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APPENDIX 15.5A

Antelope Valley-East Kern Water Agency 2022 Annual Water Quality Summary Table – Kern County System

Antelope Valley-East Kern Water Agency
2022 Annual Water Quality Report - Kern County System

The Antelope Valley-East Kern Water Agency provides treated surface water and treated groundwater as our sources of drinking water.
Treatment technique: Conventional
EPA Turbidity Performance Standards: Turbidity of the filtered water must:

1. Be less than or equal to 0.30 NTU in 95% of measurements in a month.
2. Not exceed 1 NTU at any time.

Lowest monthly percentage of samples that met Turbidity Performance Standard No. 1: **100%**
Highest single turbidity measurement during the year: **0.19 NTU**
Percentage of samples < 0.30 NTU: **100%**
The number of violations of any surface water treatment requirements: **NONE**
Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements.

The Antelope Valley-East Kern Water Agency also provides chlorinated groundwater as an alternative source of drinking water.
Treatment technique: Chlorination
EPA Groundwater Rule: AVEK meets the requirements of the Groundwater Rule by providing a minimum of 4-log reduction of viruses by continously providing a minimum free chlorine residual of 0.5 mg/L leaving the clearwell.

Lowest single free chlorine residual measurement during the year: **0.89**
Number of violations of the Groundwater Rule: **NONE**

MICROBIOLOGICAL CONTAMINANTS

Type of Sample(s)	Parameter	Sampling Frequency	MCL	No. of Months in Violation	System Results Range	System Results Average
Distribution	Total Coliform Bacteria	56 - 70 / mo	5% positive	None	0%	0%
Distribution	E. coli	56 - 70 / mo	1 pos. with 2 TC pos.	None	0%	0%

INORGANIC CONTAMINANTS

					RESULTS							
					Rosamond Plant				Water Bank			
					Plant Effluent (CWR)		Raw Influent (Sources)		Effluent (CWR)		Wells	
Parameter	Units	MCL	DLR	PHG	Range	Average	Range	Average	Range	Average	Range	Average
Aluminum	µg/L	1000	50	600	93-250	130	ND	ND				
Antimony	µg/L	6	6	1		ND	ND	ND				
Arsenic	µg/L	10	2	0.004		3.6	3.2-8.1	5.0	2.5-7.3	5.5	2.2-12	5.2
Barium	µg/L	1000	100	2000		58	30-58	44				
Beryllium	µg/L	4	1	1		ND	ND	ND				
Cadmium	µg/L	5	1	0.04		ND	ND	ND				
Chromium (Total)	µg/L	50	10			5.1	5.1-15	11				
Chromium (Hexavalent)	µg/L	*	1	0.02		5.8	5.4-14	8.6				
Cyanide	µg/L	150	100	150		ND	ND	ND				
Fluoride	mg/L	2	0.1	1		0.28	0.29-0.36	0.32				
Mercury	µg/L	2	1	1.2		ND	ND	ND				
Nickel	µg/L	100	10	12		ND	ND	ND				
Nitrate (as N)	mg/L	10	0.4	10		2.5	1.2-2.5	1.9			1.2-4.5	2.5
Nitrite (as N)	mg/L	1	0.4	1		ND	ND	ND			ND	ND
Nitrate+Nitrite (as N)	mg/L	10		10		2.5	ND-2.5	0.83			1.5-3.4	2.2
Perchlorate	µg/L	6	2	1		ND	ND	ND			ND	ND
Selenium	µg/L	50	5	30		ND	ND	ND				
Thallium	µg/L	2	1	0.1		ND	ND	ND				

*There is currently no MCL for hexavalent chromium. The previous MCL of 0.010 mg/L was withdrawn on September 11, 2017.

