Central Rivers Power

Boott Hydropower, LLC
Subsidiary of Central Rivers Power US, LLC
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Via eFiling

January 14, 2022

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Lowell Hydroelectric Project (FERC No. 2790-074);
Fish Passage Operations Data Submittal.

Dear Secretary Bose:

On November 15, 2021 Boott Hydropower, LLC ("Boott"), licensee of the Lowell Hydroelectric Project (FERC No. 2790) submitted its response[1] to the Commission's October 14, 2021 Additional Information Request (AIR).[2] Item 11 of the AIR requested that Boott submit certain project operational data for the 2017 to 2020 upstream shad passage seasons. Boott submitted the requested data for 2020 in its November 15 response, and indicated that it would submit the data for 2017 through 2019 in a subsequent filing. Please find attached a Microsoft Excel workbook which provides the requested daily average flow and water surface elevation data collected during the 2017, 2018 and 2019 alosid upstream passage seasons.

Data are provided for the full alosid upstream passage season of each year, from "first lift" to "last lift." The data source for each column of data is as follows:

- Avg. Inflow: Daily average inflow to the project calculated as the daily average flow at USGS gage 01100000 Merrimack River below Concord River at Lowell, MA minus the daily average flow at USGS gage 01099500 Concord R below River Meadow Brook at Lowell, MA.
- E.L. Field Units: Daily average flow through the E.L. Field Powerhouse units, based on SCADA records except as noted below.
- Fish Bypass: Estimated flow through the downstream fish bypass located in the left forebay wall. The bypass operates at a constant flow of 132 cfs.
- Fish lift: Fish lift attraction flow based on data recorded during each lift in accordance with the Project's Fishway Operation and Maintenance Plan (FOMP).
- Fish Ladder: Total flow through the fish ladder at the Pawtucket Dam, including attraction flows. A constant flow of 500 cfs is assumed based on the ladder's design parameters. The

[1] Accession Number 20211115-5191
[2] Accession Number 20211014-3050

fish ladder was operated through the upstream passage season during each of the years provided.

- Downtown Canals: Estimated flow released to the downtown Lowell canal system via the Guard Lock and Gates Facility ("Guard Locks"). The downtown mill units were not operated during the fish passage season during any of the years provided. Therefore, for 2017 and 2018 flows released through the Guard Locks was assumed to be an estimated 250 cfs average flow necessary to make up for leakage from the downtown canal system. During 2019 Boott intentionally released elevated flows from the Guard Locks to mimic operation of the downtown units during elevated flow conditions for its Upstream and Downstream Adult Alosine Passage Assessment study.
- Pawtucket Dam Spill: Estimated spill of excess inflow over the Pawtucket Dam's spillway, calculated as the Avg. Inflow minus the sum of the other 5 outflow routes (E.L. Field units, fish bypass, fish lift, fish ladder and downtown canals). Under lower flow conditions the spill estimate was limited to a minimum of 0 cfs, i.e. the sum out estimated outflows may exceed the calculated inflow under lower flow conditions.
- Headpond: Daily average water level (NGVD29) of the Project impoundment, which is also the water level at the Pawtucket Dam fish ladder exit. Data are derived from Project SCADA records, except as noted below.
- ELF Forebay: Water level at the E.L. Field powerhouse forebay, in front of the trashracks. Data are derived from Project SCADA records, except as noted below.
- ELF Tailrace: Water level at the E.L. Field powerhouse tailrace. Data are derived from Project SCADA records, except as noted below.
- Fish ladder entrance: Water level at the entrance to the Pawtucket Dam fish ladder, immediately downstream of the Pawtucket Dam. Boott began to maintain written daily inspection records of fish ladder operating conditions in 2019, therefore no records are available for 2017 or 2018.

Notes and exceptions to the above for 2017 are as follows:

- The Project's crest gate system was still under construction during 2017. The spillway crest control during this passage season was a hybrid of pneumatic crest gates and wooden flashboards.
- Project SCADA system data records maintained by Boott's previous owner are no longer available for 2017. The operating data provided here are largely derived from the above-mentioned fishway operations logs.
- It appears that at the beginning of the 2017 passage season, the fishway operators initially recorded headpond elevations of ± 93.0 ft. However at mid-day on May 1 the fishway operators began recording water levels less than 90.0 ft, which are consistent with typical forebay levels. Boott assumed that this was the case and was able to back-fill the forebay levels from other data sources. However no recorded pond level readings for the remainder of the passage season were located.
- In accordance with the Project's Comprehensive Fish Passage Plan, lifting operations were suspended for 2 brief periods when river flows as recorded at USGS gage 01100000 exceeded 25,000 cfs. The fish ladder at the Pawtucket Dam continued to operate during

these periods. There was no suspension of fish lift operations due to high flows during 2018 or 2019.

