

1 **TOPIC: Section 2 Overview of the Project**

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3 **REFERENCE:**

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5 **PREAMBLE: Page 6 Figure 2-4**

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7 **QUESTION:**

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9 a) For the YIS Please provide a table of monthly actual hydro generation, actual other
10 renewable energy generation (microgeneration, IPP SOP, etc.), actual thermal
11 generation, and actual total generation excluding any secondary sales; plus
12 additional columns (or rows) for actual secondary sales generation and “spilled”
13 surplus (potential) generation for each the years 2017 to 2021 inclusive. The
14 months may be placed in rows and the generation sources in columns or vice versa
15 as is most convenient for YEC.

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17 b) Please provide similar tables for the YIS for the years 2024 and 2035 as forecast
18 and assumed in preparing this EPA.

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20 **ANSWER:**

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22 **(a) and (b)**

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24 Please see Table 1 for actual generation by source for 2017-2021 and Table 2 for the
25 forecast generation used for Atlin EPA thermal displacement analysis.

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27 Please note that YEC does not administer the microgeneration program and therefore
28 does not have the actual generation numbers. The microgeneration totals are embedded
29 in actual generation numbers [i.e., the actual generation numbers reflect reduced load due
30 to microgeneration load generated by customers].

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32 The forecast incremental microgeneration numbers are provided to YEC by the
33 Department of Energy, Mines and Resources.

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Table 1: 2017-2021 YEC Actual Generation

	Month	Hydro	YEC Wind	IPPs	Thermal	Total Firm Generation	Secondary Sales Generation	Total Generation
		[GWh]	[GWh]	[GWh]	[GWh]	[GWh]	[GWh]	[GWh]
2017	January	46.47	0.00	0.00	2.70	49.18	0.38	49.56
	February	38.33	0.00	0.00	1.79	40.12	0.98	41.10
	March	39.81	0.00	0.00	2.46	42.27	0.05	42.32
	April	33.73	0.00	0.00	0.02	33.75	1.00	34.75
	May	33.12	0.03	0.00	0.11	33.26	1.06	34.32
	June	28.39	0.00	0.00	0.16	28.55	0.81	29.36
	July	28.50	0.00	0.00	0.13	28.63	1.21	29.84
	August	29.67	0.00	0.00	0.22	29.90	0.84	30.73
	September	27.73	0.00	0.00	0.66	28.39	0.80	29.20
	October	38.25	0.00	0.00	0.06	38.31	0.59	38.91
	November	45.02	0.00	0.00	1.46	46.48	0.89	47.37
	December	42.93	0.00	0.00	4.70	47.63	0.48	48.11
	Total	431.95	0.03	0.00	14.47	446.46	9.09	455.55
2018	January	44.91	0.00	0.00	5.54	50.46	0.00	50.46
	February	40.27	0.00	0.00	7.09	47.36	0.00	47.36
	March	34.43	0.00	0.00	6.33	40.76	0.00	40.76
	April	33.85	0.00	0.00	5.69	39.55	0.00	39.55
	May	28.32	0.00	0.00	1.13	29.45	0.00	29.45
	June	29.98	0.00	0.00	0.41	30.39	0.02	30.40
	July	29.54	0.00	0.00	0.34	29.89	0.02	29.91
	August	31.39	0.00	0.00	0.09	31.49	0.16	31.65
	September	29.66	0.00	0.00	0.01	29.67	0.08	29.75
	October	35.78	0.00	0.00	1.93	37.71	0.00	37.72
	November	36.23	0.00	0.00	2.80	39.02	0.00	39.02
	December	38.40	0.00	0.00	5.94	44.34	0.00	44.34
	Total	412.77	0.00	0.00	37.32	450.09	0.28	450.37
2019	January	40.21	0.00	0.00	7.56	47.77	0.00	47.77
	February	36.99	0.00	0.00	7.44	44.43	0.00	44.43
	March	27.22	0.00	0.00	8.57	35.78	0.00	35.79
	April	25.04	0.00	0.00	9.61	34.65	0.00	34.65
	May	20.97	0.00	0.00	7.71	28.68	0.00	28.68
	June	24.57	0.00	0.00	1.41	25.97	0.00	25.97
	July	29.22	0.00	0.00	0.16	29.38	0.00	29.38
	August	29.01	0.00	0.00	0.06	29.07	0.00	29.07
	September	31.02	0.00	0.00	1.02	32.04	0.00	32.04
	October	32.81	0.00	0.00	7.29	40.10	0.00	40.10
	November	33.41	0.00	0.00	8.75	42.16	0.00	42.16
	December	40.35	0.00	0.00	10.29	50.64	0.00	50.64
	Total	370.82	0.00	0.00	69.86	440.68	0.00	440.68
2020	January	41.51	0.00	0.00	17.15	58.66	0.00	58.66
	February	38.49	0.00	0.00	9.80	48.29	0.00	48.29
	March	35.11	0.00	0.00	11.98	47.09	0.00	47.09
	April	27.79	0.00	0.00	11.51	39.29	0.00	39.29
	May	27.67	0.00	0.00	5.10	32.77	0.00	32.77
	June	30.99	0.00	0.00	1.13	32.12	0.00	32.12
	July	33.14	0.00	0.00	0.04	33.18	0.00	33.18
	August	33.10	0.00	0.00	0.05	33.14	0.00	33.14
	September	32.06	0.00	0.00	0.98	33.03	0.00	33.03
	October	41.21	0.00	0.00	0.61	41.82	0.66	42.47
	November	47.78	0.00	0.00	4.96	52.74	0.00	52.74
	December	46.53	0.00	0.00	6.13	52.66	-0.46	52.20
	Total	435.36	0.00	0.00	69.44	504.79	0.19	504.98
2021	January	43.65	0.00	0.00	5.00	48.65	0.00	48.65
	February	47.38	0.00	0.00	10.64	58.02	0.00	58.02
	March	47.91	0.00	0.00	0.88	48.79	0.00	48.79
	April	41.75	0.00	0.00	1.17	42.92	0.00	42.92
	May	34.22	0.00	0.00	0.60	34.82	0.00	34.82
	June	34.82	0.00	0.00	0.02	34.84	2.12	36.97
	July	31.63	0.00	0.00	0.15	31.79	0.46	32.25
	August	35.63	0.00	0.00	0.48	36.11	0.41	36.52
	September	33.95	0.00	0.00	0.36	34.30	0.28	34.58
	October	41.87	0.00	0.00	0.74	42.62	0.96	43.58
	November	46.55	0.00	0.00	5.60	52.15	0.74	52.89
	December	48.76	0.00	0.00	13.57	62.34	0.13	62.47
	Total	488.13	0.00	0.00	39.22	527.35	5.11	532.46

