



**Nuyakuk River Hydroelectric Project (FERC No. 14873)  
Initial Study Report Meeting Summary**

**December 5, 2023  
1:00 PM – 4:00 PM (AK Time)  
Hosted in-person in Nushagak Cooperative’s  
Boardroom and Virtually via Microsoft Teams**

*Table 1. Initial Study Report Meeting Agenda.*

<b>TIME</b>	<b>TOPIC</b>
1:00 – 1:10	Introduction of Meeting Participants, Logistics, Meeting Intent, etc.
1:10 – 1:30	Reminder of Current Project Status, Open Discussion
1:30 – 3:30	2023 Nuyakuk Project Feasibility Studies Presentation
3:30 – 4:00	Global Questions, Next Steps, Opportunity to Comment, Wrap-up
4:00	Adjourn

## Initial Study Report Meeting Summary Attachments

- Attachment A      [ISR Meeting Participant Lists \(Sign-in Sheet and Virtual Attendees\)](#)
- Attachment B:    [Initial Study Report Meeting Presentation](#)
- Attachment C:    [Federal Energy Regulatory Commission Presentation](#)

## Welcome, Introductions, Meeting Logistics, and Meeting Intent

At 1:00pm, Mr. Cory Warnock (McMillen) welcomed the meeting participants to the Nuyakuk River Hydroelectric Project (Project), afternoon Initial Study Report (ISR) Meeting.

### **Participant Introductions**

The Project team members in attendance at the meeting are listed in Table 2. ISR Meeting attendees are listed in Attachment A.

*Table 2. Nuyakuk River Hydroelectric Project Team Members in Attendance.*

<b>Name</b>	<b>Agency/Organization</b>	<b>Attendance Type</b>
Will Chaney	Nushagak Electric & Telephone Cooperative (Cooperative)	In-person
Cory Warnock	McMillen, Inc. (McMillen)	In-person
Laura Johnson	McMillen	In-person
Chuck Sauvageau	McMillen	In-person
Dr. Mary Louise Keefe	Kleinschmidt Associates	In-person
Dr. Kevin Nebiolo	Kleinschmidt Associates	In-person
Audrey Thompson	Kleinschmidt Associates	In-person
Sean Ellenson	McMillen	Virtual
Noble Hendrix	QEDA Consulting	Virtual
Dave Jones	SLR Consulting	Virtual
Taryn Oleson-Yelle	R&M Alaska	Virtual
Maria Lewis	MLP&A	Virtual
Lindsey Kendall	MLP&A	Virtual
Cam Wobus	CK Blueshift	Virtual
Mike Yarborough	CRC Alaska	Virtual

## Meeting Logistics and Meeting Intent

The presentation shown during the ISR Meeting is provided in Attachment B.

Mr. Matt Cutlip (Federal Energy Regulatory Commission; FERC) spoke to the participants regarding the purpose of the ISR meeting and next steps following the ISR meeting. Mr. Cutlip introduced himself as a fish biologist and Project Coordinator for FERC. He stated that the ISR is an interim report that summarizes data collection to date and should also discuss any variances from the study plan. Mr. Cutlip discussed the comment period and purpose of commenting, including modifications to the study program or requests for new studies. Per the approved process plan that issued by FERC last year, the Cooperative is required to file a meeting summary by December 31, 2023. Comments on the meeting summary, requested modifications to existing studies, or requests for new studies are due to FERC no later than January 30, 2024. Mr. Cutlip stated that the Cooperative is not required to re-file the ISR with edits or clarifications. FERC will only be responding to requests for new studies or study modifications. Mr. Cutlip provided

supplemental documentation following the meeting to the Cooperative, which is provided in Attachment C.

Mr. Cory Warnock (McMillen) provided guidance regarding the flow of the meeting, including the time designated for asking questions following the conclusion of the presentations on each of the natural resource study areas portion of the presentation. Mr. Warnock also documented the Cooperative's approach to presenting the plans for continuing the study program in 2024 and the formation of several Technical Working Groups later in the meeting.

