ADDENDUM

Stakeholder Comments and Response to Comments

Coachella Valley SNMP - TM-1

Stakeholder	No.	Comment	Response
Agua Caliente Band of Cahuilla Indians Margaret E. Park, AICP Director of Planning & Natural Resources	1	The limitations of the spatial and temporal distribution of concentration data were described, and a 3-step method for filtering data to remove inherent biases was presented. The second filter takes the median of the yearly medians to compute one concentration (i.e. TDS, nitrate) for the AWQ at that well's location. For wells without a clear trend in water quality, selecting the median year is a valid way of dealing with periodic changes in concentration. For wells with clear trends in water quality; such as the Palm Springs area wells (04SOSE04N01 S and 04S05E09N03S) with TDS, or the Palm Desert wells with nitrate; selecting the median year will underestimate the initial water quality, and in turn, overstate the assimilative capacity. For assimilative capacity calculations for these wells with clear trends, the most recent (highest or lowest) concentration or a projected concentration should be used as representative of ambient conditions.	The comment makes valid points. The benefit of using a baseline period is to ensure enough data points to accurately characterize a management zone's water quality. The use of medians will determine a representative water quality for the baseline period and remove outliers. Considering trends is important, as such, a Mann-Kendall trend analysis within the final SNMP will examine trends within the baseline period.
	2	MWH proposes to calculate the salt and nutrient loading using a spreadsheet-based planning tool. The limitation of using a spreadsheet versus a numerical groundwater model is that the spreadsheet assumes instant and thorough mixing (constantly stirred reactor model concept) of different qualities of water. A numerical model is usually the better tool to simulate the occurrence and movement of water through a heterogeneous subsurface, and account for the loading (mixing of different concentrations in water) of salts and nutrients. A spreadsheet-based calculation provides an averaged impact of changes within the basin, and may not account for the range of salt and nutrients loading under different conditions.	There are uncertainties with most methods of simulating water quality in a dynamic physical system. Accomplishing objective policy will not require a numerical model. Spreadsheet models do provide an averaged impact of changes within the basin or management zone. Numerical groundwater models also have uncertainty associated with characterizing properties of the physical system. Numerical models also typically have a great cost associated with their development and use. The use of a spreadsheet model is a simple approach that can be further developed and or converted to a numerical model with time. The policy states that the SNMP must be updated in the future. The development of a numerical model may be recommended for future project analysis.
	3	TM-1 discussed why golf course fertilization is not included as a source of nitrate. However, the cited study, by Washington State University (Gibeault et al, 1998), requires an optimal set of conditions for a golf course to not produce nitrate rich runoff or infiltration to groundwater. This indicates a different conclusion, and that less than ideal conditions or improper golf course management could impact water quality.	There are many different conditions that could negatively impact water quality. An additional local reference was added to the technical memorandum, a local leaching study by Wu *et al.* (2007) that suggests nitrate loading may be controlled with well-managed turf grass.
	4	Other constituents of concern should include uranium, high levels of which have forced groundwater treatment in the town of Whitewater. While not at the maximum contaminant limit in the Palm Springs area, uranium levels in groundwater are significantly elevated compared to the Public Health Goal (PHG). There is a report in the references on pg. 69, "GSi/water, 2011a. Study and Report on Uranium and the District's Wells, Prepared for Mission Springs Water District," however it is not cited within this document.	Comment noted. Uranium can be considered a constituent of concern in the area. Uranium was added to the constituents of concern list. Nitrate and TDS were selected as the primary COCs as they are materially affected by recycled water use or other salt/nutrient loads. The GSi/water reference was removed.
	5	It is stated that the presence of hexavalent chromium and arsenic in groundwater is "naturally occurring." However the potential impacts from pumping distribution or changes to the redox state were not addressed. Arsenic, for example, is highly sensitive to the stability of the iron oxides and sulfides (such as pyrite) it adsorbs to in the surrounding geologic formations.	Comment noted. Hexavalent chromium is a constituent of concern. Aquifer tests in test wells prior to well development and distributed pumping show chromium and arsenic occur in local groundwater almost entirely in oxidized states measured as hexavalent chromium and arsenate, respectively.
	6	This section doesn't discuss the spatial occurrence of hexavalent chromium or with depth. A potential concern is that the "naturally occurring" hexavalent chromium may be more concentrated in geologic formations that the lower aquifer consists of and may be mobilized by overproduction of groundwater.	Comment noted. Hexavalent chromium is a constituent of concern. Aquifer tests in test wells prior to well development show hexavalent chromium is mostly uniformly distributed in relation to depth within local aquifers used for beneficial uses.

