection Agency. (1991). *Industrial User Inspection and Sampling Manual for POTWs* (EPA 831-B-94-001). (https://www.epa.gov/sites/default/files/2015-10/documents/owm0024.pdf)

IV. TYPICAL DOMESTIC WASTEWATER QUALITY CHARACTERISTICS

General Order Finding I.B.2 explains that, pursuant to Water Code section 13263, subdivision (i), it is appropriate to prescribe general WDRs for Large WWTPs because they share common features. This section describes the commonality of Large WWTPs' waste characteristics (constituents of concern and concentrations).

The quality of domestic wastewater and treated wastewater varies depending on source water quality, the activities generating the wastewater, water conservation efforts, inflow and infiltration, and treatment technology. Table 2 below presents some examples of typical domestic wastewater and treated wastewater characteristics. Water conservation efforts by some communities in recent years have resulted in increased wastewater strength.

Table 2: Summary of Domestic Wastewater Characteristics

Constituent	Units	Typical Domestic Wastewater Influent	Secondary Treatment Effluent
Biochemical Oxygen Demand, 5-Day	mg/L (See 1 below)	200-488 (See 2 & 3 below)	30-45 (See 4 below)
Total Suspended Solids	mg/L	200-389 (See 2 & 3 below)	30-45 (See 4 below)
Ammonia (as N)	mg/L	6-41 (See 2 & 3 below)	0-65 (See 5 below)
Nitrite and Nitrate (as N)	mg/L	<1 (See 2 & 3 below)	0-65 (See 5 below)
Total Nitrogen	mg/L	35-100 (See 2 & 3 below)	5-35 (See 6 below)
Total Phosphorous	mg/L	5.6-12 (See 2 & 3 below)	0-10 (See 6 below)

1. mg/L denotes milligrams per liter.
2. Table 4-3, U.S. EPA Wastewater Treatment/Disposal for Small Communities, Manual, September 1992, EPA/625/R-92/005.

3. Tchobanoglous et al., (2014) Wastewater Engineering Treatment Resource Recovery, Fifth Edition, Metcalf & Eddy/AECOM, McGraw-Hill Education, page 221, Table 3-18.
4. 40 C.F.R. section 133.102.
5. Value highly variable depending upon treatment technology.
6. U.S. EPA Case Studies on Implementing Low-Cost Modifications to Improve Nutrient Reduction at Wastewater Treatment Plants. (https://www.epa.gov/sites/default/files/2015-08/documents/case_studies_on_implementing_low-cost_modification_to_improve_potw_nutrient_reduction-combined_508_-_august.pdf)

Domestic Wastewater Constituents of Concern

Domestic wastewater contains or may contain several constituents with the potential to degrade water quality and create nuisance conditions, including:

1. Salinity (e.g., electrical conductivity [EC], fixed dissolved solids [FDS], and total dissolved solids [TDS]),
2. Nitrogen (including nitrogen in the forms of nitrate, nitrite, ammonia, and organic nitrogen),
3. Pathogens (viruses, bacteria, parasites, protozoa, and fungi), and
4. Organics (i.e., BOD)

Information about each of the wastewater constituents of concern, including things to consider regarding treatment and disposal, is discussed below:

Salinity

EC is a measure of the capacity of water to conduct electrical current and is an indicator of salinity. TDS is representative of overall salinity. The best measure for total salinity in groundwater is TDS. FDS is the non-volatile fraction of TDS. For wastewater discharged to land, FDS is the primary salinity constituent of concern as it does not degrade biologically. Therefore, the non-volatile fraction of TDS (i.e., FDS) has the greatest potential to percolate or leach into shallow groundwater and impact the beneficial uses of groundwater for agricultural purposes and drinking water use.

Nitrogen

For nitrogen-containing nutrients such as nitrate, the potential for groundwater degradation depends on wastewater quality and the ability of the vadose zone below the percolation ponds and land disposal areas to support nitrification and denitrification to convert nitrogen to nitrogen gas before it reaches the water table.

Organic nitrogen and ammonia, which are the primary forms of nitrogen in untreated domestic wastewater, can readily mineralize and convert to nitrate (with some loss via ammonia volatilization) in aerobic soil conditions.

Public Health Concerns

High levels of nitrates in drinking water pose several public health risks, most notably the potentially fatal "blue baby syndrome" (methemoglobinemia) in infants, which impairs the blood's ability to carry oxygen. For the general population, long-term exposure to nitrates may be associated with other health issues, including thyroid problems, adverse pregnancy outcomes, and certain cancers.