Mr. Will Chaney (Nushagak Cooperative) welcomed the meeting participants. Mr. Chaney gave a brief overview of the Project and Project location, highlighting the fact that the Project design, which is a river diversion that does not include a dam. Mr. Chaney displayed a map of the proposed Project area and conceptual location of the transmission line, including the proximity of Dillingham and the four outlying villages (Koliganek, Ekwok, Levelock, and Stuyahok) that would receive electricity from the proposed Project. No roads are proposed as part of Project development. The Project site has been accessed by float plane, helicopter, and boat to date. The highest annual flows of the Nuyakuk River coincide with the peak of the generation needs for fish processing. Mr. Chaney discussed the need for the proposed Project, with respect to almost completely eliminating the need for fossil fuel. Mr. Chaney summarized other projects that have been evaluated by the Cooperative to date, and the reason why those projects were not pursued further. Thus far, the Nuyakuk Project has appeared more feasible for development and as a result, the Cooperative is continuing to advance the assessment of the proposed Project.

Mr. Will Chaney (Nushagak Cooperative) gave a description of the proposed Project site and Project facilities, including the limited footprint and short bypass reach. No dam is proposed as part of the Project, and instead natural flows will be utilized for generation. A groin, if needed, would be constructed out of rock from the Project site and would be used to control the water level near the intake when river flows are low.

Mr. Cory Warnock (McMillen) provided a summary of the Project efforts completed in 2023, including continued collaboration and meetings of the Aquatic Resources Working Group (ARWG), geotechnical investigation, establishment of the study camp at the Project site, permits acquired, development of several models including the Life Cycle Model and economic models and the completion of the 2023 portion of the study program. The 2023 study season had no safety incidents.

Mr. Will Chaney (Nushagak Cooperative) provided an overview of the Project goals, with respect to evaluating proposed Project feasibility and collaboration with the Bristol Bay community, Tribal entities, and individuals. The Cooperative is using the best possible science and regional experts to assess the feasibility of the proposed Project. If deemed feasible, licensed and ultimately constructed, the Project would provide a long-term, renewable power source for region, provide lower electricity rates over time, significantly reduce or eliminate the reliance on fossil fuels for electricity generation, and create short- and long-term employment opportunities in the region. A series of Sustainable Energy Meetings are planned in Dillingham and the outlying villages beginning next week and the Cooperative will be participating in those forums to continue the discussion regarding the proposed Project and anticipated benefits.

## Natural Resource Study Program and 2023 Study Results

Mr. Cory Warnock (McMillen) displayed a list of the studies being conducted as part of the Project's natural resource study program, per the Revised Study Plan (RSP). Study leads then presented information about the studies conducted and preliminary results, as currently available.

### Fish and Aquatic Resource Studies

Ms. Audrey Thompson (Kleinschmidt Associates) provided an overview of the Fish Community and Behavior Near the Project Area study results. The study utilized water surface elevation monitoring, United States Geologic Service (USGS) and Project site gage data, radio telemetry, Sockeye tagging, Sonar, predator tagging, and fish community sampling. Ms. Thompson described the radio telemetry array that was established at the Project site and the zones that were evaluated using the array. The preliminary results include evaluation of the telemetry detection success. Thus far, results indicate that 96% of the Sockeye salmon tagged below Nuyakuk Falls were detected passing through the Falls and exiting the study area. The next component of the Fish Community study will include development of the 2-Dimensional (2D) hydraulic model. The 2D model will include field data, the stage-discharge relationship, and water surface elevation. A rating curve will be developed, and the 2D model will incorporate (Light Detection and Ranging) LiDAR data collected at the proposed Project site. Ms. Thompson displayed a preliminary 2D model output of the river flow at high flow (18,000 cfs) and low flow (7,500 cfs).

