

BOYCE HYDRO POWER LLC

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March 17, 2015

ORIGINAL

The Secretary
 Federal Energy Regulatory Commission
 888 First Street NE
 Washington, D.C. 20426

FILED
 SECRETARY OF THE
 COMMISSION
 2015 MAR 20 A 11: 25
 FEDERAL ENERGY
 REGULATORY COMMISSION

RE: Request for Water Quality Monitoring License Amendment for
 Article 407 of Sanford P-2785, and Article 402 of Edenville P-10808,
 Secord P-10809, Smallwood P-10810

Dear Secretary:

On January 30, 2015 Boyce Hydro Power LLC (Boyce) filed an Application for Amendment to the Projects and License Articles referenced above dealing with Water Quality Monitoring and maintenance. The Amendment Application was based on the past two years of water quality monitoring at the four sites. The license articles require that certain temperature and dissolved oxygen limits be maintained downstream of the four dams. The past two years of monitoring has shown the varying temperature requirements are met at all times but the dissolved oxygen minimum limit of 5 mg/l is not. The Application for Amendment has asked for relief from this requirement. The supporting documentation previously submitted with the Application for Amendment contains our conclusions about this condition and why we believe it is not the responsibility of the licensee to attempt a cure. On February 26, 2015 the Michigan Department of Natural Resources (MDNR) filed a letter with the Commission objecting to the Amendment Application. We are now writing to provide additional information and arguments in support of the Amendment Application.

Sanford P-2785, Article 407

In addition to the Dissolved Oxygen (DO) requirement at Sanford, the license requires the project to pass a minimum flow of 210 cfs at all times, except March 15 to April 30 when it is 650 cfs. With the contribution of this bypass flow the DO requirement at Sanford is satisfied the majority of the time. However, even this volume of flow does not provide 5 mg/l in all instances.

Edenville P-10808, Smallwood P-10810, and Secord P-10809, Article 402

Attached hereto are three additional spreadsheets, one for each project, showing the amount of time the DO in the tailraces was below 5 mg/l over the past two years. Also enclosed please find a disk of electronic data containing all test results for 2013 and 2014. As can be seen from the spreadsheet data, the DO deficiency extends through the warm months from mid-June to mid-September. The MDNR would require Boyce to spill water at each plant whenever the DO concentrations dropped below 5 mg/l. This would require spilling water on the days and hours indicated on the spreadsheets under the columns titled "hours DO<5" (mg/l). As can be seen, this is almost every hour during the warm months when the turbines are not running. In fact, in the case of Smallwood there were 59 days where the DO level was below 5 mg/l while the turbine was running. This also happened 3 or 4 times at Secord and Edenville.

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The spreadsheets were developed in an attempt to determine the cost to Boyce if spill were initiated whenever the DO level dropped below 5 mg/l in the tailraces. From an operational concern we would monitor the DO conditions beginning in June until the DO dropped below 5 mg/l. We would then open a gate each day when the turbine was shut down and leave the gate open until the next morning when the turbine was started again. It would be an operational nightmare to try to have a SCADA system alert the operator when it was time to open gates. This could result in multiple times during the evening and night throughout the week and weekend when not running.

To follow a procedure of constant flow when not running turbines, the first concern would be how much water would have to be discharged to bring the DO level above 5 mg/l. In making these determinations it must be kept in mind the Smallwood situation of low DO levels regardless of turbine flow and the fact that the Sanford discharge of 200+cfs does not satisfy the 5 mg/l in every instance. For Secord we have projected 20 cfs. The limited test conducted in 2013 showed that 15 cfs worked. However, this was not the worst time of the summer for DO levels so we have more conservatively selecting 20 cfs. In the case of Smallwood it is impossible to determine how much gate spill would be needed when 700 cfs turbine discharge is at times not adequate. Based on results at Sanford we have selected 200 cfs for the deficient times. At Edenville the 2013 gate test showed that DO was above 5 mg/l at a flow of 15 cfs. However, the DO levels before and after this test were all above 5 mg/l so the gate spill was inconclusive. Therefore, given the size and depth of the Edenville reservoir and the conditions at the upstream and downstream plants we have used 50 cfs.

