APPENDIX C

Regulation of Waste Discharges in the Central Valley

Based on the definitions and requirements of the California Water Code and the CWA, discharges can be generally divided into the discharge of pollutants to surface waters or other types of discharges (i.e. waste discharges to land or discharges that affect groundwater). Discharges to surface waters are regulated by permits issued under the NPDES program while discharges of other types are permitted through WDRs or waivers to WDRs issued under the Porter-Cologne Act.

In the Central Valley, as in other regions of California, regulated waste discharges include:

- municipal and industrial wastewater;
- municipal and industrial storm water; and
- agricultural runoff from irrigated lands and from dairies/confined animal feeding operations.

The elements of the regulatory programs associated with these waste discharges to surface water and to land/groundwater were evaluated based on a review of recent permits to assess practices that result in the current conditions in receiving water as discussed below.

Surface Water

Point source discharges to surface waters that are waters of the United States are controlled through regulations described in both WDRs and NPDES permits. The requirements of section 402 of the CWA apply in addition to requirements under the Water Code section 13260 and section 13263. Current quality of surface water in the Central Valley is the result of dischargers generally complying with the effluent limitations established in NPDES permits. The current approach to implementation of state and federal requirements for wastewater, storm water and agricultural discharges to surface water is discussed below.

Wastewater

Wastewater discharges are regulated to control the impacts to receiving waters from municipal and industrial wastewater. Wastewater from municipalities is primarily domestic wastewater with some commercial/industrial discharges. Industrial wastewater discharges vary depending on the industry. This discussion is focused on industrial activities with the potential to discharge salts and nitrate.

Municipal

Municipal wastewater NPDES permits are used to regulate discharges to protect beneficial uses by including discharge prohibitions, effluent limitations, receiving water limitations, monitoring and reporting requirements, and special provisions. NPDES permits are subject to disapproval by U.S. EPA and are subject to renewal every five years. The Central Valley Water Board uses a standardized NPDES template to organize and describe the requirements that are applicable to each permitted discharger as described below. A subset of recently adopted

permits was reviewed to determine typical current permit provisions[3].

Discharge Prohibitions

Discharge prohibitions that are common to all NPDES permits include prohibiting bypass of treatment operations, creation of a nuisance, discharge of pollutant-free wastewater (e.g., rainwater, groundwater) or any discharge in a manner different than described in the permit. In addition, site-specific prohibitions may include restrictions on discharging under conditions of low receiving water flow or discharges that may not meet other regulatory requirements.

Effluent Limitations

Effluent limitations are the primary mechanism used to protect water quality and beneficial uses. Effluent limitations may be technology-based or water quality-based. Technology-based effluent limitations ensure that treatment processes are operating properly and address biochemical oxygen demand, total suspended solids, bacteria, and pH. Standard limitations for biochemical oxygen demand and total suspended solids are established based on the type of treatment that is required by the NPDES permit (i.e., secondary or tertiary treatment standards). Technology-based effluent limitations also include flow, chlorine residual and percent removal. WQBELs are established to provide reasonable protection of beneficial uses. Water quality standards are established in the California Toxics Rule and the Basin Plans, as described previously. Effluent limitations are assigned for constituents that are determined to have a reasonable potential to cause or contribute to an exceedance of an applicable water quality standard in the receiving water.

In cases where a discharger shows that they cannot consistently comply with a WQBEL, the discharger can be granted a compliance schedule with interim performance-based limitations. This discharger must provide a plan and schedule to come into compliance with final effluent limitations that becomes part of the compliance schedule order. Site-specific objectives that consider conditions unique to the receiving water may also be developed.

Receiving Water Limitations

In addition to meeting effluent limitations, the discharges must not cause or contribute to an exceedance of water quality objectives in receiving waters.

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[3] The municipal wastewater NPDES permits that were reviewed include: City of Lodi (R5-2013-0125-1), City of Manteca (R5-2015-0026), City of Stockton (R5-2014-0070-02), Mountain House Community Services District (R5- 2013-0004-01), Cities of Turlock/Modesto (R5-2016-0010), and Sacramento Regional County Sanitation District (R5-2016-0020).

Monitoring and Reporting Requirements

To verify that effluent and receiving water limitations are being met, every NPDES permit includes a monitoring and reporting program that outlines constituents to be monitored in effluent and receiving water, and describes the frequency, location and analytical methods to be used. In addition to monitoring for constituents with effluent limitations, monitoring of priority pollutants and other parameters are required to more completely characterize the discharge. Characterization monitoring is required one or more times during each permit term. For dischargers to the Delta, receiving water monitoring requirements may be met by participating in the Central Valley Water Board's Delta Regional Monitoring Program.

