

## Estimated Total Water Demand

### Blythe Energy Project, Phase II

This analysis details the changes in the plant's estimated total water demand between the original AFC filing and the AFC Addendum filing.

#### Estimated Total Water Demand in Original AFC Filing

The estimated total water demand for the original AFC filing is presented in Table 7.13-6 as follows:

<b>Table 7.13-6 Estimated Total Water Demand for BEP II</b>		
Water Use	Key Assumptions	Total
Low Condition Water Use	1,609 gpm, @ 59 °F, (0.24/yr)	618 Acre-feet
High Condition Water Use	3,017 gpm, @ 110 °F, (0.01/yr)	53 Acre-feet
Average Water Use	<b>2,288 gpm, @ 74 °F, (0.70/yr)</b>	<b>2,586 Acre-feet</b>
Pond Influent & Flash	20 gpm	32
Non-Operational Periods Annual O&M, etc.	25 gpm, (0.05/year)	2 Acre-feet
Annual Total Water Use	95% operation, 8322 hrs	3,289 Acre-feet

The estimated total water demand of 3,289 acre-feet contained in this Table is based on the plant being in operation 95 percent or 8,322 hours per year. This calculates to an average water demand of 2,039 gallons per minute (gpm) over the entire year or 2,146 gpm per actual operating hour.

#### Estimated Total Water Demand in the AFC Addendum Filing

The revised estimated total water demand for the AFC Addendum filing is presented in the attached Table, Water Balance & Consumption for Blythe Energy Project Phase II. This Table details an annual water demand of 2,281.2 acre-feet. This Table also reflects the 570 MW maximum net power output due to the transmission line power export limitation. The actual operating schedule for the plant is detailed in this Table and is summarized as follows:

Yearly Plant Operation Schedule				
Month	Days in Month	Operating		
		Days per Week	Hours per Day	Hours per Month
January	31	5	16	354.3
February	28.25	Outage	0	0.0
March	31	5	16	354.3

Yearly Plant Operation Schedule				
Month	Days in Month	Operating		
		Days per Week	Hours per Day	Hours per Month
April	30	5	16	342.9
May	31	5	16	354.3
June	30	7	24	720.0
July	31	7	24	744.0
August	31	7	24	744.0
September	30	7	24	720.0
October	31	5	16	354.3
November	30	5	16	342.9
December	31	5	16	354.3
TOTAL				5,385.1

Based on the operating schedule in this Table, the plant will be operating 5,385.1 hours per year or approximately 61 percent of the year. The original AFC filing had the plant operating 8,322 hours or 95 percent of the year. Based on operating 5,385.1 hours per year, the average water demand is 1,414.3 gpm over the entire year or 2,300 gpm per actual operating hour.

#### Plant Revisions for the AFC Addendum Filing

For the AFC addendum the plant's configuration was changed to enable "Fast Start" capabilities. The combustion turbines were changed from Siemens V84.3A to SGT6-5000F. The new combustion turbines are larger than the original turbines and have increased the plant's net output. The combustion turbine inlet chiller has also been replaced with evaporative coolers.

In addition to the power island changes outline above the cooling tower was changed to a plume abated tower and the cooling tower's drift rate was reduced from 0.0006 to 0.0005 percent.

The plant's increased capacity coupled with the cooling tower modifications results in a water demand increase of 154 gpm (2,300 - 2,146) for actual hours of operation. The yearly water demand decrease of 1,008 acre-feet (3,289 - 2,281) is the results of more accurately defining the plant's actual operating hours.