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Table 2: 2024 and 2035 Forecast Generation

	Month	LTA Hydro	Atlin [net of losses]	Total IPPs and Incremental Microgen	LTA Thermal	Total Firm Generation
		[GWh]	[GWh]	[GWh]	[GWh]	[GWh]
2024	January	39.19	5.47	4.33	2.07	51.07
	February	36.70	4.98	3.45	2.12	47.25
	March	38.48	3.60	3.53	3.24	48.85
	April	33.36	1.49	3.24	3.33	41.41
	May	31.90	2.09	4.13	1.17	39.29
	June	33.77	0.00	2.50	0.08	36.35
	July	34.73	0.00	2.24	0.09	37.06
	August	33.79	0.00	3.80	0.00	37.59
	September	33.29	2.51	3.13	0.01	38.94
	October	41.23	1.98	3.01	0.21	46.43
	November	44.01	2.56	3.38	1.11	51.06
	December	42.87	4.18	3.19	2.32	52.56
	Total	443.31	28.85	39.93	15.76	527.85
2035	January	40.63	5.47	4.33	0.69	51.13
	February	37.68	4.98	3.45	1.04	47.16
	March	36.40	3.60	3.53	1.14	44.67
	April	30.88	1.49	3.24	1.15	36.75
	May	27.93	2.09	4.13	0.18	34.33
	June	28.50	0.00	2.50	0.00	31.00
	July	29.51	0.00	2.24	0.00	31.75
	August	28.52	0.00	3.80	0.00	32.32
	September	27.92	2.51	3.13	0.00	33.56
	October	36.55	1.98	3.01	0.00	41.54
	November	40.38	2.56	3.38	0.02	46.34
	December	44.84	4.18	3.19	0.30	52.52
	Total	409.75	28.85	39.93	4.53	483.07

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See Table A3-1 in the Submission for annual summaries. Atlin LTA winter deliveries to Jakes Corner are 30.8 GWh (row 1 in Table A3-1); Atlin deliveries for LTA thermal displacement assessments with YECSIM assume 6.2% losses for transmission on AEY System from Jakes Corner to Whitehorse S150 (row 2 in Table A3-1).

1 **REVISED RESPONSE**

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3 **(a) and (b)**

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5 On March 14, 2022, Mr. Maissan by email correspondence to the Board requested further
6 information regarding this response noting that the response did not include a column of
7 figures (estimates) for the summer surplus generation and “without some hard figures as
8 to what the actual surplus is or will be one cannot get a good overall picture of the YIS and
9 its winter - summer energy imbalance.” Mr. Maissan requested that YEC provide this
10 further information.

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12 Please see updated Table 1 and 2 below. For the purposes of this analysis, summer
13 months are May through October which differs from Summer Period as defined in the EPA
14 (June through August).