Special Provisions

Special studies and other provisions are included for topics that may include the development of management practices or plans, specialized monitoring, or special studies to evaluate site-specific conditions (e.g., mixing zone/dilution, translators or water-effect ratios).

Specific Requirements Regarding Salinity, Nitrate and Secondary MCL Parameters

Most Central Valley wastewater NPDES permit includes an effluent limitation for EC. The EC limitation is typically an annual average based on current performance. Water conservation and recent drought have led to reduced flows to municipal wastewater treatment plants, which in some cases have resulted in increasing concentrations of salinity-related parameters, such as EC. However, in many cases, the total load of salts discharged remains relatively constant. Therefore, performance-based limitations may increase without resulting in any increase in load to the receiving water.

Municipalities also have a provision in their permit to develop and implement a salinity minimization and evaluation plan or salinity source control program to minimize salinity in effluent discharges.

Effluent limitations are also included for nitrate in some permits. Discharges found to have reasonable potential to cause or contribute to the exceedance of the primary MCL for nitrate in a receiving water designated as supporting the MUN beneficial use will be given an effluent limitation for nitrate set equal to the MCL of 10 mg/L-N, particularly where water bodies are considered impaired for nutrients.

In addition, non-salinity secondary MCL parameters (e.g., manganese, iron, and aluminum) that may be found at levels of concern in municipal wastewater also will be assigned effluent limitations. Turbidity is usually controlled through operational specifications or through a receiving water limit.

There are TMDLs for salt and boron applicable to the Lower San Joaquin River that also contain requirements for managing salts.

Industrial

Industrial discharges to surface water are regulated in much the same way as municipal wastewater discharges with the same NPDES permit elements and requirements. The specific effluent limitations assigned depend on the nature of the discharge. The industrial activities most likely to discharge significant levels of salt and nitrate are food processors and wineries. Regulation and impacts to receiving waters of these activities are discussed in Section 3.2.4.2, Groundwater.

Hatchery discharges to surface water were also reviewed for current permitting of salts and nitrate. Hatchery discharges to surface water (and groundwater) are regulated by the General Order for Cold Water Concentrated Aquatic Animal Production (Order No. R5-2014-0161) with effluent limitations for formaldehyde, copper and chlorine. Surface water limitations are included for EC and TDS based on each Basin Plan and groundwater limitations are specified for nitrate (10 mg/L-N) and TDS (500 mg/L).

Storm Water

Municipal (Phase I and Phase II)

The Central Valley Water Board Municipal Storm Water Permitting Program regulates storm water discharges from municipal separate storm sewer systems (MS4). MS4 permits were issued in two phases[4].

- Under Phase I (starting in 1990), the Central Valley Water Board adopted NPDES storm water permits for medium (population between 100,000 and 250,000) and large (population greater than 250,000) municipalities. Most of these permits are issued to groups of co-permittees encompassing large metropolitan areas (examples include East Contra Costa County, Sacramento County, and City of Stockton/San Joaquin County).

- On April 30, 2003, as part of Phase II, the State Water Board issued a General Permit for the Discharge of Storm Water from Small MS4s (Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities (population less than 100,000), including non-traditional small MS4s (e.g., military bases, public campuses, prisons and hospital complexes). The Phase II Small MS4 General Permit covers Phase II permittees statewide. On February 5, 2013, the Phase II Small MS4 General Permit was renewed and became effective on July 1, 2013[5].

The Central Valley Water Board adopted a region-wide MS4 NPDES permit (Order No. R5-2016-0040[6]) in June 2016 (effective October 1, 2016). While the primary focus is on enrolling Phase I MS4 permittees as their current permits expire, Phase II MS4 permittees have the option to enroll under this general permit and terminate coverage under the State Water Board's Phase II Small MS4 General Permit.

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[4] http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

[5] http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

[6] http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016- 0040_ms4.pdf

The Phase I and Phase II permits are structured very similarly and are used to regulate discharges to protect beneficial uses by including discharge prohibitions, effluent limitations, receiving water limitations, monitoring and reporting requirements, and special provisions. The Central Valley Water Board and State Water Board use a similar approach to organize and describe the requirements that are applicable to each permitted discharger. These requirements, as included within the Central Valley Water Board region-wide MS4 permit (Order No. R5-2016-0040) and State Water Board Phase II general permit (Order No. 2013-0001-DWQ), are briefly described below.

Discharge Prohibitions

The NPDES permits include storm water and non-storm water discharge prohibitions.

- The storm water discharge prohibitions incorporate applicable water quality control plan prohibitions as well as a prohibition on creating a condition of pollution, contamination or nuisance.