Antelope Valley-East Kern Water Agency
2022 Annual Water Quality Report - Kern County System

GENERAL PHYSICAL AND SECONDARY STANDARDS

RESULTS

Parameter	Units	MCL	DLR	Rosamond Plant				Water Bank			
				Plant Effluent (CWR)		Raw Influent (Sources)		Effluent (CWR)		Wells	
				Range	Average	Range	Average	Range	Average	Range	Average
Aluminum	µg/L	1000	50	93-250	140	ND	ND				
Calcium	mg/L	no standard			63	63-97	74				
Chloride	mg/L	250			54	40-53	47				
Color	Units	15		<5	<5	<5	<5				
Copper	µg/L	1000	50		ND	ND	ND				
Foaming Agents (MBAS)	mg/L	0.5			ND	ND	ND				
Hardness (Total) as CaCO3	mg/L	no standard			200	91-200	140				
Iron	µg/L	300	100		ND	ND	ND				
Magnesium	mg/L	no standard			9.7	5.7-9.7	8.3				
Manganese	µg/L	50	20		ND	ND	ND				
Odor @ 60 C	Units	3	1	<1	<1	<1	<1				
pH	Units	no standard		7.3-7.9	7.6	7.7-8.6	8.0				
Silver	µg/L	100	10			ND	ND				
Sodium	mg/L	no standard			46	ND-44	15				
Specific Conductance	µmhos	900			580	420-580	500				
Sulfate	mg/L	250	0.5		60	47-58	53				
Thiobencarb (Bolero)	µg/L	1	1		ND	ND	ND				
Methyl tert-Butyl Ether (MTBE)	µg/L	5	3		ND	ND	ND				
Total Dissolved Solids	mg/L	500			330	240-320	290				
Turbidity	Units	5		0.01-0.20	0.05	0.02-1.1	0.10				
Zinc	µg/L	5000	50		450	ND	ND				
Total Alkalinity (as CaCO3)	mg/L	no standard			140	120-150	140				
Bicarbonate Alkalinity(as HCO3)	mg/L	no standard			140	ND-150	50				
Carbonate (as CO3)	mg/L	no standard			ND	ND	ND				
Hydroxide (as OH)	mg/L	no standard			ND	ND	ND				

RADIOLOGICAL CONTAMINANTS

RESULTS

Parameter	Units	MCL	DLR	PHG	Rosamond Plant Raw Influent Sources		Water Bank Wells	
					Range	Average	Range	Average
Gross Alpha	pCi/L	15	3					
Gross Beta	pCi/L	50	4			ND		
Strontium 90	pCi/L	8	2	0.35				
Tritium	pCi/L	20,000	1,000	400				
Uranium	pCi/L	20	1	0.43		3.5		
Radium 228	pCi/L		1	0.019		ND		
Radium 226	pCi/L		1	0.05		ND		

VOLATILE ORGANIC CONTAMINANTS

RESULTS

Parameter	Units	MCL	DLR	PHG	Rosamond Plant Raw Influent (Sources)		Water Bank Wells	
					Range	Average	Range	Average
1,1,1-Trichlorethane (1,1,1-TCA)	µg/L	200	0.5	1000	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	µg/L	1	0.5	0.1	ND	ND	ND	ND
1,1,2-Trichloroethane (1,1,2-TCA)	µg/L	5	0.5	0.3	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	µg/L	5	0.5	3	ND	ND	ND	ND
1,1-Dichloroethylene (1,1-DCE)	µg/L	6	0.5	10	ND	ND	ND	ND
1,2,4-Trichlorobenzene	µg/L	5	0.5	5	ND	ND	ND	ND
1,2-Dichlorobenzene (o-DCB)	µg/L	600	0.5	600	ND	ND	ND	ND

Antelope Valley-East Kern Water Agency
2022 Annual Water Quality Report - Kern County System

