State of California The Resources Agency

Memorandum

Date: April 24, 2007

To: Ms. Dorothy R. Rice
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, California 95814

David H. Roose, Chief
SWP Operations Control Office

From: **Department of Water Resources**

Subject: Report of Potential Exceedence of South Delta Water Quality Agricultural Objective

This letter, prepared in coordination with the U.S. Bureau of Reclamation (the Bureau), is written pursuant to the State Water Resources Control Board's Order WR 2006-0006 to the Department of Water Resources (DWR) and the Bureau ("Order," February 15, 2006).[1] The Order requires that DWR and the Bureau notify the SWRCB Executive Director if they project there will be an exceedence of the South Delta water quality objectives. In addition, DWR and the Bureau must submit a report demonstrating that the potential exceedence is caused by actions beyond their reasonable control or they should initiate corrective actions. (See Order, Condition 4, page 30; and Letter from the Celeste Cantu to DWR Director Snow (October 13, 2006) clarifying the requirements of the Order.) (See Attachment 1.)

By this letter, DWR and the Bureau are reporting that a potential exceedence of the agricultural water quality objective in the South Delta will likely occur at Old River near Tracy Road Bridge on or shortly after April 30, 2007. We also project potential exceedences at Brandt Bridge and possibly Old River near Middle River during May through August of 2007. DWR and the Bureau are not required to initiate corrective actions when actions causing the exceedence are beyond their reasonable control and, as such, we are not proposing any corrective actions at this time. DWR and the Bureau are providing information on current water quality conditions in the South Delta and on

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[1] Condition 4 of Order WR 2006-0006 states: "In the event that DWR and/or the Bureau projects a potential exceedence of the 0.7 EC objective at Interagency Stations C-6, C-8, and P-12, prior to July 1, 2009, DWR and/or the Bureau shall immediately inform the State Water Board of the potential exceedence and shall describe the corrective actions they are initiating to avoid the exceedence. Corrective actions may include but are not limited to additional releases for upstream Central Valley Project (CVP) facilities or south of the Delta State Water Project (SWP) or CVP facilities, modifications in the timing of releases from Project facilities, reductions in exports, recirculation of water through the San Joaquin River, purchases or exchanges of water under transfers from other entities, modified operations of temporary barriers, reductions in highly saline drainage from upstream sources, or alternative supplies to Delta farmers (including overland supplies)."

possible affects of local drainages and diversions on this water quality. DWR is also providing results of recent modeling of SWP and CVP operations to demonstrate that these operations will not effectively control the increasing salinity, nor do DWR and the Bureau have control over the actions that appear to be causing the increased salinity in the South Delta. This report also provides information on the status of the proposed DMC Recirculation Project. DWR and the Bureau will continue to monitor the water quality conditions in the South Delta and report to the Board as conditions change.

Projected Water Quality Conditions in the South Delta April - August

Water year 2007 is likely to be classified as a "dry" water year in the Sacramento Basin and "critically dry" for the San Joaquin River basin. The summer time 0.7 mmhos/cm EC agricultural water quality objective at the three interior South Delta stations is effective beginning in April (the start of the major irrigation season) and continuing through the month of August. The 30 day objective for April of 0.7 EC becomes effective on April 30, 2007. As of April 23, 2007, the 30-day average EC was 0.64 at Vernalis, 0.74 at Brandt Bridge, 0.83 at Old River near Tracy Road Bridge and 0.70 at Old River near Middle River. Based on this data, the objective at Old River near Tracy Road Bridge is projected to be exceeded on or shortly after April 30, 2007. We project exceedences at Brandt Bridge and possibly Old River near Middle River may occur during May through August of 2007. The Bureau has assured us that the Vernalis objective will be met all year.

Local Drainage and Diversion Affects in the South Delta

DWR is gathering information on sources of salinity in the South Sacramento-San Joaquin Delta. DWR provided a draft report of this information to the SWRCB during the January 2007 workshop on South Delta Salinity Objectives for Agriculture. (See Attachment 2 "Sources of Salinity in South Sacramento-San Joaquin Delta" by Barry Montoya, updated 4/19/07, "Montoya Report".) Information in the report shows that local municipal and agricultural drainages occurring in the South Delta and on the San Joaquin River between Vernalis and Brandt Bridge are factors increasing the mean salinity in the South Delta during the irrigation season and contributing to exceedence of the 0.7 EC objective. DWR and the Bureau do not control these drainages.

Approximately 74 discharge sites exist on waterways immediately upstream of the State and federal export facilities in the south Sacramento-San Joaquin Delta and downstream of Vernalis. (See Montoya Report pp. 3-21.) The discharges are mostly agricultural but also include four NPDES discharges, urban runoff, and groundwater effluence. The waterways include south Old River, Grant Line Canal, and a 17-mile stretch of the San Joaquin River from Vernalis to the head of Old River. (Id.)

