# REVIEW OF APPLICATION FOR CERTIFICATION BY THE LOW IMPACT HYDROPOWER INSTITUTE OF THE ARROWROCK PROJECT

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November 23, 2021

## I. INTRODUCTION

This report summarizes the review findings of the application submitted by Clatskanie People's Utility District (Applicant or licensee) to the Low Impact Hydropower Institute (LIHI) for certification of the Arrowrock Hydroelectric Project FERC (P-4656). The Project is a 15-MW facility that operates in a run-of-river mode with the ability to shape flows on a daily basis located on the Boise River approximately 75.7 miles upstream of the confluence with the Snake River near Boise, Idaho.

The Project was originally certified in 2011 as LIHI #81 for a five-year term. At recertification in 2016 following issuance of the Stage 1 review report, the Applicant elected not to proceed to Stage 2 and the Project was withdrawn. However, on September 22, 2021 LIHI received a complete application package for certification of the Project. This current review was conducted using the new 2nd Edition LIHI Certification Handbook.

## II. PROJECT'S GEOGRAPHIC LOCATION

The Project is located on the Boise River about 22 miles upstream of the city of Boise in Elmore and Ada Counties at the base of Arrowrock dam. Arrowrock dam is owned by the US Bureau of Reclamation (Reclamation) and is one of four federal dams within the upper Boise River watershed that are part of the Columbia River network of dams (Figure 1). Upstream is the Anderson Ranch Dam and hydro project constructed in 1950 and located on the South Fork Boise River. About 11 miles downstream of Arrowrock is the Lucky Peak dam constructed in 1955 and owned and operated by the US Army Corps of Engineers (USACE).

## III. PROJECT AND IMMEDIATE SITECHARACTERISTICS

Arrowrock Dam was constructed in 1915. It has a spillway length of 1,150 feet with an upstream impoundment depth of 257 feet. The crest elevation is at 3216.0 feet msl. When full, the reservoir has a surface area of 3,100 acres and a length of 12.8 miles along the mainstem. Two series of ten outlet conduits extend through Arrowrock Dam to provide irrigation releases at centerline elevations of 3018 feet msl and 3105 feet msl; the Project penstocks are tied into two conduits in the lower of the two tiers. Clamshell gates installed on the downstream end of each conduit are used to control water releases through the dam. There is also an overflow side-channel spillway on the dam which is used occasionally to release water for flood control using six drum gates that are six feet high with an invert elevation of 3210.0 feet msl (Figure 2).

A FERC license was issued on March 27, 1989 to a group of local irrigation districts however, construction was never initiated. Following several license extensions and a 2005 FERC Notice of Probable License Termination, the licensee filed a license amendment application on August 1, 2007 which FERC subsequently granted in August 2008. The Arrowrock Hydro Project began operation in 2010. The primary Project components include:

- Two 58-inch diameter steel penstocks
- A 70-foot-high powerhouse
- Two 7.5-MW Francis turbine generating units
- A 55-foot-wide, 125-foot-long tailrace discharging into Lucky Peak Lake with a tailrace control weir
- Electrical transmission infrastructure including generator leads, switchyard, and transmission interconnection with the Idaho Power Company system (see Figures 2 - 4).