Parameter	Units	MCL	DLR	PHG	Rosamond Plant Raw Influent (Sources) Range	Rosamond Plant Raw Influent (Sources) Average	Water Bank Wells Range	Water Bank Wells Average
1,2-Dichloroethane (1,2-DCA)	µg/L	0.5	0.5	0.4	ND	ND	ND	ND
1,2-Dichloropropane	µg/L	5	0.5	0.5	ND	ND	ND	ND
1,3-Dichloropropene (Total)	µg/L	0.5	0.5	0.2	ND	ND	ND	ND
1,4-Dichlorobenzene (p-DCB)	µg/L	5	0.5	6	ND	ND	ND	ND
Benzene	µg/L	1	0.5	0.15	ND	ND	ND	ND
Carbon tetrachloride	µg/L	0.5	0.5	0.1	ND	ND	ND	ND
cis-1,2-Dichloroethylene (c-1,2-DCE)	µg/L	6	0.5	100	ND	ND	ND	ND
cis-1,3-Dichloropropene	µg/L				ND	ND	ND	ND
Dichloromethane (Methylene Chloride)	µg/L	5	0.5	4	ND	ND	ND	ND
Ethylbenzene	µg/L	300	0.5	300	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE)	µg/L	13	3	13	ND	ND	ND	ND
Monochlorobenzene (Chlorobenzene)	µg/L	70	0.5	70	ND	ND	ND	ND
Styrene	µg/L	100	0.5	0.5	ND	ND	ND	ND
Tetrachloroethylene (PCE)	µg/L	5	0.5	0.06	ND	ND	ND	ND
Toluene	µg/L	150	0.5	150	ND	ND	ND	ND
trans-1,2-Dichloroethylene (t-1,2-DCE)	µg/L	10	0.5	60	ND	ND	ND	ND
trans-1,3-Dichloropropene	µg/L				ND	ND	ND	ND
Trichloroethylene (TCE)	µg/L	5	0.5	1.7	ND	ND	ND	ND
Trichlorofluromethane (Freon11)	µg/L	150	5	1300	ND	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	µg/L	1200	10	4000	ND	ND	ND	ND
Vinyl Chloride (VC)	µg/L	0.5	0.5	0.05	ND	ND	ND	ND
Xylenes (Total)	µg/L	1750	0.5	1800	ND	ND	ND	ND

SYNTHETIC ORGANIC CHEMICALS

RESULTS

Parameter	Units	MCL	DLR (DL)	PHG	Raw Influent (Sources) Range	Raw Influent (Sources) Average	Water Bank Wells Range	Water Bank Wells Average
Alachlor	µg/L	2	1	4	ND	ND		
Atrazine	µg/L	1	0.5	0.15	ND	ND		
Bentazon	µg/L	18	2	200	ND	ND		
Benzo(a)pyrene	µg/L	0.2	0.1	0.007	ND	ND		
Carbofuran	µg/L	18	5	0.7	ND	ND		
Chlordane	µg/L	0.1	0.1	0.03	ND	ND		
2,4-D	µg/L	70	10	20	ND	ND		
Dalapon	µg/L	200	10	790	ND	ND		
Dibromochloropropane (DBCP)	µg/L	0.2	0.01	0.0017	ND	ND		
Di(2-ethylhexyl)adipate	µg/L	400	5	200	ND	ND		
Di(2-ethylhexyl)phthalate	µg/L	4	3	12	ND	ND		
Dinoseb	µg/L	7	2	14	ND	ND		
Diquat	µg/L	20	4	6	ND	ND		
Endothall	µg/L	100	45	94	ND	ND		
Endrin	µg/L	2	0.1	0.3	ND	ND		
Ethylene Dibromide (EDB)	µg/L	0.05	0.02	0.01	ND	ND		
Glyphosate	µg/L	700	25	900	ND	ND		
Heptachlor	µg/L	0.01	0.01	0.008	ND	ND		
Heptachlor Epoxide	µg/L	0.01	0.01	0.006	ND	ND		
Hexachlorobenzene	µg/L	1	0.5	0.03	ND	ND		
Hexachlorocyclopentadiene	µg/L	50	1	2	ND	ND		
Lindane	µg/L	0.2	0.2	0.032	ND	ND		
Methoxychlor	µg/L	30	10	0.09	ND	ND		
Molinate	µg/L	20	2	1	ND	ND		
Oxamyl	µg/L	50	20	26	ND	ND		
Pentachlorophenol	µg/L	1	0.2	0.3	ND	ND		
Picloram	µg/L	500	1	166	ND	ND		

Antelope Valley-East Kern Water Agency
2022 Annual Water Quality Report - Kern County System

