

# Kern Fan Groundwater Storage Project

RESPONSE TO DEC REVIEW FINDINGS

## Exhibit K: Conveyance Canal Quantity Calculations

July 1, 2020



**IRVINE RANCH / ROSEDALE RIO BRAVO WATER STORAGE DISTRICT  
KERN FAN GROUNDWATER STORAGE PROJECT - CONVEYANCE CHANNEL  
EARTHWORK VOLUME CALCULATIONS**

STATION	DESC	DIST	END AREA		AVG END AREA		VOLUME	
			CUT (ft2)	FILL (ft2)	CUT (ft2)	FILL (ft2)	CUT (yd3)	FILL (yd3)
-	BEGIN CANAL		112.1	362.7				
		604			389.9	181.4	8,722	4,057
604		600	667.7	-	333.9	503.9	7,419	11,197
1,204		600	-	1,007.7				
		600			-	957.0	-	21,266
1,804		1,000	-	906.2				
		1,000			-	878.9	-	32,550
2,804		1,000	-	851.5				
		1,000			-	878.9	-	32,550
3,804		1,000	-	906.2				
		1,000			-	913.1	-	33,819
4,804		1,000	-	920.0				
		1,000			-	940.8	-	34,844
5,804		1,000	-	961.6				
		1,000			-	899.8	-	33,324
6,804		1,000	-	837.9				
		1,000			-	858.4	-	31,791
7,804		776	-	878.8				
		776			201.8	439.4	5,798	12,629
8,580	BEGIN SIPHON		403.5	-				
8,900	END SIPHON		236.5	122.8				
		1,055			258.9	96.9	10,116	3,786
9,955		1,020	281.3	71.0				
		1,020			254.3	103.7	9,605	3,918
10,975		1,000	227.2	136.4				
		1,000			241.6	116.2	8,948	4,304
11,975		1,035	256.0	96.0				
		1,035			397.8	48.0	15,247	1,840
13,010	BEGIN SIPHON		539.5	-				
13,335	END SIPHON		248.6	106.0				
		525			248.6	106.0	4,834	2,061
13,860	BEGIN SIPHON		248.6	106.0				
14,185	END SIPHON		297.6	56.2				
		75			297.6	56.2	827	156
14,260	PP#1 FOREBAY		297.6	56.2				
					<b>REACH 1 SUBTOTAL</b>		71,517	264,090
14,340	PP#1 AFTERBAY		-	865.1				
		1,000			48.1	635.4	1,780	23,533
15,340		1,000	96.1	405.7				
		1,000			172.8	255.3	6,398	9,454
16,340		1,000	249.4	104.8				
		1,000			124.7	475.9	4,619	17,626
17,340		1,000	-	847.0				
		1,000			-	913.5	-	33,831
18,340		1,000	-	979.9				
		1,000			-	1,015.7	-	37,619
19,340		1,000	-	1,051.5				
		1,000			27.0	795.8	998	29,472
20,340		1,430	53.9	540.0				
		1,430			75.0	472.9	3,972	25,044
21,770	BEGIN SIPHON		96.1	405.7				

STATION	DESC	DIST	END AREA		AVG END AREA		VOLUME	
			CUT (ft2)	FILL (ft2)	CUT (ft2)	FILL (ft2)	CUT (yd3)	FILL (yd3)
22,190	END SIPHON		99.2	397.0				
		1,040			184.4	239.6	7,103	9,229
23,230			269.6	82.2				
		1,000			295.2	59.6	10,931	2,206
24,230			320.7	36.9				
		1,040			352.6	18.5	13,582	711
25,270	BEGIN SIPHON		384.5	-				
25,690	END SIPHON		511.0	-				
		1,030			511.0	-	19,494	-
26,720	PP#2 FOREBAY		511.0	-				
					<b>REACH 2 SUBTOTAL</b>		68,876	188,724
26,700	PP#2 AFTERBAY		22.7	668.2				
		1,100			28.1	644.5	1,143	26,257
27,800			33.4	620.8				
		1,000			128.6	381.1	4,763	14,115
28,800			223.8	141.4				
		1,000			275.2	86.8	10,193	3,215
29,800			326.6	32.2				
		1,000			194.4	271.7	7,198	10,063
30,800			62.1	511.2				
		1,000			68.6	480.0	2,539	17,778
31,800			75.0	448.8				
		1,000			84.8	429.5	3,139	15,906
32,800			94.5	410.1				
		1,000			93.0	414.6	3,443	15,354
33,800			91.4	419.0				
		1,000			121.6	344.8	4,502	12,770
34,800			151.7	270.6				
		1,000			142.0	292.0	5,259	10,815
35,800			132.3	313.4				
		1,000			163.9	250.4	6,069	9,274
36,800			195.4	187.4				
		1,000			208.6	166.0	7,726	6,148
37,800			221.8	144.6				
		1,480			220.8	146.2	12,100	8,014
39,280	PP#3 FOREBAY		219.7	147.8				
					<b>REACH 3 SUBTOTAL</b>		68,073	149,708
39,360	PP#3 AFTER BAY		-	906.2				
		1,240			-	844.0	-	38,759
40,600			-	781.7				
		1,000			94.7	489.8	3,507	18,139
41,600			189.4	197.8				
		1,000			111.9	407.3	4,144	15,083
42,600			34.4	616.7				
		1,000			65.3	511.2	2,417	18,933
43,600			96.1	405.7				
		1,000			117.7	351.7	4,359	13,024
44,600			139.3	297.6				
		1,800			320.0	148.8	21,333	9,920
46,400			528.7	-				
					<b>REACH 4 SUBTOTAL</b>		35,761	113,859
					<b>TOTALS</b>		244,227	716,381


