ANTELOPE VALLEY SALT/NUTRIENT MANAGEMENT PLAN
STAKEHOLDER MEETING MINUTES

May 15, 2013
Location: Palmdale Water District – Board Room
11:30 a.m. – 12:30 p.m.

Attendees: Tom Barnes (AVEK), Dwayne Chisam (AVEK), Erika de Hollan (LACSD), Wanda Deal (Edwards AFB), Susan Haseltine (Edwards AFB), Aracely Jaramillo (LACWD), Bob Large (Lake Town Council), Yvonne Malikowski (Lake LA Park Association), Jose Saez (LACSD Consultant), Iwen Tseng (LACWD), Cindy Wise (Lahontan RWQCB), Jan Zimmerman (Lahontan RWQCB)

RWQCB/DWR Updates

Cindy Wise reported that State Water Board members are more interested in the progress of the salt and nutrient management plans (SNMP) statewide and will be asking for more frequent updates. The SNMP was one of the Regional Board's top priorities for Fiscal Year 13-14. Erika de Hollan said that more input would be needed from the Regional Board when we get to the final stages, in terms of CEQA and adopting it into the Basin Plan. She asked if the intent was still to adopt the SNMP into the Basin Plan or leave it as a separate document that would be approved. Cindy confirmed that the direction is to adopt it into the Basin Plan, which can happen after the SNMP due date. Whether to adopt the SNMP by reference or to add specific objectives into the Basin Plan is still to be determined and will depend on the final SNMP. Statewide, they are looking at external peer review needs, which will be required for the Basin Plan modifications.

Project List

Aracely Jaramillo presented a new Project Identification Short Form (*see Attachment A*). The intent is to track projects reviewed by the stakeholders. The forms will help document general project information, proponent contact information for updates, and source water to evaluate potential impact to salts and nutrients. The applicable source water quality and implementation date information will be used in the analysis. Projects that are found not to have potential salt/nutrient impacts within the projection period of the SNMP will not be included in the project list or the analysis. Erika pointed to the Boron arsenic removal project as an example. That project is in concept phase and can be mentioned in the SNMP, but will not be in the project list or be included in further analysis. Erika also suggested adding Planning as another option for project status phase.

Bob Large and Susan Haseltine discussed alternatives for arsenic mitigation such as using more AVEK water to blend or building a plant for arsenic removal which would not impact water supply. Erika suggested including these alternatives in the Implementation Measures section of the SNMP.

No new projects were brought up for consideration. However, Bob suggested for the group to take another look at the AV IRWMP project list after the AV IRWM stakeholder group finishes the review of new projects.

Salt/Nutrient Characterization

Iwen Tseng presented water quality results for 10-year average constituent concentrations (*See Attachment B and C*).

Attachment B shows mean constituent concentration for well data compiled from the USGS database. *Attachment C* was based on well data from the GeoTracker GAMA database, which includes data from USGS and CDPH. For the base period analyzed, 2001-2010, the averages are similar and the results mostly agree with each other. Some basins had high arsenic concentrations. They were found to be naturally occurring in the groundwater and not caused by a land use activity. It's the same case for fluoride and boron.

Susan Haseltine inquired about the public water supply data. Erika said a separate set of more current data is available, 2007-2012, but was not incorporated into the tables.

Wanda asked for clarification regarding the differences in the two data sets. Erika explained that GeoTracker GAMA has more data points, but not as much information for each data point. There is some overlap in the data. Iwen went on to explain that the GAMA database compiles data submitted, but there is no QA/QC. The data range varies widely and errors could be caused by missed unit conversions such as mg/L instead of μg/L which could be 1000 times off, but there is no way for us to clean data. In addition, the GAMA database has no detection limit listed which can vary based on method and lab equipment. There is some interpretation involved so Iwen counted data with Non-Detect (ND) as zero and data with qualifiers as the number (less than zero was treated as zero or greater than five was treated as five). Iwen mentioned she called the Help Desk regarding a data anomaly for fluoride and found we can't trace the data since we can't obtain contact information for the well owners.