Dr. Kevin Nebiolo (Kleinschmidt Associates) described the Agent-Based Model (ABM) that's been developed and is being refined for the Project. Each agent represents an individual fish and simulates fish behavior. The ABM will assist with understanding sockeye salmon passage through Nuyakuk Falls. The proof-of-concept of the ABM is complete and is currently undergoing refactoring to support vectorized operation. Validation of the model using site-specific telemetry data and expert opinion is planned for quarter 1 of 2024. Dr. Nebiolo provided initial results from the ABM, including imagery of passage routes, plots of agent movements, and agent (fish) lengths that were used in the model. Dr. Nebiolo displayed model output in the form of a video of agent movement through the Falls.

Dr. Kevin Nebiolo (Kleinschmidt Associates) provided an overview of the Fish Entrainment and Impingement Study, which will be conducted in 2024 and will utilize results from Year 1 of the Fish Community and Fish Passage studies. Dr. Nebiolo also presented an overview of Tailrace False Attraction Study, which will also be conducted in 2024 and will utilize Year 1 of the Fish Community and Fish Passage studies.

Dr. Noble Hendrix (QEDA Consulting) described the Chinook and Sockeye Life Cycle Model (LCM) that is currently being developed for the proposed Project. The purpose of the LCM is to provide a method for assessing proposed Project effects on different life cycles of Chinook and Sockeye salmon over multiple generations. Additionally, the LCM will allow for evaluation of proposed Project effects under different climate change and/or operational scenarios. The LCM relies on both local, site-specific data as well as long-term datasets from other regional systems. An initial "straw man" LCM has been developed and will be refined during 2024. Data from other sources/river system is being reviewed for potential inclusion in the LCM. Site-specific data collected in 2023 and 2024 will be utilized in the LCM.

Mr. Pat Vermillion (Royal Coachman Lodge) asked if there will be a pink salmon model. Dr. Hendrix replied that there will not be a pink salmon LCM.

The next steps for the LCM include further data collection and acquiring existing datasets, data analysis, integration of other Project models (climate and water flow scenarios) and continued calibration of the model.

Dr. Kevin Nebiolo presented the Integrated Risk Assessment (IRA) of Fish Populations. The IRA is proposed to evaluate potential Project impacts to fisheries resources at the fish population/community level. A strawman list of management objectives, risk sources, their elements, and receptors (species at risk) has been developed. A risk calculation spreadsheet for a single receptor with example risk matrix was displayed. A workshop is being hosted by the Cooperative on December 6<sup>th</sup>, 2023 to further develop the management objectives and risk sources.

### Fish and Aquatic Resource Studies Questions and Discussion

Fritz Johnson (meeting attendee): asked if the Project work has come up with a different number of fish that have gone up the river versus the Alaska Department of Fish & Game's (ADF&G's) downstream fish counts, and also how many adult Chinook were observed at the Project site. Ms. Audrey Thompson (Kleinschmidt Associates) stated that abundance of adult Chinook was not estimated. Observations of Chinook salmon were made using underwater videography, but due to the high numbers of Sockeye salmon it was difficult to estimate the number of Chinook at the Project site.

Ms. Leah Ellis (ADF&G) asked if catch per unit effort (CPUE) data will be presented. Ms. Audrey Thompson (Kleinschmidt Associates) confirmed that CPUE data will be provided as part of the Updates Study Report (USR) and associated meeting but were not completed in time to be included in the ISR.

Mr. Mark Lisac (Nushagak Cooperative Board and community member) asked how much time it takes for fish to pass through the Falls. Ms. Audrey Thompson (Kleinschmidt Associates) stated that passage time ranged from 2-3 days to 20-24 days. Ms. Thompson stated that there does appear to be a correlation between higher river flows and longer passage times. Dr. MaryLouise Keefe (Kleinschmidt Associates) stated that there are two different datasets (the fish tagged at the Falls, and the fish tagged later in the season by the Bristol Bay Science and Research Institute (BBSRI)) that need to be evaluated. The two sites are approximately 17 miles apart. Mr. Bryan Nass (BBSRI) commented that these two datasets provide an opportunity to observe fish over a longer period of time.

