Draft

Proposed Amendments to the Water Quality Control Plan for the Lahontan Region (Basin Plan)

Revised Standards for Surface Waters of the Antelope Hydrologic Unit

California Regional Water Quality Control Board, Lahontan Region
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Introduction

The California Regional Water Quality Control Board, Lahontan Region (Water Board) is considering amendments to the *Water Quality Control Plan for the Lahontan Region (*Basin Plan) to revise standards for surface waters downstream of the Los Angeles County Sanitation District No. 14 (LACSD No. 14) wastewater discharge to Amargosa Creek. These waters are in the Antelope Valley watershed (or Antelope Hydrologic Unit) and are entirely within the boundaries of Edwards Air Force Base. LACSD No. 14 provides municipal wastewater treatment for the city of Lancaster and nearby areas in eastern Los Angeles County. The plan amendments would be implemented through the Water Board's existing permitting and enforcement authority.

The rationale for the proposed changes is contained in a separate technical staff report. Environmental impacts of the plan amendments are analyzed in a draft California Environmental Quality Act "Substitute Environmental Document". These documents, and the existing Basin Plan, are available on the Board's Internet web page at: http://www.waterboards.ca.gov/lahontan.

Summary of Proposed Changes

Basin Plan Chapter 2, Beneficial Uses

The following changes are proposed in Table 2-1:

- Make editorial changes to the beneficial use table to show that the COLD and COMM uses designated categorically for minor surface waters of the Antelope Hydrologic Unit as a whole apply to the "Minor Surface Waters" categories of all of its subunits. (The subunits include seven Hydrologic Areas that are not otherwise affected by the Basin Plan amendments.)

- Make an editorial correction to the spelling of "Roger's Lake Wetlands" (first entry under the Antelope HU heading) by removing the apostrophe in "Roger's."

- Remove the Municipal and Domestic Supply (MUN), Cold Freshwater Habitat (COLD), Water Contact Recreation (REC-1) and Commercial and Sportfishing (COMM) uses from the waters downstream of LACSD's discharge where these uses are now designated categorically. Affected waters include a segment of Amargosa Creek, Piute Ponds, and Rosamond Dry Lake.

- Add the Rare,Threatened and Endangered Species Habitat (RARE) and Preservation of Biological Habitats of Special Significance (BIOL) beneficial uses for the Piute Ponds wetlands to recognize their use by multiple sensitive bird species. Add the Freshwater Replenishment (FRSH) use for two segments of Amargosa Creek and for the Paiute Ponds.

- Remove the categorical Agricultural Supply (AGR) use from and add the Inland Saline Water Habitat (SAL) use to Rosamond Dry Lake. A footnote to Table 2-1 would be added to clarify that the SAL use does not apply to tributaries of Rosamond Dry Lake.

For clarity these changes are shown in two different tables. The first table shows the proposed editorial changes to the “minor” waters categories of the eight HAs within the HUs in underline format. In the second table, new rows are added for specific water bodies or water body segments within the Lancaster HA.The beneficial uses in these rows include the uses already designated categorically for each of these waters as “minor surface waters” or “minor wetlands”, and the changes summarized above: This table assumes that the editorial changes in the first table have been made, and shows the regulatory changes (additions or deletions of uses) in strikeout/underline format.

The tables below are in Microsoft WORD format. Table 2-1 in the Basin Plan is in Microsoft Excel format, and fonts, row and column sizes, and spacing may change when the amendments are finally incorporated into the main plan.

Basin Plan Chapter 3, Water Quality Objectives

The following changes are proposed:

- Correct a typographic error in the existing regionwide water quality objective for ammonia (Basin Plan page 3-13). This is a nonregulatory editorial change).

- Add new site specific objectives (SSOs) for ammonia under the Antelope Hydrologic Unit heading on Basin Plan page 3-11 and in new Tables 3-19a and 319b. Add a new map of the water bodies affected by the SSOs. The objectives are based on the U.S. Environmental Protection Agency’s 1999 nationwide freshwater ammonia toxicity criteria. They include equations for calculation of applicable acute (1 hour average) and chronic (30 day average) limits for total ammonia concentrations under different temperature and pH conditions.

Basin Plan Chapter 4, Implementation

Update the informational (nonregulatory) description of LACSD No. 14’s facilities on page 4.4-12.

