

REVIEW OF APPLICATION FOR LIHI RE-CERTIFICATION OF THE COSGROVE INTAKE AND POWER PLANT PROJECT

FERC Project No. 10688 (Conduit Exemption)
Massachusetts, MA
Clinton, MA, Worcester County



Source: MWRA 2023

November 3, 2023
Nuria Holmes, LIHI Reviewer

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FINAL REVIEW OF APPLICATION FOR LIHI RE-CERTIFICATION OF THE COSGROVE INTAKE AND POWER PLANT PROJECT

This report provides final review findings and recommendations related to the re-certification application submitted to the Low Impact Hydropower Institute (LIHI) by the Massachusetts Water Resources Authority (MWRA) for the Cosgrove Intake and Power Plant Project (Cosgrove Project). The final re-certification application package including fees was filed on September 1, 2023, and is subject to review under the current 2nd edition LIHI Handbook (Revision 2.05, January 1, 2022). The Project was first certified in 2010 and was recertified in 2015.

I. INTRODUCTION

The 2.4-megawatt (MW) Cosgrove Project (LIHI #55) is located off-stream in Clinton, Massachusetts. The Cosgrove Project is a conduit facility associated with the Cosgrove Aqueduct, and generates power as it regulates flow transferred from Wachusett Reservoir into the MetroWest Tunnel for distribution through MWRA's service territory. The hydroelectric turbines operate when the water drops from one elevation (the Reservoir) in the water supply system into a lower elevation (the Aqueduct).

MWRA is a wholesale water supply department that provides drinking water to 50 communities throughout the Boston metropolitan area, equating to approximately 200 million gallons of water per day. The Cosgrove Aqueduct was constructed in 1965 and is not a historic structure. The hydropower associated with the Cosgrove Project began operation in 1969.

II. PROJECT LOCATION

The Cosgrove Project receives water from the Quabbin Reservoir, located approximately 65 miles west of Boston, and the Wachusett Reservoir, about 35 miles west of Boston. Both are man-made reservoirs, and were originally constructed, and still function today, as water supply reservoirs. The water conveyance system is comprised of over 100 miles of active tunnels and aqueducts which are part of the MWRA service area and distribution system. Although the Cosgrove Project is off-stream, it is located within the Chiopee River Watershed.

Other projects within this water conveyance system include the the [Loring Road Project \(LIHI #56\)](#), and the [Oakdale Project \(LIHI #57\)](#) which are both owned and operated by MWRA.

III. EXISTING FACILITIES

The Project's facilities are located entirely within the intake building and include:

- a North and South intake, which include a hydraulic turbine and two bypass lines;
- each intake containing three channels with traveling water screens;
- each intake containing an upper sluice gate and lower intake sluice gate;
- each bypass line containing a sleeve valve, designed to regulate flows;
- Kaplan turbine generator 1;
- Kaplan turbine generator 2; and
- appurtenant facilities associated with the MWRA facility.

The turbines (Photo 1) are vertically oriented and contain six adjustable runner blades. Although these turbines were installed in 1969, they were rehabilitated and upgraded, now having a total installed capacity of 2.4 MW.



Photo 1: Kaplan Turbine at Cosgrove Project

IV. EXISTING OPERATIONS

As noted above, the Cosgrove Project is off-stream on a water transfer aqueduct, and does not discharge into any rivers. Water within MWRA's system (Figure 1) is treated as drinking water, and held to rigorous drinking water standards.

