STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

ORDER WQ 2005-0005

In the Matter of the Petition of

CITY OF MANTECA
For Review of Waste Discharge Requirements Order No. R5-2004-0028
[NPDES No. CA0081558] and
Cease and Desist Order No. R5-2004-0029
Issued by the
California Regional Water Quality Control Board,
Central Valley Region

SWRCB/OCC FILE A-1634

BY THE BOARD:

On March 19, 2004, the Central Valley Regional Water Quality Control Board (Regional Board) issued renewed waste discharge requirements in Order No. R5-2004-0028 for the wastewater quality control facility (WQCF) operated by the City of Manteca (City). The requirements also serve as a National Pollutant Discharge Elimination System permit (NPDES permit) under the Clean Water Act.[1] Based on a finding that the City currently is not able to consistently comply with limitations for 11 regulated effluent constituents, the Regional Board concurrently issued a cease and desist order that established a time schedule for compliance with specified provisions of the renewed permit.[2] The City filed a petition with the State Water Resources Control Board (State Board) to review several provisions of the permit and the cease and desist order. In this order, the State Board addresses the significant issues raised in the

---

[1] 33 U.S.C. § 1251 et seq.; see *id.* § 1342. Under the Clean Water Act, a pollutant discharge from a point source, such as a pipe, is prohibited unless regulated under a NPDES permit. The permits are issued by the United States Environmental Protection Agency (USEPA) or by states with approved permit programs. California has an approved program.

[2] Water Code section 13385(j) exempts a discharger from mandatory minimum penalties that would otherwise apply if the discharge is in compliance with a cease and desist order issued pursuant to Water Code section 13301.

petition and revises certain provisions of the permit and the cease and desist order. The remaining issues raised by the City are dismissed.[3]

I. BACKGROUND

The City's WQCF receives wastewater from within the City and from areas in the City of Lathrop. A portion of the treated wastewater effluent is discharged to land owned by the City and on property leased by the City from Dutra Farms. The remainder is discharged to the San Joaquin River at a point within the Sacramento-San Joaquin Delta. At the time the permit was renewed, the monthly average flow of discharge was 5.72 million gallons per day (mgd) of which 4.89 mgd was discharged to the San Joaquin River and the remainder was discharged seasonally to land. The daily peak discharge was 7.21 mgd, of which 6.29 mgd was discharged to the river. The City discharges effluent through a side-bank outfall on the eastern bank of the San Joaquin River approximately 16 miles downstream of the Vernalis gage[4] and approximately 50 feet upstream of a discharge that Brown Sand, Inc. operates through an outfall on the same side of the river. Flows in the river near the City's discharge are influenced by tidal conditions.

The City's WQCF is undergoing a $47 million expansion and upgrade, which is scheduled to be completed in 2007. The design flow of the completed project is 9.87 mgd. Following completion of the expansion and upgrading project, the plant will provide tertiary treatment for effluent discharged to the river. In addition, the City also plans to discharge an average of 2.0 mgd to land, including the discharge to land leased from Dutra Farms. Despite the planned improvements to its WQCF, the City contends that it will not be able to comply with several conditions of the permit issued by the Regional Board.

Wastewater discharges to surface waters are regulated by the federal Clean Water Act and by the state Porter-Cologne Water Quality Control Act.[5] An NPDES permit is required

---

[3] Dismissed issues are determined to be not sufficiently substantial to warrant review. (See *People v. Barry* (1987) 194 Cal.App.3d 158; Cal. Code Regs., tit. 23, § 2052(a)(1).) Many of the issues raised by the petitioner have been addressed in previous State Board orders.

[4] The. United States Geological Survey operates a gage to measure the flow in the San Joaquin River near the town of Vernalis.

[5] 33 U.S.C. § 1251 et seq. and Wat. Code § 13000 et seq.

for any point source[6] discharge of a pollutant to surface waters. In California, waste discharge requirements issued by a Regional Water Quality Control Board or the State Board for point source discharges to surface waters serve as the NPDES permits required by the Clean Water Act. (Wat. Code §§ 13370 and 13377.) Water quality standards governing allowable discharges are contained in statewide and regional water quality control plans, which designate beneficial uses of specified water bodies and establish water quality objectives to protect those uses, and in federal criteria promulgated by the U. S. Environmental Protection Agency (USEPA) and applicable in California. Discharges to the San Joaquin River are subject to the provisions of the Water Quality Control Plan for Sacramento River and San Joaquin River Basins (Basin Plan).[7] The City's permit contains limitations consistent with these requirements.

The beneficial uses of water in the San Joaquin River and Delta downstream of the City's point of discharge are municipal and domestic supply, agricultural irrigation, agricultural stock watering, industrial process and industrial service supply water, contact recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, wildlife habitat, and navigation.[8] In order to protect the beneficial uses of water identified in the Basin Plan, the permit issued to the City establishes effluent limitations for numerous constituents that are contained in the City's treated effluent. The City's petition challenges the effluent limitations for eight of the regulated constituents, as well as other provisions of the permit. The City's contentions generally concern the following five subjects:

(1) the Regional Board's use of the water quality objectives established in the Basin Plan in determining effluent limitations specified in the permit;

(2) limitations on the total discharge of iron and manganese, which the City contends do not properly account for the relationship between total discharge of the constituents and the dissolved concentrations of the constituents for which numeric objectives are established in the Basin Plan;

---

[6] A "point source" is "any discernible, confined and discrete conveyance" such as a pipe, ditch, channel, tunnel, conduit or well. (33 U.S.C. § 1362(14).)

[7] *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins.* Order No. R5-2004-0028 identifies various other laws, plans, and policies that apply to discharges under the City's permit.

[8] Basin Plan, Table II-1.

(3) the Regional Board's denial of dilution credit in establishing effluent limitations for copper, methylene blue active substances (MBAS), arsenic and cyanide;

(4) the provision of the permit restricting discharges to periods of outgoing tides rather than periods of positive downstream flow of 0.5 foot per second; and

(5) allegedly inadequate consideration of the high cost of permit compliance in view of the anticipated water quality benefits that will result.