Miscellaneous editorial changes

Appropriate changes will be made to the page numbers, record of amendments page, index, table of contents, list of tables, list of figures, bibliography, etc. to reflect the proposed amendments.

Text of Proposed Basin Plan Amendments

(Note: The following pages do not include the editorial changes to the page numbers, Table of Contents, etc., that will be made after final approval of the amendments. Font sizes, placement of text in two-column format on the affected pages, and the format of the tables and figure may change when the approved amendments are incorporated into the Basin Plan. The figure will be redrawn using Geographic Information System (GIS) software.)

Proposed Editorial Changes to Basin Plan Chapter 2

*(The following changes are proposed to pages 2-40 and 2-41. Changes are shown with bold, underlined "**X**s" in a larger font for emphasis. When the changes are incorporated into the plan, fonts for "x" entries will be made consistent throughout the table.)*

TABLE 2-1. BENEFICIAL USES OF SURFACE WATERS OR THE LAHONTAN REGION

Unless otherwise specified, beneficial uses also apply to all tributaries of surface waters identified in Table 2-1.

HU No.	HYDROLOGIC UNIT/SUBUNIT DRAINAGE FEATURE	WATERBODY CLASS MODIFIER	BENEFICIAL USES																						RECEIVING WATER
			MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	AQUA	WARM	COLD	SAL	WILD	BIOL	RARE	MIGR	SPWN	WQE	FLD	
626.00	**ANTELOPE HYDROLOGIC UNIT**																								
	~~ROGER'S~~ ROGERS LAKE WETLANDS	WETLANDS	x								x	x			x		x	x					x	x	
	OAK CREEK	PERENNIAL STREAM	x	x		x	x				x	x	x		x			x							ANTELOPE VALLEY GW
	LITTLE ROCK CREEK	INTERMITTENT STREAM	x				x				x	x	x			x		x							ANTELOPE VALLEY GW
	BIG ROCK CREEK	PERENNIAL STREAM	x	x		x	x				x	x	x			x		x							ANTELOPE VALLEY GW
	MESCAL CREEK	PERENNIAL STREAM	x	x			x				x	x	x			x		x							L.A. AQUEDUCT
	FAIRMONT RESERVOIR	RESERVOIR	x	x		x	x				x	x	x		x			x							L.A. AQUEDUCT
	HAROLD RESERVOIR	RESERVOIR	x	x		x	x				x	x	x		x			x							ANTELOPE VALLEY GW
	LITTLE ROCK RESERVOIR	RESERVOIR	x	x		x	x				x	x	x			x		x							ANTELOPE VALLEY GW
	LAKE PALMDALE	RESERVOIR	x	x			x				x	x	x			x		x							L. A. AQUEDUCT
	MINOR SURFACE WATERS		x	x			x				x	x	x		x	x		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x							
626.10	CHAFFEE HYDROLOGIC AREA																								
	MINOR SURFACE WATERS		x	x			x				x	x	**X**		x	**X**		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x					x	x	

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			MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	AQUA	WARM	COLD	SAL	WILD	BIOL	RARE	MIGR	SPWN	WQE	FLD	
626.20	GLOSTER HYDROLOGIC AREA																								
	MINOR SURFACE WATERS		x	x			x				x	x	**X**		x	**X**		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x					x	x	
626.30	WILLOW SPRINGS HYDROLOGIC AREA																								
	MINOR SURFACE WATERS		x	x			x				x	x	**X**		x	**X**		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x					x	x	
626.40	NEENACH HYDROLOGIC AREA																								
	MINOR SURFACE WATERS		x	x			x				x	x	**X**		x	**X**		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x					x	x	
626.50	**LANCASTER HYDROLOGIC AREA**																								
	MINOR SURFACE WATERS		x	x			x				x	x	**X**		x	**X**		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x					x	x	
626.60	**NORTH MUROC HYDROLOGIC AREA**																								
	MINOR SURFACE WATERS		x	x			x				x	x	**X**		x	**X**		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x					x	x	