Ms. Ali Eskelin (Alaska Department of Natural Resources (ADNR)) asked if there will be a IRA for other species of fish such as grayling. Dr. MaryLouise Keefe (Kleinschmidt Associates) responded that there is a list of resident fish that will be evaluated in the IRA after Chinook and Sockeye salmon are completed. Dr. Noble Hendrix (QEDA Consulting) stated that there will be some focused quantitative risk assessment associated with the LCM in addition to the qualitative risk assessment for species besides Chinook and Sockeye salmon. Ms. Eskelin (ADNR) asked if the team had a plan for tagging 100 Chinook salmon in the coming year as required by the study plan. Ms. Audrey Thompson (Kleinschmidt Associates) responded that lessons learned this year with respect to the dilution factor given the large number of Sockeye present at the same time,

tagging location, and tagging methods will enable the team to attempt to tag 100 Chinook salmon in 2024.

It was asked if there were Chinook salmon observed at the BBSRI counting tower. Mr. Bryan Nass (BBSRI) responded that the BBSRI team observed a number of larger fish that were likely Chinook salmon at the counting tower.

Ms. Kristina Andrew (meeting attendee) asked for more information about the 96% of fish passage, and whether the other 4% of fish die and go downstream. Ms. Thompson stated that there are several next steps to determine where the missing 4% of fish ended up to the extent possible, but that work has not been completed yet.

Mr. Dan Dunaway (meeting attendee) asked how outmigrating juvenile salmonids will be evaluated including with respect to potential Project impacts. Dr. MaryLouise Keefe (Kleinschmidt Associates) stated that the sonar array was used to detect outmigrating juvenile smolts. The Project team has high-quality data including abundance of outmigrating smolts. The team has distribution data and abundance of smolts from the sonar array. Ms. Audrey Thompson (Kleinschmidt Associates) stated that the ISR contains an example of the way that the sonar data were analyzed, and a visual example of what smolt sonar detections look like. The full analyses were not ready for the ISR, but will be used in the future. Mr. Bryan Nass (BBSRI) added that the sonar array was designed so that the team could look at both horizontal and vertical distribution of smolts in the water column.

Mr. Dan Dunaway (meeting attendee) asked about the potential use of fish-friendly turbines in the Project. Mr. Sean Ellenson (McMillen) stated that typical Kaplan turbines pass about 94-96% of smolts. Fish-friendly Kaplan turbines have a passage success rate of about 97-98%.

Mr. Andy Angstman (Tikchik Narrows Lodge) stated that he would like the Project team to investigate pink salmon. 2024 is an even-numbered year which is a pink salmon year. They are important upstream of the Falls. Mr. Cory Warnock (McMillen) asked Mr. Angstman to file these comments with FERC as well.

Dr. Daniel Schindler (University of Washington) encouraged the team to keep sonar equipment in the water longer to ensure that the smolt pulses are captured. Ms. Audrey Thompson (Kleinschmidt Associates) replied that the sonar array was kept in until mid-July and smolt detections had flatlined by the time it was removed. Dr. Schindler asked about climate change and fish migration time, and how risk would be evaluated based on potential future conditions. Dr. MaryLouise Keefe (Kleinschmidt Associates) stated that all of the models being run will have a climate change component incorporated into them. Dr. Keefe asked that if Dr. Schindler had any temperature projections for the Nuyakuk River system that he provide them to the Project team. Dr. Schindler replied that he wasn't sure that temperature projections had been completed but that he thought they were important.