Pathogens

Domestic wastewater contains a wide variety of pathogens, including bacteria, viruses, and parasites. These microorganisms can cause various illnesses, ranging from gastroenteritis and diarrhea to more severe diseases, and pose a public health risk if not properly treated before being released into the environment.

1. Bacteria: These include Salmonella (typhoid), Shigella (dysentery), Vibrio cholerae (cholera), E. coli (diarrhea), Campylobacter (diarrhea), and Leptospira (leptospirosis).
2. Viruses: Common viruses found in wastewater include norovirus, adenovirus, rotavirus, hepatitis A and E, enterovirus, and SARS-CoV-2.
3. Parasites: This category includes parasites like Cryptosporidium and Giardia, which can cause gastrointestinal illnesses.

Organics

Domestic wastewater organics are carbon-based compounds. These substances act as a food source for microorganisms, which can create high BOD, leading to the depletion of dissolved oxygen. Wastewater treatment processes are necessary to remove these organic pollutants and prevent environmental damage. These organics include, but are not limited to, the following:

1. Components of domestic wastewater organics.
2. Proteins, fats, oils, and greases: These are major components of domestic wastewater, originating from human waste and food.
3. Carbohydrates: Sugars and other carbohydrates are also a significant part of the organic load.
4. Detergents and synthetic compounds: These are found in wastewater from laundry and dishwashing and contribute to pollution.

5. Fibers: Fibers are a large portion of the organic matter in domestic wastewater.
6. Endocrine-disrupting chemicals: Wastewater can contain various compounds like pharmaceuticals, hormones, and other chemicals that are harmful to the environment and potentially human health, as noted by ACS Publications.

Environmental Impact of Untreated Organics

Excessive application of high organic strength or high BOD wastewater can create nuisance odors, damage soil and crops, and degrade groundwater with nitrogen compounds and metals. These impacts can be minimized through proper best management practices.

High BOD loading can deplete oxygen in the vadose zone, creating anoxic conditions that can lead to odors and vector breeding. Reduced oxygen levels can also create reducing conditions that mobilize metals such as iron, manganese, and arsenic, especially in acidic soils, allowing them to migrate toward groundwater. While some BOD breaks down near the soil surface, elevated concentrations can persist in the vadose zone. The amount of BOD that can be safely applied depends on soil characteristics and system management.

V. WASTEWATER TREATMENT AND DISPOSAL

Treatment Technologies

General Order Finding II.B.2 explains that, pursuant to Water Code section 13263, subdivision (i), it is appropriate to prescribe general WDRs for Large WWTPs because they share common features. This section describes the treatment methods and disposal techniques commonly employed at Large WWTPs and provides background on their implementation.

Primary Treatment

Physical processes that stratify wastewater by density to remove solids, most commonly grit chambers, sedimentation tanks, skimmers, and sludge removal.

Secondary Treatment

Largely refers to biological waste digestion and stratification processes. Secondary treatment processes involve a combination of physical and biological treatment to remove biodegradable organics and suspended solids. Advanced secondary processes include nitrogen removal (e.g., full nitrification and denitrification). Secondary and advanced secondary treatment can occur in fully-enclosed reactors, such as tanks, or in concrete-lined basins of limited areal extent. Examples of contained treatment include aerobic systems (e.g., activated sludge, sequencing batch reactors, extended aeration, membrane biological reactors) and biofiltration systems (e.g., attached growth systems, trickling filters, etc.). Secondary treatment can also occur in ponds (e.g., aerobic, facultative).

Tertiary Treatment

Involves treating oxidized effluent received from secondary treatment to reduce the concentration of residual total suspended solids and biochemical oxygen demand. Tertiary treatment is provided through filtration, including but not limited to sand filtration, multimedia filtration, membrane filtration, cloth media, and disc filtration. Tertiary treatment processes include filtration to further reduce biodegradable organics and suspended solids prior to disinfection if required for disposal or reuse.

Disinfection

The process of either destroying or reproductively sterilizing pathogens in treated wastewater (i.e., either secondary or tertiary-treated wastewater). Disinfection is typically achieved either through chlorine treatment or ultraviolet light (UV) treatment. Disinfection of treated wastewater is necessary for certain types of recycled water uses per California Code of Regulations, title 22 (Title 22) as well as in certain hydrogeological settings (i.e., shallow groundwater conditions without sufficient vadose zone treatment).