Following notification by the State Board that the City's petition was complete, the Regional Board filed a written response to the petition, together with a lengthy administrative record concerning issuance of the permit and the cease and desist order. Several of the issues raised by the City are addressed below.[9]

II. CONTENTIONS AND FINDINGS

A. Use of Basin Plan Water Quality Objectives in Establishing Effluent Limitations

Contention: The City contends that the Regional Board improperly relied upon or improperly applied the water quality objectives established in the Basin Plan to establish effluent limitations for each of the eight discharge constituents identified in the City's petition.

Findings: The City raises a number of objections to the Regional Board's use of the water quality objectives that are established or referenced in the Basin Plan as the basis for establishing the effluent limitations on various constituents regulated by the City's permit. The water quality objectives applied by the Regional Board and the problems associated with the Regional Board's use of the water quality objectives for electrical conductivity (EC) are discussed below.[10]

1. Summary of Water Quality Objectives Applied by the Regional Board

The effluent limitations for arsenic, copper, cyanide, iron, and manganese are all based on the maximum concentrations for trace elements specified in Table III-1 of the Basin Plan. The effluent limitation for MBAS was based on the narrative chemical constituents

[9] In this review, the Board addresses only those issues that are deemed to be substantial. (Cf. Cal. Code Regs., tit. 23, § 2052(a)(1).)

[10] Electrical conductivity is one measurement of water salinity.

objective (which incorporates the secondary maximum contaminant level (MCL)[11] for foaming agents) and on the Basin Plan narrative water quality objective for floating material, tastes and odors. The effluent limitation for aluminum was based on the narrative toxicity water quality objective in the Basin Plan and the narrative chemical constituents objective. In implementing the narrative water quality objective for aluminum, the Regional Board applied the numerical effluent limitation for aluminum specified in the USEPA Water Quality Criteria for the protection of Freshwater Aquatic Life as authorized by 40 Code of Federal Regulations part 122.44(d)(1)(vi)(B). Finally, the effluent limitation for EC was based on the water quality objective for the southern Delta referenced in Table III-5 of the Basin Plan (which was taken from the State Board's May 1991 "Water Quality Control Plan for Salinity, San Francisco Bay/Sacramento-San Joaquin Delta Estuary").

Water Code section 13263(a) provides that the requirements governing the discharge of waste under permits issued by the Regional Board must implement relevant water quality control plans. Water Code section 13377 requires that NPDES permits must ensure compliance with the Clean Water Act and with effluent limitations necessary to implement water quality control plans or protect beneficial uses. Thus, in acting on the City's application for renewal of its NPDES permit, the Regional Board focused on implementation of established water quality objectives and other provisions of the Basin Plan rather than on re-examination of Basin Plan provisions.

To implement previously adopted water quality control plans, permits must include effluent limitations for all pollutants that have a reasonable potential to cause or contribute to an excursion of water quality standards.[12] Order No. R5-2004-0028 and the accompanying Information Sheet (Attachment "A" to the order) cite evidence in the record to support the Regional Board's findings that the City's discharge of treated effluent has a

---

[11] The secondary maximum contaminant level for MBAS is 0.5 mg/l. (Cal. Code Regs., tit. 22, § 64449.)

[12] The term "reasonable potential" is based on 40 C.F.R. § 122.44(d)(1)(i), which requires that permit issuers include effluent limitations for all pollutants that "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." If a pollutant does not require a limit under this test, the pollutant is said not to have "reasonable potential."

reasonable potential to cause or contribute to an instream excursion above Basin Plan objectives for each of the eight constituents identified in the City's petition.

Although Water Code section 13241 identifies economic considerations and several other factors to be considered in establishing the water quality objectives in a water quality control plan, consideration of those factors is not required each time the Regional Board adopts effluent limitations to implement previously established objectives. (*Hampton v. Superior Court* (1977) 67 Cal.App.3d 472; State Board Orders WQ 2001-16, WQ 94-8, WQ 77-16, and WQ 73-4.) Of the numeric and narrative water quality objectives utilized by the Regional Board and the effluent limitations in the City's permit based on those objectives, the State Board believes that substantial issues exist only with respect to: (1) the effluent limitations that the Regional Board established for EC; (2) the relationship between total concentrations of pollutants and dissolved concentrations; and (3) the use of mixing zones and dilution credits.

2. Effluent Limitations Established Based on Water Quality Objectives for Electrical Conductivity (EC)

The water quality objectives for EC applied by the Regional Board are set forth in Table III-5 of the Basin Plan. The footnote to Table III-5 of the Basin Plan explains that the water quality objectives in the table were "taken from the State Water Board's Water Quality Control Plan for Salinity, May 1991." The document referred to in the Basin Plan is the "Water Quality Control Plan for Salinity, San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 91-15 WR, May 1991." (1991 Delta Plan.) The 1991 Delta Plan is one in a series of documents that the State Board has prepared and adopted in its efforts to protect water quality in the Delta area through the coordinated exercise of the State Board's authority over water rights and water quality.[13]

Table 1-1 of the 1991 Delta Plan specifies water quality objectives for EC to protect agriculture in the area covered by the plan. The table includes water quality objectives for EC at the Vernalis gage station--and three southern Delta locations--of 0.7 millimhos per centimeter (mmhos/cm) from April 1 through August 31 and 1.0 mmhos/cm from September 1

[13] The State Board's water quality control plans for the Sacramento/San Joaquin Delta have been based, in part, upon recognition of the interrelationship between water rights and water quality in the complex Delta system. In addition to addressing the effect of water diversions from the Delta and upstream tributaries on water quality in the
(Continued on next page)

through March 31.[14] Although the plan was adopted in 1991, it did not require the EC objectives to be fully implemented until 1996. The table also includes the statement that, if a contract has been negotiated between the Department of Water Resources, the U.S. Bureau of Reclamation, and the South Delta Water Association, that contract will be reviewed prior to implementation of the specified EC standard for the southern Delta, and appropriate revisions will be made to the objectives after considering the needs of other beneficial uses.