Question from meeting chat: do fish ever draft off of other fish when in schools to conserve energy? Dr. Kevin Nebiolo (Kleinschmidt Associates) replied that yes, they are influenced by schools around them, however, tired fish will still fall back. A second question from the chat was "do fish try again"? Dr. Nebiolo responded they won't go back to the same place twice if they fail at passage the first time.

Ms. Ali Eskelin (ADNR) asked if fish passage success rates were equivalent to survival rates. Mr. Sean Ellenson (McMillen) confirmed that those rates are for survival at several different time periods including 24 or 48 hours after passage. The metrics provided earlier in the ISR Meeting for fish-friendly turbines were about 97-98% survival 48 hours after passage.

Ms. Ali Eskelin (ADNR) asked about pressure changes influencing fish and how that could impact survival. Mr. Kevin Nebiolo (Kleinschmidt Associates) responded that this is one of the aspects the team would be evaluating and noted that salmonids have a physostomous swim bladder and are able to expel excess gas from their swim bladder. Mr. Bryan Nass (BBSRI) confirmed this.

Mr. Cody Larson (Bristol Bay Native Association (BBNA)) asked about comment periods associated with the ISR. Mr. Cory Warnock (McMillen) responded that the Cooperative is listening to all comments, but comments about modifying studies should also be made to FERC. Mr. Larson asked whether the Cooperative had proposed any modifications or variances to the studies. Mr. Warnock responded that the Cooperative was not proposing study plan modifications. Mr. Larson stated that some of the studies hinge on the species periodicity. He asked that if the Cooperative doesn't have that information, when and how it would be generated. Dr. MaryLouise Keefe (Kleinschmidt Associates) responded that the Cooperative does have periodicity information but will be refining that information based on Project-specific data collected during the Project study program. Ms. Audrey Thompson (Kleinschmidt Associates) added that the data that will inform species periodicity have been collected and are currently undergoing quality control internally prior to being utilized in Year 2 of the study program.

Ms. Leah Ellis (ADF&G) asked if smolt passage through the rock reef groin will be evaluated during the fish entrainment and impingement study. Dr. MaryLouise Keefe (Kleinschmidt Associates) stated that the groin structure is part of the 2D model and that flow fields will be used and evaluated during the entrainment and impingement study.

Mr. Sean McDermott (National Marine Fisheries Service (NMFS)) asked if the calibration flows for the 2D model were complete, in terms of having a large enough range of flows for model calibration. Mr. Chuck Sauvageau (McMillen) described the site-specific stage-discharge relationship and rating curve. The 2D model is currently being calibrated for a range of flows using site-specific data. Mr. McDermott asked if there were any surprises in terms of the fish species observed that may affect entrainment. Ms. Audrey Thompson (Kleinschmidt Associates) replied that there were no surprises in terms of slow-moving resident fish in the intake vicinity. Mr. McDermott asked if there were any issues with interference or false detections of tags. Ms. Thompson stated that the receivers were set up in order to try to avoid this using different receiver frequencies and locations, and the data are currently being analyzed for false detection data. Mr. McDermott stated that downstream survival of smolts is key, and that the Project should meet NMFS passage criteria.

A question was asked in the meeting chat about whether fish survival through turbines decline over time due to the degradation of equipment. Mr. Sean Ellenson (McMillen) stated that if turbines were causing increased fish mortality, they would be overdue for being pulled for rehabilitation.

A question was asked in the meeting chat about whether the fish friendly turbines been used successful on rivers with large numbers of salmon such as the Nuyakuk. Mr. Sean Ellenson (McMillen) responded that the fish-friendly Kaplan turbines are used extensively in the Columbia

River system, where there are lots of salmon. Mr. Ellenson stated that he was unsure if this style of turbines had been used in systems with large numbers of Sockeye salmon.