The result of this analysis shows a loss of revenue of \$109,200 for the four summer months. In addition, to accomplish this change in operation we will incur overtime hours to operate the gates. We normally run for eight hours each day five days a week in the summer. To operate the gates as described we would need 1.5 hours of overtime after turbine shut down to travel to each site and open gates, and the same time in the morning to closed them before startup. This overtime would amount to 3 hrs/day times 5 days/week times 13 weeks equals 195 hours. At an overtime rate of \$38/hour this adds \$7,400 for labor and results in a total loss of \$116,600 per year.

Because the root cause of the DO deficiencies is beyond Boyce's control and the degradation so pervasive, and because Boyce is facing a tremendous expense in connection with meeting the Commission's dam safety standards at Edenville over the next few years, requiring Boyce to meet the water quality standards at all times is not a reasonable and prudent measure. Boyce therefore renews its request that the Commission grant its application for amendment of the license

Sincerely,
Boyce Hydro Power, LLC



Frank O. Christie, P.E.
General Manager

cc: Lee W. Mueller, Co-Member Manager
Stephen B. Hultberg, Co-Member Manager
Michigan Department of Natural Resources
US Fish and Wildlife Service

Day	June					July					August					September				
	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5
1	24	0				8	16	3	0	3	8	16	5	0	5	8	24	8	0	8
2	24	0				8	16	1	0	1	8	16	7	1	6	8	24	8	0	8
3	24	0				7.5	16.5	0	0	0		24	10	0	10	8	16	0	0	0
4	22	2					24	2	0	2		24				8	16	6	0	6
5	14.5	9.5				10.75	13.25	1	0	1	8	16				8	16	0	0	0
6	14.5	9.5					24	7	0	7	8	16				8	16	0	0	0
7	11	13					24	11	0	11	8	16	1	1	1	8	24	2	0	2
8	7.75	16.25				8	16	7	1	6	8	16	4	4	4	8	24	0	0	0
9	5.5	18.5				8	16	7	0	7	8	16	0	0	0	8	16	3	0	3
10	15	9				8	16	12	7	5		24	1	1	8	16	3	2	1	1
11	11.5	12.5				7.5	16.5		7		8	24				8	16	4	0	4
12	8	16				8	16				8	16				8	16			
13	12	12				2.75	21.25				8	16				8	16			
14	15	9					24	4	0	4		16.5				8	24			
15	7	17				4.5	19.5	8	0	8		21				8	24			
16	5.5	18.5				3	21	11	3	8	6.75	17.25				8	16			
17	11.75	12.25				5.5	18.5	10	2	8		24				8	16			
18	14.5	9.5				5.75	18.25	14	7	7		24				8	16			
19	8.5	15.5				8	16	24	16	8	8	16				8	16			
20	8	16					24	11	0	11	5	19				8	16			
21	8	16					24	10	0	10	8	16				8	24			
22	4	20				8	16	8	3	5	7.5	16.5				8	24			
23		24				8	16	11	4	7	6	18				8	16			
24	8	16				8	16	0	0	0		24				8	16			
25	8	16				8	16	3	0	3		24				8	16			
26	7.75	16.25				8	16	2	0	2	8	16				8	16			
27	10	14				7.5	24	8	0	8	12	12				8	16			
28	17	7					24	10	0	10	11	13				8	24			
29	19.25	4.75				8	16.5	9	2	7	7.5	16.5				8	24			
30	10	14				8	16	0	0	0	6.25	17.75				8	16			
31						8	16	3	0	3						8	16			

Edenville Total Lost Revenue \$10,574

Gate spill @50 cfs	Cu. Ft. lost, gate = 50 cfs	8	31	8100000	27360000	152	40	95	7200000	17100000	4	43
Equivalent hrs run time @ 880 cfs		0.46	1.77	2.56	8.66	2.28	5.41	0.23	623.56	14809.53	0.23	2.45
KWhs lost		1247.12	4832.58	7015.04	23695.25	436.49	833.78	623.56	6703.26	43.65	377.39	
Revenue lost		87.30	272.07	491.05	1334.04							