Rather than focusing primarily on meeting water quality objectives through regulation of discharges, the 1991 Delta Plan provides "the State Board recognizes that the flow requirements and salinity objectives are largely to be met by the regulation of water flow." (1991 Delta Plan, p. 2-2.) With respect to reducing the quantity of salt in the southern Delta area, the State Board established a goal of reducing the salt load discharged to the San Joaquin River by at least 10 percent and estimated that goal could be met through increased irrigation efficiency to reduce subsurface drainage. The State Board referred to development of a salt load reduction policy, the goals of which "should be achieved through development of best management practices and waste discharge requirements for non-point source dischargers." (1991 Delta Plan p. 7-5.)

In May 1995, the State Board adopted a revised water quality control plan for the Delta. ("Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 95-1WR, May 1995" (1995 Delta Plan).) The 1995 Delta Plan delayed the implementation date for the EC objectives in the southern Delta until December 31, 1997. (1995 Delta Plan, p. 17, Table 2.) In discussing the implementation program for meeting the southern Delta agricultural salinity objectives, the Plan states:

> "Elevated salinity in the southern Delta is caused by low flows, salts imported in irrigation water by the State and federal water projects, and discharges of land-derived salts primarily from agricultural drainage. Implementation of the objectives will be accomplished through the release of adequate flows to the San Joaquin River and control of saline agricultural drainage to the San Joaquin River and its tributaries. Implementation of the

Delta, the plans discuss the effects that agricultural irrigation return flows have had on the increased discharge of salt to the Delta and Delta tributaries.

[14] The values were specified as maximum 30-day running averages of mean daily EC.

agricultural salinity objectives for the two Old River sites shall be phased in so that compliance with the objectives is achieved by December 31, 1997.

". . . The SWRCB will evaluate implementation measures for the southern Delta agricultural salinity objectives in the water right proceeding." (1995 Delta Plan, p. 29.)

On March 15, 2000, the State Board adopted Revised Water Right Decision 1641, which once again addresses the relationship between water diversions and implementation of Delta water quality objectives. Revised Decision 1641 states:

"Water quality in the southern Delta downstream of Vernalis is influenced by San Joaquin River inflow; tidal action; diversions of water by the SWP, CVP, and local water users; agricultural return flows; and channel capacity. (R.T. p. 3668; DWR 37, p. 8.) The salinity objectives for the interior southern Delta can be implemented by providing dilution flows, controlling in-Delta discharges of salts, or by using measures that affect circulation in the Delta. . . .

"Even when salinity objectives are met at Vernalis, the interior Delta objectives are sometimes exceeded. (R.T. p. 3677; SWRCB 1e, Figures [IX-19]-[IX-26]; SWRCB 76.) Exceedance of the objectives in the interior Delta is in part due to water quality impacts within the Delta from in-Delta irrigation activities. (R.T. p. 7794.)

". . . In 1987, DWR and SDWA identified flow barriers that could be constructed in the southern Delta to enhance water levels and circulation. The DWR, the USBR and the SDWA have agreed that the salinity problems in the southern Delta can be mitigated using the barrier program. . . . Since 1991, DWR has been installing and operating temporary barriers to assist SDWA diversions. Permanent barriers are proposed as components of the preferred alternative for the ISDP. (DWR 37.)

"The construction of permanent barriers alone is not expected to result in attainment of the water quality objectives . . . The objectives can be met consistently only by providing more dilution or by treatment. (R.T. p. 3737.) . . . Modeling shows that construction and operation of the temporary barriers should achieve water quality of 1.0 mmhos/cm at the interior stations under most hydrologic conditions.

"The DWR and the USBR are partially responsible for salinity problems in the southern Delta because of hydrologic changes that are caused by export pumping. Therefore, this order amends the export permits of the DWR and of the USBR to require the projects to take actions that will achieve the benefits of the permanent barriers in the southern Delta to help meet the 1995 Bay-Delta Plan's interior Delta salinity objectives by April 1, 2005. Until then, the DWR and the USBR will be required to meet a salinity requirement of 1.0 mmhos/cm. If, after actions are taken to achieve the benefits of barriers, it is determined that it is not feasible to fully implement the objectives, the SWRCB will consider revising the interior Delta salinity objectives when it reviews the 1995 Bay-Delta Plan. . . ." (Revised Water Right Decision 1641, pp. 86-88, emphasis added.)

Revised Water Right Decision 1641 summarized the State Board's conclusions regarding salinity problems in the southern Delta as follows:

". . . Salinity problems in the southern Delta result from low flows in the San Joaquin River and discharges of saline drainage water to the river. The actions of the CVP are the principal causes of the salinity concentrations exceeding the objectives at Vernalis. Downstream of Vernalis, salinity is influenced by San Joaquin River inflow, tidal action, diversions of water by the SWP, CVP, and local water users, agricultural return flows, and channel capacity. Measures that affect circulation in the Delta, such as barriers, can help improve the salinity concentrations." (Revised Water Right Decision 1641, p. 89.)

Although the water right decision did not amend the water quality objectives in the 1995 Delta Plan, the decision defines the responsibilities of the Department of Water Resources and the Bureau of Reclamation for implementation of several provisions of the plan, including the southern Delta EC objectives. Footnote 5 to Table 2 of the decision provides that:

"The 0.7 EC objective becomes effective on April 1, 2005. The DWR and USBR shall meet 1.0 EC at these stations year round until April 1, 2005. The 0.7 EC objective is replaced by the 1.0 EC objective from August after April 1, 2005 if permanent barriers are constructed or equivalent measures are implemented in the southern Delta and an operations plan that reasonably protects southern Delta agriculture is prepared by the DWR and the USBR and approved by the Executive Director of the SWRCB. The SWRCB will review the salinity objectives for the southern Delta in the next review of the Bay-Delta objectives following construction of the barriers." (Revised Water Right Decision 1641, p. 182.)