Please do not hesitate to contact me at (978) 935-6039 or kwebb@centralriverspower.com if you have any questions concerning this submittal.

Sincerely,
Boott Hydropower, LLC

Kevin M. Webb
Licensing Manager

cc: K Scott, HDR
C. Mooney, CRP

LOWELL HYDROELECTRIC PROJECT (FERC No. 2790)
PROJECT OPERATIONS DURING 2017 UPSTREAM FISH PASSAGE SEASON

	DAILY AVERAGE FLOWS (CFS)					
Date	**Avg Inflow**	**E.L. Field Units**	**Fish Bypass**	**Fish Lift**	**Fish Ladder**	**Downtown Canals**
4/25/2017	13,810	4,276	132	130	500	250
4/26/2017	14,023	4,476	132	130	500	250
4/27/2017	16,619	4,547	132	132	500	250
4/28/2017	18,303	4,440	132	140	500	250
4/29/2017	17,282	4,720	132	140	500	250
4/30/2017	15,589	4,564	132	140	500	250
5/1/2017	14,092	4,438	132	146	500	250
5/2/2017	13,441	4,333	132	140	500	250
5/3/2017	16,026	4,360	132	150	500	250
5/4/2017	16,408	4,418	132	150	500	250
5/5/2017	15,283	4,360	132	150	500	250
5/6/2017	16,357	4,358	132	150	500	250
5/7/2017	19,606	4,276	132	151	500	250
5/8/2017	20,801	4,260	132	150	500	250
5/9/2017	20,050	4,260	132	150	500	250
5/10/2017	18,067	4,160	132	150	500	250
5/11/2017	15,257	3,893	132	150	500	250
5/12/2017	12,118	3,698	132	150	500	250
5/13/2017	11,038	3,820	132	150	500	250
5/14/2017	11,379	3,827	132	150	500	250
5/15/2017	18,578	3,570	132	157	500	250
5/16/2017	24,720		**No Fishway Operation due to high flow**			
5/17/2017	24,750		**No Fishway Operation due to high flow**			
5/18/2017	21,658	4,738	132	150	500	250
5/19/2017	17,148	4,631	132	150	500	250
5/20/2017	14,850	5,089	132	150	500	250
5/21/2017	12,552	5,209	132	150	500	250
5/22/2017	10,945	5,062	132	150	500	250
5/23/2017	9,955	5,942	132	150	500	250
5/24/2017	9,676	5,893	132	150	500	250
5/25/2017	9,616	6,089	132	150	500	250
5/26/2017	10,267	6,209	132	150	500	250
5/27/2017	19,267	6,111	132	150	500	250
5/28/2017	20,664	6,036	132	150	500	250
5/29/2017	18,113	6,018	132	150	500	250
5/30/2017	14,491	5,880	132	150	500	250
5/31/2017	12,662	6,471	132	150	500	250
6/1/2017	12,584	6,560	132	150	500	250
6/2/2017	13,997	6,453	132	150	500	250
6/3/2017	12,987	6,440	132	150	500	250