Stakeholder	No.	Comment	Response
	7	Some crops incorporate groundwater arsenic into the consumed portion. This section does not discuss if the type of agriculture is appropriate for arsenic-rich water.	Comment noted. Arsenic is a constituent of concern in the area and the discussion of arsenic is related to general water quality. There are numerous studies that evaluate the differences in relative risks between organic arsenic found in plants and inorganic arsenic found in drinking water. The SNMP effort is not intended to evaluate or add to these studies.
Valley Sanitary District Ron Buchwald, P.E. District Engineer	8	The purpose of this TM was to " ... summarizes the purpose o f the SNMP, reviews the areas for which the plan will cover, summarizes a preliminary data review conducted to assess technical methods, and proposes technical methods to develop the SNMP." In general, the TM does a very thorough job of accomplishing these objectives.	Comment noted.
	9	From reading the document, it is not clear what VSD's role is in the development of the SNMP. It appears that the TM was intended for the CVRWMG and its stakeholders. It is recommended that a brief definition be included of the roles different agencies and stakeholders have in this process as the SNMP is a living document that has shared responsibilities amongst us all.	A brief section stating how stakeholders can contribute to the plan was added. A key contribution for stakeholders includes water quality data what projects are planned that may impact salt and nutrients within the region's management zones.
	10	The Phases of the SNMP process (e.g. Phase I, Phase II, etc.) are clearly defined on page eight. However, there are also "stages" of the Phases, which are described, but the delineation of the stages is not quite so clear. Providing a table or figure may be helpful to define the various stages of the phases.	Commented noted, text was added to reflect the comment and clarify stages of Phase II, see section one and section five.
	11	The groundwater modeling description is detailed and in-depth, but it is not clear how the basins and cells interact, and the time step of the modeling. Does one basin drain into another basin and do cells from basins interact with neighboring cells? What is the time step of the modeling and what is the duration of the time series? Overall, our opinion is that the groundwater modeling approach that has been proposed is very ambitious. If the consultant is confident that they can execute what they have proposed, then there are no concerns.	No groundwater modeling is being performed using these models. The groundwater models provide a convenient discretization of the basin for filtering the data and determining volume-weighted ambient water quality. As these models have been peer-reviewed for technical soundness, using them allows the ability to leverage the work already done. The grid enables the grouping of data points from groundwater wells into grid cells and layers while preserving different aquifer properties specific to each grid cell and layer.
	12	There is extensive discussion of the available groundwater data and whether or not it is sufficient. It was not until the end of the document when one gets a sense of how many results and sampling locations were used. The addition of the number of analyses should be presented in the tables where the averages, medians, and ranges are provided (starting with Table 3-1 on page 31).	The text was revised to reflect the comment, including adding the number of analyses ("Count") to the tables referenced.
	13	On page 33, "uptake of nitrogen by managed turf should be addressed in this SNMP..." How is this going to be accomplished? This seems to be an ambitious endeavor.	Agricultural engineers are a part of the project team and will evaluate the uptake of nitrogen by different agricultural practices, including managed turf. This issue will be further addressed in the final SNMP.
	14	In section 5.4.1 Data Preparation: Although there is a decent explanation for using zero for non-detect values, it is not intelleclually honest to treat non-detect values as zero values. This is somewhat of a minor issue and will most likely not have a major impact on the results.	This substitution is consistent with several statistical methods guides such as EPA Data Quality Assessment based on the number of nitrate records in the dataset that are non-detects. Additional text and reference regarding the methods has been added.
	15	On page 7, Figure 1-4, IWA is not referenced in the Key to Features legend.	Commented noted, text is modified to reflect the comment.
	16	On page 9, the last sentence is incomplete.	Commented noted, text is modified to reflect the comment.
	17	On Page 10, Section 2.1, the sentence that reads "In an effort ... " the word "it" appears to be missing between the words "updated" and "in."	Commented noted, text is modified to reflect the comment.
	18	On Page 15, Section 2.3.1, the sentence that reads "For example ... " the word "as" appears to be missing between the words "such" and "contact."	Commented noted, text is modified to reflect the comment.
	19	On page 20, Section 3.1, the sentence that begins "Geologic faults" appears to be missing words in the final phrase or the word "and" should be deleted.	Commented noted, text is modified to reflect the comment.
	20	On page 20, is there no groundwater discharge to rivers or streams?	Within the study area, there is groundwater outflow to phreatophtyes in southern portions of the Mission Creek Management Zone, this may have historically included discharge to streams. Currently there is only outflow to phreatophytes, tile drains, the CVSC, and the Salton Sea.

Stakeholder	No.	Comment	Response
	21	On page 23, in the second paragraph, the sentence that begins "The dividing line .... " Is awkward and appears to be missing words between "irregular" and "trending."	Commented noted, text is modified to reflect the comment.
	22	On Page 23, second and fourth bullet points: replace "correlative" with "correlated" for parallelism.	Commented noted, text is modified to reflect the comment.
	23	On page 23, USGS footnote has too many parentheses.	Commented noted, text is modified to reflect the comment.
	24	In general, starting on page 23, use of word "thick" to describe the aquifer is unclear. At first I understood it to mean "deep" but later the use of "depth" led me to conclude that "thick" meant "wide." I would suggest clarifying this language.	Commented noted, text will be modified to clarify the description. IT is intended to refer to vertical thickness of an aquifer or geologic layer.
	25	If Upper Aquifer and Lower Aquifer are proper names, both words need to be capitalized in all locations.	These descriptions are not proper names. All instances of these descriptions will be checked for consistency.
	26	On page 25, Section 3.1.1.4, last paragraph: more explanation is needed regarding the "reversed the direction of this subsurface flow" and include any references.	Commented noted, text is modified to reflect the comment.
	27	On page 28, end of second paragraph: "waste of groundwater" is an ominous term.	Commented noted, text is modified to reflect the comment.
	28	On Page 28, third paragraph: "Recent" is inappropriately capitalized.	In this context, "Recent" is used as a proper noun describing a particular geologic time period.
	29	On page 33, second paragraph, second sentence: the word "be" is missing between the words "may" and "more."	Commented noted, text is modified to reflect the comment.
	30	On page 34, Section 3.2.8.1: insert words "a limit of" prior to "10 ug/L".	Commented noted, text is modified to reflect the comment.
	31	On page 36, Section 3.3.2, second paragraph: this paragraph is confusing. If the groundwater is generally higher northeast of the fault, then why is the groundwater higher in the southern portion or the sub-basin? I recommend a figure showing the various faults and sub-basins to help explain this.	North and east of the fault system water levels are higher than south and west of the fault system. Within the subbasin, water levels are higher to the west and lower to the east. Text was revised to be more clear.
	32	On page 39, Section 3.4, first paragraph: insert the word "in" between "exhibited" and "a".	Commented noted, text is modified to reflect the comment.
	33	On page 40, Section 3.4.3: delete extra table reference.	Commented noted, text is modified to reflect the comment.
	34	On page 45, Section 4.2: use of i.e. should be replaced with e.g.	Comment noted.
	35	On page 59, Figure 5-2: the legend shows a symbol for highways but none are shown in the figure.	Commented noted, the figure is modified to reflect the comment.
Bureau of Indian Affairs Robert Eben Superintendent	36	The dominant form of groundwater chemistry should be included within the anticipated baseline data. Changing groundwater chemistry, regardless of total salt load can impact the beneficial uses of groundwater. For example a change to more sodium-based waters may cause issues related to sodic soils or worst case saline-sodic soils, if groundwater sources are to be used for irrigation within agriculture or turf grass applications such as golf courses or recreational fields.	Comment noted. Evaluating the differing forms of salts is a rigorous analysis that is out of the scope for the SNMP and not feasuble. TDS, however, is a commonly used surrogate for salts and other potential constituents of concern. TDS measurements are also readily available. Use of surrogates is a common practice, for example, drinking water surrogate testing for total coliform bacteria is commonly conducted as it would be infeasible to assess water sources for each individual pathogen.
	37	Data quality assessment and metadata should be included and documented within the available data set, if not already. The EPA has a number of available guides within the EPA's Quality Management Tools - Data Quality Assessment website, http://www.epa.gov/QUALITY/dqa.html. These could be used to address questions brought up within the presentation, such as whether the measurement of nitrate being used was the same in all cases. Without accurate metadata or initial quality assessment, resolving technical issues could be time consuming and under restricted time frames may be overlooked.	The following guides were used to scrutinize the data: - USGS Techniques of Water-Resources Investigations of the United States Geological Survey: Statistical Methods in Water Resources - EPA Data Quality Assessment: Statistical Methods for Practitioners, was used to scrutinize the data Metadata is tracked within the water quality database.
	38	TM-1 states that the methodology for handling non-detects would be to set the data to zero. Statistical approaches for handling non-detects like the one listed in the EPA guide, Data Quality Assessment: Statistical Methods for Practitioners, http://www.epa.gov/QUALITY/qs-docs/g9s-final.pdf, should be utilized or similar approaches in order to help eliminate the potential bias from large numbers of non-detects, currently noted to be set to zero.	According to Table 4-4 "Guidelines for Analyzing Data with Non-Detects", simple substitution with zero is an acceptable statistical analysis method for datasets with less than 15% non-detect values. A detection limit substitution was not used because that information is not available for a significant amount of nitrate records. Text was revised to reflect the comment.