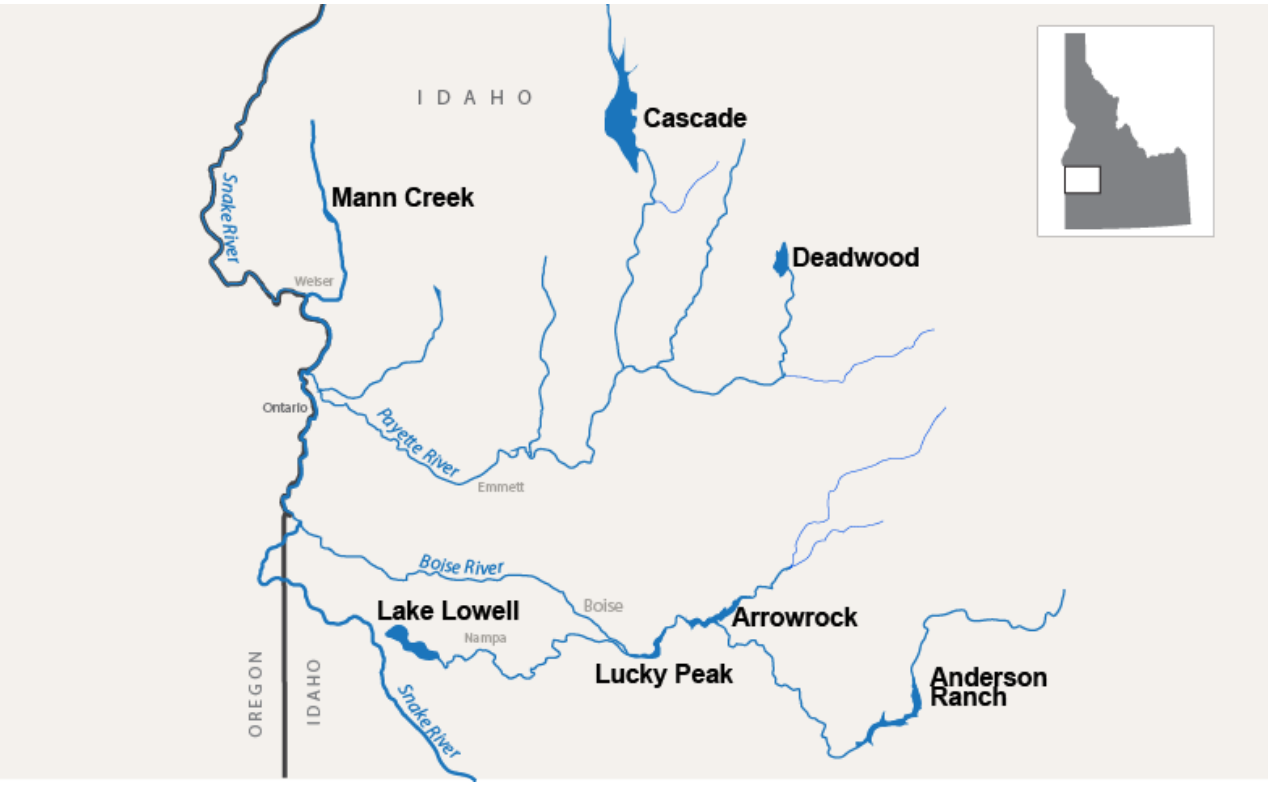


**Figure 1 – Arrowrock Project Location**

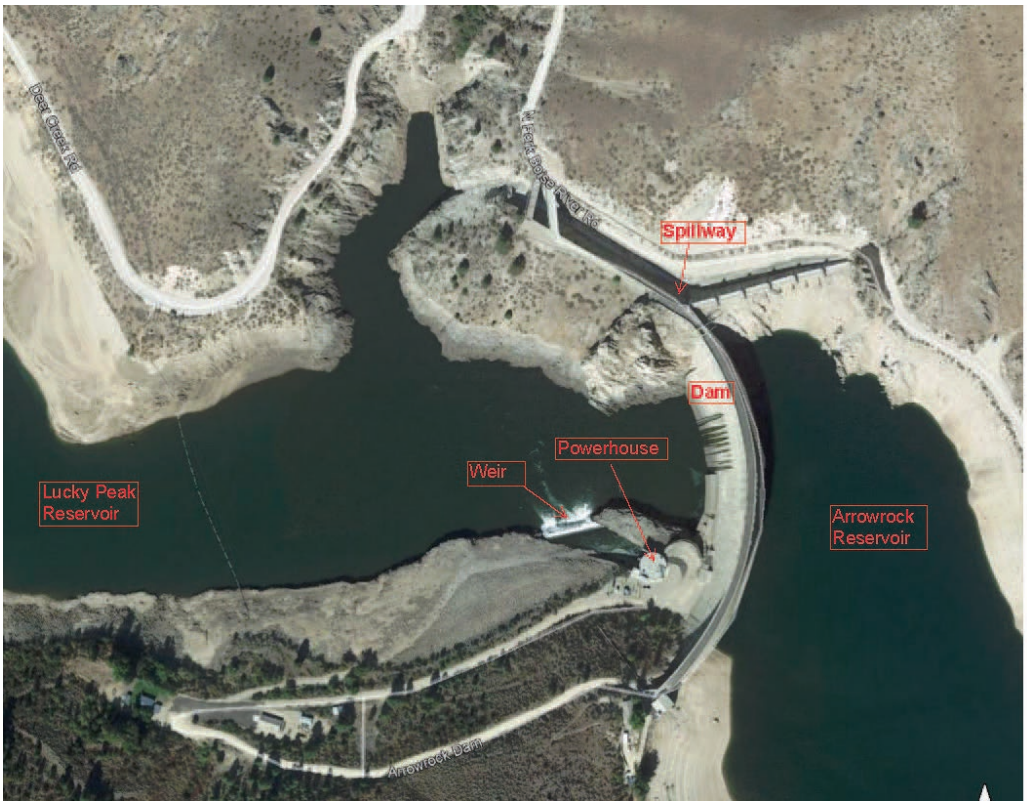


**Figure 2 –Arrowrock Project**

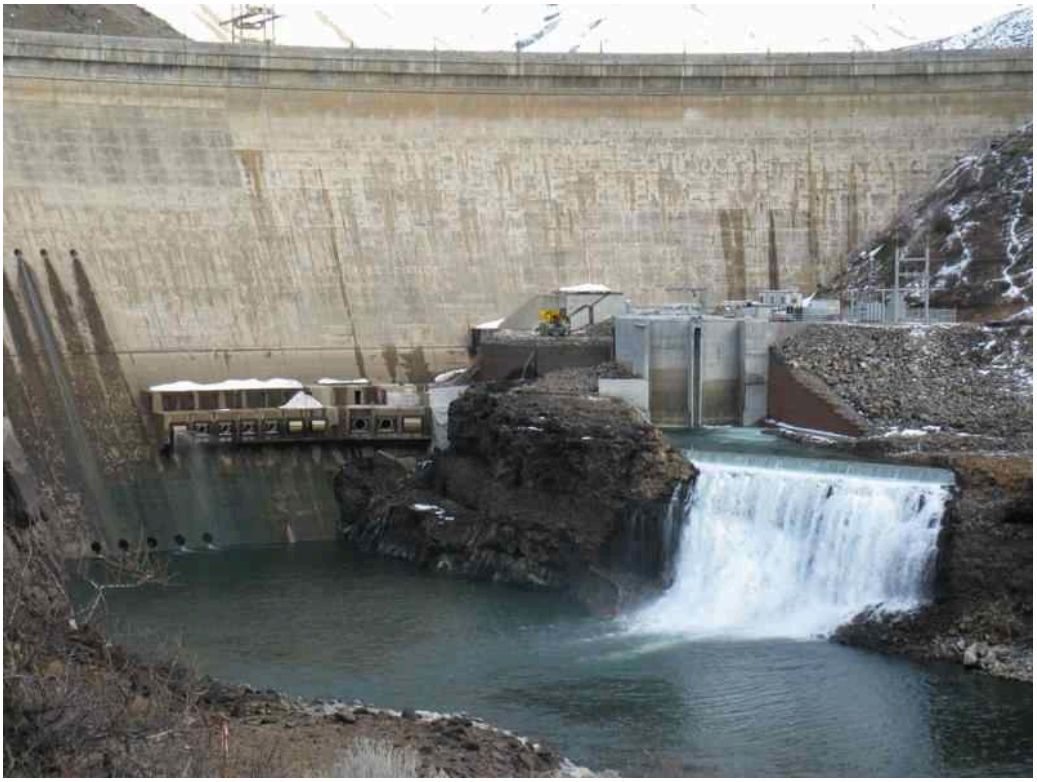

**Figure 3 – Arrowrock Downstream Area and Powerhouse**

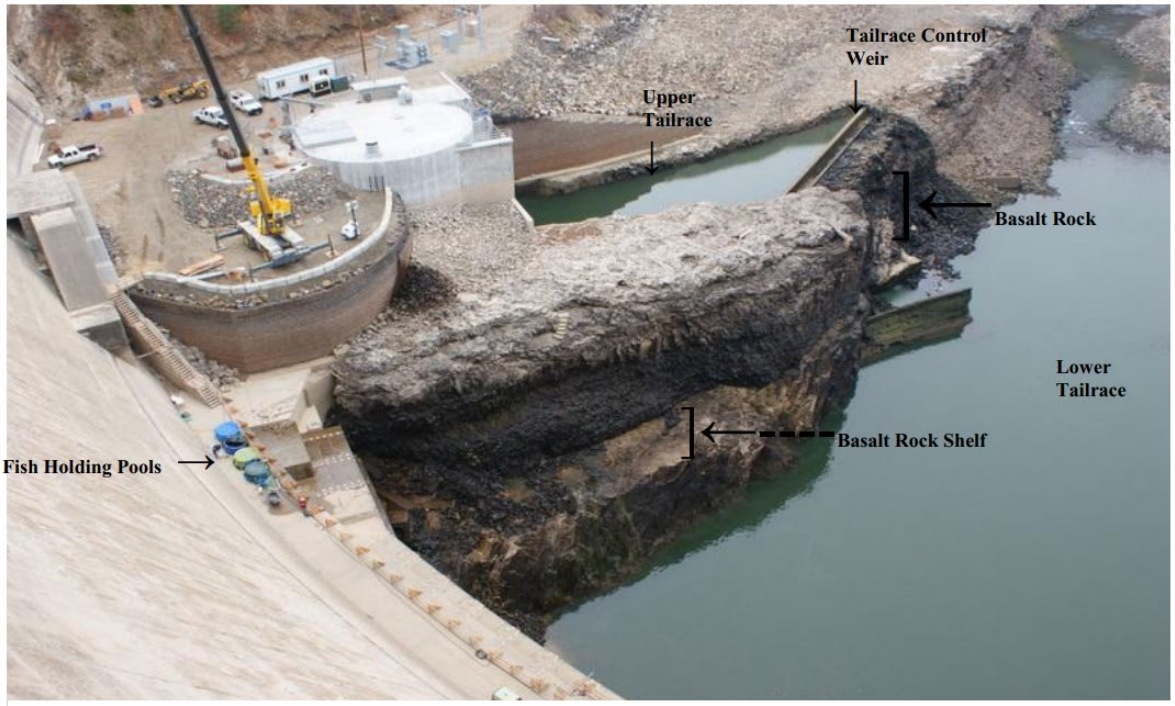


**Figure 4 – Arrowrock Downstream Area and Dam**

## IV. ZONES OF EFFECT AND STANDARDS SELECTED

Two Zones of Effect (ZOEs) were designated by the Applicant and were determined to be appropriate. Zone 1 includes the Arrowrock impoundment; Zone 2 includes the tailrace and downstream reach. Table 1 shows the Standards selected for each criterion for the two ZOEs. Where applicable, reviewer recommendations for alternate standards are show in **red**.

**Table 1. Standards Matrix for the Arrowrock Project.**

| | **Zone:** | **1: Impoundment Reach** | **3. Downstream Reach** |
|---|---|---|---|
| | **River Mile Extent:** | RM 75.7 – 76.3 | RM 75.4 – 75.7 |
| **Criterion** | | **Standard Selected** | |
| ***A*** | ***Ecological Flows*** | 1 | ~~1,~~ **2** |
| ***B*** | ***Water Quality*** | 3 | 3 |
| ***C*** | ***Upstream Fish Passage*** | 1 | 1 |
| ***D*** | ***Downstream Fish Passage*** | 2 | 1 |
| ***E*** | ***Shoreline and Watershed Protection*** | 1 | 1 |
| ***F*** | ***Threatened and Endangered Species*** | 3 | 3 |
| ***G*** | ***Cultural and Historic Resources*** | 2 | 2 |
| ***H*** | ***Recreational Resources*** | 2 | 2 |

## V. REGULATORY AND COMPLIANCE STATUS

The Project was issued a license order from the Federal Energy Regulatory Commission (FERC) in 1989[1] and a major license amendment in August 2008[2]. A water quality certification was first issued by the State of Idaho on December 11, 1984 and was subsequently re-issued on February 1, 2008[3] when the Project was modified under FERC's amendment. The Project was first certified by LIHI in 2011 for a 5-year term that expired on April 30, 2016. At the time of recertification in 2016, a recertification application was submitted but the owners ultimately decided to let the certification lapse, being unable to monetize the value of LIHI recertification at that time.