WATER BALANCE & CONSUMPTION FOR BLYTHE ENERGY PROJECT PHASE II

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL	MAXIMUM					
<b>Plant Operation:</b>																			
Plant Operating Mode	5 X 16	Outage	5 X 16	5 X 16	5 X 16	7 X 24	7 X 24	7 X 24	7 X 24	5 X 16	5 X 16	5 X 16							
Operating Temperature	< 95° F	< 95° F	< 95° F	< 95° F > 95° F	< 95° F > 95° F	< 95° F > 95° F	< 95° F > 95° F	< 95° F > 95° F	< 95° F > 95° F	< 95° F > 95° F	< 95° F > 95° F	< 95° F > 95° F							
Plant Operating Hours per Day	16.0	-	16.0	16.0	16.0	24.0	24.0	24.0	24.0	16.0	16.0	16.0							
Plant Operating Days per Week	5.0	-	5.0	5.0	5.0	7.0	7.0	7.0	7.0	5.0	5.0	5.0							
Days in Month	31.0	28.3	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0							
Operating Hours per Month	354.3	-	354.3	342.9	354.3	720.0	744.0	744.0	720.0	354.3	342.9	354.3	5,385.1						
Operating Hours per Month < 95° F	354.3	-	354.3	294.9	235.3	409.0	373.0	330.0	601.0	-	-	354.3							
Operating Hours per Month > 95° F	-	-	-	48.0	119.0	311.0	371.0	414.0	119.0	-	-	-							
% Maximum Output (570 MW)	100%	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%							
Plant Net Output (MW)	570.0	-	570.0	570.0	570.0	570.0	570.0	570.0	570.0	570.0	570.0	570.0							
CTG Evap Cooling (On/Off)	Off	Off	Off	Off	On	Off	On	On	On	On	On	Off		On					
HRSG Duct Firing (On/Off)	Off	Off	Off	Off	On	Off	On	Off	On	Off	On	Off		On					
<b>Ambient Conditions:</b>																			
Average Dry Bulb Temp (°F)	55.9	60.9	66.1	77.7	82.8	82.3	85.6	97.7	88.1	72.4	63.8	55.9							
Average Wet Bulb Temp (°F)	42.5	47.3	50.7	54.1	56.2	62.1	67.3	72.3	66.4	58.1	47.6	48.7							
Operating Dry Bulb Temp (°F)	58.9	64.1	69.6	76.3	88.5	79.3	101.3	83.9	103.4	83.4	99.7	75.9	59.2	121					
Operating Wet Bulb Temp (°F)	44.2	48.9	52.1	53.6	62.2	57.0	64.3	59.4	65.5	65.4	71.4	57.5	49.3	80					
Calculation Relative Humidity (%)																			
<b>Water Balance (gpm):</b>																			
<b>Raw Water</b>																			
1 Raw Water from Wells	1,861	10	2,039	2,210	2,698	2,267	2,666	2,365	2,713	2,347	2,697	2,364	2,717	2,237	2,609	2,167	1,993	1,882	3,105
2 Raw Water to Cooling Tower	1,851	-	2,029	2,200	2,386	2,257	2,442	2,375	2,483	2,205	2,491	2,244	2,533	2,121	2,437	2,157	1,983	1,872	2,867
3 Raw Water to Plant	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
4 Raw Water to Evap Coolers	-	-	-	-	212	-	214	-	220	132	196	110	174	106	162	-	-	-	226
<b>Evaporative Coolers (2 each)</b>																			
Operating Hours/Day	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Cycles of Concentration	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 Raw Water to Evap Coolers	-	-	-	-	212	-	214	-	220	132	196	110	174	106	162	-	-	-	226
5 Evaporation	-	-	-	-	196	-	107	-	110	66	98	55	87	53	81	-	-	-	114
8 Blowdown to Cooling Tower	-	-	-	-	196	-	107	-	110	66	98	55	87	53	81	-	-	-	114
<b>Cooling Tower (Plume Abated)</b>																			
Cycles of Concentration	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2 Raw Water to Cooling Tower	1,851	-	2,029	2,200	2,386	2,257	2,442	2,375	2,483	2,205	2,491	2,244	2,533	2,121	2,437	2,157	1,983	1,872	2,867
6 Evap Cooler Blowdown	-	-	-	-	106	-	107	-	110	66	98	55	87	53	81	-	-	-	114
7 Cooling Tower Drift (0.005%)	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Evaporation	1,813	10	1,939	2,158	2,447	2,215	2,504	2,332	2,547	2,229	2,543	2,266	2,574	2,133	2,473	2,116	1,944	1,834	2,931
9 From Brine Concentrator	330	-	372	413	482	427	496	455	506	430	505	436	513	407	468	403	362	336	596
10 To Brine Concentrator	424	-	468	511	583	535	597	554	608	528	607	535	615	504	589	500	457	430	704
11 From HRSG Blowdown Tank	56	-	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
12 To HRSG Blowdown Tank	28	-	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
13 From Plant Sump	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
14 Blowdown from Demineralizer	19	-	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
<b>Brine Concentrator</b>																			
10 Blowdown from Cooling Tower	424	-	468	511	583	525	587	554	608	528	607	535	615	504	589	500	457	430	704
19 Feed to Demineralizer	74	-	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
9 Return to Cooling Tower	330	-	372	413	482	427	496	455	506	430	505	436	513	407	468	403	362	336	596
20 Blowdown to Evap Pond	20	-	22	24	27	24	27	25	28	24	28	25	28	23	27	23	21	20	32
<b>Demineralizer</b>																			
19 Makeup Water to Demin	74	-	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
18 Demineralized Water	55	-	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
14 Blowdown to Cooling Tower	19	-	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
16 Demin Water to HRSG	55	-	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
<b>HRSG (2 each)</b>																			
16 Demin Water to HRSG	55	-	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
17 HRSG Losses	20	-	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
15 Blowdown to Tank	35	-	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
<b>HRSG Blowdown Tank (2 each)</b>																			
15 Blowdown to Tank	35	-	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
12 Quench from Cooling Tower	28	-	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
16 Flash to Atmosphere	7	-	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
11 Blowdown to Cooling Tower	56	-	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
<b>Plant Usage</b>																			
3 Raw Water to Plant	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
21 Plant Waste to Plant Sump	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
13 Plant Sump to Cooling Tower	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
<b>Water Consumption:</b>																			
<b>Month:</b>																			
Operating Hours per Month	354.3	-	354.3	294.9	48.0	235.3	119.0	409.0	311.0	373.0	371.0	330.0	414.0	601.0	119.0	354.3	342.9	354.3	5,385.1
Water Consumption (GPM)	1,861	10	2,039	2,210	2,698	2,257	2,666	2,365	2,713	2,347	2,697	2,364	2,717	2,237	2,609	2,167	1,993	1,882	
Water Consumption/Mon (gal)	39,559,543	406,600	43,343,314	39,098,057	7,511,040	32,003,563	19,035,240	58,527,900	50,624,560	52,525,860	60,035,220	46,807,200	67,490,260	80,666,220	18,628,260	48,064,229	40,996,657	40,005,943	743,332,106
Water Consumption/Mon (sf)	121.4	1.2	133.0	120.0	23.1	98.2	58.4	179.6	155.4	161.2	164.2	143.6	207.1	247.6	57.2	141.4	125.8	122.8	2,261.2