Stakeholder	No.	Comment	Response
	39	Within the TM-1 document it was noted that the exceedance of the Total Maximum Daily Load (TMDL) would cause more frequent sampling, and as such some of the averaging within a period of record was used to help eliminate data bias. The frequency of TMDL exceedance should be noted and the exceedance limits during the period of record to reflect changes in modern or historical standards.	There is no reference to Total Maximum Daily Loads (TMDLs) within TM-1; TMDLs are typically developed to restore impaired surface waters, whereas this SNMP is concerned with protecting beneficial uses of groundwater. The frequency bias filtering addresses theoretical increased sampling and how the filter prevents skewing of the data. Existing monitoring and sampling frequency will be discussed in the draft SNMP.
	40	The different techniques for calculation of ambient water quality should be identified and filterable via the tool for the potential bias related to technique differences, or noted if they were averaged together. Uncertainty of the various averaged parameters should also be capable of being tracked.	Statistical summaries of AWQ using pre- and post-filtered data will be presented in TM-2 to track the effects of filtering and provide a transparent review of the data.
	41	The data used to create the SNMP (a public document) should be made publicly available in a documented format for evaluation and use by stakeholders.	The data will be provided to stakeholders/public in the SNMP.
	42	Finally, while not related to the current document, foreseeable questions are centered on the baseline data and how it will be evaluated. Would uncertainty estimation, bootstrapping, monte carlo simulations, or other methodologies be utilized for assessing tool accuracy?+ Since median values are going to be utilized for contouring, will standard deviation contours also be calculated?	At this time no uncertainty evaluation is anticipated. Standard statistics, including standard deviation will be documented for entire management zones and portions of management zones.
Mission Springs Water District Arden Wallum, Mission Springs Water District Michael Thornton, TKE Engineering	43	As indicated in Table 1-1, the SNMP must identify stakeholders responsible for conducting, compiling, and reporting monitoring data. Define the anticipated MSWD role. MSWD's involvement in this process is only fair and necessary to achieve a better analysis. In addition, the SNMP requirements include identifying salt and nutrient sources. For the Mission Creek and Garnet Hill Subbasins, as presented in TM No. 1, key constituents include TDS, nitrates, hexavalent chromium, and uranium. The primary contributors of TDS to groundwater are septage from waste disposal, saline subsurface flow from Desert Hot Springs subbasin, imported water recharged at the Mission Creek Spreading Facility, and percolation of treated wastewater.1 MSWD has and/or will successfully complete $39 million of sewer conversion improvements. MSWD continues to pursue funding opportunities to fully mitigate all onsite disposal systems in its service area effectively managing septage. Wastewater effluent is currently being treated in compliance with MSWD's Waste Discharge Permit (WDR) requirements. Regarding saline subsurface flow from the Desert Hot Springs subbasin and imported Colorado River water, MSWD requests that the SNMP identify these sources of potential groundwater quality degradation and specify measures required to effectively manage them to prevent long term degradation. Note that saline from the Desert Hot Springs subbasin is naturally occurring and yet MSWD has won several awards regarding the taste of water produced from the Mission Creek subbasin. Degradation due to saline increases will be detrimental to the water supply and the region's economic foundation-water. Therefore, imported water and its TDS concentrations are the greatest issues related to water quality degradation in the Mission Creek subbasin. Imported water is the principal source of supplemental water supply for both subbasins and the need for additional imported water is expected to increase in the future. Finally, projects that are identified and evaluated in the SNMP must be implemented to protect groundwater quality. Define the proposed implementation plan.	Comments noted. Please see response to comment No. 9. All stakeholders will be listed in the SNMP along with the public meeting record. To the extent possible, all sources of salt and nutrients will be identified in the SNMP report. Projects related to the management of salts and nutrients will also be documented in the SNMP report. An implementation plan will be provided within the SNMP.
	44	Section 1.4, Salt and Nutrient Management Plan Development - Delete the third full paragraph. Indicate that the SNMP is not being prepared under the direction of the CVRWMG. The last paragraph appears to include an incomplete sentence.	Comment noted. The TM makes note that Phase II and possibly Phase III of this SNMP are being prepared outside of the framework of the CVRWMG.
	45	Section 2.1, Recycled Water Policy - Define quantities of recycled water currently available for reuse together with the expected increases by 2045.	This will be summarized in the draft SNMP. The purpose of this memorandum was to review the areas for which the plan will cover, summarize a preliminary data review, and propose technical methods to develop the SNMP. This information is currently available in the Mission Creek / Garnet Hill 2013 Water management Plan and the Coachela Valley Water Management Plan 2010 Update.