Turbine @ 83% gate = 880cfs
 880 cfs = 3168000 cfh
 880 cfs = 2735 kW

hours run	hours off	hours DO<5	June		July		August		September							
			On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5		
15	24	9	0	4	10.25	13.75	14	8	16	9	2	7	24	12	0	12
8	16	16	0	1	8	16	5	0	24	9	0	9	16	10	2	9
8	16	16	0	6	8	16	5	0	24	11	0	11	16	8	1	8
8	16	16	0	1	4	24	0	0	16	12	4	8	16	7	0	7
8	16	16	0	3	8	20	0	0	19	11	3	8	16.5	7	1	7
8	24	24	0	4	8	24	0	0	24	16	8	8	24	10	0	10
8	16	16	0	4	8	16	0	0	16	10	2	8	24	8	0	8
8	16	16	0	4	8	16	0	0	22	12	6	12	16	6	0	6
8	16	16	0	1	8	16	0	0	24	11	0	11	16	1	0	1
7	17	17	0	1	8	16	0	0	16	20	12	8	16	3	0	3
4	20	20	0	6	11	24	0	0	16	16	9	7	17.25	2	0	2
2	22	22	0	1	12	13	0	0	17	14	6	8	24	2	0	2
8	24	24	0	4	13	11	0	0	16	10	2	8	21.5	4	0	4
8	16	16	0	0	11	13	0	0	18.25	9	1	8	16			
8	16	16	1	3	12.5	11.5	4	4	23	11	0	11	16			
8	16	16	0	0	11	13	7	7	24	11	0	11	16			
8	16	16	0	0	6	18	9	1	16	10	2	8	16			
8	16	16	0	0	8	24	8	0	16	9	1	8	16			
8	24	24	0	0	8	16	10	1	16	11	3	8	24			
2	22	22	0	1	8	16	12	4	16	9	2	7	24			
8	16	16	0	4	8	16	16	8	16	9	1	8	16			
8	16	16	0	4	8	16	10	2	24	9	0	9	16			
8	16	16	0	5	8	16	9	2	24	10	0	10	16			
8	16	16	0	5	8	16	13	5	16	2	1	1	16			
11	13	13	0	0	8	24	12	0	16	17	9	8	24			
8	16	16	0	3	10	14	12	1	16	8	1	7	24			
2	22	22	0	4	8	16	9	2	17	7	0	7	24			
2	22	22	0	13	8	16	9	2	24	13	0	13	16			
12	12	12	0	7	8	16	10	2	19	13	0	13	16			

20150320-0023 FERC PDF (Unofficial) 03/20/2015

2	55	360000	9900000	39	220	75	261	4	78
0.11	3.13	7020000	39600000	2.22	12.54	4.27	14.88	0.23	4.45
311.78	8573.94	6079.70	34295.76	425.58	1930.85	11691.74	40687.24	623.56	12159.40
21.82	482.71					818.42	2290.69	43.65	684.57