Agricultural and groundwater drainage in the South Delta is particularly saline due to heavily mineralized resident soils originating from eroded Diablo Range marine sedimentary rock. All four of the NPDES facilities are similarly saline with conductivities ranging almost exclusively above the X, most lenient receiving water objective. These discharges are cumulatively raising the salinity of water flowing from Vernalis on the San Joaquin River to the export sites via south Old River and Grant Line Canal. (Id. pp. 11-17.)

The water quality impacts of these discharges are further amplified by over 100 individual agricultural diversion sites located on the subject waterways between Vernalis and the State and federal export sites. These diversions cumulatively remove water that would otherwise provide in-channel dilution for co-located saline discharges. One diversion is particularly large (Banta Carbona) and, during the peak irrigation in summer of 2002, individually removed almost 20 percent of San Joaquin River flow just upstream of the New Jerusalem Drain. (Id. pp. 22-24.)

The combined effect of these discharges and diversions was examined by comparing upstream/downstream salinity between Vernalis on the San Joaquin River and Old River at Tracy Boulevard Bridge. Conductivity was consistently highest at the Old River station with the exception of a few relatively short duration periods. Differences in conductivity between the stations were highest between April and November. During this 8-month period, conductivity at the Old River station was 100 to 185 uS/cm higher than at Vernalis (median values). (Id. pp. 25-28.)

A similar upstream/downstream comparison between the Vernalis and Grant Line Canal stations also showed increases, but to a lesser degree. (Id. p. 28.) A number of factors can explain why conductivity consistently increased between the Vernalis and Old River stations. The sheer number of saline discharges (as well as diversions) situated between these two stations provides strong rational for causative effects. The Old River station appears to be especially influenced by saline outflows from Tom Paine Slough, Paradise Cut, and groundwater effluence. This was evidenced by a statistically higher conductivity in Old River than Grant Line Canal during most of the year. (Id. p. 30). Further, the intake of the Old River water quality station appears to be located in the plume of a nearby saline agricultural discharge or discharges. (Id. pp. 33-34.)

DWR and the Bureau Operations and Effects on South Delta Water Quality Level

The Bureau New Melones Operations

The Bureau will meet the 0.7 EC water quality objective at Vernalis from April through August 2007 through operation of New Melones Reservoir. The Bureau believes Storage releases from New Melones Reservoir on the Stanislaus River beyond the levels needed to meet the South Delta water quality objective at Vernalis could prevent the Bureau from meeting in-stream fishery requirements and are not being proposed.

Temporary Barriers Project

In April 2007, DWR constructed three seasonal rock barriers on Middle River, Grant Line Canal, and Old River near Tracy Road Bridge to improve water levels for agriculture as part of the Temporary Barriers Project. The barriers became fully operational as of April 22, 2007, coincident with the completion of the Head of Old River barrier. The barrier at the head of Old River near the San Joaquin River is installed to benefit migrating salmon as part of the Vernalis Adaptive Management Program (VAMP). Removal of this barrier begins in the latter part of May with complete removal possibly extending into early June. The three agricultural barriers will remain in place and be operational through the irrigation season and removed in November.

The physical configuration and operation of temporary barriers has been described in the project description contained in various permits obtained by DWR. Substantial modifications to the present barrier system would not be consistent with these permits. Actual operation does allow for the culverts to be in the "closed" position or to be tied in the "open" position. If salinity increases in the South Delta, DWR could tie the culverts open to provide a potential improvement to water quality within the zone of influence that barrier operation effects. However, leaving the culverts open may reduce water levels that would occur if the culverts were closed. Actual operation of the barriers in 2007 will be coordinated with the South Delta Water Agency and may vary depending on water level versus water quality "tradeoffs" for operational modification. In addition, under the temporary barrier program permits, DWR must coordinate with the fishery agencies to ensure barrier operations are consistent with endangered species act requirements.

Modeling of Project Operations

DWR modeled SWP and CVP Delta export operations and Sacramento River system reservoir storage releases to evaluate the effectiveness of changes in export rates or reservoir releases in controlling salinity in the South Delta.

The base case includes upstream releases and Delta exports as anticipated between April 19, 2007 and May 31, 2007. Oroville releases are at 2,500 cfs through April 30, then drop to 1,750 cfs for the month of May. CVP and SWP exports are 1,500 cfs combined throughout the VAMP period (April 22 through May 22), then are projected to be about 2700 and 2400 cfs, respectively, through May 31, 2007.

In the first alternative run (Scenario B), Oroville releases were increased from 2,500 cfs to 10,000 cfs beginning April 20, 2007 and continuing through May 31, 2007. SWP exports were also increased to the maximum allowable level under the export-to-inflow ratio limit—approximately 7,000 cfs during the April VAMP period, about 6,300 cfs in the May VAMP period, and about 5,200 cfs for the remainder of May, to draw the released water into the South Delta area. (Note that these exports would far exceed the maximum allowable exports under the VAMP study, which is currently underway.)

