Notice of Certification Application Filing

Occum Hydroelectric Project (FERC No. P-11574)

Harrington Park, New Jersey (March 6, 2013) – LIHI is pleased to announce that Norwich Public Utilities has submitted an application for Certification of its Occum Hydroelectric Project.

The Occum Project is located on the Shetucket River, a tributary to the Thames River, in the Village of Occum, City of Norwich and Village of Versailles, Town of Sprague, New London County, Connecticut. The Occum Project is composed of a concrete and masonry dam, impoundment, intake structure, forebay, powerhouse, fish passage facilities and appurtenant facilities. The dam is comprised of two contiguous spillway sections with a total length of 450 feet, bordered on either side by an earth embankment. The east spillway section is a concrete ogee spillway, 170 ft in length, with a crest elevation of 66.1'. The west section is a stone masonry spillway 280 ft in length with a permanent crest elevation of 64.35' and 1.75 ft high wooden flashboards. The west section is equipped with a 4 ft wide fish ladder and a downward opening 6 ft wide trash gate with a sill elevation of 60.32'. The upstream fish ladder parallels the forebay and extends from the dam to the powerhouse tailrace. The intake structure is approximately 85 ft in length and extends from the earth embankment that abuts the western side of the spillway to the west headgate wall. The intake gate structure controls the river flow into the forebay with 6 manually operated motorized rack and pinion gates. The forebay measures approximately 225 ft long by 160 ft wide. A forebay spillway with a crest elevation of 64.4' is topped with 1.7 ft flashboards that raise the pool elevation to the normal water surface elevation (66.1'). This spillway, bordered by the earth embankment to the north and the powerhouse to the south, is approximately 30 ft wide and extends 50 ft along the east side of the forebay. The powerhouse is a 32 ft wide by 40 ft long structure that contains one vertical Kaplan turbine-generator unit. The unit has an installed capacity of 800 KW, at a flow capacity of 900 cfs and a normal net head of 13 ft.

Construction of the original stone and masonry dam was completed in the late 1860's. The dam was purchased by NPU in 1932 from a local manufacturing company. Construction of the powerhouse began in 1934 and included the installation of the 800 KW generating unit, which was placed on-line in April of 1937. Fish passage facilities were installed at the project in 2005.
The upstream fish passage facility consists of a 4 ft wide concrete Denil ladder with a 1:10 floor slope extending from the Occum Dam to the station’s tailrace. The ladder alignment is along the western shore of the bypassed river reach, immediately adjacent to the masonry wall structures. The ladder consists of a rectangular flume with a series of baffles placed on an angle to the water flow to allow the fish to swim through the flume. Water into the ladder is controlled through use of baffles set at appropriate heights to limit the amount of water entering the fishway. Walkways, stairs and platforms are provided to allow access to the viewing window chamber, entrance gate and exit gate. A 6 ft wide trash sluice gate abuts the eastern wall of the fish ladder to promote the passage of river debris and maintain spillway hydraulic discharge capacity. The system has been operational since 2006 and is continuing to access the system’s effectiveness.

The downstream fish passage facility is located immediately adjacent to the project’s powerhouse and intake structure. The facilities generally consist of a 5 ft wide by 20 ft long concrete collection chamber, a 5 ft wide by 7 ft high dual leaf downward opening flow control gate and a 26-inch diameter high density polyethylene buried pipe exiting the existing tailrace wall. Water into the passage is controlled through the use of the electric operated steel control gate set at appropriate heights to limit the amount of water entering the fishway. The system has been operational since 2006 and is continuing to access the system’s effectiveness.

An upstream eel ladder is located between the upstream fish ladder and the western dam abutment. The eel ladder consists of an elevated 20-inch wide aluminum trough with strip drain interior surface and aluminum cover plate. Water for the eel ladder is supplied by a submersible electric pump located within a vertical standpipe near the fish ladder exit flume. The eel ladder is equipped with two entrances, one near the forebay spillway toe and the second at the dam toe area. The system has been operational since 2006 and has completed effectiveness testing requirements.

**Project Operation**

The Occum Project is operated primarily as a cycling facility and is dependent upon flows from the upstream Scotland Project (FERC No. 2662). The Scotland Project, owned and operated by First Light Energy, utilizes one turbine which has a normal discharge of 1200 cfs. During periods when river flow does not fully support the operation of the unit at the Scotland Project, the Scotland Project operates in a peaking mode and the impoundment is drawn down 2 ft via use of the unit. A minimum flow of 84 cfs is released at all times from the Scotland dam. The effect for the downstream Occum Project is an inflow which fluctuates greatly in magnitude. The resulting operation for the Occum Project is essentially pulsing. The Occum Project generates during the time period when 1200 cfs is being received from the Scotland Project and continues to operate after the Scotland Project ceases operation until the Occum headpond is drawn down approximately 2 ft. At that time the project is shut down, and does not begin to generate again until the next pulse of water from the Scotland Project has begun to fill the head pond. Travel time for water between the Scotland Project and the Occum Project is approximately two hours at the higher flow level.

The project is required to provide a minimum 30 cfs, or inflow if less, bypass flow which may increase to 100 cfs depending upon the impoundment level of the downstream Taftville station. Approximately 10 cfs of leakage flow originates from the dam and unit with the remaining required flow being provided by the downstream fish passage or dam trash gate. During periods when the Taftville Project headpond is above elevation 48.3 ft (referenced to Taftville
headpond gage), the Occum tailrace is backwatered. Below that level, an approximately 1000 ft long reach of river is exposed. When the Taftville headpond is drawn down below elevation 48.3', NPU is required to release a flow of 100 cfs, or inflow if less, below the powerhouse. The higher minimum flow release is provided through a combination of unit leakage, dam sluice gate and flows through the downstream fishway.

**Public Comments**
We encourage public comments on this application. Specifically, we are interested in knowing whether you think the Occum Hydroelectric Project meets our LIHI criteria. Please review the program and criteria in greater detail and then review the Project’s application. Comments that are directly tied to specific LIHI criteria (flows, water quality, fish passage, etc.) will be most helpful, but all comments will be considered. Comments may be submitted to the Institute by e-mail at info@lowimpacthydro.org with “Occum Hydroelectric Project Comments” in the subject line, or by mail addressed to LIHI, PO BOX 194, Harrington Park, New Jersey 07640. Comments must be received at the Institute on or before 5 pm Eastern time on May 6, 2013 to be considered. All comments will be posted to the web site and the applicant will have an opportunity to respond. Any response will also be posted.

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