

Section 5: Monitoring

5.1 Monitoring Plan Development

The AV SNMP monitoring plan is designed to determine water quality in the basin and focus on the water quality in water supply wells and areas proximate to large water projects, as discussed in the Recycled Water Policy. Results will be used to determine whether the concentrations of salt and nutrients over time are consistent with the SNMP predictions discussed in Section 4 and the applicable SNMP water quality management goals. The monitoring program will be used to determine whether implemented measures to manage the SNMP constituents in the groundwater basin are beneficial and/or cost-effective and if additional measures are needed.

5.2 Monitoring Locations

Per the Recycled Water Policy, the preferred approach to selecting groundwater monitoring locations is to target existing wells, as feasible and appropriate, as was done in developing the SNMP monitoring program. The groundwater wells included in the SNMP monitoring program are water supply wells that were selected based on their proximity to the projects listed in Section 3. Well selection was limited to those available on the State Board's Groundwater Ambient Monitoring and Assessment (GAMA) database, which is based on subsets of other well databases and does not encompass all the State regulated wells. Most of the Antelope Valley Basin wells with data available in GAMA are located in the Lancaster sub-basin. The remaining Antelope Valley sub-basins are largely undeveloped and several do not have any well monitoring data available in GAMA. Since monitoring results for these wells can be found in GAMA, it is likely that future monitoring results will also be available in the GAMA database. Additional discussion on the GAMA database can be found in Section 3.

If needed, additional groundwater monitoring results that are not available from the GAMA program may be examined. Also, the United States Geological Survey (USGS) database may be accessed to compile additional groundwater data and information for the monitoring report. If new projects are added to the SNMP list of projects having the potential to significantly contribute to salt and/or nutrient impacts to the Antelope Valley Groundwater Basin, the agency responsible for the project shall designate a groundwater well (existing or new), as appropriate, for inclusion in the SNMP monitoring program. Other water sources, such as imported and recycled waters, are typically monitored at the applicable treatment plant.

The SNMP groundwater wells to be included in the SNMP monitoring plan are listed in Table 5-1 and the locations are depicted in Figure 5-1. The Lancaster sub-basin is suitably represented with 23 monitoring locations. Buttes, Pearland, and Neenach sub-basins have three locations each. A minimum of three wells per sub-basin is preferred to be considered statistically valid for monitoring. Of the 32 potential wells, 24 are owned and operated by established water utilities or US Air Force. The remaining wells belong to mutual water companies, industrial companies and some smaller entities (hospital, elementary school, casino). Two wells used by Rosamond CSD and Land Project Mutual Water Company were

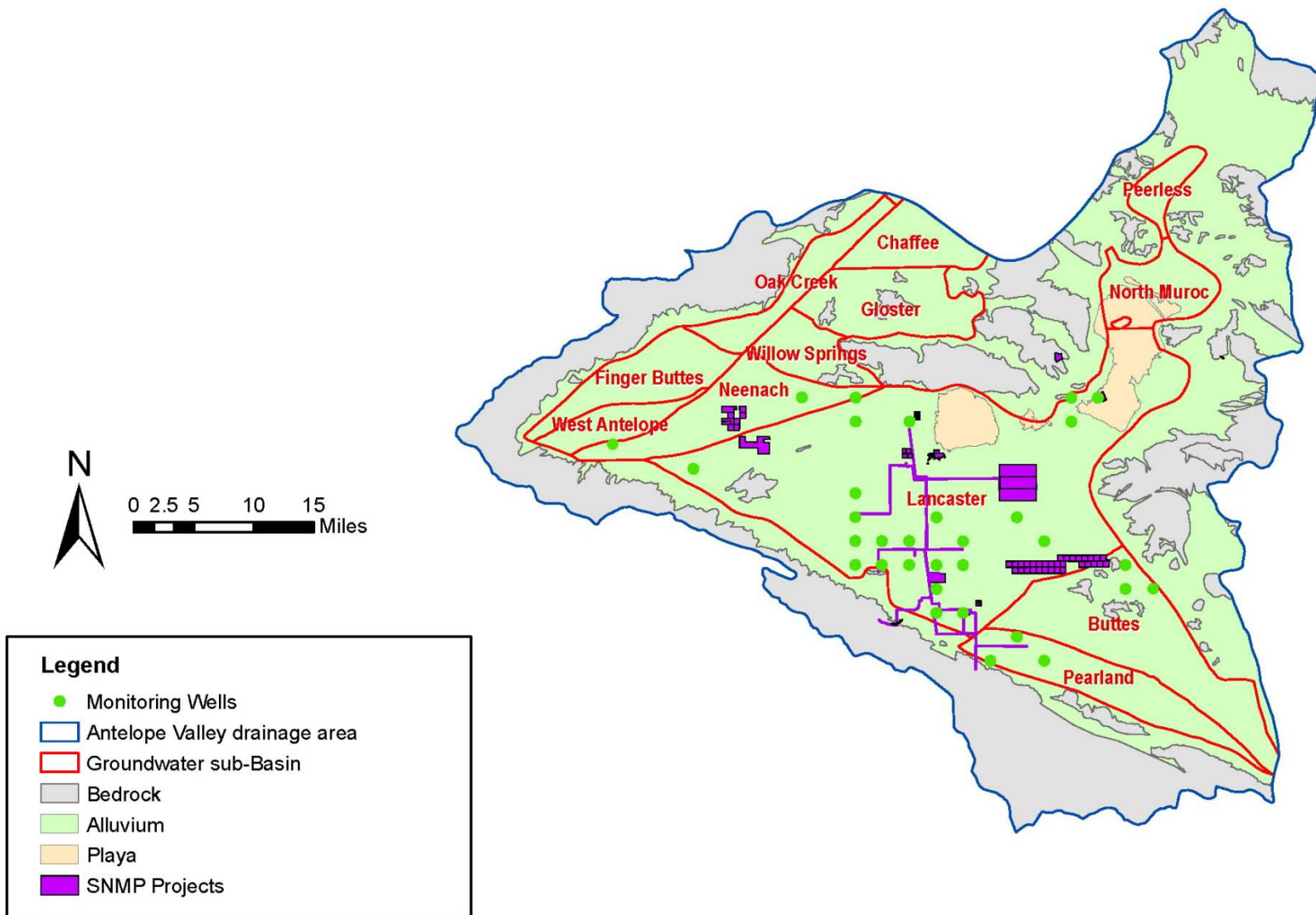
discussed at a stakeholder meeting and found to be abandoned/inactive and no longer in use. These wells are not included in the SNMP monitoring plan.

