



# Evaluation of the Costs and Benefits of Implementing Ocean Water Desalination as a Local Drinking Water Supply

Chapter III - Appendix D  
OWDP Power  
Consumption Calculation  
West Basin Municipal  
Water District

Final Report  
July 30, 2021

Submitted by



in association with  
 RAFTELIS





# Appendix D – OWDP Power Consumption Calculation

Appendix D	By	Tom Joseph
	Date	5/20/2019
	Rev.	A

MWh/yr	kWh/yr	kWh/day	kWh	kw's
105,000	105,000,000	287,671	11,986	12,500

Breakdown Real Time Energy Costs	
Sum of kWh Cost during HOT SUMMER WEEKDAY (>=91)	\$ 1,341,702.23
Sum of kWh Cost during MODERATE SUMMER WEEKDAY (81-90)	\$ 973,914.04
Sum of kWh Cost during MILD SUMMER WEEKDAY (<=80)	\$ 1,646,914.47
Sum of kWh Cost during WINTER WEEKDAY (>90)	\$ -
Sum of kWh Cost during WINTER WEEKDAY (<=90)	\$ 857,897.26
Sum of kWh Cost during HIGH COST WEEKEND (>=78)	\$ 830,284.38
Sum of kWh Cost during LOW COST WEEKEND (<78)	\$ 851,821.54

Annual Delivery Service Costs	
Energy Charge (\$/kWh/Meter/Month)	\$ 1,698,900.00
Customer Charge (\$/month)	\$ 18,205.80
Facilities Related Demand Charge (\$/kW)	\$ 895,500.00
Time Related Summer On-Peak (\$/kW)	\$ 1,023,750.00
Time related Winter Mid-Peak (\$/kW)	\$ -
Power Factor Adjustment (\$/KVAR)	\$ 26,623.41

	Annual \$/kWh All Inclusive, 2019 dollars in 2019	Forecast years	Average Growth %	Future (2023) - Annual \$/kWh All Inclusive.	
<b>Total Annual Cost of Energy</b>	<b>\$ 10,165,513.13</b>	<b>\$ 0.097</b>	<b>4</b>	<b>4%</b>	<b>\$ 0.12</b>

Days per month in Los Angeles of at least 70, 80 or 90 °F				Summer						Winter				Weekend				
Month	70 °F	80 °F	90 °F	Days per Month or Year	Mild Summer Weekday (below 80 deg. F)		Moderate Summer Weekday (between 81-90 deg. F)		Hot Summer Weekday (>= 91 deg. F)		Above 90 deg. F		Below 90 deg. F		High Cost Weekend (Above 78 deg. F)		Low Cost Weekend (Below 78 deg. F)	
	21 °C	27 °C	32 °C		Total Days	Weekday Days	Total Days	Weekday Days	Total Days	Weekday Days	Total Days	Weekday Days	Total Days	Weekday Days	Total days	Weekend days	Total Days	Weekends
January	12	3	0	31	N/A	N/A	N/A	N/A	N/A	N/A	0	0	31	22	3	1	28	8
February	11	3	0	28	N/A	N/A	N/A	N/A	N/A	N/A	0	0	28	20	3	1	25	7
March	14	3	0	31	28	20	3	2	0	0	N/A	N/A	N/A	N/A	3	1	28	8
April	17	6	1	30	24	17	5	4	1	1	N/A	N/A	N/A	N/A	6	2	24	7
May	24	5	1	31	26	19	4	3	1	1	N/A	N/A	N/A	N/A	5	1	26	7
June	28	9	2	30	21	15	7	5	2	1	N/A	N/A	N/A	N/A	9	3	21	6
July	31	22	3	31	9	7	19	14	3	2	N/A	N/A	N/A	N/A	22	7	9	3
August	31	24	5	31	7	5	19	14	5	4	N/A	N/A	N/A	N/A	24	7	7	2
September	30	19	5	30	8	14	10	5	4	4	N/A	N/A	N/A	N/A	19	5	11	3
October	28	11	3	31	20	14	8	6	3	2	N/A	N/A	N/A	N/A	11	3	20	6
November	18	5	1	30	25	18	4	3	1	1	N/A	N/A	N/A	N/A	5	1	25	7
December	11	2	0	31	N/A	N/A	N/A	N/A	N/A	N/A	0	0	31	22	2	1	29	8
Year	252	113	21	365	171	122	83	59	21	15	21	0	90	64	112	32	253	72

