



ERLER & KALINOWSKI, INC.

SUPPLEMENT TO

EXPERT REPORT ON WATER USE AT THE COPA DE ORO PROPERTY,

KERN COUNTY, CALIFORNIA:

MONTHLY AVEK DELIVERIES DATA

Ms. Vera H. Nelson of Erlar & Kalinowski, Inc. (“EKI”) has prepared this Supplement to the *Expert Report on Water Use at the Copa de Oro Property, Kern County, California* (“Expert Report”), prepared by Ms. Nelson on behalf of the Copa de Oro Land Company (“Client”), dated 3 January 2013. This Supplement presents and discusses new information on monthly water deliveries from the Antelope Valley-East Kern Water Agency (“AVEK”) to the Copa de Oro property, located in southern Kern County, California (“Subject Property”). The new information was obtained by Client’s counsel, Bartkiewicz, Kronick & Shanahan (“BKS”), on 24 January 2013.

Monthly AVEK Deliveries Data

Pursuant to a request by BKS, AVEK provided BKS with data on monthly deliveries of AVEK water to the Subject Property for the period from January 2000 through December 2004. A copy of this information is included in Attachment A of this Supplement. Previously, AVEK had provided BKS with a summary of annual AVEK deliveries to the Subject Property from 1976 through 2010 in a letter dated 28 July 2011 (see Attachment A of Expert Report).¹ The newly obtained data consists of two tables of monthly AVEK water deliveries to the Subject Property: one for meter 11.6R2 and one for meter 11.6R3. The monthly values for the two meters were added together to obtain a total monthly AVEK deliveries value for each month (see Table 1). The monthly totals were compared to previously obtained annual totals and were found to agree (i.e., the monthly totals sum up to the annual values for each year from 2000 through 2004).

Figure 1 shows a graph of monthly totals between January 2000 and December 2004. The data shown on Table 1 and the graph depicted in Figure 1 clearly demonstrate that AVEK water deliveries followed a seasonal pattern, with the greatest deliveries occurring in summer months (i.e., July in years 2000 through 2003, and June in 2004), and nearly all deliveries occurring between the months April and October. Deliveries were zero in December of each year, and were near zero for most years in November, January and February. This seasonal pattern in water deliveries is consistent with agricultural water use.

Comparison of Monthly AVEK Deliveries Data and Agricultural Water Use Estimates Presented in Expert Report on Water Use at the Copa de Oro Property

The Expert Report contained agricultural water use estimates for the Subject Property that are calculated based on the following information:

¹ Actual deliveries of AVEK water to the Subject Property started in 1977 and lasted through 2004.

- cropping data obtained from the Kern County Department of Agriculture and Measurement Standards (“KCDAMS”);
- climate data from nearby weather stations;
- information on typical irrigation efficiency; and
- information on the typical water requirements of crops grown at the Subject Property (i.e., growing seasons, crop coefficients, additional water used for field preparation and erosion control), including information from Appendix D of Beeby et al., 2010² (“Antelope Valley Expert Report”).

Crop water use is calculated in the Expert Report for a range of alternative growing season scenarios, each with a constant duration for a given crop but different planting and harvesting dates³, as the specific planting period for any given year is unknown. These crop water use estimates were compared to monthly AVEK water deliveries, and a “best-fit” growing period was identified for each year and crop. The best-fit growing period for each year was identified based on the smallest root mean squared error (“RMSE”)⁴ and AVEK delivery data. A 75 percent irrigation efficiency was assumed. The results are shown on Figure 2. The data match well, with the exception of year 2002, where there is a discrepancy between the KCDAMS reported cropping information for the Subject Property and the AVEK water deliveries data, suggestive of a reporting error in the KCDAMS cropping data. Review of monthly AVEK deliveries relative to crop water use estimates presented on Figure 2 indicates that additional water was likely applied in advance of, and potentially after, the main growing season during most years. Pre-season water use for field preparation and erosion control is discussed and incorporated into water use factors developed in Appendix D of the Antelope Valley Expert Report, and is incorporated into the range of crop water use estimates presented in the Expert Report. Information presented in this Supplement corroborates these practices and further supports conclusions regarding estimated water use on the Subject Property presented in the Expert Report.