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16 With respect to the source of summer surplus estimates, Table 1 figures were developed
17 based on summer month spill records excluding actual secondary sales.¹ These years
18 showed considerable variability in water conditions. Overall, 2017 and 2020 were higher
19 water years for Aishihik, and 2021 was a higher water year for Whitehorse. Therefore,
20 Table 1 shows higher summer surplus energy volume for those years. Lower water
21 availability in 2018 and 2019 accounts for lower summer surplus energy volume for those
22 years.

23
24 Table 2 on forecast conditions for 2024 and 2035 – energy generation is forecast based
25 on LTA water and other renewable resource availability, with no forecast secondary sales.
26 The increases in summer surplus energy volumes for 2024 and 2035 load cases are
27 predominantly due to added renewable energy options, including IPPs, which lead to
28 increased spills of YEC hydro generation capability. JM-YEC-1-12(a) provides a figure
29 showing estimated summer surplus energy for 2030.

¹ In summary, the recorded spill was limited only to amounts that could have been used for electricity generation given the existing hydro generation capability.

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Table 1: 2017-2021 YEC Actual Generation

Month	Hydro	YEC Wind	IPPs	Thermal	Total Firm Generation	Secondary Sales Generation	Total Generation	Generatable Summer Surplus Energy	
	[GWh]	[GWh]	[GWh]	[GWh]	[GWh]	[GWh]	[GWh]	[GWh]	
2017	January	46.47	0.00	0.00	2.70	49.18	0.38	49.56	0.00
	February	38.33	0.00	0.00	1.79	40.12	0.98	41.10	0.00
	March	39.81	0.00	0.00	2.46	42.27	0.05	42.32	0.00
	April	33.73	0.00	0.00	0.02	33.75	1.00	34.75	0.00
	May	33.12	0.03	0.00	0.11	33.26	1.06	34.32	0.41
	June	28.39	0.00	0.00	0.16	28.55	0.81	29.36	9.10
	July	28.50	0.00	0.00	0.13	28.63	1.21	29.84	2.57
	August	29.67	0.00	0.00	0.22	29.90	0.84	30.73	11.26
	September	27.73	0.00	0.00	0.66	28.39	0.80	29.20	14.86
	October	38.25	0.00	0.00	0.06	38.31	0.59	38.91	2.18
	November	45.02	0.00	0.00	1.46	46.48	0.89	47.37	0.10
	December	42.93	0.00	0.00	4.70	47.63	0.48	48.11	0.00
Total	431.95	0.03	0.00	14.47	446.46	9.09	455.55	40.48	
2018	January	44.91	0.00	0.00	5.54	50.46	0.00	50.46	0.00
	February	40.27	0.00	0.00	7.09	47.36	0.00	47.36	0.00
	March	34.43	0.00	0.00	6.33	40.76	0.00	40.76	0.00
	April	33.85	0.00	0.00	5.69	39.55	0.00	39.55	0.00
	May	28.32	0.00	0.00	1.13	29.45	0.00	29.45	0.14
	June	29.98	0.00	0.00	0.41	30.39	0.02	30.40	3.36
	July	29.54	0.00	0.00	0.34	29.89	0.02	29.91	4.82
	August	31.39	0.00	0.00	0.09	31.49	0.16	31.65	2.18
	September	29.66	0.00	0.00	0.01	29.67	0.08	29.75	1.16
	October	35.78	0.00	0.00	1.93	37.71	0.00	37.72	1.26
	November	36.23	0.00	0.00	2.80	39.02	0.00	39.02	0.00
	December	38.40	0.00	0.00	5.94	44.34	0.00	44.34	0.00
Total	412.77	0.00	0.00	37.32	450.09	0.28	450.37	12.93	
2019	January	40.21	0.00	0.00	7.56	47.77	0.00	47.77	0.00
	February	36.99	0.00	0.00	7.44	44.43	0.00	44.43	0.00
	March	27.22	0.00	0.00	8.57	35.78	0.00	35.79	0.00
	April	25.04	0.00	0.00	9.61	34.65	0.00	34.65	0.00
	May	20.97	0.00	0.00	7.71	28.68	0.00	28.68	0.11
	June	24.57	0.00	0.00	1.41	25.97	0.00	25.97	4.65
	July	29.22	0.00	0.00	0.16	29.38	0.00	29.38	3.48
	August	29.01	0.00	0.00	0.06	29.07	0.00	29.07	1.59
	September	31.02	0.00	0.00	1.02	32.04	0.00	32.04	0.83
	October	32.81	0.00	0.00	7.29	40.10	0.00	40.10	0.28
	November	33.41	0.00	0.00	8.75	42.16	0.00	42.16	0.00
	December	40.35	0.00	0.00	10.29	50.64	0.00	50.64	0.00
Total	370.82	0.00	0.00	69.86	440.68	0.00	440.68	10.93	
2020	January	41.51	0.00	0.00	17.15	58.66	0.00	58.66	0.00
	February	38.49	0.00	0.00	9.80	48.29	0.00	48.29	0.00
	March	35.11	0.00	0.00	11.98	47.09	0.00	47.09	0.00
	April	27.79	0.00	0.00	11.51	39.29	0.00	39.29	0.00
	May	27.67	0.00	0.00	5.10	32.77	0.00	32.77	0.31
	June	30.99	0.00	0.00	1.13	32.12	0.00	32.12	0.12
	July	33.14	0.00	0.00	0.04	33.18	0.00	33.18	0.38
	August	33.10	0.00	0.00	0.05	33.14	0.00	33.14	4.68
	September	32.06	0.00	0.00	0.98	33.03	0.00	33.03	15.15
	October	41.21	0.00	0.00	0.61	41.82	0.66	42.47	6.77
	November	47.78	0.00	0.00	4.96	52.74	0.00	52.74	0.08
	December	46.53	0.00	0.00	6.13	52.66	-0.46	52.20	0.00
Total	435.36	0.00	0.00	69.44	504.79	0.19	504.98	27.48	
2021	January	43.65	0.00	0.00	5.00	48.65	0.00	48.65	0.00
	February	47.38	0.00	0.00	10.64	58.02	0.00	58.02	0.00
	March	47.91	0.00	0.00	0.88	48.79	0.00	48.79	0.00
	April	41.75	0.00	0.00	1.17	42.92	0.00	42.92	0.00
	May	34.22	0.00	0.00	0.60	34.82	0.00	34.82	6.46
	June	34.82	0.00	0.00	0.02	34.84	2.12	36.97	4.77
	July	31.63	0.00	0.00	0.15	31.79	0.46	32.25	11.67
	August	35.63	0.00	0.00	0.48	36.11	0.41	36.52	7.53
	September	33.95	0.00	0.00	0.36	34.30	0.28	34.58	5.41
	October	41.87	0.00	0.00	0.74	42.62	0.96	43.58	2.79
	November	46.55	0.00	0.00	5.60	52.15	0.74	52.89	0.00
	December	48.76	0.00	0.00	13.57	62.34	0.13	62.47	0.00
Total	488.13	0.00	0.00	39.22	527.35	5.11	532.46	38.61	