- Non-storm water discharges into the MS4 must be effectively prohibited, where such discharges are not authorized by a separate NPDES permit or conditionally authorized within the MS4 permit.[7]

The primary compliance approach (pollutant prioritization) allows the permittee to develop a customized storm water management plan[8]. The objective of the storm water management plan is to describe a storm water management program that identifies and addresses MS4 discharge impacts so that such discharges do not cause or contribute to exceedances of water quality standards in waters of the United States (as defined in 40 C.F.R. § 230.3). The storm water management plan includes milestones, strategies and activities, and corresponding schedules for implementation. In general, the permittee's full compliance with the requirements in the NPDES permit, including timely implementation of the storm water management program, constitutes compliance with the discharge prohibitions.

Effluent Limitations

Within the context of NPDES permits for MS4s, the CWA does not explicitly reference a requirement to meeting technology-based effluent limitations or water quality standards. MS4s must effectively prohibit non-storm water discharges and reduce pollutants in the discharge to the maximum extent practicable. However, requiring strict compliance with water quality standards by imposing numeric effluent limitations is at the discretion of the permitting agency. The permits include technology-based effluent limitations and WQBELs (while the Central Valley Water Board general permit uses these terms, the State Water Board Phase II general permit does not).

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7 Conditionally authorized pursuant to 40 Code of Federal Regulations section 122.26(d)(2)(iv)(B)(1), require the implementation of BMPs, or is a discharge associated with emergency containment or cleanup.

8 The secondary compliance approach (prescriptive) is reserved for permittees that are unsuccessful in complying with the requirements under the pollutant prioritization approach.

- Maximum extent practicable is the technology-based standard.[9] Meeting maximum extent practicable requires the continual assessment and modification of the storm water management program to ensure that the program is effectively addressing the pollutants of concern.

- NPDES permits must incorporate WQBELs that are consistent with the assumptions and requirements of applicable waste load allocations.[10] In the context of MS4 discharges, WQBELs may be expressed in the form of either numeric limitations or, where authorized by the Basin Plan, BMPs.[11] With the exception of certain WQBELs based on applicable TMDLs, the general permits do not contain numeric effluent limitations and, instead, include requirements to reduce pollutants in storm water discharges to the maximum extent practicable[12].

In general, the permittee's full compliance with the requirements in the NPDES ,permit, including timely implementation of the storm water management program, constitutes compliance with the effluent limitations.

Receiving Water Limitations

The general NPDES permits include receiving water limitations, which provide that the storm water discharges from the MS4 shall not cause or contribute to exceedances of water quality standards in the receiving waters. The general permits incorporate/refer to applicable water quality control plan water quality standards. If exceedances persist, notwithstanding implementation of the storm water management program, the permittee must follow a process to identify if any modifications to the storm water management plan are necessary.

In general, the permittee's full compliance with the requirements in the NPDES permit, including timely implementation of the storm water management program, constitutes compliance with the receiving water limitations. Final attainment of a water quality standard is demonstrated when the permittee's MS4 discharges are no longer causing or contributing to exceedances of that water quality standard within the applicable receiving water or that receiving water is meeting water quality standards. Final attainment is verified through monitoring and reporting results.

Monitoring and Reporting Requirements

The Central Valley Water Board general permit requires the development and implementation of a monitoring program.[13] The goal of the monitoring program is to inform the permittee, to the extent feasible, about the nexus between the implementation of the storm water program, the quality of the discharges from the MS4, and the resulting impact, if any, on the receiving water.

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[9] CWA section 402(p)(3)(B)(iii).

[10] 40 C.F.R. § 122.44(d)(1)(vii)(B).

[11] 40 C.F.R. § 122.44(k).

[12] The applicable WQBELs and TMDL requirements are contained within Attachment G of both general permits.

[13] Under the Phase II general permit some permittees may be exempt from the requirement to develop a monitoring program.

The monitoring program may include receiving water monitoring, source characterization, urban discharge monitoring, special studies, and/or TMDL monitoring. Certain permittees may participate in the Central Valley Water Board's Delta Regional Monitoring Program to address all or part of the local water quality monitoring requirements.

As applicable, the Phase II general permit requires permittees to develop and implement monitoring programs for discharges to areas of special biological significance, to support TMDLs, for discharges to CWA section 303(d) listed water bodies to evaluate receiving water quality, or to evaluate the effectiveness of water quality projects or the storm water program.

Special Provisions

While the general permits do not include any requirements to conduct special studies, they recognize the use of these types of studies as a part of monitoring program; receiving water assessment; or effectiveness assessments.

