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Central Valley Regional Water Quality Control Board

9 August 2017

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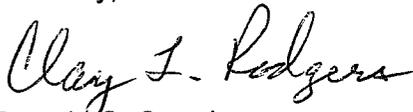
REVIEW OF THE CAWELO WATER DISTRICT COALITION'S COMPREHENSIVE GROUNDWATER QUALITY MANAGEMENT PLAN

Thank you for your 11 May 2015 submittal of the Cawelo Water District Coalition's (Coalition) Comprehensive Groundwater Quality Management Plan (GQMP). The GQMP was submitted in response to Waste Discharge Requirements General Order for Growers in the Tulare Lake Basin that are Members of a Third Party Group, Order No. R5-2013-0120 (General Order). Central Valley Water Board staff has reviewed the GQMP and has noted areas within the plan that must be addressed to comply with the General Order.

The enclosed staff review memorandum describes GQMP elements in need of revision. Key elements that need to be addressed are the immediate need for growers to implement specific management practices (wellhead protection, proper destruction of abandoned wells, and accounting for nitrate in irrigation water) as a first step to protect groundwater quality, prior to availability of results from the Southern San Joaquin Valley Management Practices Evaluation Program (SSJV MPEP) report, and performance goals for implementation of those practices. Additionally, the GQMP should include a focus on growers identified as outliers through the nitrogen management plan summary reports (see memorandum for details).

Please revise the GQMP in accordance with the staff review memorandum and resubmit an updated GQMP by **22 September 2017**. If you have any questions regarding this letter, please contact David Sholes at (559) 445-6279 or by email at david.sholes@waterboards.ca.gov.

Sincerely,


for Pamela C. Creedon
Executive Officer

Enclosure: Central Valley Water Board Staff Review Memo of the Coalition's GQMP

cc: Sue McConnell, Central Valley Water Board, Rancho Cordova

Central Valley Regional Water Quality Control Board

TO: David Sholes, PG 4321 *DS*
Senior Engineering Geologist
Irrigated Lands Regulatory Program

FROM: Ryan K. West *Ryan K. West*
Engineering Geologist
Irrigated Lands Regulatory Program

DATE: 7 August 2017

SUBJECT: REVIEW OF THE CAWELO WATER DISTRICT COALITION
COMPREHENSIVE GROUNDWATER QUALITY MANAGEMENT PLAN

On 11 May 2015, the Cawelo Water District Coalition (Coalition) submitted a Comprehensive Groundwater Quality Management Plan (GQMP) as required by section VIII.I. of Waste Discharge Requirements General Order R5-2013-0120 (General Order). Groundwater Quality Management Plans are a key mechanism under the General Order to help ensure that waste discharges from irrigated lands do not cause or contribute to an exceedance of applicable water quality objectives in the underlying groundwater, unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.

Table 1 (see page 7 of this memorandum) lists the General Order's requirements for the GQMP and identifies where in the document they have been addressed. A summary of the Coalition's GQMP approach and staff recommendations are discussed below.

Summary of the Coalition's GQMP Approach

The Coalition's approach to the management plan strategy is to determine the sources of nitrate impacts to groundwater in the high vulnerability areas. Potential sources of nitrate will be classified as one of two sources; non-irrigated agriculture or irrigated agriculture. If irrigated agriculture is determined to be a potential contributor to nitrate impacted groundwater, or should it be found inconclusive, then the associated coalition members in high vulnerability areas will be required to participate in education and outreach programs. Outreach and education programs will focus on providing resources to help growers improve irrigation and nutrient management practices. Management practices identified as part of the Southern San Joaquin Valley Management Practices Evaluation Program (SSJV MPEP) will be evaluated and provided to appropriate member growers. Management practice changes will be tracked by the Coalition.

The actions that will be taken to meet the objectives of the GQMP include:

- Identification/determination of nitrate sources;
- Outreach and education;
- Implementation of management practices; and
- Tracking of management practices.

Identification/determination of nitrate sources – The Coalition will investigate potential sources of nitrate impacts to groundwater and determine if current irrigated agricultural practices can be definitively established as a non-contributor. Information and data compiled from Farm Evaluations will be used to determine potential irrigated agricultural sources of nitrate impacted groundwater. The Coalition may also conduct additional field surveys or inquiries to determine potential irrigated agricultural nitrate sources. Potential sources of nitrate will be classified as one of two sources; non-irrigated agriculture or irrigated agriculture. Sources of nitrate identified as non-irrigated agriculture will be documented and reported to the Regional Board.