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Table 2: 2024 and 2035 Forecast Generation

	Month	LTA Hydro	Atlin [net of losses]	Total IPPs and Incremental Microgen	LTA Thermal	Total Firm Generation	Summer Surplus Renewable Generation
		[GWh]	[GWh]	[GWh]	[GWh]	[GWh]	[GWh]
2024	January	39.19	5.47	4.33	2.07	51.07	0.00
	February	36.70	4.98	3.45	2.12	47.25	0.00
	March	38.48	3.60	3.53	3.24	48.85	0.00
	April	33.36	1.49	3.24	3.33	41.41	0.00
	May	31.90	2.09	4.13	1.17	39.29	1.35
	June	33.77	0.00	2.50	0.08	36.35	4.97
	July	34.73	0.00	2.24	0.09	37.06	8.79
	August	33.79	0.00	3.80	0.00	37.59	10.53
	September	33.29	2.51	3.13	0.01	38.94	11.13
	October	41.23	1.98	3.01	0.21	46.43	3.16
	November	44.01	2.56	3.38	1.11	51.06	0.01
	December	42.87	4.18	3.19	2.32	52.56	0.00
	Total	443.31	28.85	39.93	15.76	527.85	39.94
2035	January	40.63	5.47	4.33	0.69	51.13	0.00
	February	37.68	4.98	3.45	1.04	47.16	0.00
	March	36.40	3.60	3.53	1.14	44.67	0.00
	April	30.88	1.49	3.24	1.15	36.75	0.00
	May	27.93	2.09	4.13	0.18	34.33	3.79
	June	28.50	0.00	2.50	0.00	31.00	10.83
	July	29.51	0.00	2.24	0.00	31.75	14.90
	August	28.52	0.00	3.80	0.00	32.32	16.95
	September	27.92	2.51	3.13	0.00	33.56	18.20
	October	36.55	1.98	3.01	0.00	41.54	5.97
	November	40.38	2.56	3.38	0.02	46.34	0.06
	December	44.84	4.18	3.19	0.30	52.52	0.00
	Total	409.75	28.85	39.93	4.53	483.07	70.70

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See Table A3-1 in the Submission for annual summaries. Atlin LTA winter deliveries to Jakes Corner are 30.8 GWh (row 1 in Table A3-1); Atlin deliveries for LTA thermal displacement assessments with YEC SIM assume 6.2% losses for transmission on AEY System from Jakes Corner to Whitehorse S150 (row 2 in Table A3-1).