Specific Requirements for Salinity, Nitrate and Secondary MCL Parameters

The primary location for parameter-specific requirements is within the TMDL portion of the general permits. The permits include TMDLs that have been adopted by the Central Valley Water Board or USEPA for pollutant specific issues within water bodies or segments of water bodies in Region 5. All permittees that are assigned a waste load allocation or identified as a responsible party where urban runoff is listed as the source must comply with the requirements as specified within the permit. Currently, there are no adopted TMDLs for salinity, nitrate or secondary MCL parameters that are applicable to MS4s in the Central Valley. The Lower San Joaquin River Salt and Boron TMDL concluded that stormwater contributes negligible salinity loads to the Lower San Joaquin River; less than one quarter of one percent of the river's total salt load as measured at the Airport Way Bridge near Vernalis (Central Valley Regional Water Quality Control Board 2004).

Industrial

The State Water Board first issued an NPDES Industrial General Permit (IGP) to regulate discharge of storm water associated with industrial activity in 1997 and subsequently reissued it 2014.[14] The IGP regulates industrial storm water discharges and authorized non-storm water discharges from specific categories of industrial facilities. The IGP requires the development of a site-specific storm water pollution prevention plan, which must include the information necessary to demonstrate compliance with permit requirements. The IGP is used to regulate discharges to protect beneficial uses by including discharge prohibitions, effluent limitations, receiving water limitations, monitoring and reporting requirements, and special requirements and provisions. These requirements, as included within the IGP, are briefly described below.

Discharge Prohibitions

The IGP includes storm water and non-storm water discharge prohibitions.

[14] http://www.swrcb.ca.gov/board_decisions/adopted_orders/water_quality/2014/wqo2014_0057_dwq_rev_mar2015.pdf

- Storm water discharges to waters of the United States are prohibited, except as explicitly authorized by the IGP or another NPDES permit. The storm water discharge prohibitions also incorporate applicable water quality control plan prohibitions as well as a prohibition on creating a condition of pollution, contamination or nuisance.

- With the exception of certain authorized non-storm water discharges, non-storm water discharges are prohibited.

Effluent Limitations

In the 2014 update of the IGP, the State Water Board determined that it is not feasible to establish numeric technology-based effluent limitations. However, the IGP requires dischargers to implement BMPs that comply with Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) requirements to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. The IGP's requirements constitute BCT for discharges of industrial storm water and authorized non- storm water discharges.

The USEPA established Effluent Limitation Guidelines and New Source Performance Standards (ELGs) for storm water discharges from facilities in eleven industrial categories. Storm water discharges from facilities subject to ELGs shall not exceed those storm water ELGs. For facilities where ELGs have been developed, compliance with the BAT/BCT and ELG requirements constitutes compliance with the IGP technology-based requirements.

The IGP includes annual and instantaneous maximum Numeric Action Levels. The Numeric Action Levels are not intended to serve as technology-based effluent limitations or WQBELs, and exceedance of these levels is not considered a violation of the IGP.

Dischargers must comply with TMDL-specific requirements, which may not be limited by the BAT/BCT technology-based requirements. The TMDL requirements are coordinated by each regional water quality control board. The State Water Board is in the process of amending the IGP to incorporate TMDL specific requirements.

In general, a discharger must implement minimum and advanced BMPs as necessary to achieve compliance with the effluent limitations.

Receiving Water Limitations

The IGP includes receiving water limitations, which require that the storm water discharges and authorized non-storm water discharges do not cause or contribute to exceedances of applicable water quality standards in the receiving waters, adversely affect human health or the environment, or contain pollutants in quantities that threaten to cause pollution or a public nuisance. If a discharge causes or contributes to an exceedance of a water quality standard, the discharger must implement additional BMPs or other control measures in order to attain compliance with the receiving water limitations. Compliance with water quality standards may, in some cases, require dischargers to implement controls that are more protective than controls implemented solely to comply with the technology-based requirements within the IGP. In

general, the discharger must implement minimum and advanced BMPs as necessary to achieve compliance with the receiving water limitations.

Monitoring and Reporting Requirements

The IGP contains monitoring requirements that are necessary to determine whether pollutants are being discharged and whether response actions are necessary. Data and information resulting from the monitoring assist in the evaluations of BMP effectiveness, ability to meet Numeric Action Levels and ELGs, and compliance with the IGP.

Special Requirements and Provisions

While the IGP does not include any requirements to conduct special studies, it does have special requirements for plastic materials.

Specific Requirements for Salinity, Nitrate and Secondary MCL Parameters

While the IGP monitoring program includes some salinity, nitrate, or secondary MCL-related analytical parameters based on the type of industrial facility, the IGP does not contain specific programs or studies directed at these parameters. The following IGP requirements would trigger monitoring for salinity, nitrate, or secondary MCL-related analytical parameters:

- Facilities subject to additional analytical parameters identified in IGP Table 1;
- Facilities that identify these parameters on a facility-specific basis that serve as indicators of the presence of all industrial pollutants identified in the pollutant source assessment;
- Facilities that identify these parameters associated with the industrial source assessment related to receiving waters with CWA section 303(d) listed impairments or approved TMDLs; and
- Additional parameters required by the Central Valley Water Board.