Bob asked if GAMA was the official State database and Jan Zimmerman confirmed that it was. He suggested using more recent agency data if it is available as opposed to information from a general database. However the group explained that GAMA does contain the most recent data that is coming from CDPH which gets it directly from the agency or their lab. Agency data should agree with the database information. Human error is possible, but some believe the data goes electronically from the lab to CDPH. Iwen suspected a unit conversion error or data entry error for some of the data points in the North Muroc sub-basin where the average fluoride concentration (*Attachment C*) is 342.8 mg/L because all other sub-basins are below 10 mg/L and the MCL is only 2 mg/L. Wanda suggested noting this as an anomaly and omitting the information from any calculations. But Erika and Iwen pointed out that this high concentration comes up in several data points over many years, not just one. The group agreed that the best approach is to concentrate efforts to clean up information in sub-basins with projects. Jan

volunteered to contact GAMA for questions regarding specific wells with questionable data. Iwen will e-mail Jan the well numbers and items needing clarification. Another issue is the well location approximations. Jan will also be sharing issues regarding the GAMA data with the Board management to see what they can do or let us know if there is quality control information we're not aware of.

Cindy mentioned that the State Board used the GAMA database to determine Priority Basins and is considering that information to be pretty valid. However, they only looked at TDS and Nitrates and likely did not come across anomalies like the one found here. Wanda and Susan were concerned that having faulty data may invalidate the entire report. Jose suggested at least notating data suspected to be an outlier with a footnote even if an anomaly cannot be pinpointed.

Erika found that the USGS database did not have nitrate separated from nitrite, but the numbers were pretty similar because nitrite is not found in groundwater, just like ammonia. Chromium results were limited to urban areas in Lancaster and EAFB area. Hexavalent chromium averaged higher than total chromium due to more data points. In some instances where there was no information from recent 10 years (2001-2010), Erika went back to the previous 10 years for information and those averages are shown in brackets (*Attachment B*).

Bob Large brought up committee efforts to review constituents of emerging concern (CEC), other than those typically monitored, and asked if there has been any impact on the SNMP efforts as a result. Erika said the list for recycled water and groundwater recharge had been decreased to four CECs and no monitoring required for irrigation. State Board Amendments to the Recycled Water Policy came out in January and list the constituents to be monitored and for which types of projects. Bob asked if this was built in to our testing program and was told that it would be addressed in the monitoring plan. Bob was also concerned that besides stating that we will monitor for certain constituents that we should have a step stating we are monitoring for them and take it a step further to verify with the agencies. Jan said some data is available because DPH already monitors for those CECs for public wells. Monitoring may need to be built into groundwater recharge projects depending on the water quality compliance point. Many of the CECs are expected to be zero since we are talking about man-made chemicals.

Water Quality Objectives/Assimilative Capacity

Aracely explained that the Lahontan Basin Plan was reviewed for identified beneficial uses. Municipal water supply is the only beneficial use in the Antelope Valley with specific water quality objectives, which are the CDPH primary and secondary maximum contaminant levels (MCLs). The water quality objectives (WQO) for constituents related to salts and nutrients are listed in *Attachment D*. Baseline Water Quality (BWQ) and baseline assimilative capacity are listed for the three sub-basins having projects and monitoring wells chosen by the stakeholders to be part of the monitoring plan. The baseline assimilative capacity is defined as the difference between the WQO and the BWQ. *Attachment D* is based on the GAMA data presented in *Attachment C*. Negative

numbers for baseline assimilative capacity, as with fluoride in the Lancaster sub-basin and arsenic in the Neenach Sub-basin, indicate that base groundwater concentrations are already exceeding the WQO. Aracely thought we needed to know there is no assimilative capacity available, but not necessarily need to manage it, since the constituent is naturally occurring. However, there would be some assimilative capacity available if calculated using USGS data. Wanda felt something like this will call data into question and reiterated the previous conversation about data integrity. She was wondering if these issues just became known. Erica explained that we were aware of questionable data but still trying to address them with the available resources and without having negative impacts or raising questions elsewhere. Dwayne said that the goal is not to be precise, but global in nature. He suggested finding if there is a problem, how bad, keep monitoring and address the trends moving forward. Data gives us an idea of where we are, relatively high/low, etc. Having assimilative capacity available, as shown in *Attachment D*, indicates that we have pretty good water quality compared to other areas.

Bob Large asked if the SNMP will address issues of base water quality being over the WQO. Dwayne said that as part of the SNMP we should look for projects that would reduce high concentrations and help obtain WQOs.