SMALLWOOD

2013

Day	June					July					August					September				
	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5
1	24	0				7.75	16.25	24	16	8	24	16	16	8	8	24	24	24	0	24
2	22	2				5	19	24	16	8	20.5	11	6	5	24	24	19	0	19	
3	24	0				4.25	19.75	24	16	8	24	16	0	16	18	9	4	4	5	
4	11.5	12.5					24	24	0	24	24	7	0	7	24	24	24	16	8	
5	13.5	10.5				9.5	14.5	20	12	8	16.5	13	5	8	19	17	17	9	8	
6	12.25	11.75					24	24	0	24	19.5	20	12	8	20	16	16	10	6	
7	11.5	12.5					24	24	0	24	16.5	10	2	8	24	24	24	0	24	
8	9.25	14.75				5.75	18.25	24	16	8	24	10	16	8	24	24	24	0	24	
9	4	20				6.75	17.25	23	15	8	16.5	14	6	8	18.75	18	18	10	8	
10	12.75	11.25				3.75	20.25	23	5	8	24	24	0	24	19.5	19	19	11	8	
11	10	14				5	19	23	15	8	24	24	0	24	21.25	22	22	14	8	
12	7	17				3.25	20.75	23	15	8	19	22	14	8	24	24	23	16	7	
13	12	12	1	1	0		24	24	0	24	19.5	8	1	7	19.5	8	8	7	1	
14	14.5	9.5	0	0	0		24	24	0	24	21	5	5	0	24	24	23	0	23	
15	6.75	17.25	3	3	3	4.25	19.75	24	16	8	24	17	13	4	24	24	21	0	21	
16	5	19	3	0	3		24	24	16	8	19.5	19	11	8	19.5	8	8	2	6	
17	11.5	12.5	7	1	6		24	24	16	8	24	24	0	24	21	4	4	1	3	
18	14.5	9.5	8	1	7		24	24	16	8	24	24	0	24	20.75	10	10	4	6	
19	3.25	20.75	12	5	7	7.25	16.75	24	16	8	20	20	12	8	20.25	10	10	8	2	
20	7.25	16.75	15	6	9		24	24	0	24	24	24	16	8	21.5	22	22	14	8	
21	7.75	16.25	15	7	8		24	24	0	24	19.5	19	11	8	24	24	15	0	15	
22	5.5	18.5	16	0	16		16	24	16	8	24	24	16	8	24	24	15	0	15	
23		24	24	0	24		17.5	12	5	7	19.5	20	12	8	20	24	24	0	0	
24	7.25	16.75	16	9	7		24	8	7	1	24	24	0	24	19.75	0	0	0	0	
25	5.75	18.25	17	9	8		24	24	16	8	24	24	0	24	24	5	5	4	1	
26	7.5	16.5	20	12	8		17.5	24	16	8	18	22	14	8	19	3	3	2	1	
27	4	20	24	16	8	6.5	24	24	0	24	19.5	22	16	8	20	1	1	0	1	
28	7.5	16.5	24	16	8		24	24	0	24	18.25	22	14	8	24	24	24	0	0	
29	5	19	24	0	24		16.5	12	5	7	19.5	24	16	8	24	24	24	0	0	
30	6	18	24	0	24		17	5	4	1	18	24	16	8	24	24	24	0	0	
31						3	21	20	12	8	20	24	0	24						

Gate spill @200 cfs Total hours 83 170
 Equivalent hrs run time @ 690 cfs 59760000 122400000
 Cu. Ft. lost, gate = 200 cfs 24.06 49.28
 KWh/hrs lost 29350.72 60115.94
 Revenue lost 2054.55 3384.53