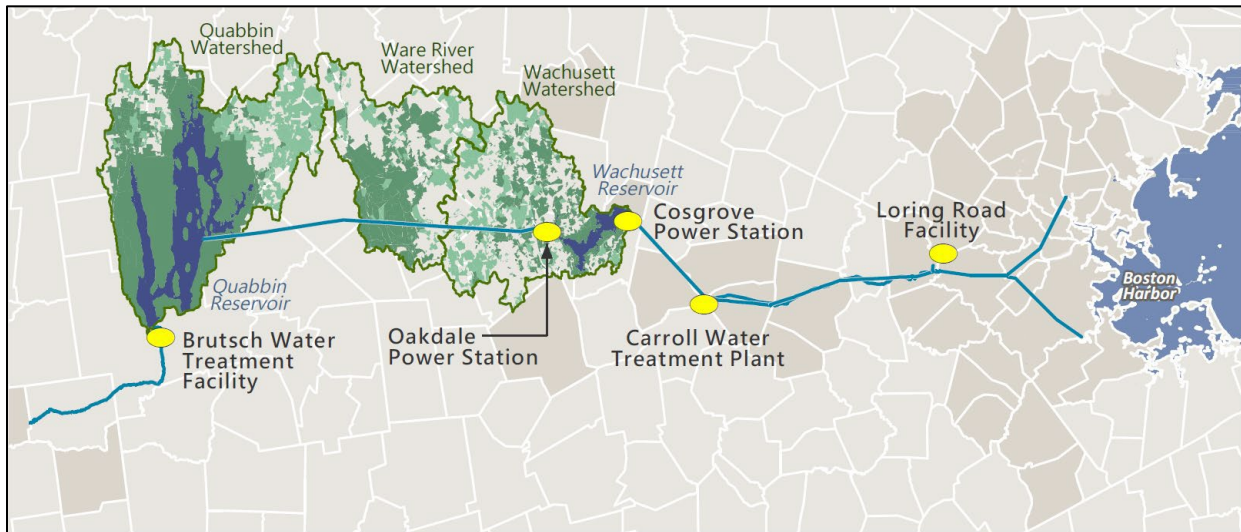


Figure 1: MWRA's Water Conveyance System

V. REGULATORY AND COMPLIANCE STATUS

This review included a docket search of the FERC eLibrary. Records for the Project date back to 1988, however, there are no compliance issues noted in the eLibrary. The Cosgrove Project was issued a conduit exemption on January 19, 1990. A conduit exemption exempts from the Cosgrove Project from Part I of the Federal Power Act. The only resource agencies engaged in the conduit exemption process of the Cosgrove Project were the U.S. Army Corps of Engineers (USACE) and the U.S. Fish and Wildlife Service (USFWS). Neither agency's comments were incorporated or germane to the issuance of the conduit exemption.

VI. PUBLIC COMMENTS RECEIVED OR SOLICITED BY LIHI

The application was publicly noticed on September 5, 2023, with a 60-day comment period, and notice of the application was forwarded to resource agency and stakeholder representatives listed in the application. No public comments were received by LIHI during the 60-day comment period which ended on November 6, 2023.

VII. ZONES OF EFFECT

The Applicant delineated the Cosgrove Project as a single Zone of Effect (ZoE 1). Standards selected for each LIHI criterion are shown in the table below. The reviewer agrees with these selections.

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality	X				
C	Upstream Fish Passage	X				
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection	X				
H	Recreational Resources	X				

VIII. DETAILED CRITERIA REVIEW

A: Ecological Flow Regimes

Goal: *The flow regimes in riverine reaches that are affected by the facility support habitat and other conditions suitable for healthy fish and wildlife resources.*

Assessment of Criterion: The applicant selected criterion Standard A-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this criterion.

Discussion: As noted in the application, the Cosgrove Project is a conduit facility located on a public water supply reservoir associated with MWRA’s drinking water conveyance system. The Cosgrove Project is off-stream, and therefore a “closed” water system. Consistent with Standard A-1, the Cosgrove Project has no bypassed reaches, minimum flow requirements, or flow release schedules associated with its operations or FERC exemption order. At the time of FERC exemption, the USFWS did not require flow recommendations. The power generation components of the Cosgrove Project run on a regular schedule, and generation is calculated based on the amount of flow available at the time. When the power generation equipment is offline for maintenance, water is conveyed continuously through the MetroWest tunnel. Based on this information, the Cosgrove Project satisfies Criterion A-1.

B: Water Quality

Goal: *Water Quality is protected in waterbodies directly affected by the facility, including downstream reaches, bypassed reaches, and impoundments above dams and diversions.*

Assessment of Criterion: The applicant selected criterion Standard B-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this criterion.

Discussion: The Cosgrove Project has no water quality certification and is not located on a Water Quality Limited riverine reach. The water is entirely contained within MWRA's closed water conveyance system. As noted in MWRA's application, the water within the facility does not affect water quality below, around, or above the facility. The water that passes through the facility is of the highest water quality as its primary purpose is drinking water. Monthly water quality test results are available on MWRA's public website. MWRA routinely evaluates the water quality for microbacteria, turbidity, corrosiveness, disinfectants, chemicals, and minerals. Based on this information, the Cosgrove Project satisfies Criterion B-1.

C: Upstream Fish Passage

Goal: *The facility allows for the safe, timely, and effective upstream passage of migratory fish. This criterion is intended to ensure that migratory species can successfully complete their life cycles and maintain healthy populations in areas affected by the facility.*

Assessment of Criterion: The applicant selected criterion Standard C-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this criterion.

Discussion: The Project is a closed, off-stream system unconnected to a natural river with no possibility that fish could enter the water supply system to move upstream through the Project. The power generation equipment is located inside buildings, and therefore there is no interaction between fish migrating upstream and the hydropower facility. Water passing through the turbines is used for drinking water only and is also enclosed within the closed system for distribution to end users, therefore there is no possible water for fish to migrate upstream via the Cosgrove Project. Based on this information, the Project satisfies Criterion C-1.