These parameters may also be identified within the TMDL portion of the IGP. The IGP includes TMDLs that have been adopted by the applicable regional water quality control board or USEPA for pollutant specific issues within water bodies or segments of water bodies throughout the state that are applicable to industrial dischargers. Currently, there are no TMDLs listed for Region 5. The State Water Board is in the process of amending the IGP to incorporate TMDL-specific requirements.

Agriculture

Agriculture is not regulated through the NPDES program. WDRs have been adopted that do have requirements for surface water discharges from agriculture, as described below.

Irrigated Agriculture

Irrigated agriculture discharges are regulated by WDRs under the ILRP. Specific elements of the irrigated agriculture WDRs are described in Section 3.2.4.2. WDRs for irrigation agriculture

contain surface water limitations to address potential impacts to surface waters. In addition, the WDRs require that erosion and sediment control plans be developed and implemented to address potential impacts to surface water.

Receiving water limitations are applied to surface water as narrative objectives stating that wastes discharged from coalition member operations shall not cause or contribute to an exceedance of a water quality objective. Trigger limits are established for constituents of concern. If the trigger is exceeded two or more times in a three-year period at a given sampling location, then a surface water quality management plan must be developed and implemented. A time schedule for addressing the water quality problem is required to be included in the surface water quality management plan and may not exceed ten years.

Dairies

Dairies are regulated by a General Order WDRs R5-2013-0122. The general order prohibits discharges of wastes or wastewater to surface waters unless authorized separately by an NPDES permit.

Groundwater

Current quality of groundwater in the Central Valley is influenced by discharges that generally comply with the effluent limitations and other requirements established in WDRs. The elements of WDRs and how they are designed to maintain and protect beneficial uses are described below.

Wastewater

WDRs for domestic and industrial wastewater follow the same general framework with certain differences associated with aspects that are unique to either municipal or industrial systems.

Municipal

Municipal wastewater WDRs are used to regulate discharges to protect beneficial uses of groundwater by including discharge prohibitions, effluent limitations, groundwater limitations, monitoring and reporting requirements, and other provisions. A subset of recently adopted WDRs was reviewed to determine typical current provisions[15].

Discharge Prohibitions

Discharge prohibitions that are common to Central Valley WDRs for municipal wastewater discharges include prohibiting discharge to surface water, bypass of treatment operations, discharge of hazardous waste, toxic substances that would disrupt the treatment process, discharge of pollutant-free wastewater, or any discharge in a manner different than described in the WDRs.

[15] The WDRs that were reviewed include: City of Lathrop (R5-2016-0028), Tesoro Viejo Mutual Water Company (R5-2016-0057), City of Fresno (R5-2014-0162), City of Sanger (R5-2014-0004), City of Tulare (R5-2013-0019).

Effluent Limitations

Effluent limitations are the primary mechanism used to protect water quality and beneficial uses, and are established for flow and specific constituents. Flow limitations are established for average dry weather flow. The need for effluent limitations is discussed in the antidegradation findings in most WDRs. In cases where a discharger shows it they cannot consistently comply with a WQBEL, interim performance-based limitations are established along with a plan and schedule for the discharger to come into compliance with final effluent limitations.

Groundwater Limitations

In addition to meeting effluent limitations, groundwater limitations are established to protect beneficial uses. Limitations are established for salts (EC or TDS) and nitrate. The WDRs require that the discharge does not cause an exceedance of applicable water quality objectives.

Monitoring and Reporting Requirements

To verify that effluent and receiving water limitations are being met, each WDRs order includes a monitoring and reporting program that outlines constituents to be monitored in effluent and receiving water and describes the frequency, location and analytical methods to be used. In addition to monitoring for constituents with effluent limitations, monitoring of other parameters may be required to more completely characterize the discharge. Characterization monitoring is required one or more times during the term of the WDRs.

Provisions

Provisions may include compliance schedules and operational requirements. For WDRs for facilities that produced recycled water, provisions related to operation of the UV disinfection system or other elements of the Recycled Water Program may be included in the provisions. Other provisions or discharge specifications may be related to storage pond management or solids disposal.

Specific Requirements Regarding Salinity, Nitrate and Secondary MCL Parameters

Central Valley WDRs include effluent limitations for TDS or EC, and nitrate. In addition, if necessary, effluent limitations are established for other constituents with secondary MCLs. Groundwater limitations are also established such that effluent will not cause an exceedance of a water quality objective or MCL in the groundwater. If the constituent concentration in the groundwater is greater than the water quality objective, then the groundwater limitation may be set equal to the current groundwater quality. In addition, specific wells may be designated for determining compliance with groundwater limitations.