Erika suggesting using the USGS data to paint the water quality picture of the basin since she considers it to be more precise. Then, use the GAMA database to support those findings. Wanda reiterated that data issues should be fixed to avoid making bad decisions based on bad data in the future. Erika and Jan said the Board's intent is to have the GAMA database be the information repository for all SNMPs. As such, Aracely wanted consensus for using the GAMA information to calculate assimilative capacity and as the base for future monitoring data comparisons moving forward. However, some felt USGS data was more accurate. If issues are addressed and data is cleaned up and made consistent with each other, either database should work or ease of obtaining the information may be the determining factor. Bob also felt GAMA information may show significant changes in one period if one well was shut down and another well was used for water quality in the same area.

Per the State Board Antidegradation Policy, a project may not use more than 10 percent of the baseline assimilative capacity in the basin/sub-basin and multiple projects, collectively, may not use more than 20 percent of the baseline assimilative capacity. To satisfy the Antidegradation Policy when implementing multiple projects, each sub-basin is required to maintain 80 percent of the baseline assimilative capacity which is the required remaining assimilative capacity (RRAC). RRAC was shown in the meeting handouts as assimilative capacity minus 20 percent (*Attachment E)*. The intent was to demonstrate that the source water quality for projects is better than the baseline water quality. To simplify the point, *Attachment F* was added after the meeting. It shows groundwater baseline water quality, instead of the RRAC, to compare to the source water quality. If the source water constituent concentrations are higher than the baseline water quality, then it is likely that an issue with that constituent may arise and will need to be monitored. For example, if recycled water was used to recharge in the Neenach Sub-basin, the high concentration of TDS could potentially increase the groundwater

concentration above the maximum constituent concentration allowed by the Antidegradation Policy. Therefore, monitoring and tracking the trend for TDS concentrations would be required. The average arsenic concentration for the California Aqueduct was also questioned. For nine out of the ten years in the baseline period, arsenic was non-detect; however, the high average is caused by one high concentration year. Tom confirmed that the data is correct. High arsenic groundwater was pumped into the California Aqueduct in 2009 as allowed by DWR. That is how the banking program works. Banked groundwater needs to be pumped in dry years. In addition, a pilot project by USGS shows that high arsenic water concentrations are reduced after percolating through the soil. Although fluoride has no assimilative capacity, source water quality is very good and implementing the projects would potentially dilute and lower fluoride concentrations.

Based on the comparisons, source water blending with groundwater could improve the water quality. The constituents that will be incorporated into the monitoring plan due to their potential for degrading water quality are TDS, nitrate, and chloride. These are the same constituents that will be analyzed further and the draft SNMP tables will be revised to show potential loads for these constituents.

Chlorides did not seem to have the potential for impact when looking at the remaining available assimilative capacity and were suggested to be removed from the monitoring plan. However, chloride is always a concern for agriculture, which is a beneficial use that needs to be protected. In addition, since the baseline chloride concentration in the groundwater is lower than the chloride concentration in the recycled water, recycled water has potential to increase the chloride concentration in the groundwater.

Cindy reminded the stakeholders that there are constituent of emerging concern (CECs) that will need to be monitored, for the recycled water use especially.

In closing, we mentioned that implementation measures will be researched; options and benefits will be documented into the draft SNMP, but not necessarily proposed. This will be like a roadmap of what to do depending on flags that arise. Certain projects could trigger additional studies, BMPs, etc.

Upcoming Activities

The draft SNMP will be posted to the website and notification will be sent by June 14. The next SNMP stakeholder meeting is tentatively scheduled for July 9 at the City of Lancaster.

Attachment A

Project Identification Short Form

Antelope Valley Salt and Nutrient Management Plan
Project Identification Short Form
DRAFT

Project Name:_____

Project Sponsor:_____

Project Contact Person:_____

Project Contact Phone:_____

Project Contact Email:_____

Project Location (include name of sub basin):_____

_____

Project Description:_____

_____

_____

_____

_____

Source Water for the Project (check all that applies):

___ Recycled Water; _____ Acre-Feet/Year

___ Groundwater; _____ Acre-Feet/Year

___ Stormwater; _____ Acre-Feet/Year

___ Imported water (raw); _____ Acre-Feet/Year

___ Imported water (treated); _____ Acre-Feet/Year

___ Surface water; _____ Acre-Feet/Year

Project Implementation Year:_____

Project Status:

___ Planning

___ Concept

___ Design

___ Construction

Attachment B

Table 3-3: Mean Constituent Concentration Levels Within the Antelope Valley Groundwater Basin and Sub-basins.