Disinfection of domestic wastewater is a crucial step to remove harmful microorganisms before discharge or reuse. However, disinfectants can react with organic matter or other substances in the wastewater to form disinfection by-products (DBPs).

The disinfected tertiary wastewater filtration and disinfection requirements established in General Order Requirement II.B.5 implement the same treatment standards established in Title 22 for disinfected tertiary recycled water. Although the Large WWTP effluent that is subject to these requirements is disposed of to land and not distributed as recycled water, applying Title 22 tertiary criteria ensures that turbidity is reduced to allow for adequate disinfection before discharge and that the treatment reliably removes or destroys pathogens. This level of protection is appropriate for non-recycled wastewater disposal, where disinfected tertiary treatment is necessary to minimize the potential for nuisance conditions and reduce the risk of pathogen transport to groundwater or areas of public access.

Disinfection methods include:

1. Chlorine

   Advantages:

   a. Proven, widely used, and well-understood.

b. Provides residual disinfection, which helps control microbial regrowth in distribution systems.

c. Effective against a broad spectrum of pathogens.

Disadvantages:

d. Could produce harmful DBPs such as trihalomethanes (THMs) and haloacetic acids (HAAs).

e. May require dechlorination before discharge to protect aquatic life.

f. Handling and storage of chlorine gas pose significant safety risks.

2. Ultraviolet (UV) Light

Advantages:

a. Effective against bacteria, viruses, and protozoa (e.g., Cryptosporidium, Giardia).

b. No chemical addition—no DBPs or residuals.

c. Compact systems with relatively low operational complexity.

Disadvantages:

d. No residual disinfection—recontamination risk downstream.

e. Effectiveness reduced by high turbidity or suspended solids.

f. Requires regular maintenance and lamp replacement.

3. Chlorine Dioxide

Advantages:

a. More effective than chlorine against viruses and protozoa like Giardia.

b. Produces fewer regulated DBPs compared to chlorine.

c. Effective over a wide pH range.

Disadvantages:

d. Generates chlorite and chlorate as byproducts, which are regulated.

e. Requires on-site generation due to instability.

f. Higher operational complexity and cost than chlorine.

4. Ozone

   Advantages:

   a. Extremely powerful oxidant; effective against bacteria, viruses, and protozoa.
   b. No harmful residuals; breaks down to oxygen.
   c. Improves taste, odor, and color of treated water.

   Disadvantages:

   d. No residual disinfectant effect, it requires tight process control.
   e. High energy consumption and cost.
   f. Ozone is toxic and must be generated on-site due to its instability.

Emergency Bypass Ponds

General Order Requirement II.C.2 allows the use of emergency bypass ponds. WWTPs may rely on emergency bypass ponds to temporarily store untreated or partially treated wastewater when treatment processes are overwhelmed or malfunction (i.e., equipment failure/system maintenance and repairs, extreme weather events, system overload, etc.). Emergency bypass ponds provide a temporary holding area for excess wastewater, reducing the potential for an uncontrolled discharge to the environment, helping to protect the WWTP from damage and flooding, and allowing bypassed wastewater to be treated later once treatment processes return to normal conditions. Emergency bypass pond usage must be limited to short durations and not cause or contribute to, or threaten to cause or contribute to, a condition of pollution, contamination, and/or nuisance in compliance with the prohibitions established in the General Order.

Wastewater Disposal

In the Central Valley region, WWTPs typically dispose of treated wastewater by discharging to unlined ponds or to land disposal areas (e.g., spray fields/controlled flood areas). Poorly managed wastewater disposal practices can pose a higher risk of creating nuisance conditions and degrading water quality. Some examples of high-risk wastewater disposal are discussed below:

1. Discharging untreated wastewater to unlined pond(s) for treatment, storage, and/or disposal (e.g., percolation pond). Lining treatment, storage, or evaporation ponds with synthetic or low-permeability material reduces percolation rates and minimizes potential threats to water quality.

2. Inadequately designed percolation ponds, such as those undersized, with improper percolation rates, or insufficient separation from groundwater, significantly increase risks to surface and groundwater quality.

3. Excessive loading of BOD to wastewater ponds can cause nuisance odors and create reducing conditions in groundwater. Common mitigation measures include source control, pretreatment prior to discharge, and mechanical aeration.
4. Burrowing animals can compromise containment berm integrity, so berms must be regularly inspected and maintained to prevent failure and associated impacts.