Attachments

Table 1. Total Monthly AVEK Deliveries to the Copa de Oro Property, 2000 - 2004

Figure 1. Total Monthly AVEK Deliveries, 2000 – 2004

Figure 2. Monthly AVEK Deliveries and Best-Fit Estimated Water Use, 2000 – 2004

Appendix A. Letter from AVEK to BKS, dated 24 January 2013

² Beeby, R., Durbin, T., Leever, W., Leffler, P., Scalmanini, J.C., and Wildermuth, M., 2010, *Summary Expert Report Phase 3 – Basin Yield and Overdraft, Antelope Valley Area of Adjudication*, July 2010.

³ See Table 4 of Expert Report

⁴ The root mean squared error is defined as follows: $RMSE = [(\sum(x_{est} - x_{AVEK})^2)/n]^{0.5}$ where x_{est} is the estimated monthly water use value, x_{AVEK} is the AVEK-reported monthly water use value, n is the number of months (i.e., 12), and Σ indicates summation over all 12 monthly values.

TABLE 1
TOTAL MONTHLY AVEK DELIVERIES TO THE COPA DE ORO PROPERTY, 2000 - 2004 (a)

Copa De Oro Land Company
 Kern County, California

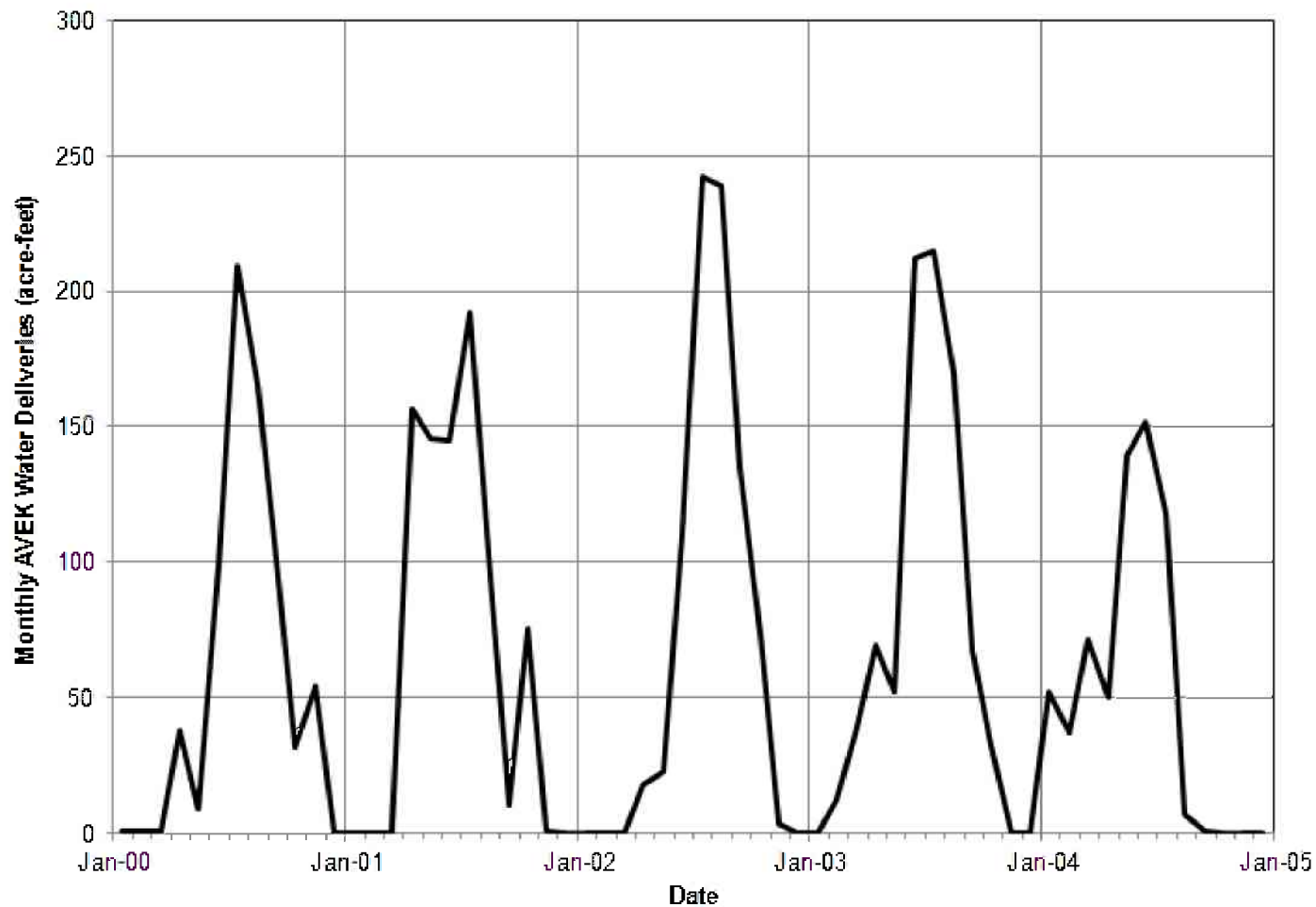
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2000	0.5	0.5	0.5	37.8	9.07	98.65	209.6	165.15	100.92	31.37	54.33	0	708.39
2001	0	0	0	156.75	145.29	144.9	192.42	103.16	9.94	75.71	0.5	0	828.67
2002	0	0	0	17.86	22.31	110.12	242.1	238.75	134.16	73.33	3.41	0	842.04
2003	0	11.97	39.2	69.06	51.86	212.33	214.53	169.41	66.84	32.28	0	0	867.48
2004	51.8	36.94	71.05	50.05	139.55	151.69	117.91	6.39	0.5	0	0	0	625.88