## VI. PUBLIC COMMENT RECEIVED OR SOLICITED BY LIHI

The application was posted for public comment on September 21, 2021 and the notice was forwarded to agencies and stakeholders listed in the application. The deadline for submission of comments was November 20, 2021. No comments were received. Based on the completeness of the application and documents available on the FERC eLibrary, I did not need to contact resource agencies.

## VII. 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 Passage:** The Applicant selected Standard A-1, Not Applicable/De Minimis Effect for both the Impoundment and Downstream zones. For reasons discussed below, this review finds that Standard A-2, Agency Recommendation is more appropriate for the Downstream Zone.

The Project is part of the USBR's "Boise Project" that collectively with several other dams and pumping plants, provides irrigation water to about 390,000 acres in southwestern Idaho and eastern Oregon. The Project operates in a run-of-river mode using available inflow from Arrowrock Reservoir with no control over impoundment operations. Most of the runoff in the Boise River system during winter and early spring is held initially in Arrowrock reservoir which is also the first reservoir in the system to be drawn down to meet irrigation demand. All inflows to the reservoir are appropriated for irrigation and flood control, and the upstream Anderson Ranch Dam creates highly regulated inflow conditions at Arrowrock. Spring high flows are used to refill the reservoir by late June and the available post-irrigation season storage capacity provides flood control during the spring refill period. The reservoir is drawn down during the irrigation months of July, August, and September with daily flow releases based on irrigation