When treated wastewater is applied to land for disposal, adequate acreage is required to ensure application rates do not cause nuisance conditions (such as vectors, odors, offsite discharge, or ponding), degrade water quality, or pose risks to public health.

Wastewater discharged to land near a surface water body has the potential to impact surface water quality via runoff, surfacing effluent, or underflow to a gaining stream. In these situations, the Central Valley Water Board Executive Officer may require additional monitoring in the facility's Monitoring and Reporting Program to evaluate the potential for surface water degradation.

General Order Requirement II.D.2 exempts certain Large WWTPs from the General Order's biochemical oxygen demand (BOD) Loading Limitations if those facilities were previously subject to individual WDRs orders adopted after 1 January 2008, and those orders specify BOD loading limits that are less stringent than those in the General Order. Large WWTPs that meet this criterion are authorized to maintain their previously-permitted BOD loading rates, which will be reflected in the Notice of Applicability issued to those dischargers when they are enrolled under this General Order.

Present-day individual WDRs orders for these types of facilities generally require that dischargers develop site-specific loading rates based on appropriate technical evaluation, such as that contained in the League of Food Processors *Manual of Good Practice for Land Application of Food Processing/Rinse Water*[1]. The Central Valley Water Board has previously determined that eligible facilities' BOD loading limits meet this standard and, thus, it is appropriate to maintain those site-specific limits rather than requiring compliance with more stringent general limits intended

---

[1] Manual of Good Practice for Land Application of Food Processing/Rinse Water. Prepared for California League of Food Producers. Brown and Caldwell; Kennedy/Jenks Consultants. Revised February 13, 2024.

for facilities that have not previously developed site-specific limits based on contemporary technical literature and practices.

VI. SETBACKS AND VARIANCE PROCESSES

In support of General Order Requirement II.B.4, this section provides guidance on the appropriate setbacks for facility components and the appropriate variance approval process for each.

The setbacks in Table 3 are derived from several sources, and the process for granting any variances from the setbacks varies with the source. For all existing, expanded, or new WWTPs, the following procedures must be implemented when determining the appropriate setback variance process.

1. When the setback requirement comes from Title 22, approval of a variance must be obtained from both the State Water Board, Division of Drinking Water (DDW), and the Central Valley Water Board Executive Officer.
2. When the setback comes from the California Well Standards, a reduced setback may be allowed based on site-specific conditions with approval from the Central Valley Water Board Executive Officer.
3. When the setback comes from the Basin Plan, the Central Valley Water Board may allow a reduced setback based on site-specific conditions.
4. When the setback comes from the California Plumbing Code, the Central Valley Water Board Executive Officer may not approve a reduced setback.

Approval of a variance for setbacks that are not referenced to a requirement listed above will be based on professional judgment and may be revised by the Central Valley Water Board Executive Officer based on site-specific conditions.

Table 3: Summary of Wastewater System Setbacks (See 1 below)

Equipment Or Activity	Domestic Well	Flowing Water Course (See 2 below)	Ephemeral Water Course (See 3 below)	Property Line	Lake, Wetland, or Reservoir (See 4 below)
Treatment System (See 5 below)	100 (See 6 below) 50 (See 7 below)	50 (See 7 below)	50	5 (See 7 below)	200 (See 8 below) 50 (See 7 below)
LAND APPLICATION BY SPRAY OR DRIP METHODS					
Land Application Area (disinfected tertiary recycled water) (See 9, 10, & 11 below)	50 (See 12 below)	25	50	25	200
Land Application Area (disinfected secondary-2.2 or secondary-23 Recycled Water) (See 13 below)	100 (See 14 below)	50	50	Spray – 100 (See 15 below) Drip – 50 (See 16 below)	200
Land Application Area (undisinfected secondary recycled water (See 17 below), undisinfected secondary treated wastewater)	150 (See 18 below)	100	100	Spray – 100 (See 15 below) Drip – 50 (See 16 below)	200
WASTEWATER IMPOUNDMENT (TREATMENT PONDS, STORAGE PONDS, DISPOSAL PONDS (See 19 below), AND LAND APPLICATION BY CONTROLLED FLOOD METHODS)					
Impoundment (disinfected tertiary recycled water) (See 9 below)	100 (See 20 below)	100	100	50	200