Abbreviations:

AVEK Antelope Valley-East Kern Water Agency

Notes:

(a) Values shown are the total deliveries, based on sum of the readings from both meters at the Subject Property (i.e., 11.6R2 and 11.6R3). Values are in acre-feet.



Abbreviations:

AVEK Antelope Valley-East Kern Water Agency

Notes:

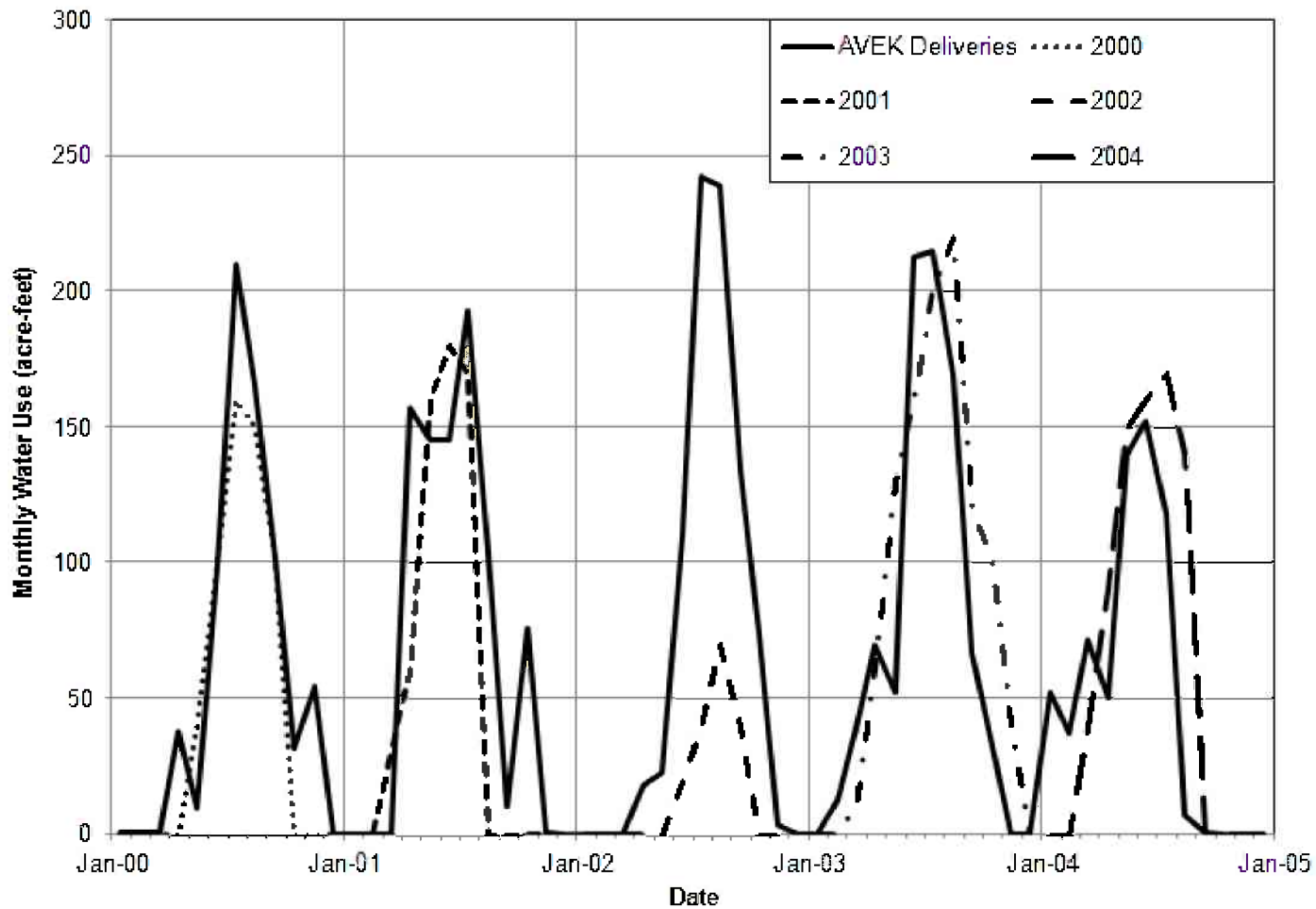
1. Values plotted are the total AVEK deliveries, based on the sum of the readings from both meters at the Subject Property (i.e., 11.6R2 and 11.6R3).
2. Data were provided by AVEK in a letter dated 24 January 2013.