[1] https://elibrary.ferc.gov/eLibrary/filelist?accession_number=19890417-0271&optimized=false
[2] https://elibrary.ferc.gov/eLibrary/filedownload?fileid=01D06FA2-66E2-5005-8110-C31FAFC91712
[3] https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20080215-0166&optimized=false

demands. The seasonal drawdown has averaged 68 feet from 2001 to 2020. Releases are diverted into irrigation canals downstream of Lucky Peak, including the New York Canal.

The volume of daily flow releases from the reservoir into the turbines is allocated by USBR; however, license Article 402 as amended on December 6, 1996, permits the Applicant to engage in daily power shaping releases, which follow the hourly change in need for power. This enables the Applicant to generate during daily peak power demand periods as long as the overall volume of water released each day remains within the daily allocation and meets USBR's irrigation and flood control requirements. Because the Project flows exceed turbine capacity between April and August of each year, daily shaping does not typically occur during that period. From November to March daily flow shaping occurs about half the time. From May 1 through June 30 the Applicant is not allowed to shape flow releases from the Project for the protection of smallmouth bass incubation and spawning per Article 402, as amended on August 1, 2008. Prior to the 2008 amendment, Article 403 required the development of a plan to determine, on an annual basis, the smallmouth bass spawning and incubation periods, and establishment of a 30-day period between May 1 and June 30 for operation without power-shaping releases. However, because the volume of water released through Arrowrock Dam between May 1 and June 30 greatly exceeds the Project's capacity, the Applicant is not capable of shaping flows during that period and requested that Article 402 be modified to require run-of-river operation in May and June, allowing Article 403 to be deleted.