Sub-basin	Total Dissolved Solids (mg/L)	Ammonia (mg-N/L)	Nitrate + Nitrite (mg-N/L)	Nitrite (mg-N/L)	Chloride (mg/L)	Arsenic (µg/L)	Total Chromium (µg/L)	Hexavalent Chromium (µg/L)	Fluoride (mg/L)	Boron (µg/L)
Buttes	372	< 0.04	1.58	< 0.008	20	[2][a]	--	--	1.97	328
Chaffee	--	--	--	--	--	--	--	--	--	--
Gloster	404	< 0.04	--	< 0.008	11.7	28.9	--	--	0.45	176
Finger Buttes	--	--	--	--	--	--	--	--	--	--
Lancaster	320	< 0.04	1.25	< 0.008	32.5	12	6.5	8.5	0.61	195
Neenach	[230][b]	[0.01][b]	[2.25][b]	[< 0.010][b]	[9.78][b]	[< 1][b]	--	--	[0.15][b]	[32][b]
North Muroc	[603][c]	--	--	--	--	[39][c]	--	--	[1][c]	[800][c]
Oak Creek	--	--	--	--	--	--	--	--	--	--
Pearland	216	< 0.04	0.83	--	9.3	0.358-0.83[d]	--	--	0.16	36
Pearless	--	--	--	--	--	--	--	--	--	--
West Antelope	403	< 0.04	4.605	< 0.008	22.4	9.4	--	--	0.41	822
Willow Springs	391	< 0.04	3.82	< 0.008	33.6	20.6	--	--	0.26	162
AV Groundwater Basin	321	< 0.04	1.34	< 0.008	31	12.8	6.5	8.5	0.61	194

(a) Results of a sample taken in 2000.
(b) Results of samples taken in 1992-1998.
(c) Results of a sample taken in 1990.
(d) Range from considering non-detections as zero to from considering non-detections as half the detection level.

Attachment C

Mean Constituent Concentrations in the Antelope Valley Sub-Basins (2001-2010) GeoTracker GAMA database								
Sub-basins	TDS	Arsenic	Boron	Chromium	Chloride	Fluoride	Nitrate as NO_3	Nitrite as N
	mg/L	µg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
Buttes	279	1.23	0.05	8.77	19.08	0.27	6.00	0.0054
Chaffee	-	-	-	-	-	-	-	-
Finger Buttes	-	-	-	-	-	-	-	-
Gloster	-	-	-	-	-	-	-	-
Lancaster	323	7.45	0.12	6.10	37.87	6.29	7.15	0.0367
Neenach	501	11.77	0.19	7.64	62.13	0.55	10.43	0.0258
North Muroc	733	90.88	0.69	10.17	154.94	342.76	8.12	0.1890
Oak Creek	-	-	-	-	-	-	-	-
Pearland	264	0.74	0.07	1.99	19.27	0.19	17.16	0.1245
Peerless	547	27.46	2.80	4.17	68.83	1.48	12.06	0.00
West Antelope	-	-	-	-	-	-	-	-
Willow Springs	279	14.95	0.00	4.00	18.08	0.20	8.60	0.0189

Attachment D

			Lancaster Sub-basin		Neenach Sub-basin		Pearland Sub-basin	
Constituent	**Units**	**Water Quality Objective**	**Mean Average Water Quality**	**Assimilative Capacity**	**Mean Average Water Quality**	**Assimilative Capacity**	**Mean Average Water Quality**	**Assimilative Capacity**
Total Dissolved Solids	mg/L	1000	323	677	501	499	264	736
Arsenic	mg/L	0.01	0.0075	0.0026	0.0118	-0.0018	0.0007	0.0093
Boron	mg/L	1	0.12	0.88	0.19	0.81	0.07	0.93
Chromium, total	mg/L	0.05	0.0061	0.0439	0.0076	0.0424	0.0020	0.0480
Chloride	mg/L	500	37.87	462.13	62.13	437.87	19.27	480.73
Fluoride	mg/L	2	6.29	-4.29	0.55	1.45	0.19	1.81
Nitrate	mg/L as $N0^3$	45	7.15	37.85	10.43	34.57	17.16	27.84
Nitrite	mg/L as N	1	0.0367	0.9633	0.0258	0.9742	0.1245	0.8755
Nitrate + Nitrite	mg/L as N	10	1.62	8.38	2.36	7.64	3.88	6.12