Stakeholder	No.	Comment	Response
	46	Section 2.3, Basin Plan - SNMP shall include an evaluation of a no degradation option and associated costs to confirm that the recommended program will maintain the highest water quality which is reasonable while considering all demands being made. A strict non-degradation option may be more feasible.	Commented noted. It should be noted that typically with any overlying water use there is degradation to local water quality and water quality must be maintained until it has been demonstrated that any change will be consistent with maximum benefit to the people of the State.
	47	Section 2.3.2, Region Water Quality Objectives - The Colorado River Basin Plan does not specify numeric groundwater objectives. It indicates that establishment of numerical objectives for groundwater involves complex considerations since the quality of groundwater varies significantly with depth and of well perforations, existing water levels, geology, hydrology and several other factors. Unavailability of adequate historical data compounds the problem. The Regional Board believes that detailed investigation of groundwater basins should be conducted before establishing specific groundwater quality objectives. This plan should also include a program to continue the acquisition of new data and information into the future. Since adoption of the Basin Plan, MSWD together with CVWD and DWA completed the Mission Creek/Garnet Hill Water Management Plan that contains data that will assist in development of water quality objectives. Using this data and data from the Coachella Valley Water Management Plan, the SNMP should establish water quality objectives prior to estimating assimilative capacities. MSWD rejects the use of the Title 22 MCL for nitrate. As indicated, current TDS levels in the Mission Creek subbasin at MSWD's production facility locations are approximately 400 to 450 mg/L. Suggested objectives of 879 mg/L or the Title 22 MCL is not appropriate. As you may be aware, litigation is pending challenging current water quality management of the Coachella Valley Water Basins. Arbitrary selection of protective water quality objectives may support the tribe's arguments related to mismanagement. For example, the suggested TDS water quality objectives may not be applicable to the Coachella Valley.	As noted on p.2, p.3, p.8, p.54, and p.56, a monitoring plan is a part of the SNMP. It is noted that MSWD rejects the use of the Title 22 MCL for nitrate. It is also noted that MSWD believes the suggested objectives of 879 mg/L or the Title 22 MCL is not appropriate.
	48	Section 2.4, Resolution No. 68-16 – State Anti-Degradation Policy - Revise the sentence "The appeals court interpreted an existing high quality water to exist where the baseline water quality (that existed in 1968) is better than the water quality objective." to "The appeals court defined high quality water as the best water quality achieved since the adoption of the anti-degradation policy by the SWRCB in 1968."	What is currently written is per the appeals court, the recommended change changes the meaning of the sentence and does not represent the appeals court decision.
	49	Section 3.3, Mission Creek Subbasin - In reference to the first paragraph, groundwater replenishment includes mountain front recharge by subsurface flow in addition to the Desert Hot Springs subbasin.	Commented noted, text is modified to reflect the comment.
	50	Section 3.3.2, Groundwater Level - The first and last paragraphs are inaccurate. Groundwater storage in the Mission Creek subbasin has declined continuously from about 1960 until significant recharge activities commenced in 2005. Under existing conditions, groundwater pumping is about 4,000 AFY greater than estimated natural recharge and current artificial recharge activities.Water Quality Control Board, Colorado River Basin – Region 7, Chapter 3 – Water Quality Objectives, Subsection IV, Groundwater Objectives. Paragraph 3, also contradicts the first paragraph. To assist in understanding basin conditions, by separate correspondence, MSWD will provide well static water level data.	Text was modified to be consistent with the Mission Creek/Garnet Hill Water Management Plan Final Report January 2013.
	51	Section 3.3.3, Groundwater Quality - The data presented in the tables does not accurately reflect water quality conditions in the Mission Creek subbasin. MSWD will provide, by separate correspondence, Title 22 water quality data for all MSWD wells. Revise all sections related to water quality based on the provided data. Please note that MSWD has won several awards regarding the taste of water produced from the Mission Creek subbasin.	Commented noted, MWH has been in contact with MSWD staff to obtain additional data. It is likely that all additional data is included in current data sources.
	52	Section 3.3.4.4, Radionuclides - Uranium contamination discussion is not accurately presented. Please review the study prepared by GSI/Water. Currently, uranium concentrations exceeding the MCL only occur in two MSWD wells that are not being used. Verify using the data provided statement regarding gross alpha.	Commented noted, text is modified to reflect the comment.
	53	Section 3.3.4.4, Radionuclides - Uranium contamination discussion is not accurately presented. Please review the study prepared by GSI/Water. Currently, uranium concentrations exceeding the MCL only occur in two MSWD wells that are not being used. Verify using the data provided statement regarding gross alpha.	Commented noted, text is modified to reflect the comment.
	54	Section 4.2, Data Sources - MSWD is providing additional data; revise the first sentence. In addition, include water quality data for the Colorado River Aqueduct.	See response to comment No. 51. Colorado River Aqueduct water quality is not necessary in this memorandum, it will be described in the SNMP report.
	55	Section 4.2.1, Groundwater Models - Further define the use of existing groundwater models for AWQ and potential management strategies. To develop an effective SNMP, modeling will be an essential tool. For example, the model will assist in determining the effects of the imported water recharge at the Mission Creek Recharge Facility on the entire MZ and other MZ's. The CV is comprised of a number of complicated subbasins connected with fault systems. Modeling is a key component to determine water quality impacts of various sources. It will prevent oversight of impacts in critical areas throughout the CV.	Comment noted, please see response to comment No. 2.
	56	Section 4.3, Data Gaps - Revise the first paragraph after review of the Title 22 well data provided by MSWD. Well data is primarily acquired from wells in the northwestern areas of the Mission Creek subbasin. The more diversified water quality data will impact methods chosen to determine AWQ.	Commented noted, MWH has been in contact with MSWD staff to obtain additional data. It is likely that all additional data is included in current data sources.