Equipment Or Activity	Domestic Well	Flowing Water Course (See 2 below)	Ephemeral Water Course (See 3 below)	Property Line	Lake, Wetland, or Reservoir (See 4 below)
Impoundment (disinfected secondary 2.2 or secondary-23-recycled water) (See 13 below)	100 (See 14 below)	100	100	50	200
Impoundment (undisinfected secondary recycled water (See 17 below), undisinfected secondary treated wastewater)	150 (See 18 below)	150	150	50	200

1. All units are in feet
2. A flowing water course must be measured from the ordinary high-water mark established by fluctuations of water elevation and indicated by characteristics such as shelving, changes in soil character, vegetation type, presence of litter or debris, or other appropriate means.
3. Ephemeral water course denotes a surface water drainage feature that flows only after rain or snowmelt and does not have enough groundwater seepage (baseflow) to maintain a condition of flowing surface *water*. The drainage must be measured from a line that defines the limit of the ordinary high-water mark (described in “a” above). Irrigation canals are not considered ephemeral drainage features. The ephemeral water course must be a “losing stream” (discharging surface water to groundwater) at the proposed Wastewater System site.
4. Lake, wetland, or reservoir boundary measured from the high-water line.
5. Treatment system addresses equipment located below ground or that impedes leak detection by routine visual inspection.
6. California Well Standards, pt. II, section 8. Site-specific conditions may allow a reduced setback or require an increased setback. See discussion in Well Standards.
7. Setback established by California Plumbing Code, Table H 101.8.
8. Setback established by the Onsite Wastewater Treatment System Policy, section 7.5.5.
9. Disinfected tertiary recycled water is defined in Title 22, section 60301.230.
10. Additional restrictions for spray irrigation of recycled water are contained in Title 22, § 60310(f).

11. No spray irrigation of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or school yard.
12. Setback established by California Code of Regulations, title 22, section 60310(a). A reduced setback is allowed as described in California Code of Regulations, title 22, section 60310(a) if all the conditions in the section are met and compliance is documented in the application and notice of applicability.
13. Disinfected secondary-2.2 recycled water is defined in Title 22, section 60301.220. Disinfected secondary-23 recycled water is defined in Title 22, section 60301.225.
14. Setback established by Title 22, section 60310(c).
15. Setback established by Title 22, section 60310(f).
16. Setback for drip or flood application methods. Spray irrigation is subject to additional setbacks and restrictions (see footnote 10).
17. Undisinfected secondary recycled water is defined in Title 22, section 60301.900.
18. Setback established by Title 22, section 60310(d).
19. Disposal ponds include evaporation and percolation ponds.
20. Setback established by Title 22, section 60310(b).