The most recent State Board action with respect to the EC water quality objectives in the southern Delta was adoption of State Board Resolution No. 2004-0062 on

September 30, 2004. The resolution adopted the staff report for the periodic review of the 1995 Delta Plan and affirmed the plan as it currently exists until changed by action of the State Board. In adopting the staff report, the State Board accepted the recommendation to receive further information to help decide whether to amend several provisions of the plan, including the southern Delta EC objectives. The State Board also accepted the staff recommendation to consider amending the Program of Implementation section of the plan as necessary for implementation of any changes to the EC water quality objectives for the southern Delta or other revised objectives. (State Board Resolution No. 2004-0062, pp. 1 and 2.)[15]

Our review of the documents discussed above leads to several conclusions regarding the southern Delta EC objectives from the 1991 and 1995 Delta Plans and the effluent limitations in the City's permit that were adopted by the Regional Board to implement those objectives. First, the lengthy record of prior State Board decisions and water quality control plans for the Delta establishes that the salinity problems in the southern Delta are the result of many inter-related conditions, including water diversions upstream of the Delta, water diversions within the Delta for export and local use, high levels of salinity in irrigation return flows discharged to Delta waterways and tributaries, groundwater inflow, seasonal flow variations, and tidal conditions. Second, although discharge of treated wastewater to the Delta or its tributaries under an NPDES permit can affect EC in the southern Delta, previous State Board decisions and water quality control plans do not discuss treated effluent discharges as a source of salinity in the southern Delta. Similarly, previously adopted implementation programs for complying with the EC objectives in the southern Delta have focused primarily on providing increased flows and reducing the quantity of salts delivered to the Delta and its tributaries by irrigation return flows and groundwater. The record also establishes that the implementation date for actions to implement the 0.7 mmhos/cm EC objective for April through August has been repeatedly postponed and that the State Board recently adopted a report recommending review of southern Delta EC objectives. Revised Water Right Decision 1641 places primary responsibility for meeting the EC objectives on the Department of Water Resources and the Bureau of

[15] The staff report adopted in State Board Resolution No. 2004-0062 recommended that the State Board not consider changes to the EC objectives upstream of Vernalis and several other provisions of the 1995 Delta Plan at this time. (State Board Resolution No. 2004-0062, p. 2.)

Reclamation, but does not require those agencies to implement the 0.7 mmhos/cm EC objective until April 1, 2005.

The City's monitoring reports from January 1998 through December 2002 show that the average EC of its effluent was 1099 micromhos per centimeter (µmhos/cm), the lowest monthly average was 819 µmhos/cm and the highest monthly average was 1300 µmhos/cm.[16] The EC data collected at receiving water sample location R1 (located 100 feet upstream from the point of discharge) from January 2002 through December 2002 show that EC in the receiving water ranged from 380 µmhos/cm to 1100 µmhos/cm and averaged 686 µmhos/cm in 12 sampling events. Hourly EC data from the downstream Department of Water Resources Mossdale monitoring station (RSAN087) located near the City's outfall show that, from December 2000 through September 2002, the conductivity of the San Joaquin River ranged from 299 µmhos/cm to 1131 µmhos/cm and averaged 721 µmhos/cm. The EC data from the Vernalis station upstream of the City's discharge for between 1985 and 1998 showed frequent exceedances of EC water quality objectives. Based on the data cited, there is a reasonable potential for the City's effluent to contribute to a violation of the EC water quality objectives, and the Regional Board correctly determined that the City's permit should include EC effluent limitations. The Regional Board order establishes effluent limitations based on the 1995 Delta Plan water quality objectives for EC in the southern Delta. Until April 1, 2005, the year-round EC effluent limitation is 1000 µmhos/cm. On April 1, 2005, the EC effluent limitation for April 1 through August 31 is reduced to 700 µmhos/cm and it remains at 1000 µmhos/cm for the remaining months.

At the time of the Regional Board proceeding, the City relied entirely upon groundwater sources for the water it delivers. The record establishes that the City is in the process of replacing a portion of its groundwater supplies with lower salinity surface water from the South San Joaquin Irrigation District.[17] The City estimates that the changes in its water supply will reduce the EC of the effluent it discharges to the river to an average of between 825 and 1026 µmhos/cm. The City further estimates that implementation of other source control

[16] The effluent limitations for EC in the permit are expressed in µmhos/cm and the water quality objectives for EC in the Basin Plan are expressed in mmhos/cm. (1000 µmhos/cm are equal to 1.0 mmhos/cm.)

[17] The EC of the surface water supply is 100 µmhos/cm.

measures could further reduce the EC of its effluent to an average of 725 to 926.7 µmhos/cm, although it questions the extent to which source control measures will be effective in view of statutory protections for use of water softeners.[18] The City contends that the only way it could assure compliance with the 700 µmhos/cm EC effluent limitation in its permit would be through construction and operation of a reverse osmosis water treatment facility. The City estimates that the capital cost of reverse osmosis facilities would be $75 million and that annual operation and maintenance costs would be $13.7 million. The City estimates that compliance with the effluent limitations on EC would result in increasing City sewer rates from approximately $28 per month up to $85 per month.

There is insufficient evidence in the record for this Board to fully evaluate the cost of compliance with the EC effluent limitations in the City's permit. However, the existing record supports the conclusions that: (1) assuring compliance with the 700 µmhos/cm EC limitation in the City's permit for April through August would probably require construction and operation of a reverse osmosis treatment plant for at least a portion of the City's effluent at a very large cost; and (2) because of the relatively high salinity of the receiving water and the relatively small portion of flow provided by the City's discharge, the City's use of reverse osmosis would have relatively little effect on the EC of water in the river. In addition, the State Board takes official notice[19] of the fact that operation of a large-scale reverse osmosis treatment plant would result in production of highly saline brine for which an acceptable method of disposal would have to be developed. Consequently, any decision that would require use of reverse osmosis to treat the City's municipal wastewater effluent on a large scale should involve thorough consideration of the expected environmental effects.