Stakeholder	No.	Comment	Response
	57	Section 5, Technical Approach - MSWD reserves comments related to this section for further consideration. MSWD will confer with the Regional Board and other experts to assemble comments.	All stakeholder comments are welcomed, this project is an open and transparent process. While we would consider future comments, we respectfully would like to remind you that we are moving forward to adhere to the strict schedule requirements determined by the Regional Water Quality Control Board; therefore, any comments received after the comment deadlines are not guaranteed to be incorporated in the technical memorandum.

AGUA CALIENTE BAND OF CAHUILLA INDIANS

PLANNING & DEVELOPMENT DEPARTMENT
CONSTRUCTION DIVISION • ECONOMIC DEVELOPMENT DIVISION
PLANNING & NATURAL RESOURCES DIVISION • TRIBAL HISTORIC PRESERVATION OFFICE

September 17, 2014

Sent via: U.S. Postal Service
Email: preyes@cvwd.org

Patti Reyes, P.E.
Planning and Special Programs Manager
Coachella Valley Water District
P.O. Box 1058
Coachella, CA 92236

RE: Comments on Technical Memo #1, SNMP Technical Methods for Calculation of Ambient Water Quality

Dear Ms. Reyes:

Thank you for the opportunity to review and comment on Technical Memo #1, SNMP Technical Methods for Calculation of Ambient Water Quality. As you are aware, the Tribe submitted comments on the SNMP Work Plan in December 7, 2012 and continues to participate in the ongoing stakeholder meetings. The Tribe offers the following comments:

1. The limitations of the spatial and temporal distribution of concentration data were described, and a 3-step method for filtering data to remove inherent biases was presented. The second filter takes the *median of the yearly medians* to compute one concentration (i.e. TDS, nitrate) for the AWQ at that well's location. For wells without a clear trend in water quality, selecting the median year is a valid way of dealing with periodic changes in concentration. For wells with clear trends in water quality; such as the Palm Springs area wells (04S05E04N01S and 04S05E09N03S) with TDS, or the Palm Desert wells with nitrate; selecting the median year will underestimate the initial water quality, and in turn, overstate the assimilative capacity. For assimilative capacity calculations for these wells with clear trends, the most recent (highest or lowest) concentration or a projected concentration should be used as representative of ambient conditions.

2. MWH proposes to calculate the salt and nutrient loading using a *spreadsheet-based planning tool*. The limitation of using a spreadsheet versus a numerical groundwater model is that the spreadsheet assumes instant and thorough mixing (*constantly stirred reactor model concept*) of different qualities of water. A numerical model is usually the better tool to simulate the occurrence and movement of water through a heterogeneous subsurface, and account for the loading (mixing of different concentrations in water) of salts and nutrients. A spreadsheet-based calculation provides an averaged impact of changes within the basin, and may not account for the range of salt and nutrients loading under different conditions.

3. TM-1 discussed why golf course fertilization is not included as a source of nitrate. However, the cited study, by Washington State University (Gibeault et al, 1998), requires an optimal set of conditions for a golf course to not produce nitrate rich runoff or infiltration to groundwater. This indicates a different conclusion, and that less than ideal conditions or improper golf course management could impact water quality.

4. Other constituents of concern should include uranium, high levels of which have forced groundwater treatment in the town of Whitewater. While not at the maximum contaminant limit in the Palm Springs area, uranium levels in groundwater are significantly elevated compared to the Public Health Goal (PHG). There is a report in the references on pg. 69, "GSi/water, 2011a. *Study and Report on Uranium and the District's Wells, Prepared for Mission Springs Water District*," however it is not cited within this document.

5. It is stated that the presence of hexavalent chromium and arsenic in groundwater is "naturally occurring." However the potential impacts from pumping distribution or changes to the redox state were not addressed. Arsenic, for example, is highly sensitive to the stability of the iron oxides and sulfides (such as pyrite) it adsorbs to in the surrounding geologic formations.

6. This section doesn't discuss the spatial occurrence of hexavalent chromium or with depth. A potential concern is that the "naturally occurring" hexavalent chromium may be more concentrated in geologic formations that the lower aquifer consists of and may be mobilized by overproduction of groundwater.

7. Some crops incorporate groundwater arsenic into the consumed portion. This section does not discuss if the type of agriculture is appropriate for arsenic-rich water.

Thank you for the opportunity to review Technical Memo #1. If you have any questions, please feel free to contact me at 760-883-1326.