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**IRVINE RANCH / ROSEDALE RIO BRAVO WATER STORAGE DISTRICT  
KERN FAN GROUNDWATER STORAGE PROJECT - SUBGRADE PREPARATION  
EARTHWORK VOLUME CALCULATIONS**

STATION	DESC	DIST	END AREA		AVG END AREA		VOLUME	
			CUT (ft2)	FILL (ft2)	CUT (ft2)	FILL (ft2)	CUT (yd3)	FILL (yd3)
-	BEGIN CANAL		144.8	144.8				
		604			72.4	72.4	1,620	1,620
604			-	-				
		600			112.9	112.9	2,509	2,509
1,204			225.8	225.8				
		600			223.6	223.6	4,969	4,969
1,804			221.4	221.4				
		1,000			220.2	220.2	8,156	8,156
2,804			219.0	219.0				
		1,000			220.2	220.2	8,156	8,156
3,804			221.4	221.4				
		1,000			221.7	221.7	8,211	8,211
4,804			222.0	222.0				
		1,000			222.9	222.9	8,256	8,256
5,804			223.8	223.8				
		1,000			221.1	221.1	8,189	8,189
6,804			218.4	218.4				
		1,000			219.3	219.3	8,122	8,122
7,804			220.2	220.2				
		776			110.1	110.1	3,164	3,164
8,580	BEGIN SIPHON		-	-				
8,900	END SIPHON		110.1	110.1				
		1,055			55.1	55.1	2,151	2,151
9,955			-	-				
		1,020			56.2	56.2	2,123	2,123
10,975			112.4	112.4				
		1,000			108.9	108.9	4,033	4,033
11,975			105.4	105.4				
		1,035			52.7	52.7	2,020	2,020
13,010	BEGIN SIPHON		-	-				
13,335	END SIPHON		107.2	107.2				
		525			107.2	107.2	2,084	2,084
13,860	BEGIN SIPHON		107.2	107.2				
14,185	END SIPHON		-	-				
		75			-	-	-	-
14,260	PP#1 FOREBAY		-	-				
					<b>REACH 1 SUBTOTAL</b>		73,763	73,763
14,340	PP#1 AFTERBAY		219.6	219.6				
		1,000			184.8	184.8	6,844	6,844
15,340			150.0	150.0				
		1,000			128.5	128.5	4,759	4,759
16,340			107.0	107.0				
		1,000			163.0	163.0	6,035	6,035
17,340			218.9	218.9				
		1,000			221.8	221.8	8,213	8,213
18,340			224.6	224.6				
		1,000			256.0	256.0	9,481	9,481
19,340			287.4	287.4				
		1,000			226.3	226.3	8,381	8,381
20,340			165.2	165.2				
		1,430			157.6	157.6	8,347	8,347
21,770	BEGIN SIPHON		150.0	150.0				

STATION	DESC	DIST	END AREA		AVG END AREA		VOLUME	
			CUT (ft2)	FILL (ft2)	CUT (ft2)	FILL (ft2)	CUT (yd3)	FILL (yd3)
22,190	END SIPHON		149.0	149.0				
		1,040			74.5	74.5	2,870	2,870
23,230		1,000	-	-				
24,230		1,040	-	-				
25,270	BEGIN SIPHON		-	-				
25,690	END SIPHON		-	-				
		1,030						
26,720	PP#2 FOREBAY		-	-				
					<b>REACH 2 SUBTOTAL</b>		54,931	54,931
26,700	PP#2 AFTERBAY		187.0	187.0				
		1,100			180.4	180.4	7,350	7,350
27,800		1,000	173.8	173.8				
		1,000			143.5	143.5	5,315	5,315
28,800		1,000	113.2	113.2				
		1,000			56.6	56.6	2,096	2,096
29,800		1,000	-	-				
		1,000			81.0	81.0	3,000	3,000
30,800		1,000	162.0	162.0				
		1,000			161.7	161.7	5,989	5,989
31,800		1,000	161.4	161.4				
		1,000			156.0	156.0	5,776	5,776
32,800		1,000	150.5	150.5				
		1,000			151.1	151.1	5,594	5,594
33,800		1,000	151.6	151.6				
		1,000			142.1	142.1	5,263	5,263
34,800		1,000	132.6	132.6				
		1,000			135.5	135.5	5,019	5,019
35,800		1,000	138.4	138.4				
		1,000			129.5	129.5	4,796	4,796
36,800		1,000	120.6	120.6				
		1,000			112.2	112.2	4,156	4,156
37,800		1,480	103.8	103.8				
		1,480			109.1	109.1	5,978	5,978
39,280	PP#3 FOREBAY		114.3	114.3				
					<b>REACH 3 SUBTOTAL</b>		60,331	60,331
39,360	PP#3 AFTER BAY		221.4	221.4				
		1,240			218.7	218.7	10,042	10,042
40,600		1,000	215.9	215.9				
		1,000			169.1	169.1	6,261	6,261
41,600		1,000	122.2	122.2				
		1,000			141.7	141.7	5,248	5,248
42,600		1,000	161.2	161.2				
		1,000			155.6	155.6	5,763	5,763
43,600		1,000	150.0	150.0				
		1,000			143.2	143.2	5,304	5,304
44,600		1,800	136.4	136.4				
		1,800			68.2	68.2	4,547	4,547
46,400			-	-				
					<b>REACH 4 SUBTOTAL</b>		37,164	37,164
					<b>TOTALS</b>		226,189	226,189


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