Parameter	Units	MCL	DLR (DL)	PHG	Raw Influent (Sources) Range	Raw Influent (Sources) Average	Water Bank Wells Range	Water Bank Wells Average
Polychlorinated Biphenyls	µg/L	0.5	0.5	0.09	ND	ND		
Simazine	µg/L	4	1	4	ND	ND		
Thiobencarb (Bolero)	µg/L	70	1	42	ND	ND		
Toxaphene	µg/L	3	1	0.03	ND	ND		
2,3,7,8-TCDD (Dioxin)	pg/L	30	5	0.05	ND	ND		
2,4,5-TP (Silvex)	µg/L	50	1	3	ND	ND		
1,2,3-Trichloropropane	µg/L	0.005	0.005	0.0007	ND	ND		

DISINFECTION RESIDUAL, PRECURSORS, and BYPRODUCTS

Type of Sample(s)	Parameter	Units	MCL/MRDL	DLR	MRDLG	RESULTS Range	RESULTS Average
Distribution	Chlorine (as total Cl2)	mg/L	4.0**		4	0.26-1.48	1.07
Treated Water	Total Organic Carbon (TOC)	mg/L	Treatment Requirement	0.3		0.4-0.9	0.6
Source Water	Total Organic Carbon (TOC)	mg/L	Treatment Requirement	0.3		0.5-0.9	0.6
Distribution	Stage 2 D/DBP Rule Total Trihalomethanes	µg/L	80**			14-25	20 #
Distribution	Stage 2 D/DBP Rule Total Haloacetic Acids	µg/L	60**			2.2-7.2	2.1 #
Treated Water	Bromate	µg/L	10[+]	1.0		ND	ND

** Running Annual Average of distribution system samples. The MCLs are based upon Running Annual Averages.
Stage 2 D/DBP Rule Total THMs and Total HAAs compliance is based upon Locational Running Annual Averages.

Location with the highest TTHM average

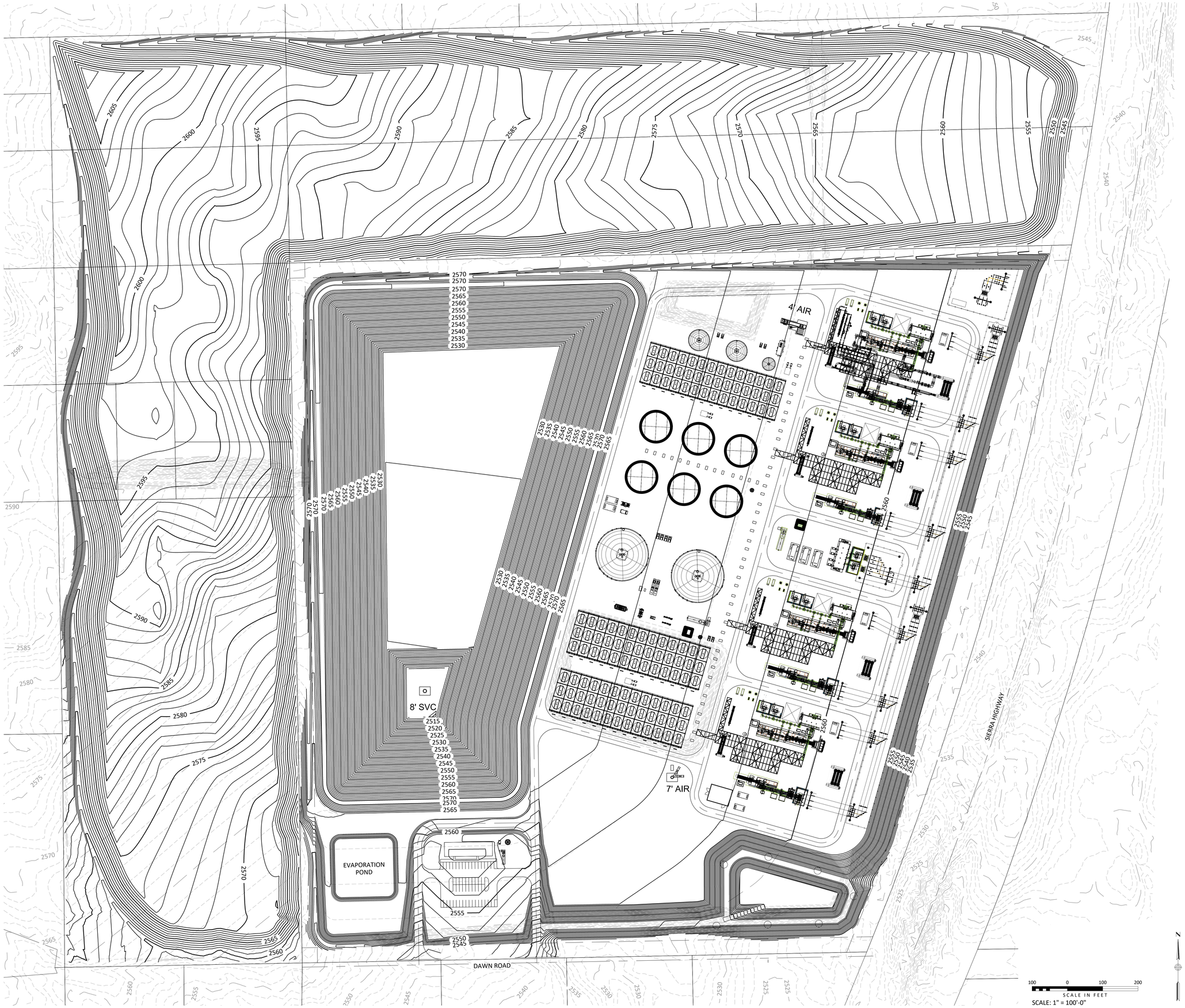
[+] Compliance is based on the running annual average computed quarterly, of monthly samples, collected at the entrance to the distribution system.