Smallwood Total Lost Revenue \$87,629

Turbine @ 85% gate = 690cfs
 690 cfs = 2484000 cfh
 880 cfs = 1220 kW

SMALLWOOD

2014

June	hours run	hours off	hours DO<5	On peak		Off peak		July	hours run	hours off	hours DO<5	On peak		Off peak		August	hours run	hours off	hours DO<5	On peak		Off peak		September	hours run	hours off	hours DO<5	On peak		Off peak					
				hrs DO<5	hrs DO<5	hrs DO<5	hrs DO<5					hrs DO<5	hrs DO<5	hrs DO<5	hrs DO<5					hrs DO<5	hrs DO<5	hrs DO<5	hrs DO<5					hrs DO<5	hrs DO<5	hrs DO<5	hrs DO<5				
13	24	11	0	0	0	0	0	12	12	16	8	8	8	8	4.5	19.5	21	13	8	8	8	8	4	24	24	24	0	0	24	24					
7	17	17	0	0	0	0	0	5	19	21	13	8	8	8	24	24	24	0	0	24	24	24	4	20	14	14	6	8	8	8					
7	17	17	0	0	0	0	0	5	19	20	12	8	8	8	24	24	24	0	0	24	24	24	6	18	18	18	10	8	8	8					
5	19	19	0	0	0	0	0	5	24	24	0	0	0	0	16	19	19	11	11	8	8	8	4.75	19.25	16	16	8	8	8	8					
5	19	19	0	0	0	0	0	3.5	24	24	0	0	0	0	21	21	24	11	11	8	8	7	17	17	17	9	9	8	8	8					
6	18	18	0	0	0	0	0	5.5	18.5	19	11	11	8	8	20.25	24	24	11	11	8	8	5.25	18.75	18	17.5	17	9	9	8	8					
6	18	18	0	0	0	0	0	5.5	18.5	20	12	8	8	8	24	24	24	0	0	24	24	6	18	18	18	10	10	8	8	8	8				
7	17	17	0	0	0	0	0	5.5	20.5	21	14	14	7	7	16	16	16	8	8	8	8	6.75	17.25	16	17.25	16	16	10	9	7	7				
3	21	21	0	0	0	0	0	5.5	18.5	21	0	0	24	24	18	18	13	6	6	7	7	6	18	18	18	18	10	8	8	8	8				
4	20	20	0	0	0	0	0	5.5	24	24	0	0	24	24	19	19	5	5	5	5	5	6	24	24	24	16	16	16	16	16	16				
4	24	24	0	0	0	0	0	7.5	16.5	22	14	8	8	8	18	18	5	3	3	2	2	2	24	24	24	19	19	19	19	19	19	19			
6	18	18	0	0	0	0	0	12	12	12	4	4	7	7	21	21	14	8	8	14	14	8	8	16	16	13	13	5	5	5	5	5			
8	16	16	0	0	0	0	0	10.5	13.5	22	14	8	8	8	24	24	24	0	0	24	24	8	8	16	16	10	10	2	2	2	2	2	2		
4	20	20	0	0	0	0	0	10.75	13.25	24	16	16	8	8	21	21	23	15	15	8	8	2	22	22	22	10	10	4	4	4	4	4	4		
6	18	18	0	0	0	0	0	5.5	18.5	24	0	0	24	24	16	16	20	11	11	8	8	8	16	16	16	10	10	2	2	2	2	2	2	2	
8	16	16	0	0	0	0	0	4	24	24	16	16	8	8	21.5	21.5	15	7	7	8	8	8	24	24	24	9	9	9	9	9	9	9	9		
8	24	24	0	0	0	0	0	8	20	24	16	16	8	8	17	17	17	9	9	8	8	8	16	16	16	2	2	2	2	2	2	2	2	2	
8	16	16	0	0	0	0	0	8	16	24	16	16	8	8	17	17	17	8	8	8	8	8	18.75	18.75	10	10	1	1	1	1	1	1	1	1	
6	18	18	0	0	0	0	0	7	17	24	16	16	8	8	24	24	24	0	0	24	24	6.25	17.75	17.75	15	15	6	6	6	6	6	6	6	6	
6	18	18	0	0	0	0	0	3	21	24	16	16	8	8	18.75	18.75	18	10	10	8	8	5.5	18.5	18.5	12	12	5	5	5	5	5	5	5	5	
8	16	16	0	0	0	0	0	8.3	24	24	0	0	24	24	17	17	18	10	10	8	8	5.75	18.25	18.25	12	12	5	5	5	5	5	5	5	5	
2	22	22	0	0	0	0	0	7	19.7	24	16	16	8	8	19	19	19	11	11	8	8	7	24	24	10	10	3	3	3	3	3	3	3	3	3
11	13	13	0	0	0	0	0	4.5	19.5	24	16	16	8	8	20	20	20	0	0	24	24	4.5	19.5	19.5	11	11	3	3	3	3	3	3	3	3	3

128160000	188640000	211680000	278640000	133920000	292320000	98640000	215280000
178	262	294	387	186	406	137	299
51.59	75.94	85.22	112.17	53.91	117.68	39.71	86.67
62944.93	92649.28	103965.22	136852.17	65773.91	143571.01	48446.38	105733.33
4406.14	5216.15	7277.57	7704.78	4604.17	8083.05	3391.25	5952.79