### Water Resources Studies

Mr. Chuck Sauvageau (McMillen) described the Water Quality study, which evaluated dissolved oxygen (DO) and water temperature in the Nuyakuk River. Mr. Sauvageau described the dissolved oxygen and water temperature data collection methods and results, compared to Alaska Department of Environmental Conservation (ADEC) water quality criteria. The Cooperative collected water temperature data from 2018-2021, and again from June 1-September 30, 2022. DO met ADEC criteria during the monitoring period. Overall, DO concentrations upstream and downstream of the Falls were similar overall with more fluctuation seen upstream of the falls. Water temperature was nearly always below 20 degrees C, with the exception of one exceedance in 2019 between July 5-11. In 2024, at ADF&G's request, DO monitoring will occur for 3-5 days during the period when large schools of adult sockeye salmon are staging at the base of Nuyakuk Falls.

Mr. Chuck Sauvageau (McMillen) described the Flow Duration Curve Assessment. A Project-specific gage was installed and will be used to more accurately define flow volumes used to generate flow duration curves at the Project site. The Project site gage at Nuyakuk Falls provides an excellent correlation with the USGS gage located at the outlet of Tikchik Lake into Nuyakuk River, 4.6 miles upstream of the Project site. The site-specific gage was installed when the Nuyakuk River was flowing at approximately 20,000 cfs, which resulted in an inability to install in a fashion where low flows during the winter months could be documented. That said, the USGS gage data at the lake outlet is available during this time. A follow-up effort was made toward the end of the field season to retrofit the gage by lowering the stilling well to enable data collection at lower flows and water levels. That work was successful. The non-stationarity detection tool developed by the U.S. Army Corps of Engineers will be used in 2024 to determine which time periods are most appropriate for developing flow duration curves for the Project-site.

Mr. Cam Wobus (CK Blueshift) provided an overview of the Future Flows Study. The Future Flows Study utilized a Global Change Model (GCM), made as site-specific as possible. Mr. Wobus presented a summary of MikeShe/Mike Hydro software package results. The model produces a flexible, integrated water-groundwater model with a choice of spatial and temporal scales and simple to complex solutions. The climate change model produced results showing decreased winter snowpack because more precipitation is projected to fall as rain, which leads to increased winter flows and decreased summer runoff by 2040, with more potential change by late century, depending on emissions scenarios.

Mr. Chuck Sauvageau (McMillen) presented an overview of the Ice Processes Assessment that is being conducted for the Project at the National Marine Fisheries Service's (NMFS's) request. The initial assessment includes a review of available imagery provided by NMFS, information gathering from a nearby hydroelectric project (Tazimina Falls) that has ice mitigation strategies, and collection of site-specific imagery near the proposed Project intake to assess frazil ice formation and ice breakup conditions at the Project site. The cameras failed to collect site-specific ice imagery during the winter of 2022/2023, likely due to harsh winter conditions at the Project site or a programming error. Additional, more weather-resistant cameras are now in place to capture ice conditions during the winter of 2023/2024. The Cooperative has had preliminary meetings with



George Hornberger, the General Manager of the Iliamna Newhalen Nondalton Electric Cooperative (INNEC), which owns and operates the Tazimina Falls Project that has been in service since 1998. Mr. Sauvageau showed some photographs of the Tazimina Falls Project, which included heated intake grates to minimize shutdowns from river icing. Mr. Will Chaney (Nushagak Cooperative) provided a summary of his conversations with Mr. Hornberger regarding the operations of Tazimina, where they have greatly reduced their diesel generation needs because they can produce electricity during periods of river icing due to the heated intake grates.

### Water Resources Studies Questions and Discussion

Mr. Chuck Sauvageau (McMillen) stated a question in the meeting chat posed by Mr. Carl Reese (ADNR), asking if the Cooperative plans to operate within the existing ADF&G flow reservation LAS 28250 or request changes to the flow reservation. Mr. Sauvageau responded that the Cooperative needs to complete the Project feasibility assessment prior to making that decision. The Cooperative won't know the approach until the study program is complete.