Outreach and education – If irrigated agriculture is determined to be a potential contributor to nitrate impacted groundwater, then member growers in high vulnerability areas will be required to participate in education and outreach programs. These programs will focus on providing resources to help growers improve irrigation and nutrient practices. Additionally, management practices determined by the SSJV MPEP to be protective of water quality will be incorporated into the Coalition's outreach and education programs.

Implementation of management practices – The Coalition will support grower efforts to implement protective management practices through outreach and education. As additional protective management practices are identified through the SSJV MPEP, the Coalition will reach out to growers to promote and track implementation progress of the additional practices.

Tracking of management practices – Nitrogen management methods and irrigation methods identified through Farm Evaluations (submitted by growers) will be tracked by the Coalition. Member growers will also be required to report management practice changes to the Coalition.

Summary of Staff Recommendations and or Comments

Central Valley Water Board staff have reviewed the GQMP to determine compliance with the General Order. Based on staff review, additional information is needed. This memorandum provides comment on one issue and recommendations for nine areas that require additions/revisions.

- Land Use/Crop Data
Section B.1.a. of Appendix MRP-1 of the Monitoring and Reporting Program requires that the GQMP provide land use maps which identify the crops being grown in the GQMP area. While the GQMP did provide land use information and a 2014 crop survey map, it did not provide the data in an electronic format (ArcGIS shapefile) as required.

Staff Recommendation: The Coalition should provide the most recent crop data in an ArcGIS shapefile format. ArcGIS shapefiles should be sent via email as attachments or sent via regular mail as digital files on a disk or thumb drive.

- Beneficial Uses of Groundwater

The GQMP did not provide a list of the designated beneficial uses of groundwater as required by Section B.1.c. of Appendix MRP-1 of the Monitoring and Reporting Program.

Staff Recommendation: The Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2004 (Basin Plan) designates the following beneficial uses for ground water in Detailed Analysis Unit 256 of the Kern County Basin hydrologic unit: Municipal and Domestic Supply (MUN); Agricultural Supply (AGR); Industrial Service Supply (IND); and Industrial Process Supply (PRO). The GQMP should acknowledge MUN, AGR, IND, and PRO beneficial uses of groundwater.

- Regional and Area Specific Geology

Section B.3.b.i. of Appendix MRP-1 of the Monitoring and Reporting Program requires that the GQMP provide regional and area specific geology, including stratigraphy and existing published geologic cross sections. Geologic and stratigraphic information were provided in the GQMP; however, geologic cross sections were not provided.

Staff Comment: Geologic cross sections that extend across portions of the Coalition's area can be found in United States Department of the Interior Geological Survey report Subsurface Geology of the Late Tertiary and Quaternary Water-Bearing Deposits of the Southern Part of the San Joaquin Valley, CA [Water –Supply Paper 1999-H].

- Groundwater Chemistry within the GQMP Area

Section B.3.b.ii. of Appendix MRP-1 of the Monitoring and Reporting Program requires that information be provided on groundwater basin(s) and sub-basins contained within the GQMP area, including a discussion of their general water chemistry (range of EC, concentrations of major anions and cations, nutrients, TDS, pH, dissolved oxygen and hardness). The GQMP did not provide general groundwater chemistry data.

Staff Recommendation: A discussion of the general chemistry of groundwater (range of EC, concentrations of major anions and cations, nutrients, TDS, pH, dissolved oxygen and hardness) should be provided in the GQMP. The discussion should reference and provide figures of existing Piper Diagrams, Stiff Diagrams and/or Durov Diagrams. Groundwater quality data for the Coalition's area can be obtained from the National Water Quality Monitoring Council website (<https://www.waterqualitydata.us/portal/>). This site contains both recent and historical groundwater quality data (including well depths).

- Management Plan Strategy

The Coalition has proposed a two phased approach to its management plan strategy. The first phase would attempt to identify all potential sources of nitrates that have impacted groundwater quality. The potential sources would be classified as either non-irrigated agriculture or irrigated agriculture. Farm Evaluation data would also be used to evaluate potential irrigated agricultural sources of nitrate. The first phase is estimated to take 6 to 12 months, but a significant amount of additional time may be needed for additional field studies. The GQMP states "... a conclusive determination of nitrate sources may be infeasible or unlikely for most of the high vulnerability areas."