DEFINITIONS and FOOTNOTES:

Plant Effluent, CWR, is finished, treated drinking water.
Raw Water is the Source Water, the California Aqueduct or wells, prior to treatment.
Units: mg/L = milligrams per liter, parts per million (ppm)
µg/L = micrograms per liter, parts per billion (ppb)
pg/L = picograms per liter, parts per quadrillion (ppq)
µmhos = micromhos, a measure of specific conductance
pCi/L = pico Curies per liter
< = less than
> = greater than
ND = none detected above the DLR
NTU = nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
MCL: Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water. MCLs are set by the US Environmental Protection Agency or the State Water Resources Control Board as close to the PHGs and MCLGs as is economically or technologically feasible.
MRDL: Maximum Residual Disinfectant Level. The level of a disinfectant added for water treatment that may not exceeded at the consumer's tap.
DLR: Detection Limit for purposes of Reporting.
(DL): Detection limit determined by the Laboratory when no DLR has been established.
MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.
MRDLG: Maximum Residual Disinfectant Level Goal. The level of a disinfectant added for water treatment below which there is no known or expected risk to health. MRDLGs are set by the US Environmental Protection Agency.
PHG: Public Health Goal. The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Office of Environmental Health Hazard
Primary Drinking Water Standard: Primary MCLs, specific treatment techniques adopted in lieu of primary MCLs, and monitoring and reporting requirements for MCLs that are specified in regulations.
Assessment.
Secondary Standards: Aesthetic standards established by the State Water Resources Control Board.
All analyses performed by ELAP certified laboratories: AVEK Water Agency, Eurofins Eaton Analytical Laboratories, or Eurofins subcontract lab.