Effluent limitations are also included for nitrate or total nitrogen and are set equal to the MCL of 10 mg/L-N. In the Tulare Lake Basin, effluent limitations for EC are set equal to 1,000 µmhos/cm or set equal to source water EC concentration plus 500 µmhos/cm, whichever is more stringent.

Effluent limitations may also be set for secondary MCLs to support the MUN beneficial use. In addition, effluent limitations for salts (e.g., sodium, chloride, boron) may be established to

protect the AGR beneficial use. In these cases, the SNMP is referred to as being used to set effluent limitations for these constituents in the future.

Industrial

Industrial wastewater WDRs for food processors and wineries, similar to municipal wastewater WDRs, are used to regulate discharges to protect beneficial of groundwater by including discharge prohibitions, effluent limitations, groundwater limitations, monitoring and reporting requirements, and other provisions. These WDRs elements are described below based on a review of WDRs adopted in 2014–2015[16].

In addition to the food processors and wineries, WDRs for oil fields and mines were also reviewed. The WDRs that were reviewed were primarily associated with requirements to close these facilities and cease wastewater discharges. Oil field WDRs include limitations for EC, chloride and boron based on Basin Plan objectives.

Discharge Prohibitions

Discharge prohibitions that are common to Central Valley WDRs include prohibiting discharge to surface water, bypass of treatment operations, discharge of hazardous waste, toxic substances that would disrupt the treatment process, discharge of pollutant-free wastewater, or any discharge in a manner different than described in the WDRs. In addition, food processors and wineries discharge to land application areas. As a result discharge prohibitions are established for residual solids and other wastes that may be produced that cannot be disposed of to the land application areas to prevent odors and/or nuisance. Many industrial WDRs also contain prohibitions against discharging domestic wastewater to the industrial disposal sites.

Effluent Limitations

Effluent limitations are the primary mechanism used to protect water quality and beneficial uses and are established for flow and specific constituents. Flow limitations are established for average dry weather flow. Constituents requiring effluent limitations include biochemical oxygen demand and, depending on the discharger, TDS or fixed dissolved solids and nitrate or total nitrogen. The need for effluent limitations is discussed in the antidegradation findings. In general, effluent limitations are expressed as mass loading to the land application areas.

Discharge Specifications

In addition to effluent limitations, discharge specifications for the land application areas and for handling of solids are included in industrial WDRs. These specifications are associated with applying wastewater at agronomic rates and managing solids to minimizing leaching.

[16] The WDRs that were reviewed for this summary include: Edison Grape Processing (R5-2015-xxxx), Sutter Home Winery (R5-2015-0085), Del Monte Foods (R5-2014-0116), Reedley Winery (R5-2014-0045), Morning Star Tomato Packing (R5-2013-0144), ConAgra Tomato Processing (R5-2014-0106), Oil Fields (R5-2013-0061), Zenda Mine (R5-2014-0138).

Groundwater Limitations

In addition to meeting effluent limitations, groundwater limitations are established to protect beneficial uses. Limitations are established for salts (EC or TDS), nitrate, and other constituents identified in Title 22. The WDRs require that the discharge does not cause an exceedance of an applicable water quality objective. In cases where the groundwater exceeds the objective, the groundwater limitation states that the discharge cannot cause a "statistically significant increase." Compliance with these effluent limitations is determined at specific wells identified in the monitoring and reporting plan.

Monitoring and Reporting Requirements

To verify that effluent and receiving water limitations are being met, each WDRs order includes a monitoring and reporting program that outlines constituents to be monitored in effluent and groundwater and describes the frequency, location and analytical methods to be used. Monitoring is required for constituents with effluent or groundwater limitations, general minerals and other constituents identified in Title 22. Monitoring of source water is also required in many industrial WDRs.

Provisions

Provisions may include time schedule orders and operational requirements. Work plans to develop or modify a groundwater monitoring network may be included in the provisions. In addition, requirements to develop Solids, Salinity and/or Nitrogen Management Plans may be included.

Specific Requirements Regarding Salinity, Nitrate and Secondary MCL Parameters

Effluent limitations for TDS are established as performance-based annual average limitations. For dischargers with levels of nitrogen that are a concern, nitrogen limitations are expressed as the nitrogen mass loadings that will not exceed the agronomic rate when applied to land application areas. Groundwater limitations are set depending on the ambient groundwater quality for nitrogen, secondary MCLs, and TDS or fixed dissolved solids. Solids, salinity or nitrogen management plans may be required. Other forms of requiring assessments of salt and nitrate include biochemical oxygen demand and nitrogen application and irrigation management reports and/or groundwater limitation compliance assessment plans. Monitoring for TDS, nitrate, MCLs and standard minerals in effluent and groundwater is also required.