Ms. Leah Ellis (ADF&G) commented that the Tazimina Falls Project has a natural fish barrier so there are no fish concerns with respect to the concrete groin. Ms. Ellis asked if the Cooperative had communicated with Igiugig regarding their in-river hydroelectric project. Mr. Chaney responded that the Cooperative works with Igiugig on the fiber project and corresponds with them, and that their hydroelectric project is a bit different but communication between the two entities occurs on a regular basis. Ms. Ellis asked about the stream gage and whether it was operated year-round. Mr. Chuck Sauvageau (McMillen) responded that it was, but that when it was installed at 20,000 cfs, the team could not see a bedrock shelf that was present below the gage, and the installation has since been adjusted slightly to measure water levels during lower river flow conditions in the winter. Ms. Ellis (ADF&G) inquired about the type of ice that's typically present at the Project site in the winter. Mr. Will Chaney (Nushagak Cooperative) stated that he suspects there is shelf ice with an open channel flowing during most of the winter. Ms. Ellis asked if the team plans to take wintertime discharge measurements. The Cooperative is not currently planning to due to logistical challenges. The Cooperative has conducted low flow discharge measurements down to 2,900 cfs, so additional data aren't necessary for 2D model calibration.

Mr. Pat Vermillion (Royal Coachman Lodge) asked how the Cooperative could suggest that diesel generation could be eliminated when wintertime river flows are low as 1,000 to 2,000 cfs. Mr. Will Chaney (Nushagak Cooperative) responded that there are scenarios where the Cooperative would be generating electricity by burning diesel fuel during low flow periods. However, the transmission lines that would be installed as part of the proposed Project would enable the more efficient diesel generators in Dillingham to supply the four outlying villages with electricity, thus negating the need to run the less efficient generators in those villages.

Mr. Bryan Nass (BBSRI) asked about the elevation of the groin and at what flows migrating smolts would encounter the groin. Mr. Sean Ellenson (McMillen) stated that the groin would be set at a relatively low elevation to raise the water level for generation during low flow periods, so most of the time, outmigrating smolts wouldn't encounter the groin. The groin may not be necessary as part of the Project, and the Cooperative will be evaluating the need for the structure.

Mr. Andy Angstman (Tikchik Narrows Lodge) stated that at least three lakes in the Tikchik Lake system are fed by glaciers, and once the glaciers are gone, summer flows may be affected and the

Cooperative should consider this factor. Mr. Cam Wobus (CK Blueshift) responded that glaciers were not specifically evaluated as a water source during the Future Flows Study, but that it's a good point. Mr. Will Chaney (Nushagak Cooperative) added that there is some information out there that could be utilized to assess glaciers. Mr. Pat Walsh, who retired from the Togiak National Wildlife Refuge, published a study about the retreat of the glaciers that may be able to be utilized (Walsh et al. 2015).

Mr. Cody Larson (BBNA) asked if the Cooperative would be modifying the natural resource study program to add a study to evaluate potential modifications to the ADF&G instream flow reservations. Mr. Chuck Sauvageau (McMillen) responded that any potential modifications to the ADF&G instream flow reservations would depend on the Project feasibility assessment results. The Cooperative will determine at a later time if revisions to the existing ADF&G instream flow reservations would be requested or necessary.

### Terrestrial Resources Studies

Ms. Maria Lewis (MLP&A) presented the Wetlands and Botanical Study that was conducted for the Project. Ms. Lewis described the area studied and the data collected. The wetland delineation resulted in approximately 5 acres of wetlands within the nearly 90-acre study area. No non-native or invasive species were identified. One rare plant (*Primula spp.*) was potentially located in the Project study area, but the species identification was not certain and will be confirmed in 2024.

Ms. Lindsey Kendall (MLP&A) described the Caribou Population Evaluation that was conducted in 2023 to evaluate potential impacts to the Mulchatna Caribou Herd (MCH) in the proposed Project area. The study included a desktop literature review and analysis of survey & inventory (S&I) data collected by ADF&G. The study found that the Project may result in a small loss of habitat area, but it does not overlap current calving areas. A Terrestrial Resources Technical Working Group is being formed, and additional discussion regarding potential impacts to MCH will occur within that Technical Working Group.