Very truly yours,

Margaret Park

Margaret E. Park, AICP
Director of Planning & Natural Resources
AGUA CALIENTE BAND
OF CAHUILLA INDIANS

C: Tribal Council
Tom Davis, Chief Planning and Development Officer
John Plata, In-House Counsel

September 18, 2014

Ms. Patti Reyes
Planning and Special Programs Manager
Coachella Valley Water District
P.O. Box 1058
Coachella, CA 92236

Re: DRAFT – Technical Memorandum No. 1 Preliminary Data Review and Documentation of Technical Methods

Dear Ms. Reyes:

Valley Sanitary District (VSD) along with their consultant reviewed the following document: DRAFT – Technical Memorandum No. 1 Preliminary Data Review and Documentation of Technical Methods dated August 29, 2014. VSD is providing the following general comments:

1. The purpose of this TM was to "…summarizes the purpose of the SNMP, reviews the areas for which the plan will cover, summarizes a preliminary data review conducted to assess technical methods, and proposes technical methods to develop the SNMP." In general, the TM does a very thorough job of accomplishing these objectives.
2. From reading the document, it is not clear what VSD's role is in the development of the SNMP. It appears that the TM was intended for the CVRWMG and its stakeholders. It is recommended that a brief definition be included of the roles different agencies and stakeholders have in this process as the SNMP is a living document that has shared responsibilities amongst us all.
3. The Phases of the SNMP process (e.g. Phase I, Phase II, etc.) are clearly defined on page eight. However, there are also "stages" of the Phases, which are described, but the delineation of the stages is not quite so clear. Providing a table or figure may be helpful to define the various stages of the phases.
4. The groundwater modeling description is detailed and in-depth, but it is not clear how the basins and cells interact, and the time step of the modeling. Does one basin drain into another basin and do cells from basins interact with neighboring cells? What is the time

step of the modeling and what is the duration of the time series? Overall, our opinion is that the groundwater modeling approach that has been proposed is very ambitious. If the consultant is confident that they can execute what they have proposed, then there are no concerns.

5. There is extensive discussion of the available groundwater data and whether or not it is sufficient. It was not until the end of the document when one gets a sense of how many results and sampling locations were used. The addition of the number of analyses should be presented in the tables where the averages, medians, and ranges are provided (starting with Table 3-1 on page 31).
6. On page 33, "uptake of nitrogen by managed turf should be addressed in this SNMP..." How is this going to be accomplished? This seems to be an ambitious endeavor.
7. In section 5.4.1 Data Preparation: Although there is a decent explanation for using zero for non-detect values, it is not intellectually honest to treat non-detect values as zero values. This is somewhat of a minor issue and will most likely not have a major impact on the results.

In addition, some other minor comments were noted. Those are provided below.

1. On page 7, Figure 1-4, IWA is not referenced in the Key to Features legend.
2. On page 9, the last sentence is incomplete.
3. On Page 10, Section 2.1, the sentence that reads "In an effort..." the word "it" appears to be missing between the words "updated" and "in."
4. On Page 15, Section 2.3.1, the sentence that reads "For example..." the word "as" appears to be missing between the words "such" and "contact."
5. On page 20, Section 3.1, the sentence that begins "Geologic faults" appears to be missing words in the final phrase or the word "and" should be deleted.
6. On page 20, is there no groundwater discharge to rivers or streams?
7. On page 23, in the second paragraph, the sentence that begins "The dividing line...." Is awkward and appears to be missing words between "irregular" and "trending."
8. On Page 23, second and fourth bullet points: replace "correlative" with "correlated" for parallelism.
9. On page 23, USGS footnote has too many parentheses.
10. In general, starting on page 23, use of word "thick" to describe the aquifer is unclear. At first I understood it to mean "deep" but later the use of "depth" led me to conclude that "thick" meant "wide." I would suggest clarifying this language.
11. If Upper Aquifer and Lower Aquifer are proper names, both words need to be capitalized in all locations.
12. On page 25, Section 3.1.1.4, last paragraph: more explanation is needed regarding the "reversed the direction of this subsurface flow" and include any references.
13. On page 28, end of second paragraph: "waste of groundwater" is an ominous term.
14. On Page 28, third paragraph: "Recent" is inappropriately capitalized.

15. On page 33, second paragraph, second sentence: the word "be" is missing between the words "may" and "more."
16. On page 34, Section 3.2.8.1: insert words "a limit of" prior to "10 ug/L".
17. On page 36, Section 3.3.2, second paragraph: this paragraph is confusing. If the groundwater is generally higher northeast of the fault, then why is the groundwater higher in the southern portion of the sub-basin? I recommend a figure showing the various faults and sub-basins to help explain this.
18. On page 39, Section 3.4, first paragraph: insert the word "in" between "exhibited" and "a".
19. On page 40, Section 3.4.3: delete extra table reference.
20. On page 45, Section 4.2: use of i.e. should be replaced with e.g.
21. On page 59, Figure 5-2: the legend shows a symbol for highways but none are shown in the figure.

If you have any questions, please do not hesitate to contact me at (760) 238-5408 or at rbuchwald@valley-sanitary.org.

Sincerely,

VALLEY SANITARY DISTRICT

Ron Buchwald, P.E.
District Engineer

UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF INDIAN AFFAIRS
SOUTHERN CALIFORNIA AGENCY
1451 RESEARCH PARK DRIVE, SUITE 100
RIVERSIDE, CALIFORNIA 92507
PHONE (951) 276-6624
TELEFAX (951) 276-6641

SEP 18 2014

IN REPLY REFER TO:
Natural Resources
Hydrologist

Attn: Patti Reyes
Coachella Valley Salt and Nutrient Management Plan Technical Group
Planning and Special Programs Manager
Coachella Valley Water District
P.O. Box 1058
Coachella, CA 92236

Subject: Comments of the Bureau of Indian Affairs Southern California Agency regarding Coachella Valley Salt and Nutrient Management Plan Technical Group Technical Memorandum No. 1.