Storm Water

Municipal (Phase I and Phase II)

The Central Valley Water Board region-wide general permit and State Water Board Phase II permit are both NPDES permits and WDRs. While they are primarily focused on surface water, they do include a requirement to protect groundwater quality when implementing infiltration BMPs so that the pollutants of concern are not transferred to groundwater. The permits also support improved groundwater recharge.

Industrial

While the IGP is an NPDES permit, and not a WDR, it does include requirements to protect groundwater quality when implementing infiltration BMPs so that the industrial pollutants are not transferred to groundwater.

Agriculture

Regulation of irrigated agriculture and dairies is implemented through WDRs as described below. WDRs for the Sacramento River Watershed, East San Joaquin and Tulare Lake Basin were reviewed to assess requirements for irrigated agriculture that contribute to current receiving water quality conditions. The General Order for Milk Cow Dairies was reviewed to assess requirements for dairies that contribute to current receiving water conditions.

Irrigated Agriculture

The Central Valley Water Board has adopted WDRs for discharges from irrigated lands to protect both surface water and groundwater throughout the Central Valley. The Central Valley Water Board's ILRP implements the WDRs, which have been adopted for discrete regions within the Central Valley. The WDRs allow for a third party or coalition to coordinate efforts by growers within a discrete region to comply with the regulatory requirements. WDRs have been adopted for growers within the following coalitions:

- Eastern San Joaquin Watershed
- Grassland Drainage Area
- Rice Growers within the Sacramento Valley
- Sacramento River Watershed
- San Joaquin County and Delta Area
- Tulare Lake Basin Area
- Western San Joaquin River
- Western Tulare Lake Basin Area

The WDRs include discharge prohibitions, receiving water limitations, provisions, and monitoring and reporting requirements, as described below, and specify the responsibilities of both the coalition and the individual growers. The WDRs for the Sacramento River Watershed (Order No. R5-2014-0030-R1), Tulare Lake Basin Area (Order No. R5-2013-0120) and the Eastern San Joaquin Watershed (Order No. R5-2012-0116-R3) were specifically reviewed for this assessment. The Eastern San Joaquin Watershed WDR is currently under review by the State Water Board and the action taken may change the regulation of discharges from irrigated agriculture in this part of the Central Valley in the future. However, the current WDRs were assumed to be representative of current practices and used to evaluate baseline conditions.

Discharge Prohibitions

Discharges of hazardous waste are prohibited and discharges of wastes (e.g., fertilizers, fumigants, pesticides) to groundwater via backflow into a water supply well or down a groundwater well casing are prohibited.

Receiving Water Limitations

Receiving water limitations are applied to surface water and groundwater, and are narrative stating that wastes discharged from coalition member operations shall not cause or contribute to an exceedance of a water quality objective. Triggers are established for constituents of concern. If the trigger is exceeded two or more times in a three-year period at a given sampling location, then a surface water quality management plan or groundwater quality management plan must be developed and implemented. A time schedule for addressing the water quality problem is included in the surface water quality management plan or groundwater quality management plan and may not exceed ten years. The proposed time schedule must be supported with appropriate technical or economic justification as to why the proposed schedule is as short as practicable.

Provisions

General provisions outline the responsibilities of the coalition and its members (i.e., growers). Provisions require individual growers to participate in coalition outreach events, implement water quality management practices, and develop and implement a sediment and erosion control plan, management practice evaluation program, farm evaluation plan, and nitrogen management plan. The coalition develops and implements a plan to track and evaluate the effectiveness of water quality management practices, conducts water quality monitoring and assessment, and prepare and submit annual reports on these activities. The coalition is required to conduct education and outreach to inform growers of program requirements and water quality problems.

Monitoring and Reporting

The WDRs require both surface water and groundwater monitoring. Surface water monitoring sites in the Sacramento River Watershed are categorized as representative sites, integration sites and special studies sites. Representative monitoring sites are representative of all areas and all types of irrigated agricultural waste discharge within the coalition's area. Surface water monitoring sites are selected to allow characterization of water flow, quality, and irrigated agricultural waste discharges. Integration sites are used for identifying cumulative effects and long-term trends in water quality. Sites may also be designated for special studies, if needed, for a surface water quality management plan to evaluate commodity or management practice-specific effects on identified water quality problems, to evaluate sources, and to track the status of the identified water quality problems. Constituents that are required to be monitored include *E. coli*, EC, nitrogen compounds, total suspended solids, turbidity, and hardness.