Although the conditions in waste discharge permits are established to implement relevant water quality control plans, the effluent limitations in permits may differ from the

[18] Health and Safety Code section 116786 establishes requirements governing local regulation of water softeners and provides that local ordinances may not require removal of water softeners installed before the effective date of the ordinance. However, the statute does not prevent cities or other local agencies from providing financial incentives for removal of water softeners.

[19] Cal. Code Regs, tit. 23, § 648.2.

numerical water quality objectives established in a Basin Plan for various reasons.[20] Where there is substantial assimilative capacity available in the receiving water, effluent limitations established in individual permits may allow for concentrations of pollutants in effluent that exceed water quality objectives for the receiving water. For instances in which a receiving water has been classified as impaired pursuant to section 303(d) of the Clean Water Act, federal law provides for establishing a total maximum daily load (TMDL) for the pollutant involved and allocating allowable amounts of the regulated pollutant among the dischargers to the body of water involved.[21] The TMDL process may result in allowing permit effluent limitations for some dischargers to exceed a numerical water quality objective in the Basin Plan provided that the TMDL implementation program leads to achieving the water quality objectives for the receiving water.

In the present case, the record indicates that the 700 µmhos/cm EC receiving water objective for April through August in the southern Delta frequently is not met, and that requiring the City to comply with an effluent limitation of 700 µmhos/cm EC would not significantly change the EC of water in the southern Delta area. In addition, the State Board's 1991 and 1995 Delta Plans, Revised Water Right Decision 1641, and State Board Resolution No. 2004-0062 all establish that the intended implementation program for meeting the 700 µmhos/cm EC objective was based primarily upon providing increased flows, possible construction of salinity barriers, and reducing the salt load entering the San Joaquin River from irrigation return flows and groundwater.

The causes and potential solutions to the salinity problems in the southern Delta are highly complex subjects that have received and are continuing to receive an unprecedented amount of attention from the State Board in the exercise of its coordinated authority over water rights and water quality. The southern Delta water quality objectives for EC referenced by the Regional Board were established in the State Board's 1995 Delta Plan. Although the ultimate solutions to southern Delta salinity problems have not yet been determined, previous actions

---

[20] The "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California, 2000" (State Implementation Policy or SIP) provides a methodology for establishing numeric effluent limitation for priority pollutants as identified in the California Toxics Rule (CTR) (40 C.F.R. § 131.38). However, EC is not classified as a priority pollutant in the CTR.

[21] 33 U.S.C. § 1313(d).

establish that the State Board intended for permit effluent limitations to play a limited role with respect to achieving compliance with the EC water quality objectives in the southern Delta.

The year-round 1000 µmhos/cm EC effluent limitation in the City's permit that became effective immediately upon adoption of Order No. R5-2004-0028 is a reasonable condition that will reduce the salinity of the City's effluent and help achieve compliance with the receiving water quality objectives in the Basin Plan. The City's shift toward use of lower salinity surface water for a large portion of its water supply, as well as other source control measures, should allow the City to comply with the 1000 µmhos/cm requirement.[22] Adoption of a cease and desist order to ensure that the City pursues the steps necessary to bring it into compliance with a 1000 µmhos/cm EC effluent limitation is also a reasonable enforcement action. The record indicates, however, that compliance with the permit effluent limitation of 700 µmhos/cm EC scheduled to become effective on April 1, 2005, could not be assured without construction and use of reverse osmosis facilities.[23] Construction and operation of reverse osmosis facilities to treat discharges from the City's WQCF, prior to implementation of other measures to reduce the salt load in the southern Delta, would not be a reasonable approach.[24]

Without prejudging the question of possible revisions to the southern Delta EC water quality objectives, or the question of the possible conditions that may eventually be imposed on the City's permit or other permits in order to comply with water quality objectives for EC in the San Joaquin River and southern Delta, the State Board concludes that establishing

---

[22] Establishing an effluent limitation of 1000 µmhos/cm is consistent with the present conditions in the Department of Water Resources' and Bureau of Reclamation's water right permits that require operation of State Water Project and Central Valley Project facilities as necessary to comply with the 1000 µmhos/cm EC requirement in the southern Delta. (Revised Water Right Decision 1641, p. 88.)

[23] The Regional Board recognized that the City could not comply with the 700 µmhos/cm standard scheduled to become effective on April 1, 2005. Therefore, the cease and desist order adopted by the Regional Board placed the City on a time schedule calling for implementation of the 700 µmhos/cm standard by 2009.

[24] Our conclusion regarding the reasonableness of pursuing reverse osmosis at the present time is influenced by the fact that the State Board recently adopted a staff report recommending that the periodic review of the 1995 Delta Plan should consider receiving information relevant to possible revision of the southern Delta water quality objectives for EC. (State Board Resolution No. 2004-0062.) The staff report states: ". . . staff also recommends that the implementation recommendation for these [southern Delta EC] objectives be reviewed to ensure that they are timely described, effective, feasible, and consistent with existing requirements for salinity management in the southern Delta. To the extent possible, staff recommends that review of this issue be coordinated with the CVRWQCB's ongoing TMDL and Basin Plan Amendment (BPA) efforts for salt and boron on the San Joaquin River." (State Board Resolution No. 2004-0062, attached staff report, p. 32.)

an effluent limitation in the City's permit of 700 µmhos/cm EC for April through August at this time is not supported by the record.[25] Our conclusion is based on the unique background and facts in this case, and this order shall not be regarded as precedential with respect to other proceedings or with respect to actions that may be appropriate at a future time.

B. Relationship Between Total Concentrations and Dissolved Concentrations of Regulated Pollutants

Contentions: The City contends that the numeric water quality objectives in the Basin Plan for iron and manganese are expressed as dissolved concentrations, but the permit applies the numeric objectives from the Basin Plan as limitations on the total concentration of the regulated constituents. The City contends that the effluent limitations for iron and manganese should be modified to account for the relationship between the total concentrations of the regulated constituents and the dissolved concentrations of those constituents.