D: Downstream Fish Passage

Goal: *The facility allows for the safe, timely, and effective downstream passage of migratory fish. For riverine (resident) fish, the facility minimizes loss of fish from reservoirs and upstream river reaches affected by Facility operations. Migratory species can successfully complete their life cycles and to maintain healthy populations in the areas affected by the Facility.*

Assessment of Criterion: The applicant selected criterion Standard D-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this criterion.

Discussion: As outlined above, the Cosgrove Project is entirely closed. The water intake for the turbines and bypass valves has a traveling screen system which prevents both fish and debris from entering the penstock. There is no discharge from the facility that could impact downstream passage since water is discharged to the Cosgrove tunnel. Multiple resident fish species exist in the Wachusett Reservoir; however, they are not impacted by the Cosgrove Project's operations. No comments were received

from the agencies during the comment window. No impacts are anticipated to fish due to the Cosgrove Project's operations. Based on this information, the Project satisfies Criterion D-1.

E: Shoreline and Watershed Protection

Goal: *The facility has demonstrated that sufficient action has been taken to protect, mitigate or enhance the condition of soils, vegetation and ecosystem functions on shoreline and watershed lands associated with the facility.*

Assessment of Criterion: The applicant selected criterion Standard E-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this criterion.

Discussion: The hydropower facility is located entirely within the intake facility, and therefore, there are no impacts to shoreline or the watershed. MWRA is the owner of over 30% of the watershed and maintains a buffer around the water supply reservoirs in order to protect the public water supply. Additionally, MWRA maintains a partnership with the Massachusetts Department of Conservation and Recreation Division of Water Supply Protection, which is responsible for managing the activities within the watershed funded by MWRA. For water quality purposes and shoreline protection, MWRA has a narrow operational band for raising/lowering the Wachusett Reservoir's elevation which is unrelated to the hydro operation. Based on this information, the Project satisfies Criterion E-1.

F: Threatened and Endangered Species

Goal: *The facility does not negatively impact federal or state listed species.*

Assessment of Criterion Passage: The applicant selected criterion Standard F-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this criterion.

Discussion: The USFWS Information for Planning and Consultation (IPaC) database was accessed to determine federally-listed species that could occur in the vicinity of the Cosgrove Project. An updated IPaC report was generated on November 2, 2023. As noted in the application, the Wachusett Reservoir is designated by the Massachusetts Endangered Species Act (MESA) as Estimated Habitat for Rare Wildlife and Priority Habitat for Rare Species, primarily due to the presence of the Common Loon, a state species of special concern.

Additionally, the USFWS lists the monarch butterfly and Northern long-eared bat as two species that may be present in the vicinity of the Cosgrove Project. However, since the facility is contained entirely within a closed system, there are no known or anticipated impacts from the facility's operations on any federal or state listed species. Landscape maintenance does not require any tree-cutting that may impact bird species habitat or nesting. As noted in the application, several bird species are present in the Cosgrove Project footprint, however, there are no known impacts to birds from operation of the

facility. Based on this information, the Project satisfies Criterion F-1.

G: Cultural and Historic Resources Protection

Goal: *The Facility does not unnecessarily impact cultural or historic resources that are associated with the facility's lands and waters, including resources important to local Indigenous populations, such as Native Americans.*

Assessment of Criterion: The applicant selected criterion Standard G-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this criterion.

Discussion: As noted in the application, there are several cultural resources within the Wachusett Dam Historic District, which is listed on the National Register of Historic Places (NRHP) as a Historic District and National Register Thematic Resource Area, in the area including the Wachusett Dam and Wachusett Lower Gatehouse. As well, both the Wachusett Dam Historic District and the Wachusett Aqueduct Linear District are listed on the NRHP. The Cosgrove Project itself is not listed on the NRHP, nor has the Massachusetts Historical Commission inventoried it. The FERC exemption order has no conditions specific to cultural or historic resources. Based on this information, the Project satisfies Criterion G-1.

H: Recreational Resources

Goal: *The facility accommodates recreation activities on lands and waters controlled by the facility and provides recreational access to its associated lands and waters without fee or charge.*

Assessment of Criterion Passage: The applicant selected criterion Standard H-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this criterion.

Discussion: The Cosgrove Project exemption has no recreation compliance requirements associated with its operation. The facility is secure and locked and not accessible to the public due to its significance as a public drinking water system. A separate Wachusett Reservoir Public Access Plan provides passive recreation in a different part of the watershed but is unassociated with the Cosgrove Project. Based on this information, the Project satisfies Criterion H-1.

IX. RE-CERTIFICATION RECOMMENDATION

This review included evaluation of the application and supplemental additional information provided by the Applicant, a review of the FERC eLibrary, and other publicly available information. Based on the evaluation, I recommend that the Project be re-certified as Very Low Impact (VLI) for a term of fifteen (15) years since the Cosgrove Project meets the Not Applicable/De Minimis Effect standards in all LIHI Criteria. No conditions are recommended for the Certification.