This review finds that Standard A-2, Agency Recommendation is more appropriate for the Downstream Zone than Standard A-1 because while Lucky Peak reservoir backwaters to the base of Arrowrock Dam, The Applicant is capable of shaping flow releases.

Based on my review of the application, supporting documentation, and publicly available information, the Project is operated in a manner such that it does not adversely affect fish and wildlife resources under its limited flow regime. As such, the Project satisfies the Ecological Flow Regimes criterion.

## 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 Passage:** The Applicant appropriately selected Standard B-3, Site-Specific Studies for both Zones.

Idaho Department of Environmental Quality (IDEQ) classifies the waters of the impoundment and downstream zones as Category 2, which are waters that are fully supporting their assessed beneficial uses, and attainment of remaining beneficial uses has not been determined due to insufficient (or no) data and information[4]. Assessed beneficial uses for both zones include coldwater aquatic life, primary contact recreation, and salmon spawning.

[4] https://www2.deq.idaho.gov/admin/LEIA/api/document/download/14888

The Project was issued a WQC originally in 1984 which was re-issued in 2008, more than ten years ago and thus not supportive of Standard B-2, Agency Recommendation. The WQC contains two conditions – one related to consulting with IDEQ on plans for erosion and sediment control required under license Article 105 and spoils disposal under license Article 108, and the other related to consulting with IDEQ to develop a dissolved oxygen contingency plan required under license Article 404.

The Project has no control over the quantity or quality of impoundment water, and therefore no effect on impoundment water quality. FERC's 2008 Environmental Assessment[5] on the proposed license amendment application submitted by the Applicant states that water quality at the Project is generally good. The EA also states that Project operations could slightly alter dissolved oxygen (DO) concentrations immediately downstream at the head of Lucky Peak Lake when that lake is at winter low levels. Prior to the commencement of Project operations, Arrowrock Dam's valves discharged water above Lucky Peak Lake's winter water level and contributed some degree of downstream aeration. The Project now diverts a portion of the dam's discharges through the turbine and tailrace causing less turbulence and eliminating some aeration. License Article 404 required a Dissolved Oxygen Monitoring Plan that would ensure maintenance of 6 mg/L DO in the powerhouse tailrace, provide a procedure for initiating modifications of Project operation to increase DO levels in the event that they fall below the required 6 mg/L level, and a procedure for reporting DO conditions and corrective actions to consulting agencies. The final Dissolved Oxygen Monitoring Plan was submitted to FERC in 2009[6] and approved that same year[7].

Continuous DO monitoring and annual reporting have occurred ever since construction was completed. Based on a review of the annual DO monitoring reports, DO concentrations in the tailrace are in compliance with requirements.

The potential for Project-related impacts to water quality are minimized through several FERC license articles, including Article 105, which requires a plan for control of erosion, stream sedimentation, dust, and soil mass movement; Article 108, which requires a plan for soil disposal; Article 106, which requires a plan for handling solid waste and wastewater generated during construction and operation of the Project; Article 107, which requires a plan for storage, spill prevention, and cleanup of oils, lubricants, and other hazardous substances; and Article 108, which requires a plan for handling excess construction/tunnel spoils and slide material, including prevention of water contamination.

A review of the FERC eLibrary indicated that no issues related to water quality have occurred at the Project. Based on my review of the application, supporting documentation, and publicly available information, the Project does not appear to impact water quality in the river and therefore satisfies the Water Quality criterion.

[5] 20080509-3043
[6] https://elibrary.ferc.gov/eLibrary/filedownload?fileid=12035042
[7] https://elibrary.ferc.gov/eLibrary/filedownload?fileid=12205766

## 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 Passage:** The Applicant appropriately selected Standard C-1, Not Applicable/De Minimis Effect for both Zones.

There is no fish passage at the Project. License Article 203 reserves FERC authority to order alterations of Project structures and operations to take into account "to the fullest extent practicable" the regional fish and wildlife programs developed under the Pacific Northwest Electric Power Planning and Conservation Act[8], as recommended by resource agencies or affected Tribes. That authority has not been exercised to date.