VII. APPENDIX A – CV-SALTS NITRATE CONTROL PROGRAM

FIGURE N-1: PRIORITIZED DWR BULLETIN 118 GROUNDWATER BASINS/SUB-BASINS

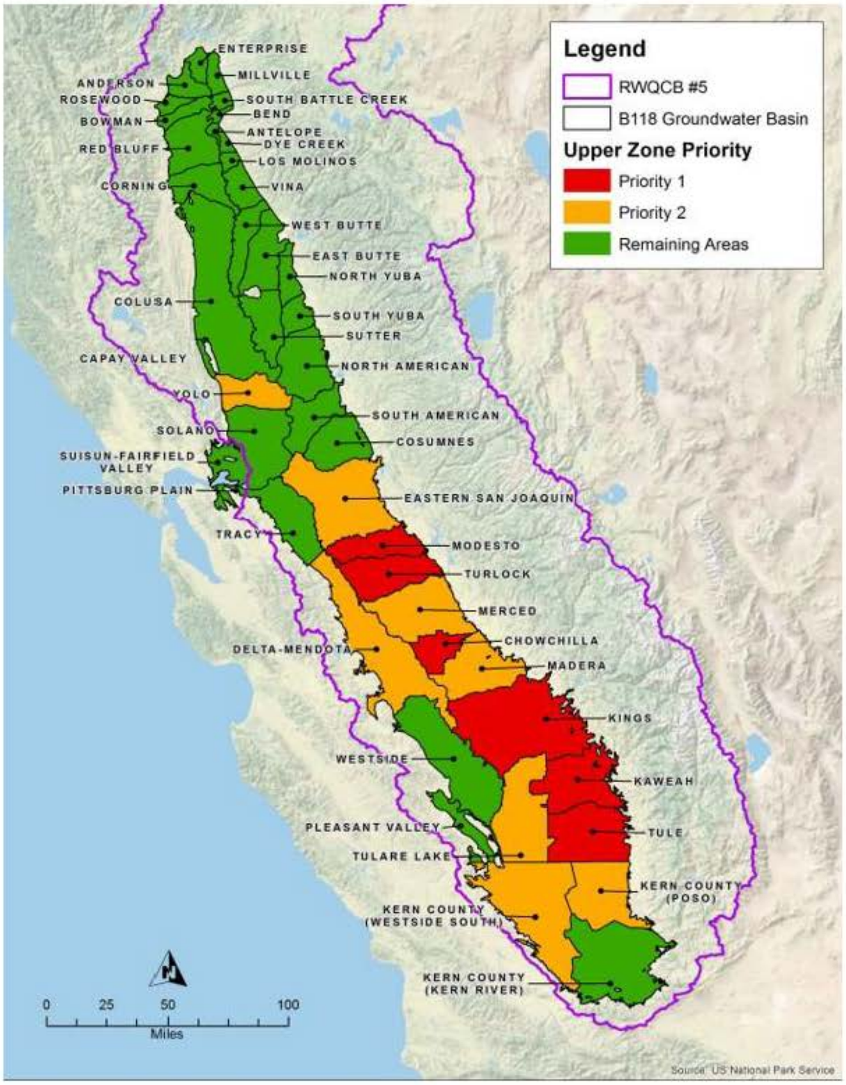

TABLE N-1: PRIORITIZED DWR BULLETIN 118 GROUNDWATER BASINS/SUB-BASINS

PRIORITY 1	
5-22.11	Kaweah
5-22.03	Turlock
5-22.05	Chowchilla
5-22.13	Tule
5-22.02	Modesto
5-22.08	Kings

PRIORITY 2	
5-21.67	Yolo
5-22.04	Merced
5-22.14	Kern County (Westside South)
5-22.12	Tulare Lake
5-22.14	Kern County (Poso)
5.22-07	Delta Mendota
5-22.01	Eastern San Joaquin
5-22.06	Madera

TABLE N-3: NITRATE CONTROL PROGRAM – INDIVIDUAL PERMITTING APPROACH (PATH A) - NITRATE DISCHARGE CATEGORIES

Category	Discharge Quality and Impact to Groundwater
Category 1 No Degradation	Discharge quality, as it reaches the Shallow Zone, (See 1 below) is better than the applicable water quality objective and is better than the average nitrate concentration in the Shallow Zone.
Category 2 De Minimis Impacts	The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective, and, over a 20-year planning horizon: • The effect of the discharge on the average nitrate concentration in the Shallow Zone is expected to use less than 10% of the available assimilative capacity in the Shallow Zone; and • The discharge, in combination with other nitrate inputs to the Shallow Zone, is not expected to cause average nitrate concentrations in the Shallow Zone to exceed a nitrate trigger of 75% of the applicable water quality objective.
Category 3 Degradation Below Trigger	The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective. Estimated that discharge is more than *de minimis*, but will not cause the average nitrate concentration in the Shallow Zone to exceed a trigger of 75% of the applicable water quality objective over a 20-year planning horizon.
Category 4 Degradation Above Trigger	The average nitrate concentration in the Shallow Zone is better than the water quality objective. Though the discharge is reasonably expected to cause the average nitrate concentration in the Shallow Zone to exceed a trigger of 75% of the applicable water quality objective over a 20-year planning horizon, the average nitrate concentration in the Shallow Zone is expected to remain at or below the applicable water quality objective over the same 20-year planning horizon.
Category 5 Discharge Above Objective	Either: • The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective, but the discharge may cause the average nitrate concentration in the Shallow Zone to exceed the water quality objective over a 20- year planning horizon; or, • The average nitrate concentration in the Shallow Zone exceeds the applicable water quality objective, and the discharge quality, as it reaches the Shallow Zone, also exceeds the applicable water quality objective.

1. For the purposes of this Table, the “Shallow Zone” is the portion of the aquifer whose areal extent is defined by the boundaries of the discharge area and whose vertical extent is defined by the depth of the shallowest 10% of the domestic water supply wells near the discharge or an equivalent alternative.

VIII. APPENDIX B – POND AND SLUDGE MANAGEMENT UNIT EVALUATION FLOW CHART

The chart below provides a generalized flow chart showing the steps for evaluating existing pond and sludge management units.