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**Total Monthly AVEK Deliveries,
2000 - 2004**

Copa De Oro Land Company
Kern County, California
January 2013
EKI A80023.02

Figure 1



Abbreviations:

AVEK Antelope Valley-East Kern Water Agency
 EKI Erler & Kalinowski, Inc.

Notes:

1. Total AVEK deliveries are based on data provided by AVEK in a letter dated 24 January 2013, and are the sum of the readings from both meters at the Subject Property (i.e., 11.6R2 and 11.6R3).
2. Best-fit estimated water use values for each year from 2000 through 2004 are based on the water use estimates shown in Table 4 of the Expert Report (EKI, 3 January 2013).

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 Kalinowski, Inc.**

**Monthly AVEK Deliveries and
 Best-Fit Estimated Water Use,
 2000 - 2004**

Copa De Oro Land Company
 Kern County, California
 January 2013
 EKI A80023.02

Figure 2

Appendix A

Letter from AVEK to BKS, dated 24 January 2013

BOARD OF DIRECTORS

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General Manager

HOLLY H. HUGHES
Secretary-Treasurer

January 24, 2013

Ms. Katrina C. Gonzales
Bartkiewicz, Kronick & Shanahan
1011 22nd Street
Sacramento, CA 95616

Re: AVEK Monthly Surface Water Deliveries (2000-2004) to Copa de Oro Property
(Gaskell Road & 110th St. W – 120th St.)

Dear Ms. Gonzales:

This correspondence completes the Antelope Valley-East Kern Water Agency's ("AVEK") response to your Public Records Act request dated January 23, 2013. The following tables show the monthly deliveries of AVEK surface water to the two 11.6R turnout meters on the Copa de Oro Property from 2000 through 2004:

Year	Meter	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2000	11.6R2	0.5	0.5	0.5	37.8	9.07	98.65	209.6	165.15	100.92	31.37	54.33	0	708.39
2001		0	0	0	127.47	91.12	144.9	192.42	103.16	9.94	75.71	0.5	0	745.22
2002		0	0	0	0	0	79.13	201.09	177.15	125.75	73.33	3.41	0	659.86
2003		0	11.97	39.2	69.06	51.86	212.33	214.53	169.41	66.84	32.28	0	0	867.48
2004		51.8	0	0	50.05	0	0	117.91	0	0	0	0	0	219.76

Year	Meter	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2001	11.6R3	0	0	0	29.28	54.17	0	0	0	0	0	0	0	83.45
2002		0	0	0	17.86	22.31	30.99	41.01	61.6	8.41	0	0	0	182.18
2003		0	0	0	0	0	0	0	0	0	0	0	0	0
2004		0	36.94	71.05	0	139.55	151.69	0	6.39	0.5	0	0	0	406.12

All usage in Acre Foot

Sincerely,

Dwayne Chisam
Assistant General Manager
Antelope Valley-East Kern Water Agency