TOU-8-D-RTP (Above 50 kV) Energy Charge Calculation											
Month	Days in Month	Average kWh used per month	Summer				Winter				Energy Charge's per Month
			On-Peak	Mid Peak	Off-Peak	Mid-Peak	Off-Peak	Super Off-Peak			
January	31	8,917,808	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 144,290.14	
February	28	8,054,795	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 130,326.58	
March	31	8,917,808	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 144,290.14	
April	30	8,630,137	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 139,635.62	
May	31	8,917,808	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 144,290.14	
June	30	8,630,137	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 139,635.62	
July	31	8,917,808	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 144,290.14	
August	31	8,917,808	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 144,290.14	
September	30	8,630,137	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 139,635.62	
October	31	8,917,808	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 144,290.14	
November	30	8,630,137	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 139,635.62	
December	31	8,917,808	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	0.01618	\$ 144,290.14	
<b>Total</b>										<b>\$ 1,698,900.00</b>	

TOU-8-D-RTP (Above 50 kV)  
GENERAL SERVICE - LARGE  
REAL TIME PRICING  
Hourly UG Rate – Above 50 kV  
TYPE OF DAY (WEEKDAY OR WEEKEND) AND APPLICABLE TEMPERATURE  
HOURLY URG RATE (\$/kWh)