This letter is provided by the U.S. Bureau of Indian Affairs Southern California Agency, (BIA), to review and comment on Coachella Valley Salt and Nutrient Management Plan Technical Group, Draft Technical Memorandum No. 1 (TM-1) located at http://www.cvwd.org/snmp/. The BIA understands that this technical memorandum is to be used in preparation for the requirements of the State Water Resources Control Board Resolution No. 2009 011 that establishes the Recycled Water Policy (http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2009/rs2009_0011.pdf).

The BIA is the oldest bureau of the United States Department of the Interior. Established in 1824, the BIA provides services to approximately 1.7 million American Indians and Alaska Natives. Among the many duties of the BIA, as established by the United States Congress, is to serve as an advocate for the sovereignty and rights of tribes in dealing with other governmental entities and, to fulfill and execute the Federal Government's trust responsibility to American Indian Tribes. *All federal agencies share in this trust responsibility.*

Below are specific comments for consideration regarding the TM-1 document, and responses should be addressed to the included parties below.

1. The dominant form of groundwater chemistry should be included within the

anticipated baseline data. Changing groundwater chemistry, regardless of total salt load can impact the beneficial uses of groundwater. For example a change to more sodium-based waters may cause issues related to sodic soils or worst case saline-sodic soils, if groundwater sources are to be used for irrigation within agriculture or turf grass applications such as golf courses or recreational fields.

2. Data quality assessment and metadata should be included and documented within the available data set, if not already. The EPA has a number of available guides within the EPA's Quality Management Tools – Data Quality Assessment website, http://www.epa.gov/QUALITY/dqa.html. These could be used to address questions brought up within the presentation, such as whether the measurement of nitrate being used was the same in all cases. Without accurate metadata or initial quality assessment, resolving technical issues could be time consuming and under restricted time frames may be overlooked.

3. TM-1 states that the methodology for handling non-detects would be to set the data to zero. Statistical approaches for handling non-detects like the one listed in the EPA guide, Data Quality Assessment: Statistical Methods for Practitioners, http://www.epa.gov/QUALITY/qs-docs/g9s-final.pdf, should be utilized or similar approaches in order to help eliminate the potential bias from large numbers of non-detects, currently noted to be set to zero.

4. Within the TM-1 document it was noted that the exceedance of the Total Maximum Daily Load (TMDL) would cause more frequent sampling, and as such some of the averaging within a period of record was used to help eliminate data bias. The frequency of TMDL exceedance should be noted and the exceedance limits during the period of record to reflect changes in modern or historical standards.

5. The different techniques for calculation of ambient water quality should be identified and filterable via the tool for the potential bias related to technique differences, or noted if they were averaged together. Uncertainty of the various averaged parameters should also be capable of being tracked.

6. The data used to create the SNMP (a public document) should be made publicly available in a documented format for evaluation and use by stakeholders.

7. Finally, while not related to the current document, foreseeable questions are centered on the baseline data and how it will be evaluated. Would uncertainty estimation, bootstrapping, monte carlo simulations, or other methodologies be utilized for assessing tool accuracy?+ Since median values are going to be utilized for contouring, will standard deviation contours also be calculated?

If there any clarification is needed, please do not hesitate to call Mr. Patrick Taber, Agency Hydrologist at 951-276-6624 x 256.

Sincerely;

Robert Eben
Superintendent

Cc: Chairperson, Torres Martinez Desert Cahuilla Indians
Chairperson, Agua Caliente Band of Cahuilla Indians
Chairperson, Twenty-Nine Palms Band of Mission Indians
Chairperson, Cabazon Band of Mission Indians
Chairperson, Augustine Band of Cahuilla Indians

MEMORANDUM

Date: September 18, 2014

To: Thomas D. McCarthy, Principal Engineer,MWH
Adnan Anabtawi, Associate Engineer, MWH

From: Arden Wallum,Mission Springs Water District
Michael Thornton, TKE Engineering

Subject: Salt and Nutrient Management Plan (SNMP)
Technical Memorandum No. 1, Preliminary Data Review and Documentation of Technical Methods
MSWD Preliminary Comments

MSWD comments are presented in the following paragraphs:

A. Section 1.2, Purpose of the Plan

As indicated in Table 1-1, the SNMP must identify stakeholders responsible for conducting, compiling, and reporting monitoring data. Define the anticipated MSWD role. MSWD's involvement in this process is only fair and necessary to achieve a better analysis.

In addition, the SNMP requirements include identifying salt and nutrient sources. For the Mission Creek and Garnet Hill Subbasins, as presented in TM No. 1, key constituents include TDS, nitrates, hexavalent chromium, and uranium. Theprimary contributors of TDS to groundwater are septage from waste disposal, saline subsurface flow from Desert Hot Springs subbasin, imported water recharged at the Mission Creek Spreading Facility, and percolation of treated wastewater.[1] MSWD has and/or will successfully complete $39 million of sewer conversion improvements. MSWD continues to pursue funding opportunities to fully mitigate all onsite disposal systems in its service area effectively managing septage. Wastewater effluent is currently being treated in compliance with MSWD's Waste Discharge Permit (WDR) requirements.

Regarding saline subsurface flow from the Desert Hot Springs subbasin and imported Colorado River water, MSWD requests that the SNMP identify these sources of potential groundwater quality degradation and specify measures required to effectively manage them to prevent long term degradation. Note that saline from the Desert Hot Springs subbasin is naturally occurring and yet MSWD has won several awards regarding the taste of water produced from the Mission Creek

[1]Mission Creek/Garnet Hill Water Management Plan, Final Report, January 2013, Section 5, Issues, Strategies and Plan Evaluation, Total Dissolved Solids.

subbasin.[2] Degradation due to saline increases will be detrimental to the water supply and the region's economic foundation-water.

Therefore, imported water and its TDS concentrations are the greatest issues related to water quality degradation in the Mission Creek subbasin. Imported water is the principal source of supplemental water supply for both subbasins and the need for additional imported water is expected to increase in the future.[3]

Finally, projects that are identified and evaluated in the SNMP must be implemented to protect groundwater quality. Define the proposed implementation plan.