In Eastern San Joaquin Watershed, surface water monitoring is linked to exceedances of trigger limits. Core monitoring sites are monitored on a rotating schedule and if a trigger limit is exceeded, then representative site monitoring and/or special studies sites are added. Constituents to be monitored are similar to those in the Sacramento River Watershed.

Groundwater monitoring requirements include preparing a groundwater quality assessment report, implementing a management practice evaluation program and conducting groundwater quality trend monitoring. Annual monitoring is conducted for EC, pH, dissolved oxygen, temperature and nitrate. In addition, monitoring wells are sampled once every five years for TDS and general minerals.

Specific Requirements Regarding Salinity, Nitrate and Secondary MCL Parameters

The WDRs require each member to develop a farm-specific nitrogen management plan. There are no specific requirements for salts or other constituents regulated by secondary MCLs. Triggers have been established for TDS (450 mg/L for the East San Joaquin Watershed Coalition and 125 mg/L for the Sacramento River Watershed Coalition) and nitrate (10 mg/L-N for the East San Joaquin Watershed Coalition) as stated in the monitoring and reporting program. If the trigger is exceeded, then a surface water quality management plan or groundwater quality management plan must be developed. Depending on the location or region, triggers are also established for other constituents with secondary MCLs. The WDRs also note that actions associated with achieving compliance with water quality objectives for salts and nitrate should be coordinated with the policies and actions of CV-SALTS.

Dairies

Dairies in the Central Valley are regulated by General Order R5-2013-0122 that include requirements for testing wells, applying fertilizer and manure to crops at agronomic rates, and meeting standards for properly storing and handling manure to minimize leaching and runoff. Requirements cover the facilities where animals are housed, waste facilities, and associated croplands.

Discharge Prohibitions

Discharge prohibitions for dairies include the following:

- Hazardous waste;
- Pollution, nuisance;
- Dead animals to ponds;
- Storm water to surface water; and
- Land application of wastes if not for nutrient recycling.

Groundwater Limitations

The General Order does not include a section on effluent limitations. Groundwater limitations are narrative and state that the discharge of waste at existing milk cow dairies shall not cause the underlying groundwater to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance. This section refers generally to Basin Plan water quality objectives.

Provisions

Provisions include requirements associated with management of wastewater retention ponds, production areas, and land application areas. Provisions specify practices to minimize leaching from solids disposal and to apply fertilizers at agronomic rates. In addition, nutrient and waste management plans and a salinity report are required.

Monitoring and Reporting

Monitoring of groundwater is required and may be conducted on an individual basis or through a representative monitoring program. Most dairies perform this monitoring through membership in a representative monitoring program. All supply wells (irrigation wells and domestic wells) must be tested annually and results reported to the Central Valley Water Board. In addition, dairies are further required to install dedicated monitoring wells to sample "first-encountered" (shallowest) groundwater.

About 1,143 Central Valley dairies are members (95 percent plus of Central Valley dairies) of the representative monitoring program, paying monthly fees to support ongoing monitoring and research into improved management practices. The representative monitoring program includes 443 wells on 42 dairies from Orland to Bakersfield, representing the range of soil, climate and cropping conditions of Central Valley dairies. Wells are monitored monthly, including quarterly water quality analysis for nine constituents (including nitrate), annual testing for 22 constituents, providing 16,000 raw data points annually. The representative monitoring program evaluates all aspects of dairies that have potential to impact groundwater, including ponds, croplands and animal housing areas, with management practices for all of these areas being evaluated.

Specific Requirements Regarding Salinity, Nitrate and Secondary MCL Parameters

As noted above, the General Order contains requirements associated with the management of nutrients, solids and salinity. There are no specific requirements related to salinity, nitrate, and secondary MCL parameters in the General Order for dairies, other than how they may be addressed through the nutrient management plan, waste management plan, and salinity report.

Nutrient management plan. All dairies of any size must follow a nutrient management plan prepared by a certified agronomist. The plan requires sampling of manure, irrigation water and harvested plant tissue so that an application/removal ratio can be calculated field by field. Any manure exported from the dairy must be recorded and accounted for. Complete records must be kept on farm and an annual report submitted to the Central Valley Water Board.

Waste management plan. All dairies must have a waste management plan prepared by a licensed engineer. The plan must affirm that animal housing and manure storage areas are designed to prevent flooding and runoff, drain properly during normal operation and rain events, and are designed with sufficient capacity to safely handle and manage the manure generated until it can be safely applied to crops at the dairy or exported off site.

Salinity Report. A report must be prepared that identifies sources of salt in waste generated at the dairy, evaluates measures that can be taken to minimize salt in the dairy waste, and certifies that they will implement the approved measures identified to minimize salt in the dairy waste.