TABLE 2-1. BENEFICIAL USES OF SURFACE WATERS OR THE LAHONTAN REGION

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HU No.	HYDROLOGIC UNIT/SUBUNIT DRAINAGE FEATURE	WATERBODY CLASS MODIFIER	BENEFICIAL USES																					RECEIVING WATER
			MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	AQUA	WARM	COLD	SAL	WILD	BIOL	RARE	MIGR	SPWN	WQE	FLD	
626.70	**BUTTES HYDROLOGIC AREA**																								
	MINOR SURFACE WATERS		x	x			x				x	x	**X**		x	**X**		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x					x	x	
626.80	ROCK CREEK HYDROLOGIC AREA																								
	MINOR SURFACE WATERS		x	x			x				x	x	**X**		x	**X**		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x					x	x	

Proposed Regulatory Changes to Basin Plan Chapter 2

The following excerpt from Basin Plan Table 2-1, page 2-41, includes only entries for the Lancaster Hydrologic Area. It assumes that the editorial changes shown in the previous table have already been made. Further changes are shown in strikeout underline format, and the changed entries are shown in a larger bold font for emphasis. In the final amendments, fonts will be made consistent with those used in the existing table.

HU No.	HYDROLOGIC UNIT/SUBUNIT DRAINAGE FEATURE	WATERBODY CLASS MODIFIER	BENEFICIAL USES																						RECEIVING WATER
			MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	AQUA	WARM	COLD	SAL	WILD	BIOL	RARE	MIGR	SPWN	WQE	FLD	
626.50	**LANCASTER HYDROLOGIC AREA**																								
	AMARGOSA CREEK ABOVE LACSD DISCHARGE	**EPHEMERAL STREAM**	x	x			x	**X**			x	x	x		x	X		x							**LOWER AMARGOSA CREEK**
	AMARGOSA CREEK BELOW LACSD DISCHARGE	**EPHEMERAL STREAM**	~~x~~	x			x	**X**			~~x~~	x	~~x~~		x	~~x~~		x							**PIUTE PONDS AND WETLANDS**
	PIUTE PONDS	**PONDS**	~~x~~	x			x	**X**			~~x~~	x	~~x~~		x	~~x~~		x	**X**	**X**					**ROSAMOND DRY LAKE**
	PIUTE PONDS WETLANDS	**WETLANDS**	~~x~~	x			x	x			~~x~~	x			x			x	**X**	**X**			x	x	**ROSAMOND DRY LAKE**
	ROSAMOND DRY LAKE[1]	**PLAYA LAKE**	~~x~~	~~x~~			x				~~x~~	x	~~x~~		x	~~x~~	**X**	x							**TERMINAL LAKE**
	MINOR SURFACE WATERS		x	x			x				x	x	x		x	x		x							
	MINOR WETLANDS	WETLANDS	x	x			x	x			x	x			x			x					x	x	

[1] The SAL use does not apply to tributaries of Rosamond Dry Lake.

Proposed Changes to Basin Plan Chapter 3

On Basin Plan page 3-4, a typographical error in the first equation should be corrected by changing the coefficient "0.052" to "0.52", as follows:

1n-NH2 =0.~~0~~52 ÷ (FT x FPH x 2)

The following changes should be made to Basin Plan page 3-11. The final amendment language will be shown in two-column format.

Antelope Hydrologic Unit

(~~See~~ Figures 3-12 and 3-12a, ~~and~~ Tables 3-19 and 3-19a ~~for water quality objectives for the Antelope HU~~.)

The following additional water quality objectives apply to Amargosa Creek downstream of the Los Angeles County Sanitation District No. 14 discharge point, and to the Piute Ponds and associated **wetlands.** The regionwide ammonia objective applies to all other surface waters of the Antelope Hydrologic Unit. (Note: the regionwide ammonia objective is derived from the USEPA's 1985 freshwater ammonia criteria, and emphasizes un-ionized ammonia. The objective below is derived from the USEPA's 1999 freshwater criteria for total ammonia.)

Ammonia, Total

The acute (1-hour) ammonia toxicity limits are dependent on pH, and the chronic (30-day) limits are dependent on pH and temperature. Concentrations of total ammonia in lower Amargosa Creek and the Piute Ponds and wetlands, expressed "as Nitrogen" or "as N," shall not exceed the acute and chronic limits for listed for the corresponding temperature and pH conditions in Tables 3-19a and 3-19b more often than once every three years, on the average**.** In addition, the highest four-day average concentration of total ammonia within the 30-day period shall not exceed 2.5 times the chronic toxicity limit.