The second phase of the management plan strategy is education and outreach programs which would focus on providing resources to help growers improve irrigation and nutrient management practices; these programs would be initiated upon completion of the first phase, and would take approximately one year to develop. According to the Coalition, if irrigated agriculture is determined (based on phase 1 results) to be a potential contributor of nitrate impacts to groundwater, members in high vulnerability areas would be required to participate in education and outreach programs. Outreach and education programs would advocate management practices determined by the Management Practice Evaluation Program (MPEP) to be protective of groundwater quality.

Staff Recommendation: While staff would agree that outreach and education is needed, the Coalition's timeframe and process for initiation of outreach and education lacks immediacy and the Coalition's reliance on information obtained from MPEP studies and source identification studies for initial outreach and education is inconsistent with the requirements of the General Order. The presence of elevated concentrations of nitrate in groundwater beneath irrigated agricultural land is sufficient cause to initiate outreach and education in the areas covered by the GQMP (concurrent with the nitrate source investigation). The GQMP should propose a more compact schedule that includes immediate education and outreach for growers in groundwater management plan areas that, at a minimum, addresses the three management practices discussed in the following section.

If the Coalition wishes to pursue a source identification study for nitrate, a source identification study work plan will need to be submitted for approval by the Executive Officer of the Central Valley Water Board. Source identification and outreach should be pursued simultaneously, not separately.

- Management Practices

Section C.4.b. of Appendix MRP-1 of the Monitoring and Reporting Program requires that information be provided regarding the identification of management practices that will be used to control sources of COCs from irrigated lands that are: technically feasible; economically feasible; proven to be effective at protecting groundwater quality; and will comply with sections III.A and B of the General Order. The GQMP did not identify

specific management practices to be implemented by growers that are protective of groundwater quality.

Staff Recommendation: The GQMP should include the following three management practices to be implemented as a first step to protect groundwater quality: (1) wellhead protection and proper maintenance of un-used wells; (2) proper destruction of abandoned wells; and (3) accounting for the amount of nitrate in irrigation supply water in order to reduce the amount of excess nitrogen applied. Immediate implementation of these three practices is required of growers in groundwater management plan areas. Growers will also be required to implement additional protective management practices identified through the MPEP process and growers with crops and conditions identified for a verified management practice must implement that practice or its equivalent. A minimal implementation timeline between MPEP identification and grower implementation of a given practice needs to be identified. The GQMP should be revised to include the above elements regarding management practices.

- Outreach Strategy

Section C.4.c. of Appendix MRP-1 of the Monitoring and Reporting Program requires the GQMP to identify the strategy for informing growers of the water quality problems that need to be addressed, the method for disseminating information on relative management practices to be implemented, and a description of how the effectiveness of the outreach efforts will be evaluated.

Staff Recommendation: The Coalition's outreach program should include a focus on growers identified as outliers through the nitrogen management plan summary reports. The GQMP should identify the method(s) of outreach to nitrogen outliers and describe how outreach will be performed; specific actions and a timeline for outreach to outliers also needs to be provided. The GQMP should also identify early targeted outreach to extreme outliers (e.g., growers with "exceptionally high" A/Y or A/R nitrogen ratios for their crop across the HVA, after considerations that would explain such a high ratio are taken into account).

- Performance Goals

Section D.3. of Appendix MRP-1 of the Monitoring and Reporting Program requires that the GQMP establish measurable performance goals that are aligned with the elements of the management plan strategy. Performance goals were not provided in the GQMP.

Staff Recommendation: The GQMP should provide performance goals for implementation of management practices that are established in accordance with the prioritization of groundwater quality management plan areas and the time schedule associated with prioritization. Information contained in the Farm Evaluations could be used to help establish performance goals within prioritized areas. For example, if information contained in the Farm Evaluations indicates that 70% of growers are currently implementing known practices to protect groundwater quality (e.g., well head protection, accounting for nitrate in irrigation water) in the highest priority groundwater

management plan area, then the Coalition could establish higher performance goals for implementation of these practices in the following years in order to reach complete implementation within the shortest period practicable. Information contained in the Farm Evaluations could help the Coalition determine which growers need additional outreach.

- Time Schedule for Compliance

Section XII. of the General Order requires that the time schedule for compliance with Groundwater Limitation III.B must be as short as practicable, but may not exceed 10 years from the date the GQMP is submitted for approval by the Executive Officer. The GQMP did not provide appropriate technical or economic justification to demonstrate that the proposed time schedule for compliance is as short as practicable.