Attachment E

		Assimilative Capacity - 20%												
2001-2010 Average Concentration	**Units**	**Lancaster Sub-basin**	**Neenach Sub-basin**	**Pearland Sub-basin**	**California Aqueduct [a]**	**Acton Plant [a]**	**Eastside Plant [a]**	**Quartz Hill Plant [a]**	**Rosamond Plant [b]**	**Recycled Water - Palmdale WRP[c]**	**Recycled Water - Lancaster WRP[d]**	**EAFB AFRL WWTP [e]**	**RCSD Treatment Plant [f]**	**Stormwater [g]**
Total Dissolved Solids	mg/L	542	399	589	300	274	284	293	290	463	472			519
Arsenic	µg/L	2.0	0.0	7.4	3.5	0.5	0.3	0.3	0.3	ND	.			2.7
Boron [h]	µg/L	704	648	744	162	240	180	170	160	.	.			.
Chromium	µg/L	35	34	38	1.4	ND	ND	ND	ND	.	.			1.0
Chloride	mg/L	370	350	385	85	83	83	86	84	149	121			71.7
Fluoride	mg/L	0	1.16	1.45	0.10	0.11	0.08	0.09	0.09	.	.			0.4
Nitrate - N	mg/L	6.9	6.3	5.0	0.90	0.87	0.97	0.91	0.92	2.41	8.41			1.3
Nitrite - N	mg/L	0.77	0.78	0.70	ND	ND	ND	ND	ND	0.17	0.041			0.03
Nitrate+Nitrite - N	mg/L	6.7	6.1	4.9	1.0	0.7	1.0	1.0	1.0	.	.			1.3

(a) Antelope Valley-East Kern Water Agency Annual Water Quality Report - Los Angeles County System
(b) Antelope Valley-East Kern Water Agency Annual Water Quality Report - Kern County System
(c) Average 2012 water quality for tertiary treatment at Plamdale WRP (LACSD)
(d) Average Aug-Dec 2012 water quality for tertiary treatment at Lancaster WRP (LACSD)
(e) Air Force Research Laboratory (AFRL) 2010 Annual Monitoring Report (average values provided)
(f) Predicted water quality for tertiary treatment at the Rosamond Community Services District (RCSD) Treatment Plant **Need to find contact for updates on the plant**
(g) Los Angeles County Integrated Water Quality Database System, Santa Clara River Station (S29)
(h) Boron is not tested regularly in drinking water because it's not a regulated constituent
*Convert nitrate as NO3 to nitrate as N: molecular weight of NO3 = 62, atomic weight of N = 14, 62/14=4.42

Attachment F

		Baseline Water Quality												
2001-2010 Average Concentration	**Units**	**Lancaster Sub-basin**	**Neenach Sub-basin**	**Pearland Sub-basin**	**California Aqueduct [a]**	**Acton Plant [a]**	**Eastside Plant [a]**	**Quartz Hill Plant [a]**	**Rosamond Plant [b]**	**Recycled Water - Palmdale WRP[c]**	**Recycled Water - Lancaster WRP[d]**	**EAFB AFRL WWTP [e]**	**RCSD Treatment Plant [f]**	**Stormwater [g]**
Total Dissolved Solids	mg/L	323	501	264	300	274	284	293	290	463	472			519
Arsenic	µg/L	7	12	1	3.5	0.5	0.3	0.3	0.3	ND	.			2.7
Boron [h]	µg/L	120	190	70	162	240	180	170	160	.	.			.
Chromium	µg/L	6	8	2	1.4	ND	ND	ND	ND	.	.			1.0
Chloride	mg/L	38	62	19	85	83	83	86	84	149	121			71.7
Fluoride	mg/L	6	1	0	0.10	0.11	0.08	0.09	0.09	.	.			0.4
Nitrate - N	mg/L	7	10	17	0.90	0.87	0.97	0.91	0.92	2.41	8.41			1.3
Nitrite - N	mg/L	0.037	0.026	0.125	ND	ND	ND	ND	ND	0.17	0.041			0.03
Nitrate+Nitrite - N	mg/L	1.62	2.36	3.88	1.0	0.7	1.0	1.0	1.0	.	.			1.3

(a) Antelope Valley-East Kern Water Agency Annual Water Quality Report - Los Angeles County System
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