The values in Table 3-19a are the USEPA's 1999 freshwater ammonia criteria for waters with salmonids (salmon and trout) absent and fish early life stages present. Salmonids are not present in lower Amargosa Creek and the Piute Ponds and wetlands. Early life stages of several warmwater fish species are present.

For temperature and pH values not explicitly in Table 3-19a, the most conservative ammonia value neighboring the actual value may be used, or the acute and chronic limits can be calculated from the following formulas from the USEPA's 1999 freshwater ammonia criteria document. In these equations, T = temperature in ^{o}C, and pH (the measure of acidity or alkalinity) is expressed in standard units.

Acute Toxicity. The formula for the acute toxicity limit (1-hour limit) for total ammonia as mg/L N is:

$$\text{Acute Limit} = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

Chronic Toxicity. The formula for the chronic toxicity limit (30-day limit) for total ammonia in mg/L N is:

$$\text{Chronic Limit} = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * MIN(2.85, 1.45 * 10^{0.028*(25-T)})$$

In the equation above, “MIN” means that the calculation should use either 2.85 or the number resulting from the second expression, whichever is lower.

Temperature and pH measurements. If receiving water samples are obtained over a period of time during which pH and/or temperature is not constant, the pH, temperature, and the concentration of total ammonia in each sample should be determined. For each sample, the toxicity limit should be determined at the pH and temperature of the sample, and then the concentration of total ammonia nitrogen in the sample should be divided by the limit to determine a quotient. The acute or chronic toxicity objective is attained if the mean of the quotients is less than 1 over the duration of the averaging period.

The following new tables and figure should be added following Table 3-19 and Figure 3-12 (Basin Plan page 3-51). Note: the final figure will be redrawn with Geographic Information System (GIS) software. The page layout, map scale and fonts may change in the final table and figure. The alternate spelling "Piute" will be used for the ponds.

Table 3-19a. pH Dependent Values of the Acute Ammonia Toxicity Objective for Lower Amargosa Creek and the Piute Ponds and Wetlands

pH	One- Hour Average Total Ammonia Concentration (mg N/L)
6.5	48.8
6.6	46.8
6.7	44.6
6.8	42.0
6.9	39.1
7.0	36.1
7.1	32.8
7.2	29.5
7.3	26.2
7.4	23.0
7.5	19.9
7.6	17.0
7.7	14.4
7.8	12.1
7.9	10.1
8.0	8.40
8.1	6.95
8.2	5.72
8.3	4.71
8.4	3.88
8.5	3.20
8.6	2.65
8.7	2.20
8.8	1.84
8.9	1.56
9.0	1.32