Findings: The effluent limitations for iron and manganese in the City's permit are the numeric water quality objectives listed in Table III.1 of the Basin Plan, which is expressed as a limitation on the dissolved concentration of each constituent. Federal regulations require that NPDES permit limits must be expressed as limits on total recoverable metal. (40 C.F.R. § 122.45(c).) A chemical translator can be applied to make the conversion between the limits on the dissolved concentration of a regulated constituent and the total concentration in the effluent. Use of a translator does not modify the water quality objective in the Basin Plan, but it serves to translate the objective for the dissolved form of a constituent to a corresponding limit in the total recoverable form in order to comply with federal regulations.

In the absence of evidence of proper site-specific translators for iron and manganese, the Regional Board applied a "default translator of 1" to develop the effluent limitations in the City's permit.[26] The Regional Board response to the petition states that, if the City submits data that shows that the iron or manganese in the City's effluent has no reasonable

[25] The effluent limitations on EC that may be included in the City's permit at a future time may be influenced by a number of factors including applicable water quality objectives, the EC of the receiving water, actions of other water users and dischargers to reduce salinity in the lower San Joaquin River and southern Delta, the effectiveness of source control measures implemented by the City, and the potential for further reductions of EC in the City's effluent through additional source control or other measures.

[26] Application of a "default translator of 1" assumes that the concentration of the dissolved concentration of a regulated constituent is equal to the total concentration of the constituent in the effluent.

potential to cause or contribute to exceedance of Basin Plan objectives for the dissolved concentration of those constituents, then the permit could be revised to remove the present effluent limitations. In the alternative, the Regional Board explains that the City can submit a site-specific translator study so that revised effluent limitations for total iron and manganese can be developed.[27]

The Regional Board's approach to establishing effluent limitations for iron and manganese is consistent with guidance provided by the USEPA for NPDES permitting actions,[28] and the State Board concludes that the effluent limitations are appropriate based on the information presently available. As suggested in the Regional Board's response to the petition, however, revision of the effluent limitations may be appropriate if the City submits data that establish that there is no reasonable potential for exceedance of the water quality objectives for dissolved concentrations of iron or manganese, or if the City submits data to support establishment of site-specific translators.

C. Mixing Zones and Dilution Credits

Contention: The City disputes the Regional Board's denial of mixing zones and dilution credits for use in establishing the permit effluent limitations for MBAS and arsenic. The City also disputes the Regional Board denial of dilution credits and a mixing zone in establishing effluent limitations for compliance with the acute toxicity water quality objectives for copper and cyanide. The City contends that (1) the Regional Board should have established a mixing zone for MBAS and arsenic and allowed a dilution credit of 222:1 based on the harmonic mean flow[29] at the Vernalis gage, and (2) the Regional Board should have established effluent limitations based on allowance of dilution credits and a mixing zone of 600 feet from the point of discharge for compliance with the acute toxicity objectives for copper and cyanide.

---

[27] NPDES permits are subject to revision pursuant to the applicable provisions of federal regulations based on the availability of new information that was not available when the permit was issued or based on changes in applicable standards. (40 C.F.R. § 122.62 and Cal. Code Regs., tit. 23, § 2235.2.)

[28] "Technical Support Document for Water Quality-Based Toxics Control," USEPA, March 1991, p. 111.

[29] The term "harmonic mean flow," as used for purposes of determining dilution credits is defined in Appendix 1 of the State Board "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California, 2000."

Findings: A mixing zone is an area within which water quality objectives do not apply. The Basin Plan provides that the Regional Board may designate mixing zones provided that the discharger has demonstrated to the satisfaction of the Regional Board that a mixing zone will not adversely impact beneficial uses. (Basin Plan, p. IV-16.00.) Guidance regarding use of mixing zones and dilution credits for toxic pollutants is provided by the State Board "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California, 2000" (State Implementation Policy or SIP). The SIP provides that allowance of mixing zones is discretionary and shall be determined on a discharge-by-discharge basis.[30] Other regulatory documents applicable to establishment of mixing zones and dilution credits are summarized in the Regional Board's Information Sheet for Order No. R5-2004-0028.

As mentioned above, flows in the river near the City's discharge are influenced by tidal conditions. During critical low flow periods, upstream flows occur on the flood tide, no flow occurs during the slack tide, and downstream flows occur during the ebb tide. The result is that the receiving water may receive multiple doses of effluent as tidal conditions affect the direction of flow in the river. The Regional Board's evaluation of dilution availability in the vicinity of the City's discharge included consideration of the effluent constituents in question and the complex dynamics of the flows in the river, tidal flows, and the intermittent side bank discharges from the City and from the Brown Sand outfall located 50 feet downstream.[31] The availability of dilution for the constituents specified in the City's petition is addressed below.

MBAS: The City's permit includes a monthly average effluent concentration limit of 500 ug/l for MBAS based on the secondary MCL for foaming agents and the Basin Plan narrative objective for chemical constituents which prohibits floating material in amounts that

[30] The SIP defines a dilution credit as "a numerical value associated with the mixing zones for the receiving water entrained into the discharge. The dilution credit is a value used in the calculation of effluent limitations. Dilution credits may be limited or denied on a pollutant-by-pollutant basis, which may result in a dilution credit for all, some or no priority pollutants in a discharge." (SIP, p. 13.)

[31] Order No. R5-2004-0028, pp. 12 and 13, and Regional Board Information Sheet for Order No. R5-2004-0028, pp. 1-6. The City submitted modeling results and an analysis developed by its consultants to support the City's conclusion that the discharge would have very little effect at downstream locations. The City's modeling results focused on thermal impacts of its discharge to the San Joaquin River. The Regional Board found that the model had not been calibrated for the location in question, that dilution and plume dimensions for pollutants were not determined under critical conditions that have occurred at the outfall, that the modeling was not run for sufficient time to properly account for tidal cycles and associated recirculation, and that there was no assurance that the plume dimensions of in-stream dilution information provided by the modeling were accurate for the City's discharge.

cause nuisance or adversely affect beneficial uses. Non-contact recreation, including aesthetic enjoyment, is identified as a beneficial use in the Basin Plan. There is evidence in the record of foaming in the vicinity of the City's discharge. Considering the relationship between foaming and MBAS in concentrations exceeding the secondary MCL, and in view of the presence of foaming at the City's point of discharge, the Regional Board correctly applied the effluent limitation for MBAS at the point of discharge, and did not provide for dilution credit and establishment of a mixing zone.