Table 5-1 includes well identification numbers and location information. The depth of each well, the screen interval(s), and land surface elevation are not available from the GAMA database. However, future reporting efforts may include tracking this information.

Table 5-1: Groundwater Wells Included in the SNMP Monitoring Plan

State Well ID	GAMA Well ID	Sub-Basin	Well Owner
1910005-008	W0601910005	Buttes	LACWD
1910027-002	W0601910027	Buttes	LACWD
1910005-003	W0601910005	Buttes	LACWD
1503360-001	W0601503360	Lancaster	Diamond Jim Casino
1510018-009	W0601510018	Lancaster	RCSD
1510701-008	W0601510701	Lancaster	EAFB
1510701-011	W0601510701	Lancaster	EAFB
1510701-013	W0601510701	Lancaster	EAFB
1900751-001	W0601900751	Lancaster	Eastside Elementary
1900929-001	W0601900929	Lancaster	High Desert Hospital
1910067-211	W0601910067	Lancaster	LADWP
1910070-011	W0601910070	Lancaster	LACWD
1910070-026	W0601910070	Lancaster	LACWD
1910070-034	W0601910070	Lancaster	LACWD
1910070-036	W0601910070	Lancaster	LACWD
1910070-049	W0601910070	Lancaster	LACWD
1910070-070	W0601910070	Lancaster	LACWD
1910070-091	W0601910070	Lancaster	LACWD
1910097-004	W0601910097	Lancaster	Northrop Grumman
1910102-009	W0601910102	Lancaster	PWD
1910102-015	W0601910102	Lancaster	PWD
1910103-001	W0601910103	Lancaster	PRID
1910103-007	W0601910103	Lancaster	PRID
1910130-006	W0601910130	Lancaster	QHWD
1910130-009	W0601910130	Lancaster	QHWD
1910137-007	W0601910137	Lancaster	Boeing Company
1500421-001	W0601500421	Neenach	Longview Mobile Estates
1502569-001	W0601502569	Neenach	First Mutual Water System
1909006-001	W0601909006	Neenach	WVCWD
1910102-021	W0601910102	Pearland	PWD
1910102-027	W0601910102	Pearland	PWD
1910203-005	W0601910203	Pearland	LACWD

Figure 5-1: Locations of the Groundwater Wells Included in the SNMP Monitoring Plan



5.3 Monitoring Frequency

Supply (e.g., raw imported and treated potable) and recycled waters are monitored annually. In general, public supply wells are monitored every year per California Department of Public Health (CDPH) requirements, but the monitoring frequency may vary depending on the specific constituent and the concentration of the constituent in the water extracted from the groundwater well (e.g., additional monitoring may be necessary if results indicated that an MCL is exceeded). The appropriate agency or well owner is responsible for monitoring water quality. For example, AVEK monitors raw imported water and the Sanitation Districts monitor the recycled water that they produce.

5.4 Constituents to be Monitored

As appropriate and necessary, the program will include monitoring of: total dissolved solids (TDS), nitrate, chloride, arsenic, total chromium, fluoride, and boron. Constituents of emerging concern (CECs; e.g., endocrine disrupters, personal care products or pharmaceuticals) and other constituents may be added to the monitoring program in consideration of actions taken by the State Board. In January 2013, the State Board adopted an amendment to the Recycled Water Policy and presented recommendations for monitoring CECs in recycled water. The Recycled water policy does not designate CEC monitoring requirements for recycled water used for landscape irrigation due to the low risk for ingestion of the water. However, the CEC monitoring requirements prescribed in the Recycled Water Policy pertain to the production and use of recycled water for groundwater recharge by surface and subsurface application methods. Only one of the listed projects in Section 3, the Littlerock Creek Groundwater Recharge and Recovery Project, proposes to use recycled water for groundwater recharge. Prior to the implementation of this project, or any other proposed groundwater recharge project using recycled water, the appropriate agency (or agencies) will monitor the water for CECs as prescribed in the Recycled Water Policy, as applicable, unless an alternative monitoring plan is approved by the Regional Board. The Recycled Water Policy does not prescribe CEC monitoring requirements for other uses of recycled water, but may in the future, at which time stakeholders may revisit and revise the SNMP monitoring plan as applicable and appropriate.