SECORD

2013

Day	June					July					August					September				
	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5
1	24	0				7.75	16.25	15	7	8	24	15	8	7	24	24	24	24	0	24
2	23	1				7.75	16.25	14	6	8	20	20	12	8	24	24	13	0	13	
3	24	0				7.5	16.5	19	11	8	24	17	0	17	16.5	2	0	0	2	
4	20.5	3.5					24	24	0	24	22	16	0	16	24	24	17	9	8	
5	14.5	9.5				11	13	12	4	8	16	14	6	8	17	3	0	0	3	
6	14.5	9.5					24	24	0	24	17	15	7	8	19	14	9	9	5	
7	11	13					24	24	0	24	16.5	10	3	7	24	24	24	0	24	
8	7.5	16.5				8	16	15	7	8	18.5	8	5	3	24	17	0	0	17	
9	3.25	20.75				7.75	16.25	15	7	8	16	12	5	7	16.5	7.5	6	6	5	
10	15	9				7.5	16.5	13	5	8	24	20	0	20	17.5	6.5	8	8	8	
11	10.5	13.5				6.5	17.5	17	9	8	24	24	0	24	19.75	4.25	10	10	8	
12	8.5	15.5					24	20	12	8	16	14	6	8	24	18	11	4	7	
13	12	12					24	24	0	24	17	8	1	7	18	0	0	0	1	
14	16	8					24	24	0	24	20.5	0	0	0	24	1	0	0	0	
15	8	16					24	8	1	7	24	5	3	2	24	0	0	0	0	
16	7	17					24	11	10	1	18	9	4	5	17.5	0	0	0	0	
17	11.5	12.5					24	24	16	8	24	7	0	7	20	0	0	0	0	
18	15	9					24	24	16	8	24	13	0	13	19.5	0	0	0	0	
19	7	17					24	18	10	8	17	15	7	8	18.75	0	0	0	0	
20	8	16					24	24	0	24	24	24	0	24	19.5	4.5	4	4	0	
21	8.5	15.5					24	20	0	24	16.25	15	7	8	24	24	0	0	0	
22	6	18				4	20	20	12	8	24	20	12	8	24	24	0	0	0	
23		24				8	16	10	3	7	18.5	16	8	8	16.75	0	0	0	0	
24	8	16					24	8	7	1	24	23	0	23	18.5	0	0	0	0	
25	8	16					24	24	16	8	24	24	0	24	24	0	0	0	0	
26	7.75	16.25				8	16	17	7	10	16.5	15	7	8	16.25	7.75	0	0	0	
27	4.75	19.25					24	24	0	24	17.5	17	9	8	19	0	0	0	0	
28	8.5	15.5					24	24	0	24	18.25	16	8	8	24	24	0	0	0	
29	6	18				7.5	16.5	8	0	8	19	18	10	8	24	24	0	0	0	
30	7.25	16.75				4	20	5	0	5	17	17	9	8	24	24	0	0	0	
31							24	23	16	7	16	15	7	8	24	24	0	0	0	

Turbine @ 98% gate = 440cfs
 440 cfs = 1584000 cfh
 440 cfs = 1340 kW

Secord Total Lost Revenue \$10,988

Gate spill @20 cfs	Cu. Ft. lost, gate = 20 cfs	Total hours	On peak hrs DO<5	Off peak hrs DO<5	On peak hrs DO<5	Off peak hrs DO<5	On peak hrs DO<5	Off peak hrs DO<5	On peak hrs DO<5	Off peak hrs DO<5
3672000	9216000	51	128	182	374	144	318	50	125	
Equivalent hrs run time @ 440 cfs	2.32	6.74	13104000	26928000	10368000	22896000	3600000	9000000	2.27	6.58
KW/hrs lost	3106.36	8892.63	8.27	19.68	6.55	16.74	8770.91	22092.63	3045.45	8684.21
Revenue lost	217.45	500.66	11085.45	25983.16	775.98	1462.85	613.96	1243.82	213.18	488.92