The application states that historically (early to mid-1800's) anadromous fish, likely Chinook salmon, accessed the Boise River in the vicinity of the Project. However, by the late 1800's dams were in place on the Boise River downstream of Arrowrock Dam, which itself was constructed in 1915. The Swan Falls dam on the Snake River downstream of the Boise River confluence was constructed in 1901. Between mining on Boise River tributaries beginning in the 1860's and dam construction downstream of Arrowrock in the late 1800's, anadromous species had disappeared from the Boise River by the time Arrowrock Dam was constructed.

Since then, the Hells Canyon Complex was built in 1967 downstream on the Snake River and a series of dams were constructed on the lower Snake and Columbia Rivers. The Lucky Peak Dam was constructed by USACE in 1955 as a flood control facility, immediately downstream of Arrowrock Dam and has no upstream fish passage facilities.

Based on my review of the application, supporting documentation, and publicly available information, the Project satisfies the Upstream Fish Passage criterion.

## D. DOWNSTREAM FISH PASSAGE AND PROTECTION

**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 are able to successfully complete their life cycles and maintain healthy populations in the areas affected by the Facility.

**Assessment of Criterion Passage:** The Applicant appropriately selected Standard D-2, Agency Recommendation for the Impoundment Zone and Standard D-1, Not Applicable/De Minimis Effect for the Downstream Zone.

As noted previously in Criterion C - Upstream Fish Passage, downstream dams were constructed

[8] https://www.nwcouncil.org/reports/northwest-power-act

prior to the Project and do not have fish passage facilities. Therefore, diadromous fish are not present in the Project area.

Both Arrowrock Reservoir and Lucky Peak Lake provide habitat for coldwater and warmwater fishes, but space and habitat variability are limiting factors for fish populations as the reservoirs are subject to substantial seasonal drawdowns. Arrowrock Reservoir supports a mixed fishery consisting of yellow perch, smallmouth bass, mountain whitefish, rainbow trout, and bull trout. Wild redband trout, considered an interior native subspecies of rainbow trout, are also present. Bull trout in Arrowrock Reservoir are part of a population that is federally listed and protected under the Endangered Species Act.

Two fisheries exist in Lucky Peak Lake: a warmwater inshore fishery dominated by smallmouth bass and a coldwater mid-water fishery dominated by rainbow trout and kokanee. The rainbow and kokanee fisheries in the lake are supplemented by stocking and through fish that may pass through Arrowrock Dam upstream. Warmwater fishes spawn successfully along the shoreline.

Fish are entrained from Arrowrock Reservoir and into Luck Peak Lake independently of the hydroelectric project. FERC's 2008 Environmental Assessment notes that the existing 2005 US Fish and Wildlife Service (USFWS) Biological Opinion for Reclamation's operation and maintenance of its facilities in the Snake River Basin upstream of Brownlee Reservoir[9] indicated that the potential for entrainment at Arrowrock is associated with both the elevation of the reservoir and the rate of discharge from the dam. Specifically, entrainment is most likely to occur when the reservoir elevation is below 3,111 feet mean sea level (msl), and discharge is greater than 695 cfs. Additionally, an analysis of monthly data for the 73-year period from 1927 through 2001 by the licensee indicated that these conditions were met in 25 of 876 months, or 3 percent of the time.

In 2007 USFWS issued a Biological Opinion for the Arrowrock Hydroelectric Project concluding that the shaping flows operation at the Project would increase the conditions when entrainment might occur by 37 days over an 11-year time period for an increase of 0.1 percent of the license term, primarily in September and October. Additionally, USFWS concluded that "the potential for the Project to result in entrainment beyond that anticipated under Reclamation's existing operations will not result in effects to bull trout in Arrowrock Reservoir that could be meaningfully measured, detected, or evaluated." FERC staff concluded in the 2008 EA that impacts to fishes through entrainment and turbine passage at the Project could only incrementally increase mortality rates of fish already entrained through Arrowrock Dam and would not result in population-level effects to fishes.

The Arrowrock Project turbines only operate when the hydraulic head is between 70 feet and 180 feet. Based on this operating criterion, the Project does not operate when the surface elevation of Arrowrock Reservoir is below 3,092 feet msl. Given the conclusion reached by USFWS in its Biological Opinion that entrainment is most likely to occur when Arrowrock Reservoir elevation is less than 3,111 feet msl, the risk of fish entrainment through the Project turbines is very low.