HOURLY ENDING @ PST	Tariff Rate HOT SUMMER WEEKDAY (>=91)	Tariff Rate MODERATE SUMMER WEEKDAY (81-90)	Tariff Rate MILD SUMMER WEEKDAY (<=80)	Tariff Rate WINTER WEEKDAY (>90)	Tariff Rate WINTER WEEKDAY (<=90)	Tariff Rate HIGH COST WEEKEND (>=78)	Tariff Rate LOW COST WEEKEND (<78)	# of days HOT SUMMER WEEKDAY (>=91)	# of days MODERATE SUMMER WEEKDAY (81-90)	# of days MILD SUMMER WEEKDAY (BELOW 80)	# of days WINTER WEEKDAY (>90)	# of days WINTER WEEKDAY (<=90)	# of days HIGH COST WEEKEND (>=78)	# of days LOW COST WEEKEND (<78)	kWh Cost during HOT SUMMER WEEKDAY (>=91)	kWh Cost during MODERATE SUMMER WEEKDAY (81-90)	kWh Cost during MILD SUMMER WEEKDAY (<=80)	kWh Cost during WINTER WEEKDAY (>90)	kWh Cost during WINTER WEEKDAY (<=90)	kWh Cost during HIGH COST WEEKEND (>=78)	kWh Cost during LOW COST WEEKEND (<78)
1 a.m.	0.0451	0.04537	0.0437	0.04754	0.04479	0.04516	0.04525	15	59	122	0	64	32	\$ 8,108.73	\$ 32,240.67	\$ 63,978.60	\$ -	\$ 34,512.84	\$ 17,321.64	\$ 39,206.34	
2 a.m.	0.04517	0.04527	0.0437	0.04713	0.04459	0.04525	0.04522	15	59	122	0	64	32	\$ 8,121.32	\$ 32,169.61	\$ 64,007.88	\$ -	\$ 34,358.73	\$ 17,394.52	\$ 39,180.34	
3 a.m.	0.04522	0.04553	0.04417	0.04685	0.0449	0.0455	0.04542	15	59	122	0	64	32	\$ 8,130.31	\$ 32,354.37	\$ 64,666.70	\$ -	\$ 34,597.60	\$ 17,452.05	\$ 39,353.63	
4 a.m.	0.04642	0.04678	0.04511	0.04749	0.04546	0.04593	0.04574	15	59	122	0	64	32	\$ 8,346.06	\$ 33,242.64	\$ 66,042.89	\$ -	\$ 35,029.11	\$ 17,616.99	\$ 39,630.89	
5 a.m.	0.04933	0.0498	0.04765	0.04868	0.0473	0.04692	0.04651	15	59	122	0	64	32	\$ 8,869.26	\$ 35,388.70	\$ 69,761.56	\$ -	\$ 36,446.92	\$ 17,996.71	\$ 40,298.05	
6 a.m.	0.05351	0.0528	0.04763	0.05247	0.05105	0.04739	0.04666	15	59	122	0	64	32	\$ 9,620.80	\$ 37,520.55	\$ 69,732.28	\$ -	\$ 39,336.47	\$ 18,176.99	\$ 40,428.01	
7 a.m.	0.04625	0.04603	0.04305	0.05743	0.05223	0.04517	0.04349	15	59	122	0	64	32	\$ 8,315.50	\$ 32,709.67	\$ 63,026.97	\$ -	\$ 40,245.72	\$ 17,325.48	\$ 37,681.40	
8 a.m.	0.04282	0.04308	0.03942	0.05619	0.04742	0.03991	0.03943	15	59	122	0	64	32	\$ 7,698.80	\$ 30,613.36	\$ 57,712.50	\$ -	\$ 36,539.38	\$ 14,540.82	\$ 29,718.84	
9 a.m.	0.04297	0.04311	0.03655	0.04703	0.04052	0.04253	0.04253	15	59	122	0	64	32	\$ 7,294.26	\$ 29,044.50	\$ 55,525.84	\$ -	\$ 31,999.66	\$ 15,792.23	\$ 21,775.60	
10 a.m.	0.0392	0.04086	0.03584	0.04476	0.03625	0.01782	0.01704	15	59	122	0	64	32	\$ 7,047.95	\$ 29,035.79	\$ 52,471.23	\$ -	\$ 27,932.36	\$ 6,835.07	\$ 14,764.11	
11 a.m.	0.03938	0.04158	0.03686	0.04329	0.03258	0.01348	0.01348	15	59	122	0	64	32	\$ 7,080.31	\$ 29,547.43	\$ 53,964.55	\$ -	\$ 25,104.45	\$ 5,626.85	\$ 11,679.59	
12 p.m.	0.04008	0.04248	0.03701	0.04194	0.02964	0.01367	0.01471	15	59	122	0	64	32	\$ 7,206.16	\$ 30,186.99	\$ 54,184.16	\$ -	\$ 22,839.04	\$ 5,243.29	\$ 12,745.31	
1 p.m.	0.04245	0.04434	0.03942	0.04123	0.03025	0.01724	0.01724	15	59	122	0	64	32	\$ 7,632.28	\$ 31,508.73	\$ 57,712.50	\$ -	\$ 23,309.08	\$ 5,787.95	\$ 14,937.40	
2 p.m.	0.04953	0.04953	0.04366	0.04141	0.0335	0.02093	0.02781	15	59	122	0	64	32	\$ 8,905.22	\$ 35,196.83	\$ 63,920.03	\$ -	\$ 25,813.36	\$ 8,027.95	\$ 24,095.65	
3 p.m.	0.05085	0.05077	0.04355	0.04194	0.03889	0.03746	0.03746	15	59	122	0	64	32	\$ 9,142.55	\$ 36,078.00	\$ 63,758.99	\$ -	\$ 29,966.61	\$ 11,104.11	\$ 32,456.78	
4 p.m.	0.05298	0.05201	0.04475	0.0406	0.04274	0.04124	0.04299	15	59	122	0	64	32	\$ 9,235.51	\$ 35,668.92	\$ 65,515.84	\$ -	\$ 32,933.22	\$ 15,818.08	\$ 37,245.18	
5 p.m.	0.07927	0.05469	0.04773	0.05658	0.04923	0.04737	0.04895	15	59	122	0	64	32	\$ 14,252.31	\$ 38,863.61	\$ 69,878.68	\$ -	\$ 37,934.08	\$ 18,169.32	\$ 42,412.16	
6 p.m.	2.91729	0.08983	0.05483	0.07734	0.45347	0.0583	0.0583	15	59	122	0	64	32	\$ 54,512.76	\$ 63,834.67	\$ 80,273.77	\$ -	\$ 47,912.67	\$ 173,933.70	\$ 50,513.36	
7 p.m.	2.81002	0.15791	0.0694	0.07762	0.06923	0.04657	0.06404	15	59	122	0	64	32	\$ 505,226.20	\$ 112,213.44	\$ 101,604.45	\$ -	\$ 53,345.03	\$ 324,711.78	\$ 55,486.71	
8 p.m.	0.70376	0.11437	0.06921	0.06391	0.06207	0.07399	0.06047	15	59	122	0	64	32	\$ 126,532.19	\$ 81,273.20	\$ 101,326.28	\$ -	\$ 47,827.91	\$ 28,379.73	\$ 52,393.53	
9 p.m.	0.07313	0.06238	0.05193	0.05923	0.05701	0.05681	0.05544	15	59	122	0	64	32	\$ 13,148.37	\$ 44,328.25	\$ 90,668.07	\$ -	\$ 43,928.94	\$ 21,790.14	\$ 48,035.34	
10 p.m.	0.0532	0.05751	0.05734	0.05829	0.05475	0.05295	0.05298	15	59	122	0	64	32	\$ 9,946.23	\$ 40,667.55	\$ 83,948.12	\$ -	\$ 42,187.50	\$ 20,693.15	\$ 45,903.90	
11 p.m.	0.04827	0.04935	0.04757	0.05561	0.05053	0.0489	0.04825	15	59	122	0	64	32	\$ 8,678.68	\$ 35,668.92	\$ 65,644.43	\$ -	\$ 38,758.56	\$ 18,756.16	\$ 41,805.65	
12 a.m.	0.0465	0.04704	0.0448	0.05056	0.04638	0.04638	0.04625	15	59	122	0	64	32	\$ 8,360.45	\$ 33,427.40	\$ 65,589.04	\$ -	\$ 35,738.01	\$ 17,789.59	\$ 40,072.77	
Sum														\$ 1,341,702.23	\$ 973,914.04	\$ 1,646,914.47	\$ -	\$ 857,897.26	\$ 830,284.38	\$ 851,821.54	





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# about GHD

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