5.5 Data Evaluation and Reporting

All public supply wells are monitored and the results reported to the State's Drinking Water Program, administered by the State Board. The State's GAMA Program compiles a portion of these monitoring results (depending on the GAMA data needs) into a publicly-accessible internet database, GeoTracker GAMA¹. GeoTracker GAMA integrates data from the State and Regional Boards, CDPH, Department of Pesticide Regulation, Department of Water Resources, USGS, and Lawrence Livermore National Laboratory.

Water quality analyses for the Drinking Water Program are required to be conducted by certified laboratories. These laboratories are required to be in compliance with the Environmental

¹ Accessible at http://www.waterboards.ca.gov/gama/geotracker_gama.shtml.

Laboratory Accreditation Program² (ELAP). ELAP is administered by the State Board and provides evaluation and accreditation of environmental testing laboratories to ensure the quality of analytical data used for regulatory purposes to meet the requirements of the State. In addition, ELAP requires laboratories to have an updated quality assurance manual that includes the following elements:

- Laboratory organization and personnel responsibilities
- Quality assurance objectives for measurement of data
- Sampling procedures (when the laboratory performs the sampling)
- Custody, holding, and disposal of samples
- Calibration, procedures and frequency
- Analytical procedures
- Acquisition, reduction, validation and reporting of data
- Internal quality control checks
- Performance and system audits
- Preventive maintenance
- Assessment of precision and accuracy
- Corrective action
- Quality assurance reports

Water samples will be collected by ELAP-certified laboratory technicians in accordance with the pre-approved quality assurance manuals. The ELAP-accredited laboratories have demonstrated capability to analyze water samples using approved methods. A sample chain-of-custody form, from the USEPA report titled “Manual for the Certification of Laboratories Analyzing Drinking Water Criteria and Procedures Quality Assurance”, is provided in Figure 5-2.

The Antelope Valley SNMP Monitoring Report (Report) prepared for submittal to the Lahontan Regional Water Board may include, but is not limited to, the following:

1. The relevant monitoring data, as described above, including TDS, nitrate, chloride, arsenic, total chromium, fluoride, and boron.
2. Determination of current ambient conditions. As stated in the definition in Section 1, the “current ambient condition” is the average concentration of a particular constituent measured in the water collected at the monitoring locations for the most recent 5-year period.
3. Comparisons of current ambient conditions to baseline conditions and to the values determined in the SNMP antidegradation analysis. Comparisons may include statistical and other analyses to test for significant differences, trends, and graphical representations (e.g., time versus concentration plots).
4. Comparisons of current water quality to applicable SNMP water quality management goals.
5. An update of the model and relevant calculations. This step may involve averaging the groundwater data from the basin to detect trends in constituent concentrations over time, which can be compared with model predictions to calibrate and improve the model.
6. An update of relevant projects and implementation information, such as discussed in Section 3.
7. Other relevant updates, such as land uses and cleanup site information from the State Board’s GeoTracker database.
8. Discussion on adequacy of the SNMP monitoring plan (e.g., whether to incorporate additional wells into the SNMP monitoring program).

² <http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx>

9. Discussion on adequacy of SNMP components (e.g., implementation strategies) based on analysis results and discussion of the SNMP monitoring program.

One goal of the SNMP monitoring and reporting is to evaluate whether basin water quality has changed over time and if it is consistent with the model predictions. This evaluation will help to assess whether the SNMP constituents are effectively managed to meet the SNMP water quality management goals or if changes to the SNMP are necessary to meet goals. The current intent is to submit the Report to the Lahontan Regional Board every three years.

The AVIRWMP group may take on the reporting responsibilities. It has also been discussed at an AV SNMP stakeholder meeting that reporting responsibilities could potentially be a duty of the eventual Antelope Valley Groundwater Watermaster.

Figure 5-2: Sample Chain-of-Custody Form

Survey				Samplers: Signature					
Station Number	Station Location	Date	Time	Sample Type			Seq. No.	No. Of Containers	Analysis Required
				Water		Air			
				Comp	Grab.				
Relinquished by: Signature				Received by: Signature					Date/Time
Relinquished by: Signature				Received by: Signature					Date/Time
Relinquished by: Signature				Received by: Signature					Date/Time
Relinquished by: Signature				Received by Mobile Laboratory for Field analysis: Signature					Date/Time
Dispatched by:		Date/Time		Received for Laboratory by: Signature				Date/Time	
Method of Shipment:									

Distribution: Orig. --Accompany Shipment, 1 Copy--Survey Coordinator Field Files