APPENDIX 15.5B

Grading and Drainage Plan, Stormwater Basin Design Drawings, and Supporting Calculations



NOTES:

1. POND DETAIL
   RESERVOIR BERM ELEV: 2570.00
   RESERVOIR BERM EXTERIOR SLOPE MIN. TOE ELEV: 2564.00
   TOP OF WORKING RESERVOIR / MAX POOL: 2566.00
   BOTTOM OF WORKING RESERVOIR: 2526.00
   BOTTOM OF SUMP: 2512.00
   WORKING RESERVOIR STORAGE VOLUME: 188 MG
   MAX POOL SURFACE AREA: 21.4 AC

NOTES:

1. PRELIMINARY EARTHWORK QUANTITIES:
   SITE
   CUT= 99,810 CY
   FILL= 72,940 CY
   BERM
   CUT = 18,785 CY
   FILL = 199,793 CY
2. BALANCE VOLUMES ARE FROM EXISTING GROUND TO MASS GRADE.
3. REFER TO PLOT PLAN (PP-001) FOR EQUIPMENT LAYOUT.

- PRELIMINARY -
NOT FOR CONSTRUCTION

REV	DESIGN BY	CHECKED BY	DATE
0	ISSUED FOR AFC		
	A. ROSS	R. PILES	01-05-24

HYDROSTOR
WILLOW ROCK ENERGY STORAGE CENTER

HYDROSTOR

Kiewit

GRADING PLAN
OPERATIONS PHASE - WITH BERM

ENGINEER/DESIGN ORIGINATOR	A. ROSS
LEAD ENG	R. PILES
ENG MGR	S. GAMER
PROJ MGR	J. LUNDQUIST

DRAWING NUMBER
20045352-CG-001

$$DATE$$ $$TIME$$ $$USERNAME$$ $$FILENAME$$

NOTES:

1. POND DETAIL
   RESERVOIR BERM ELEV: 2570.00
   RESERVOIR BERM EXTERIOR SLOPE MIN. TOE ELEV: 2564.00
   TOP OF WORKING RESERVOIR / MAX POOL: 2566.00
   BOTTOM OF WORKING RESERVOIR: 2526.00
   BOTTOM OF SUMP: 2512.00
   WORKING RESERVOIR STORAGE VOLUME: 188 MG
   MAX POOL SURFACE AREA: 21.4 AC

NOTES:

1. PRELIMINARY EARTHWORK QUANTITIES:
   SITE
   BEDROCK CUT = 1,539 CY
   CUT= 957,665 CY
   FILL= 1,200,790 CY
   BERM
   SAND STRIP = 537,784 CY
   CUT = 4,044 CY
   FILL = 1,250,472 CY
2. BALANCE VOLUMES ARE FROM EXISTING GROUND TO MASS GRADE.
3. REFER TO PLOT PLAN (PP-001) FOR EQUIPMENT LAYOUT.

NOM 50,000 BBL
CUTTINGS POND
(CLEANOUT DURING
DRILLING)

4' AIR

NOM 200,000 BBL
CUTTINGS POND
3:1 SLOPE
14' DEPTH,
12' WATER DEPTH
(CLEANOUT DURING
DRILLING)

8' SVC

EXPLOSIVES
BUNKERS

TEMPORARY EARTHWORK
STORAGE AREA
3 AC

TEMPORARY CRUSHING
1 AC

TEMPORARY CAVERN ROCK
STORAGE AREA
3 AC

WHSE
MTCE
LAYDOWN

OFFICES

PARKING

8' PROD'N

7' VENT

8' PROD'N

7' VENT
(CONV TO AIR)

AGG BINS

BATCH
PLANT

HOISTS

SHAFT &
HEADFRAME

SIERRA HIGHWAY

DAWN ROAD

- PRELIMINARY -
NOT FOR CONSTRUCTION

SCALE IN FEET
100 0 100 200
SCALE: 1" = 100'-0"

REV	DESIGN BY	CHECKED BY	DATE
0	ISSUED FOR AFC		
	A. ROSS	R. PILES	01-05-24

HYDROSTOR
WILLOW ROCK ENERGY STORAGE CENTER

HYDROSTOR
Kiewit

GRADING PLAN
CONSTRUCTION PHASE - WITH BERM

ENGINEER/DESIGN ORIGINATOR	A. ROSS
LEAD ENG	R. PILES
ENG MGR	S. GAMER
PROJ MGR	J. LUNDQUIST

DRAWING NUMBER
20045352-CG-002

$$DATE$$ $$TIME$$ $$USERNAME$$ $$FILENAME$$