Arsenic: The City's permit includes monthly average effluent concentration limits of 10 ug/l based on the Basin Plan numeric water quality objective for arsenic in the receiving water.[32] The permit does not provide for dilution credit and a mixing zone. The Regional Board found that the plume from the City's discharge would overlap with the plume of the discharge from Brown Sand, Inc., which also includes arsenic and is located 50 feet downstream. The SIP provides, among other criteria, that a mixing zone shall not overlap a mixing zone from different outfalls and that a regional water quality control board shall not approve mixing zones in violation of the conditions in the SIP.[33] Establishing a mixing zone for arsenic that would overlap the downstream plume from Brown Sand, Inc. would not comply with the provisions of the SIP. In this instance, the problems associated with allowance of a mixing zone and dilution credits for arsenic would be compounded during low flow and reverse flow conditions in the river at the point of discharge. The record supports the Regional Board's denial of a mixing zone and dilution credits in establishing the effluent limitations for arsenic.[34]

Copper and Cyanide: In establishing the effluent limitations in the City's permit for compliance with acute toxicity criteria for copper and cyanide, the Regional Board did not allow for the dilution credits and mixing zone requested by the City. The Regional Board found that the modeling results submitted by the City were questionable due to a lack of data to calibrate and validate the model. In August 2002, the City conceded that the model on which it

---

[32] The 10 ug/l concentration limit for arsenic in the City's effluent, as established in the permit. is equal to the numeric water quality objective of 0.01 mg/l for arsenic in the receiving water as specified in Table III-1 of the Basin Plan.

[33] SIP, p. 15.

[34] The record indicates that the City's proposed treatment of their source water will result in producing effluent with an average arsenic concentration of 8 ug/l, which is below the average monthly permit effluent limitation of 10 ug/l.

relied was not calibrated to site-specific conditions.[35] The Regional Board found that the City's modeling did not adequately account for local flow conditions, tidal influences, and the discharge of Brown Sand, Inc. immediately downstream. In concluding that dilution credits should not be allowed in establishing compliance with acute toxicity criteria, the Regional Board cited the limited mixing of the City's side-bank discharge near the City's outfall, the commingling with the adjacent NPDES discharge of Brown Sand, Inc., the periods of slack tide that can occur during low flow conditions, and the one-hour exposure criteria that the acute toxicity criteria are intended to protect. The evidentiary record and the findings in Order R5-2004-0028 support the Regional Board's decision to establish effluent limitations for copper and cyanide based on compliance with acute toxicity criteria at the point of discharge.

D. Restrictions on Periods of Discharge

Contention: The permit contains a condition limiting discharges from the City's WQCF to periods of outgoing tides. The City contends that the condition should allow discharges during periods of net downstream flow of 0.5 foot per second rather than restricting discharges to periods of outgoing tides.

Findings: Tidal influences can cause periods of reverse flow or no net flow in the river at the point of the City's discharge. Therefore, it was reasonable to limit the City's discharges to periods when flow conditions do not result in a build-up or concentration of pollutants in the immediate vicinity of the City's discharge. The requirement limiting discharges to periods of outgoing tides was based on a condition described in the City's environmental impact report (EIR). However, the minor change requested in the City's petition would more directly address the objective of preventing accumulation of discharged effluent in the vicinity of the outfall. The conditions of the permit should be revised to allow for discharge during periods of net downstream flow of 0.5 feet per second or more as proposed by the City.

E. Cost of Compliance With Effluent Limitations

Contention: The City contends that the Regional Board gave inadequate consideration to the high cost of permit compliance in view of the limited water quality benefits that are expected to occur.

---

[35] The City's August 29, 2002, response to comments from the Regional Board on the City's permit application states: "the RMA-10 model was not calibrated since there are no comprehensive data sets at low flows."

Findings: In establishing the effluent limitations in NPDES permits that are needed to comply with applicable water quality control plans, the Regional Board is not required to consider costs of compliance. Similarly, the fact that compliance with an effluent limitation would have a small effect on the concentration of the constituent in the receiving water is no basis for rejecting a properly established effluent limitation.

For the reasons discussed in Section II.A.2. above, however, this order revises the effluent limitations for EC established in the City's permit and, in so doing, eliminates what are by far the largest potential costs of compliance with the Regional Board order. The costs of construction, operation, and maintenance of a reverse osmosis facility need not be incurred in order to comply with the City's permit as revised by this order.

Although the cost of compliance is not a valid basis for objection to the permit effluent limitations for iron, it is in the public interest to clarify that the City's costs are expected to be substantially less than the estimate cited in the City's petition.[36] The City's estimate is based on the assumption that the City would have to utilize chemical treatment for removal of iron from its effluent. However, the City presented testimony that the iron in its source water at the time of the hearing was below detectable limits, and that the source of iron in the City's effluent is unknown.[37]

The Regional Board's pretreatment compliance inspection report states that the City has not issued or reissued permits to new or existing significant industrial users (SIUs); the City has not applied appropriate pretreatment standards to all SIUs; the City is not conducting any compliance inspections at its SIUs; and the City has not conducted any compliance sampling since the 2001 pretreatment compliance audit. The record also shows that permit applications for some companies discharging to the City's WQCF were accompanied by attachments to a pretreatment inspection report indicating that the industrial wastewater from their facilities contained iron and several other regulated constituents.[38] Other industries that discharge to the WQCF include metal finishers, food processors, and vehicle wash facilities.

---

[36] The City estimated that the annual cost of complying with the permit effluent limitations on iron would be $857,000.