In the second alternative run (Scenario C), SWP exports were cut to zero beginning April 20, 2007 through May 31, 2007 and Oroville releases were the same as in the base case—2,500 cfs through April 30, then decreased to 1,750 cfs May 1, 2007 through May 31, 2007.

The conclusions of the modeled runs at the three South Delta objectives locations are as follows:

San Joaquin River at Brandt Bridge The model results show that neither of the alternatives would affect salinity at the Brandt Bridge location. (Salinity under both alternative scenarios B and C is identical to salinity under the base case.)

Old River near Middle River The model results indicated that salinity at the Old River near Middle River location would increase slightly (+0.01 EC) under the "zero SWP export" scenario (Scenario C). On the other hand, increasing upstream releases and exports (Scenario B) would reduce salinity for a period of about six days by as much as 0.03 EC.

Old River near Tracy Road Bridge The model results show that salinity would also increase at the Old River at Tracy Road Bridge location under the "zero SWP export" scenario (Scenario C). On the other hand, increasing upstream releases and exports (Scenario B) would increase salinity one day earlier than in the base case and Scenario C, but would then hold salinity as much as 0.18 EC lower than either the base case or Scenario C for essentially the rest of the forecast period.

The graphs shown as Attachment 3 may be used for verification of these results.

In conclusion, our past and most recent studies continue to show that these alternative operating scenarios do not affect or control salinity in South Delta in an effective or efficient manner. Reducing project export pumping will worsen, not improve, salinity conditions, and it will not alleviate the possible threat of exceedences of South Delta objectives. Increasing upstream releases and SWP exports could slightly improve salinity, however, the large increase in reverse flows on the San Joaquin River at Jersey Point accompanying such an action make this alternative unworkable from a fishery management view. Consequently, DWR and the Bureau are not proposing these actions for purposes of avoiding an exceedence of the South Delta salinity objectives.

Status of Proposed DMC Recirculation Project [2]

In the Order, the SWRCB listed recirculation as a possible corrective action to improve South Delta water quality if DWR or the Bureau cause exceedence of the objectives. As noted above, DWR and the Bureau are not proposing any corrective actions at this time. However, DWR and the Bureau provide the information below regarding the proposed recirculation project to keep the SWRCB informed of this action in the event it may be available in the future.

The Bureau and DWR have recently completed public scoping meetings for the proposed DMC Recirculation Project. The project will evaluate recirculating water pumped from the Sacramento-San Joaquin Delta through a series of Central Valley Project facilities to the San Joaquin River to meet flow and water quality objectives. A Notice of Intent to prepare the EIS/EIR was published in the Federal Register and the Notice of Preparation was filed with the State Clearinghouse on Friday, March 30, 2007. The public scoping meetings were held to solicit public input on topics to be addressed in the environmental document, including resources to be evaluated, alternatives to be considered, and significant concerns and issues. Comments are due May 9, 2007. The Bureau is the lead agency under NEPA and DWR is the lead agency under CEQA. The Central Valley Regional Water Quality Control Board has raised concern of increased turbidity from waters flowing out of the Westley and/or Newman Wasteways from the CVP's San Luis Canal associated with the proposed action. In the past (August 2004), the Bureau and DWR conducted a field test of DMC recirculation. The Bureau and DWR do not plan to conduct additional tests, however, and the proposed action will not be possible until completion of the required environmental documents and permits.

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[2] The SWRCB Order included suggestions for corrective actions of improving South Delta water quality by acquisition of supplemental water to augment San Joaquin River Flow and the construction of overland facilities to supply water to farmlands. The Bureau and DWR have not pursued such actions because they have no basis to develop corrective actions at this time.

DWR and the Bureau will provide additional information and keep the SWRCB apprised of salinity conditions in the South Delta as the irrigation season progresses, as well as providing the regular quarterly reports pursuant to the Order. The real-time salinity data at the South Delta stations can also be obtained by your staff at http://wwwoco.water.ca.gov/cmplmon/reports/wqreport.html.

If you have any questions regarding the above, please contact me at (916) 574-2656, or your staff may contact Mike Ford at (916) 574-2654.

Attachment 1 - Letter from the Celeste Cantu to DWR Director Snow (October 13, 2006).

Attachment 2 - "Sources of Salinity in South Sacramento-San Joaquin Delta" by Barry Montoya, updated 4/19/07.

Attachment 3 – Any graphs or description of Modeling by Tracy Hinojosa.

cc: (See distribution list.)

Ralph A. Torres
Deputy Director
California Department of Water Resources
1416 9th Street
Sacramento, California 95814

Gerald E. Johns
Deputy Director
California Department of Water Resources
1416 9th Street
Sacramento, California 95814

Carl Torgersen
Chief, Divisions of Operations and Maintenance
California Department of Water Resources
1416 9th Street
Sacramento, California 95814

Cathy Crothers
Office of the Chief Counsel
California Department of Water Resources
1416 9th Street
Sacramento, California 95814