Staff Recommendation: The GQMP must indicate that the proposed time schedule for compliance is the shortest possible and include discussion of the following items to support the time schedule: (1) The immediate and short-term or near-term management practices that will be implemented; (2) The implementation schedule for additional management practices that are dependent upon MPEP results will closely follow the MPEP schedule and efforts will be made to minimize, to the maximum extent possible, the lag time between when a practice is proven to be protective of groundwater in the MPEP, and when that practice is rolled out to appropriate coalition members for implementation within the GQMP areas; and (3) For management practices requiring substantial monetary investment prior to implementation, the GQMP should justify the proposed implementation schedule by indicating that the schedule will be based on a reasonable timeframe to budget for the required funding necessary to implement the practice, but under no circumstances will the schedule exceed 10 years.

- Organizational Chart

Section C.3.c. of Appendix MRP-1 of the Monitoring and Reporting Program requires that an organizational chart be provided that identifies lines of authority.

Staff Recommendation: Growers should be included as a responsible party in the GQMP's organizational chart since they are responsible for implementation of practices.

Table 1. Components of the Groundwater Quality Management Plan

Item No.	Required Component	Location in GQMP
Introduction and Background		
1	Provide a discussion of the constituents of concern (COCs) that are the subject of the GQMP.	Section 1.B.
2	Provide a discussion of the water quality objective(s) or trigger(s) requiring preparation of the management plan.	Section 1.B.
3	Identification (both narrative and in a map form) of the boundaries (geographic and groundwater basin[s] or portion of a basin) to be covered by the GQMP including how the boundaries were delineated.	Section 1.A. Figure 2
4	Provide a summary of previous work conducted to identify the occurrence of the COCs (e.g., studies, monitoring conducted) for the GQMP area.	Section 2.G.
Physical Setting and Information		
5	Provide land use maps which identify the crops being grown in the GQMP area (these maps may already be presented in the GAR). Map(s) must also be provided in electronic format as ArcGIS shapefiles.	Section 2.A. Figure 4 (incomplete, GIS)
6	Provide soil types and other relevant soils data as described by the NRCS soil survey or other applicable studies. The soil unit descriptions and a map of their aerial extent within the study area must be included.	Section 2.C. Figures 5 & 6
7	Identification of the potential irrigated agricultural sources of the COC(s) for which the management plan is being developed. If the potential sources are not known, a source identification study may be designed and implemented.	Section 1.B.
8	Provide a list of the designated beneficial uses as identified in the <i>Water Quality Control Plan for the Tulare Lake Basin</i> , Second Edition, revised January 2004 (Basin Plan).	Not Provided
9	Provide a baseline inventory of identified existing management practices in use within the management plan area that could be affecting the concentrations of COCs in groundwater and locations of the various practices.	Sections 3 & 4 (incomplete)
10	Provide a summary, discussion, and compilation of available groundwater quality data for the parameters addressed by the management plan. The GAR developed for the Coalition's area, and groundwater quality data compiled in that document, may serve as a reference for these data.	Section 2.G.
Geology and Hydrogeology		
11	Provide regional and area specific geology, including stratigraphy and existing published geologic cross-sections.	Section 2.C.
12	Provide information on groundwater basin(s) and sub-basins contained within the GQMP area, including a discussion of their general water chemistry as known from existing publications, including the GAR (range of EC, concentrations of major cations and anions, nutrients, TDS, pH, dissolved oxygen, and hardness). The discussion should reference and provide figures of existing Piper Diagrams, Stiff Diagrams and/or Durov Diagrams for the GQMP area.	Section 2.D. (incomplete)