2014

June

July

August

September

hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5	hours run	hours off	hours DO<5	On peak hrs DO<5	Off peak hrs DO<5
13	24	11	0	0	12	12	13	5	8	8	16	15	7	8	24	24	24	0	24
8	11	16	0	0	7	17	16	7	9	8	24	24	0	24	8	16	13	5	8
7	16	17	0	0	6	18	11	3	8	8	24	24	0	24	8	16	14	6	8
7	17	17	0	0	5	24	14	0	14	8	16	15	7	8	16.25	15	15	7	8
7	17	17	0	0	5	24	24	0	24	7	17	16	8	8	8	16	16	7	8
5	19	11	4	1	8	24	24	0	24	7	24	24	16	8	24	24	13	0	13
24	24	0	0	0	8	16	14	6	8	8	16	15	7	8	24	24	24	0	24
24	24	0	0	0	7.75	16.25	11	3	8	8	16	14	6	8	8	16	15	7	8
7	17	5	0	5	8	16	8	0	8	1.5	22.5	22	0	22	8	16	14	6	8
7	17	0	0	0	7	17	15	0	8	8	24	24	0	24	8	16	14	6	8
7	17	0	0	0	3.5	20.5	19	7	7	8	16	15	7	8	5.5	18.5	8	1	7
4	20	8	0	8	6	24	24	0	24	8	16	15	7	8	5	19	0	0	0
7	17	5	0	5	6	18	15	0	15	8	16	8	1	7	24	24	0	0	0
8	16	10	0	10	8	16	14	6	8	8	16	0	0	0	21	21	0	0	0
8	16	14	0	14	13.75	10.25	7	0	7	3.5	20.5	0	0	0	16	16	0	0	0
8	16	8	0	8	3	21	2	0	2	7.75	24	23	0	23	16	16	0	0	0
8	16	11	0	11	12.5	11.5	8	1	6	7.75	24	10	5	5	16	16	0	0	0
8	16	12	0	12	6	18	14	2	6	8	16.25	15	7	8	18	18	0	0	0
8	16	12	0	12	4	24	24	0	14	8	16	8	6	8	16	16	0	0	0
8	16	12	0	12	4	24	24	0	24	8	16	8	1	7	24	24	0	0	1
8	16	12	0	12	5	24	15	7	7	7.5	16	12	5	7	24	24	0	0	0
8	16	24	0	24	8	16	17	9	8	8	16.5	14	6	8	16	16	0	0	0
8	16	24	0	24	8	16	16	7	7	7.5	24	24	6	8	16	16	0	0	0
8	16	14	0	14	8	16	9	2	7	8	24	24	0	24	16	16	0	0	0
8	16	14	0	14	8	16	14	7	7	8	24	24	0	24	16	16	0	0	0
8	16	14	0	14	8	16	15	7	7	7.75	24	24	0	24	16	16	0	0	0
8	16	13	0	13	8	16	15	7	7	8	16.25	15	7	8	16	16	0	0	0
11	13	11	3	8	8	24	24	0	24	8	16	14	6	8	8	16	11	0	0
8	16	14	6	8	8	24	24	0	24	8	16	11	3	8	24	24	0	0	0
8	16	20	0	20	10.75	13.25	9	2	7	8	16	10	3	7	24	24	0	0	0
2	22	22	0	22	8	16	2	2	0	4	20	12	9	3	24	24	0	0	0
12	12	11	3	8	8.25	15.75	16	6	6	5	19	22	0	22	16	16	0	0	0

50 229
 3600000 16488000
 2.27 12.05
 3045.45 15909.47
 213.18 895.70

102 340
 7344000 24480000
 4.64 17.89
 6212.73 23621.05
 434.89 1329.87

124 351
 8928000 25272000
 5.64 18.47
 7552.73 24385.26
 528.69 1372.89

45 129
 3240000 9288000
 2.05 6.79
 2740.91 8962.11
 191.86 504.57

Document Content(s)

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