Article 406 of the license required development of a plan to monitor turbine-induced injury and

[9] https://www.fws.gov/idaho/documents/BOs/05_F_0532_BORUpperSnake.pdf

mortality for five years and to file a five-year summary report with FERC, annual agency consultation meetings on the monitoring to ensure bull trout protection, annual summary reports to be filed with resource agencies and FERC, and a notification process in the event of bull trout entrainment, injury, or mortality. The plan was filed on October 20, 2009[10] and approved on December 11, 2009[11]. The plan included fish injury and mortality studies that were conducted in November 2010 and included a balloon tag study utilizing live, hatchery-raised rainbow trout (*Onchorhynchus mykiss*) and a Sensor Fish study utilizing a small electronic "fish". The balloon tag study released 100 rainbow trout in two size classes through Clamshell Valve 1, 50 fish through Turbine Unit 1, 51 fish over the tailrace waterfall, and 39 control fish. All three passage routes resulted in relatively high rates of injury and mortality. Direct 48-hour survival estimates for fish passed through Clamshell Valve 1, Turbine Unit 1, and over the tailrace waterfall were 21.7%, 6.0%, and 53.1%, respectively. The Sensor Fish study indicated most hazards to fish were due to pressure changes and shear for the clamshell passage route, collision with the turbine components for the turbine passage route, and collision with rocks for the tailrace waterfall passage route.

The plan also included a fish salvage and monitoring program during the first 5 years of Project operation. The licensee stated that since starting operations in 2010, it has determined that the week around Labor Day is the most critical time for the possibility of fish entrainment in the tailrace, due to Arrowrock and Lucky Peak reservoir operations. Based on five years of fish salvage monitoring, the licensee proposed to modify operations to ensure cool fresh water is released to the tailwater during Project shutdowns longer than 24 hours and, depending on reservoir elevations, in order to prevent fish mortality and improve water quality conditions in the tailrace. Since hydro operations began, no bull trout have ever been detected in the tailrace, and salvage operations pursuant to this provision were only required once since the Project started operating.

License Article 406, as revised in the 2008 license amendment also reserves FERC's authority to require alteration of Project operations or features to protect bull trout or other fish resources. This authority has not been exercised to date.

Based on my review of the application, supporting documentation, and publicly available information, the Project satisfies the Downstream Fish Passage and Protection criterion. Although entrainment mortality is more than de minimis, the hydro Project has only negligible effect on mortality that would otherwise occur.

## E. SHORELINE AND WATERSHED PROTECTION

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

**Assessment of Criterion Passage:** The Applicant appropriately selected Standard E-1, Not Applicable/De Minimis Effect for both Zones.

[10] 20091020-5034
[11] 20091211-3013

The FERC Project boundary covers approximately 5 acres. The areas around both reservoirs are dominated by a shrub-steppe vegetation community. At high elevations around Arrowrock reservoir, land transitions to coniferous forest. Riparian communities are limited to the areas around the numerous tributaries that flow into both reservoirs. Land use around the reservoirs is primarily undeveloped due to steep hillsides and most lands are federally owned.

The Project is not required to have, nor does it have a shoreline management or similar plan. The Project does not control or impact the shoreline of Arrowrock Reservoir nor does it influence the downstream zone given that Lucky Peak reservoir backwaters to the toe of Arrowrock dam. The run-of-release operations minimize the potential for the Project to negatively affect the shorelines.

The Project's FERC license does contain several articles that address terrestrial habitat mitigation, however these articles either were only applicable during the construction phase of the Project or are applicable to the transmission line, which is owned by Reclamation.

A review of the FERC eLibrary indicated that no issues related to shoreline and watershed protection have occurred during the FERC licensing period.

Based on my review of the application, supporting documentation, and publicly available information, the Project's operations sufficiently protect shoreline and watershed lands. Therefore, the Project satisfies the Shoreline and Watershed Protection criterion.

## F. THREATENED AND ENDANGERED SPECIES PROTECTION

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

**Assessment of Criterion Passage:** The Applicant appropriately selected Standard F-3, Recovery Planning and Action, for both Zones.

A USFWS IPaC report generated by the Applicant, included only the federally-threatened bull trout. Critical habitat for bull trout is designated throughout the species range, and the species is present in both Arrowrock and Lucky Peak reservoirs and upstream of Arrowrock. Bull trout use both the Arrowrock reservoir and the regulated stretch of the South Fork downstream of Anderson Ranch Dam for overwintering and foraging activities. Adults and subadults migrate into Arrowrock reservoir from the upstream North Fork and Middle Fork tributaries. Upstream migrations out of the reservoir occur between late March and mid-June, although a small number of fish remain over the entire summer. Most bull trout migrate from Arrowrock reservoir to upstream tributaries from March through June where they presumably find summer refuge habitat and foraging areas prior to the spawning period in late summer.

As noted earlier in Section D, in its 2007 Biological Opinion on the Project, USFWS concluded that "the potential for the project to result in entrainment beyond that anticipated under Reclamation's existing operations will not result in effects to bull trout in Arrowrock Reservoir that could be meaningfully measured, detected, or evaluated." Additionally, since hydro

operations began, no bull trout were ever detected in the tailrace, and salvage operations pursuant to this provision were only required one time since the Project started operating.

License Article 114 required a survey and mitigation plan for threatened and endangered species approved by the US Forest Service which was filed in 2008 (privileged) and subsequently approved by FERC[12]. USFWS had been consulted and they concluded that the Project with the design and construction mitigation measures in place would not adversely affect any listed species. The Forest Service confirmed that with the 2007 USFWS Biological Opinion, the Project satisfied the provisions of Article 114.