13	Provide information regarding known water bearing zones, areas of shallow and/or perched groundwater, as well as areas of discharge and recharge to the basin/sub-basin in the GQMP area (rivers, unlined canals, lakes, and recharge or percolation basins).	Section 2.D.
14	Identification of which water bearing zones within the GQMP area are being utilized for domestic, irrigation, and municipal water production.	Section 2.D.
15	Aquifer characteristics such as depth to groundwater, groundwater flow direction, hydraulic gradient, and hydraulic conductivity, as known or estimated based on existing information.	Section 2.D. Figures 7 – 12 Table 2
16	Identification, where possible, of irrigation water sources (surface water origin and/or groundwater) and their available general water chemistry (range of EC, concentrations of major cations and anions, nutrients, TDS, pH, dissolved oxygen, and hardness).	Not Provided
Management Plan Strategy		
17	Provide a description of the approach to be utilized by the management plan (e.g., multiple COC's addressed in a scheduled priority fashion, multiple areas covered by the plan with a single area chosen for initial study, or all areas simultaneously [area wide]). Any prioritization included in the management plan must be consistent with the requirements in section XII of the General Order, Time Schedule for Compliance.	Sections 3 & 4 Figure 14 (incomplete)
18	Provide a description of actions to be taken in order to achieve compliance with the receiving water limitations of the General Order (section III).	Section 3.C.
19	Provide a description of how the Coalition plans to educate Members about the sources of the water quality exceedances in order to promote prevention, protection, and remediation efforts that can maintain and improve water quality.	Section 4.B.
20	Provide a description of how the Coalition will identify, validate, and implement management practices to reduce loading of COCs to surface water or groundwater, as applicable, thereby improving water quality.	Section 3
21	Identification of key individuals involved in major aspects of the project (e.g., project lead, data manager, sample collection lead, lead for stakeholder involvement, quality assurance manager).	Section 3.F. Figure 21
22	Provide a discussion of each individual's responsibilities.	Not Provided
23	Provide an organizational chart with identified lines of authority.	Figure 21
24	Identification of the entities or agencies that will be contacted to obtain data and assistance.	Section 4.B.
25	Identification of management practices used to control sources of COCs from irrigated lands that are 1) technically feasible; 2) economically feasible; 3) proven to be effective at protecting water quality, and 4) will comply with sections III.A and B of the General Order. Practices that growers will implement must be discussed, along with an estimate of their effectiveness or any known limitations on the effectiveness of the chosen practice(s). Practices identified may include those that are required by local, state, or federal law. Where an identified constituent of concern is a pesticide that is subject to DPR's Groundwater Protection Program, the GQMP may refer to DPR's regulatory program for that pesticide and any requirements associated with the use of that pesticide provided that the requirement(s) are sufficient to meet water quality	Section 3.E. (incomplete)

	objectives.	
26	Identification of outreach that will be used to disseminate information to participating growers. This discussion shall include: the strategy for informing growers of the water quality problems that need to be addressed, method for disseminating information on relevant management practices to be implemented, and a description of how the effectiveness of the outreach efforts will be evaluated. The third-party may conduct outreach efforts or work with the assistance of the County Agricultural Commissioners, U.C. Cooperative Extension, Natural Resources Conservation Service, Resource Conservation District, California Department of Food and Agriculture, or other appropriate groups or agencies.	Section 3.D. Section 4.B.
27	Provide a specific schedule and milestones for the implementation of management practices and tasks outlined in the management plan. Items to be included in the schedule include: time estimated to identify new management practices as necessary to meet the Order's surface and groundwater receiving water limitations (section III of the Order); a timetable for implementation of identified management practices (e.g., at least 25% of growers identified must implement management practices by year 1; at least 50% by year 2).	Section 4.A. (incomplete)
28	Establish measureable performance goals that are aligned with the elements of the management plan strategy. Performance goals include specific targets that identify the expected progress towards meeting a desired outcome.	Not Provided
Monitoring Methods		
29	The monitoring system must be designed to measure effectiveness at achieving the goals and objectives of the GQMP and capable of determining whether management practice changes made in response to the management plan are effective and can comply with the terms of the General Order.	Not Provided
30	The third-party's Management Practice Evaluation Program and Groundwater Quality Trend Monitoring shall be evaluated to determine whether additional monitoring is needed in conjunction with the proposed management strategy(ies) to evaluate the effectiveness of the strategy(ies). This may include commodity-based representative monitoring that is conducted to determine the effectiveness of management practices implemented under the GQMP. Refer to section IV of the MRP for groundwater monitoring requirements.	Section 5 (incomplete)
Data Evaluation		
31	Methods to be utilized to perform data analysis (graphical, statistics, modeling, index computation, or some combination thereof).	Not Provided

32	Identify the information necessary to quantify program effectiveness going forward, including the tracking of management practice implementation. The approach for determining the effectiveness of the management practices implemented must be described. Acceptable approaches include field studies of management practices at representative sites and modeling or assessment to associate the degree of management practice implementation to changes in water quality. The process for tracking implementation of management practices must also be described. The process must include a description of how the information will be collected from growers, the type of information being collected, how the information will be verified, and how the information will be reported.	Section 5
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