Figure 3-12a. WATER QUALITY OBJECTIVES FOR LOWER AMARGOSA CREEK AND PIUTE PONDS

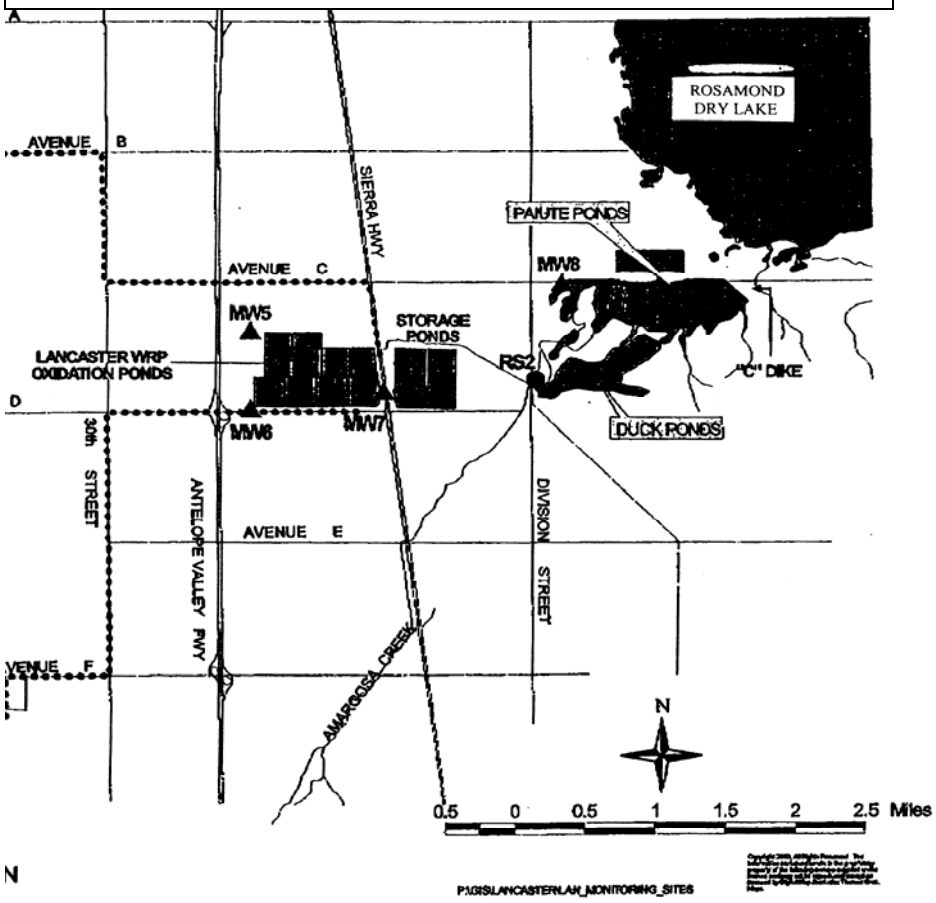

Table 3-19b. Temperature and pH- Dependent Values of the Chronic (30-Day Average) Ammonia Toxicity Objective for Lower Amargosa Creek and the Piute Ponds and Wetlands (Total Ammonia, mg N/L)

	Temperature ^{o}C									
pH	**0°**	**14°**	**16°**	**18°**	**20°**	**22°**	**24°**	**26°**	**28°**	**30°**
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

The following changes should be made to Basin Plan page 4.4-12:

Los Angeles County Sanitation District Number 14—Lancaster

~~The District's plant currently treats municipal wastewater from the City of Lancaster, the surrounding unincorporated area and Fox Airfield. The capacity of the treatment plant is 11.6 mgd; it currently treats and discharges an average of 8.4 mgd. The treatment and disposal capacity is proposed to be expanded to 16.0 mgd by the year 1995.~~

~~All wastewater is treated by primary sedimentation tanks followed by additional treatment in oxidation ponds. Sludge from the primary sedimentation tanks is treated by anaerobic digesters. Digested sludge is stockpiled onsite until exported. In July 1988 the Mira Loma Jail facility located at 45100 60th Street West in Lancaster began using the digested sludge as a soil conditioner. An average of approximately 5,400 cubic yards per month have been exported to this facility during the period inclusive of July 1988 through October 1988. Potentially much of the stockpiled sludge would be used as soil amendment by a large ranch currently under waste discharge requirements. Currently most of the effluent is discharged to Nebeker Ranch and/or chlorinated and discharged to Piute Pond. Piute Pond is a marsh-like area that is located on Edwards Air Force Base (AFB) property and is used for duck hunting and wildlife viewing as well as wastewater disposal. At Nebeker Ranch the treated wastewater is used for irrigation of fodder crops.~~

~~Oxidation pond effluent not discharged to Nebeker Ranch or Piute Pond receives further treatment by a tertiary treatment lant with a design capacity of 0.6 mgd. This plant includes chemical addition, coagulation, sedimentation, filtration, and chlorination facilities. The effluent from the tertiary treatment plant is discharged to Apollo County Park where it is used as a source of supply for three artificial recreational lakes. The lake waters are used for fishing, boating and landscape irrigation within the park and fire protection at the Fox Airfield. In addition, the lake waters are used for dust control and compaction during county road construction and maintenance activities~~.

The District treats municipal wastewater from the City of Lancaster, the surrounding unincorporated area, and part of the City of Palmdale. Historically, most of the wastewater received secondary treatment. Under a facilities plan adopted in 2004, the District will replace its existing facilities with new tertiary treatment/activated sludge facilities. Phased expansion of the treatment and disposal facilities is planned. The activated sludge facilities will be operated so as to maximize nitrification-denitrification. Tertiary effluent will be used for agriculture, municipal landscape watering, industrial purposes, and maintenance of the lakes in Apollo Lakes Regional Park and the Piute Ponds and associated wetlands located on Edwards Air Force Base property. During the winter, when agricultural demand is low, effluent will be kept in storage reservoirs. New infrastructure for the distribution of recycled water is planned.