The State of Idaho does not maintain a separate list of threatened and endangered species. Rather, the State relies on federal agencies for determination of species status.

A review of the Project's record on the FERC eLibrary indicated that no issues related to threatened and endangered species have occurred during the FERC licensing period.

Based on my review of the application, supporting documentation, and publicly available information, the Project satisfies the Threatened and Endangered Species criterion.

## G. CULTURAL AND HISTORIC RESOURCE 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 Passage:** The Applicant appropriately selected Standard G-2, Approved Plan, for both Zones.

At the time the Project was licensed, four historic sites and one archeological site were inventoried that might be affected by the Project. One historic site is Arrowrock Dam, a property listed on the National Register. In its 2008 Environmental Assessment on the proposed license amendment, FERC noted that the area of potential effect for the proposed amendment encompasses: (1) the historic Arrowrock Dam; (2) the area where the powerhouse would be located; and (3) the 26.04 acres of land occupied by the transmission line (decreased from 57.31 acres); and that these areas are not expected to contain significant archaeological resources.

Cultural resources were not identified along the transmission line in the revised transmission line authorized under the license amendment. Article 409 of the amended license contained more specific requirements including additional consultation for protection of newly discovered resources and development of a Historic American Engineering Record.

Plans to blend the new powerhouse facility with the existing dam were included in a visual quality management plan, submitted, and approved by FERC in 2008. The Historic American Engineering Record documentation was completed by Reclamation as part of a separate project

[12] https://elibrary.ferc.gov/eLibrary/filedownload?fileid=11849396

that involved replacement of the dam's lower set of 10 Ensign valves with clamshell gates between 2001 and 2004. Reclamation submitted the final confidential Historic American Engineering Record to FERC on January 29, 2015.

A review of the National Register of Historic Places database found that the Arrowrock dam is the only registered site within the City of Boise and Boise County.

Based on my review of the application, supporting documentation, and publicly available information, the Project satisfies the Cultural and Historic Resource Protection criterion.

## 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 appropriately selected Standard H-2, Agency Recommendations for all zones.

FERC's 2008 Environmental Assessment notes that most of the public recreational use of Reclamation's Arrowrock Reservoir occurs at its upstream end due to the steep topography of the surrounding land, and the annual reservoir drawdowns by Reclamation. The area around the very upstream end of Arrowrock Reservoir, and the South Fork Boise River, provide a popular area for fishing, tubing, camping, picnicking, hiking, hunting, and nature study. Primary public recreational uses of the USACE's Lucky Peak Lake, immediately downstream include waterskiing, boating, fishing, swimming, and picnicking. Due to the small Project boundary, there is no safe recreational access within the Project boundary. A 2018 FERC Environmental and Public Use Inspection Report[13] notes that the licensee does not allow public access across the Arrowrock Dam to the power plant area.

Article 410 as amended, required a road utilization plan to minimize recreational access concerns during Project construction. The plan was submitted to FERC and approved in 2008. All construction-related work and road impacts were completed with final Project construction and demobilization.

Article 412 of the license required a recreation monitoring plan and recreation survey. The plan was submitted to FERC in 2009 and approved in 2010[14]. The survey was conducted in 2010[15] and filed with and approved by FERC in 2011[16].

Article 411 required development of a parking area for anglers near Arrowrock dam on the north shoreline and an overlook off the access road below the dam. FERC issued an order on January 19, 2010 approving a modified parking plan to be located on the north shore of the Boise River arm of Lucky Peak reservoir. The plan included installing a vault toilet, metal staircase, and

[13] 20181001-3003
[14] https://elibrary.ferc.gov/eLibrary/filedownload?fileid=12313142
[15] http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12604244
[16] https://elibrary.ferc.gov/eLibrary/filedownload?fileid=12751685

electrical service, to be constructed and operated under an August 21, 2009, cost-share agreement with USACE. The licensee was exempted from filing FERC Form 80 reports in 2014 and have no further recreational obligations within the Project boundary.

Consultation with the US Forest Service concerning measures needed to ensure the protection and development of natural resource values of the Project area (article 102), and for recreational use have taken place annually since the Project began operations and are documented in submittals to FERC. To date, the Forest Service has not identified any adverse effects to recreation from operation of the Project and no funding has occurred.

A review of the FERC eLibrary indicated that no issues related to recreation have occurred during the FERC licensing period.

Based on my review of the application, supporting documentation, and publicly available information, the Project satisfies the Recreational Resources criterion.

## VIII. GENERAL CONCLUSIONS AND REVIEWER RECOMMENDATION

Based on my review, I believe that the Project meets the requirements of Low Impact Certification and recommend it be certified for a five-year period with no conditions.