B. Section 1.4, Salt and Nutrient Management Plan Development

Delete the third full paragraph. Indicate that the SNMP is not being prepared under the direction of the CVRWMG. The last paragraph appears to include an incomplete sentence.

C. Section 2.1, Recycled Water Policy

Define quantities of recycled water currently available for reuse together with the expected increases by 2045.

D. Section 2.3, Basin Plan

SNMP shall include an evaluation of a no degradation option and associated costs to confirm that the recommended program will maintain the highest water quality which is reasonable while considering all demands being made. A strict non-degradation option may be more feasible.

E. Section 2.3.2, Region Water Quality Objectives

The Colorado River Basin Basin Plan does not specify numeric groundwater objectives. It indicates that establishment of numerical objectives for groundwater involves complex considerations since the quality of groundwater varies significantly with depth and of well perforations, existing water levels, geology, hydrology and several other factors. Unavailability of adequate historical data compounds the problem. The Regional Board believes that detailed investigation of groundwater basins should be conducted before establishing specific groundwater quality

[2] Mission Creek/Garnet Hill Water Management Plan, Final Report, January 2013, Section 5, Issues, Strategies and Plan Evaluation, Water Quality in the Mission Creek Subbasin.

[3] Mission Creek/Garnet Hill Water Management Plan, Final Report, January 2013, Section 5, Issues, Strategies and Plan Evaluation, Amount of Imported Water Supplies.

objectives.[4] This plan should also include a program to continue the acquisition of new data and information into the future.

Since adoption of the Basin Plan, MSWD together with CVWD and DWA completed the Mission Creek/Garnet Hill Water Management Plan that contains data that will assist in development of water quality objectives. Using this data and data from the Coachella Valley Water Management Plan, the SNMP should establish water quality objectives prior to estimating assimilative capacities. MSWD rejects the use of the Title 22 MCL for nitrate. As indicated, current TDS levels in the Mission Creek subbasin at MSWD's production facility locations are approximately 400 to 450 mg/L. Suggested objectives of 879 mg/L or the Title 22 MCL is not appropriate.

As you may be aware, litigation is pending challenging current water quality management of the Coachella Valley Water Basins. Arbitrary selection of protective water quality objectives may support the tribe's arguments related to mismanagement. For example, the suggested TDS water quality objectives may not be applicable to the Coachella Valley.

F. Section 2.4, Resolution No. 68-16 – State Anti-Degradation Policy

Revise the sentence "The appeals court interpreted an existing high quality water to exist where the baseline water quality (that existed in 1968) is better than the water quality objective." to "The appeals court defined high quality water as the best water quality achieved since the adoption of the anti-degradation policy by the SWRCB in 1968."

G. Section 3.3, Mission Creek Subbasin

In reference to the first paragraph, groundwater replenishment includes mountain front recharge by subsurface flow in addition to the Desert Hot Springs subbasin.

H. Section 3.3.2, Groundwater Level

The first and last paragraphs are inaccurate. Groundwater storage in the Mission Creek subbasin has declined continuously from about 1960 until significant recharge activities commenced in 2005. Under existing conditions, groundwater pumping is about 4,000 AFY greater than estimated natural recharge and current artificial recharge activities.[5] Paragraph 3, also contradicts the first paragraph. To assist in understanding basin conditions, by separate correspondence, MSWD will provide well static water level data.

[4]Water Quality Control Board, Colorado River Basin – Region 7, Chapter 3 – Water Quality Objectives, Subsection IV, Groundwater Objectives.

[5]Mission Creek/Garnet Hill Water Management Plan, Final Report, January 2013, Section 5, Issues, Strategies and Plan Evaluation, Groundwater Overdraft.

I. Section 3.3.3, Groundwater Quality

The data presented in the tables does not accurately reflect water quality conditions in the Mission Creek subbasin. MSWD will provide, by separate correspondence, Title 22 water quality data for all MSWD wells. Revise all sections related to water quality based on the provided data. Please note that MSWD has won several awards regarding the taste of water produced from the Mission Creek subbasin.[6]

J. Section 3.3.4.4, Radionuclides

Uranium contamination discussion is not accurately presented. Please review the study prepared by GSI/Water. Currently, uranium concentrations exceeding the MCL only occur in two MSWD wells that are not being used. Verify using the data provided statement regarding gross alpha.

K. Section 4.2, Data Sources

MSWD is providing additional data; revise the first sentence. In addition, include water quality data for the Colorado River Aqueduct.

L. Section 4.2.1, Groundwater Models

Further define the use of existing groundwater models for AWQ and potential management strategies. To develop an effective SNMP, modeling will be an essential tool. For example, the model will assist in determining the effects of the imported water recharge at the Mission Creek Recharge Facility on the entire MZ and other MZ's. The CV is comprised of a number of complicated subbasins connected with fault systems. Modeling is a key component to determine water quality impacts of various sources. It will prevent oversight of impacts in critical areas throughout the CV.

M. Section 4.3, Data Gaps

Revise the first paragraph after review of the Title 22 well data provided by MSWD. Well data is primarily acquired from wells in the northwestern areas of the Mission Creek subbasin. The more diversified water quality data will impact methods chosen to determine AWQ.

N. Section 5, Technical Approach

MSWD reserves comments related to this section for further consideration. MSWD will confer with the Regional Board and other experts to assemble comments.

[6] Mission Creek/Garnet Hill Water Management Plan, Final Report, January 2013, Section 5, Issues, Strategies and Plan Evaluation, Water Quality in the Mission Creek Subbasin.

Comments above are only initial MSWD comments. MSWD will continue to comment as it continues to review the document. MSWD is scheduling a board study session to review the SNMP. Comments raised by MSWD's Board of Directors will be provided. If you need any clarification, please advise.