[37] At the time of the hearing, the City relied exclusively on ground water.

[38] The pretreatment inspection reports were filed by Advanced Interconnect Technologies and San Joaquin Cogen Ltd.

The presence of those industries and the absence of a well-implemented pretreatment program establish that there is a significant potential for reducing the amount of iron and other regulated constituents entering the City's WQCF through an effective pretreatment program. If an effective pretreatment program were instituted, the concentrations of pollutants reaching the WQCF would be reduced and the City's cost of complying with the permit effluent limitations for iron and other constituents would be substantially reduced.[39] The record does not establish that it would be financially infeasible for the City to meet the requirements in its permit, as amended by this order.

III. OTHER MATTERS

In implementing the Basin Plan's narrative toxicity objective for aluminum, the Regional Board utilized a numeric objective based on the USEPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life, as authorized by 40 Code of Federal Regulations part 122.44(d)(1)(vi)(B). The City contests the effluent limitation for aluminum on a variety of grounds not addressed in this order. However, the Regional Board's response to the City's petition acknowledges that aluminum can exist in a non-toxic form as aluminum silicate. The federal ambient water quality criteria for aluminum state that acid-soluble aluminum is probably the best measurement for establishment of aluminum effluent limitations.[40] The Regional Board suggests it would be appropriate to modify the effluent limitation for aluminum to allow using acid soluble methods of measurement for showing compliance with the effluent limitations, which prevent aquatic toxicity. (Regional Board Response to Petition, p. 8.) Modification of the City's permit in the manner suggested by the Regional Board would provide appropriate relief to the City without adversely affecting water quality.

The City's petition also questions effluent limitations B.7. and B.8., which restrict average dry weather discharge flow from its WQCF to specified amounts "less the

[39] Legal requirements under the Clean Water Act and federal regulations governing industrial pretreatment programs for publicly owned treatment facilities are addressed on pages 26, 27, 50 and 51 of Order No R5-2004-0028.

[40] U.S. EPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life.

amount disposed of on land at agronomic rates."[41] The City contends that the limits should apply only to wastewater discharged to the San Joaquin River, and should not include flows disposed of on land. To revise the permit as requested could permit the City to maintain its ongoing discharge of wastewater from the WQCF to land and increase its discharge to the San Joaquin River prior to completing facility upgrades to provide tertiary treatment. The limitations on average dry weather discharges established in the City's permit properly apply to all wastewater discharged from the WQCF, including ongoing discharges of treated wastewater to land. The limits on the amount of discharge set forth in effluent limitations B.7. and B.8., however, apply only to discharges from the WQCF and do not apply to the 0.55 mgd of segregated industrial wastewater that the City proposes to dispose of on land.

IV. CONCLUSION

Based on the findings above, the State Board concludes that the permit effluent limitations and the cease and desist order issued to the City should be revised to delete the 700 µmhos/cm EC effluent limitation for April 1 through August 30, and to maintain an EC effluent limitation of 1000 µmhos/cm year-round. The permit should also be revised to allow for discharge of treated effluent from the WQCF when there is a net downstream flow of 0.5 foot per second, rather than the present provision allowing for discharge during periods of outgoing tides. Finally, the City's permit should be revised to allow for using acid soluble methods of measurement for showing compliance with effluent limitations for aluminum for prevention of aquatic toxicity.

V. ORDER

IT IS HEREBY ORDERED that, based on the findings in this order, the effluent limitations established in Waste Discharge Requirements Order No. R5-2004-0028 are revised as follows:

1. The effluent limitations for electrical conductivity specified in Paragraphs B.2. and B.3. on pages 31 and 33 of Order No. R5-2004-0028 are revised to be 1000 µmhos/cm on a

[41] Effluent limitation B.7. presently restricts 30-day average dry weather discharge to 8.11 mgd. Effective February 1, 2009, effluent limitation B.8. restricts 30-day average dry weather discharges to 9.87 mgd. (Order R5-2004-0028, p. 35.)

year-round basis, and the seasonal effluent limitations for electrical conductivity specified in those paragraphs are deleted.

2. Footnote 7 on page 32 of Order No. R5-2004-0028 is deleted.

3. The following sentence is added as the first sentence of Footnote 6 on pages 30 through 32, and as the first sentence of Footnote 9 on page 34 of Order No. R5-2004-0028: "Compliance with the effluent limitations for aluminum specified in this order shall be determined using acid soluble methods of measurement."

4. Paragraph 8 on page 35 of Order R5-2004-0028 is revised to read as follows: "Effective 1 February 2009, and in compliance with provisions 1 and 4, the 30-day average dry weather discharge flow shall not exceed 9.87 million gallons per day less the amount of treated wastewater from the wastewater quality control facility that is disposed of on land at agronomic rates. All discharges shall be during periods when there is a net downstream flow of 0.5 foot per second or more at the point of discharge."

5. Paragraph 4.b. on page 44 of Order R5-2004-0028 is revised to read as follows: "The discharger shall demonstrate the ability to store effluent and discharge to surface waters only during periods when there is a net downstream flow of 0.5 foot per second at the point of discharge."

IT IS FURTHER ORDERED that:

1. The findings and revised effluent limitations contained in this order shall be considered a part of the waste discharge requirements and NPDES permit for the wastewater quality control facility operated by the City of Manteca as set forth in Order No. R5-2004-0028. Except as revised in this order, the effluent limitations of Order No. R5-2004-0028 remain in effect.

/ / /

/ / /

/ / /

2. The references in Cease and Desist Order No. R5-2004-0029 to compliance with effluent limitations contained in Order No. R5-2004-0028 shall be construed to refer to the effluent limitations of Order No. R5-2004-0028 as modified by this order.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Board held on March 16, 2005.

AYE: Arthur G. Baggett, Jr.
Peter S. Silva
Richard Katz
Gary M. Carlton
Nancy H. Sutley

NO: None.

ABSENT: None.

ABSTAIN: None.

Debbie Irvin
Clerk to the Board