6/4/2017	11,380	6,471	132	150	500	250
6/5/2017	10,441	6,404	132	150	500	250
6/6/2017	11,028	6,449	132	150	500	250
6/7/2017	20,562	6,320	132	150	500	250
6/8/2017	25,710		**No Fishway Operation due to high flow**			
6/9/2017	24,110	6,155	132	150	500	250
6/10/2017	19,830	6,137	132	150	500	250
6/12/2017	12,084	6,160	132	150	500	250
6/13/2017	10,271	6,027	132	150	500	250
6/14/2017	8,667	5,782	132	150	500	250
6/15/2017	7,121	4,800	132	150	500	250
6/16/2017	5,735	3,490	132	150	500	250
6/17/2017	6,040	3,782	132	150	500	250
6/18/2017	6,259	4,154	132	150	500	250
6/19/2017	6,275	4,036	132	150	500	250
6/20/2017	6,819	4,538	132	150	500	250
6/21/2017	8,023	5,398	132	150	500	250
6/22/2017	8,382	5,547	132	150	500	250
6/23/2017	7,367	5,182	132	150	500	250
6/24/2017	6,191	4,348	132	150	500	250
6/25/2017	6,214	4,440	132	150	500	250
6/26/2017	6,481	5,013	132	150	500	250
6/27/2017	4,951	4,138	132	150	500	250
6/28/2017	4,363	3,236	132	150	500	250
6/29/2017	4,637	4,116	132	150	500	250
6/30/2017	3,826	3,530	132	150	500	250
7/1/2017	5,279	4,717	132	150	500	250
7/2/2017	7,061	5,936	132	150	500	250
7/3/2017	13,717	5,920	132	150	500	250
7/4/2017	15,481	5,747	132	150	500	250
7/5/2017	11,714	4,973	132	150	500	250
7/6/2017	7,157	4,889	132	150	500	250
7/7/2017	5,880	5,026	132	150	500	250
7/8/2017	4,976	4,452	132	150	500	250
7/9/2017	4,824	4,280	132	150	500	250
7/10/2017	4,128	3,731	132	150	500	250
7/11/2017	3,984	3,311	132	150	500	250
7/12/2017	3,828	0	132	150	500	250
7/13/2017	4,674	4,218	132	150	500	250
7/14/2017	4,568	4,056	132	150	500	250

	DAILY AVERAGE WATER SURFACE ELEVATIONS (FT NGVD)			
Pawtucket Dam Spill	**Headpond**	**ELF Forebay**	**ELF Tailrace**	**Fish ladder entrance**
8,522	92.75	90.00	55.46	N/A
8,536	92.82	90.00	55.52	N/A
11,058	93.14	90.20	56.01	N/A
12,841	92.90	89.90	56.32	N/A
11,540	93.16	89.75	56.15	N/A
10,002	92.94	89.70	55.82	N/A
8,627	92.76	89.86	55.53	N/A
8,086		89.90	55.40	N/A
10,634		90.07	55.88	N/A
10,958		90.01	55.94	N/A
9,891		89.90	55.72	N/A
10,967		90.03	55.94	N/A
14,297		89.88	56.58	N/A
15,509		90.07	56.79	N/A
14,758		89.94	56.61	N/A
12,875		89.80	56.18	N/A
10,331		89.82	55.60	N/A
7,388		89.71	55.01	N/A
6,186		89.95	54.92	N/A
6,520		89.99	54.97	N/A
13,969		89.94	56.27	N/A
15,889		90.32	57.00	N/A
11,485		90.94	56.10	N/A
8,729		90.80	55.76	N/A
6,311		90.49	55.47	N/A
4,851		90.17	55.29	N/A
2,980		90.16	55.50	N/A
2,751		90.22	55.47	N/A
2,495		90.12	55.56	N/A
3,027		90.34	55.67	N/A
12,124		90.93	56.74	N/A
13,597		91.08	56.94	N/A
11,064		90.56	56.55	N/A
7,579		90.21	55.91	N/A
5,158		90.56	55.88	N/A
4,992		90.50	55.88	N/A
6,511		90.42	56.00	N/A
5,515		90.21	55.89	N/A

3,877		90.32	55.72	N/A
3,005		90.01	55.75	N/A
3,547		90.20	55.76	N/A
13,210		90.81	56.83	N/A
16,923		90.47	57.53	N/A
12,661		89.80	56.78	N/A
4,892		89.69	55.76	N/A
3,212		89.66	55.50	N/A
1,853		89.81	55.24	N/A
1,289		90.13	54.65	N/A
1,213		91.02	53.83	N/A
1,226		91.48	54.04	N/A
1,073		90.43	54.21	N/A
1,207		90.45	54.21	N/A
1,249		90.24	54.50	N/A
1,593		89.70	55.03	N/A
1,803		90.15	55.08	N/A
1,153		91.12	54.83	N/A
811		91.47	54.32	N/A
742		89.85	54.39	N/A
499		86.51	55.07	N/A
1		85.85	54.46	N/A
230		86.69	53.75	N/A
0		89.63	54.02	N/A
0		90.38	53.61	N/A
46		89.88	54.37	N/A
213		89.68	55.22	N/A
6,765		90.41	55.52	N/A
8,702		90.26	56.05	N/A
5,709		89.60	55.32	N/A
1,332		89.56	54.91	N/A
0		89.60	54.72	N/A
0		90.20	54.18	N/A
0		90.20	54.15	N/A
0		90.50	53.67	N/A
0		90.62	53.84	N/A
2,796		90.62	52.72	N/A
0		90.29	54.10	N/A
0		90.39	53.93	N/A