### Terrestrial Resources Studies Questions and Discussion

Mr. John Landsiedel (ADF&G) asked about subsistence hunting of caribou, and raised concerns about how caribou populations near the outlying villages may be affected by the proposed Project. Mr. Warnock (McMillen) mentioned that the Cooperative will be initiating Technical Working Groups (TWGs) for cultural, recreation, and terrestrial resources, and that anyone who is interested in discussing these resources should sign up for one or more of these TWGs.

Ms. Ali Eskelin (ADNR) stated that the airstrip isn't to scale and should be extended outside of the wetland study area to fully encompass the potential airstrip location. Ms. Eskelin discussed the placement of the transmission line and that the Cooperative may want to consider routing the line to Aleknagik through Ekwok which may have fewer impacts to caribou and improving the community's winter access routes between Aleknagik and the other outlying villages.

Mr. Cody Larson (BBNA) stated that traditional ecological knowledge may be useful to evaluate caribou use of the area, and that the subsistence study and terrestrial studies depend on one another. Mr. Cory Warnock (McMillen) agreed that the two studies will synergize and integrate with one another. Ms. Ingrid Brofman (FERC) asked for clarification on the discussion and how the studies

would be integrated. Mr. Warnock responded that there may be times that the Terrestrial and Cultural Resources TWGs would meet jointly, and that more information would be provided in the USR.

Ms. Leah Ellis (ADF&G) stated that the way the ISR is written, transmission lines may have a large or negligible impact on caribou populations. Ms. Ellis asked what else could be done to evaluate potential impacts to caribou. Mr. Cory Warnock (McMillen) suggested that Ms. Ellis join the Terrestrial Resources TWG to discuss the question further.

### Cultural Resources Studies

Mr. Will Chaney (Nushagak Cooperative) provided an update regarding the implementation of the Subsistence Study. The Cooperative will utilize existing ADF&G data to assess current subsistence use and document potential impacts associated with the Project. The Cooperative has begun initial planning for the Subsistence Study including identifying the appropriate specialists to conduct the study, and the bulk of the study will be conducted in 2024.

Mr. Mike Yarborough (CRC Alaska) provided an overview of the Section 106 Evaluation that was conducted in 2023. A field investigation was conducted in a 90-acre study area, similar to the study area used by the Wetlands and Botanical Study. The survey and shovel testing identified several cultural resources, including the Nuyakuk portage trail, a pre-contact archaeological site, and two possible cache pits. The Project as currently proposed would likely not adversely affect either of the two potentially significant sites. Recent radiocarbon dating results of the artifacts at the Portage Trail site showed that the site likely dates back 3477 years. Mr. Yarborough stated that it's unlikely that any further field work needs to be conducted, but a significant amount of consultation will occur in 2024. A set of letters initiating cultural resources consultation was distributed in 2023 but received a limited response.

### Cultural Resources Studies Questions/Discussion

Mr. Andy Angstman (Tikchik Narrows Lodge) stated that the Project infrastructure location appears to overlap the Portage Trail, thereby impacting the trail. Mr. Will Chaney (Nushagak Cooperative) responded that current Project conceptual design would be offset from the Portage Trail to avoid potential impacts. Mr. Sean Ellenson (McMillen) added that the tunnel will be located underground, thus reducing the potential for impacts to this resource. Ms. Ingrid Brofman (FERC) requested that the USR provide clarification on the Portage Trail location relative to the Project conceptual design.

Ms. Ingrid Brofman (FERC) asked if Local Research Assistants (LRAs) have been identified for the Subsistence Surveys. Mr. Will Chaney (Nushagak Cooperative) responded that there was an effort to involve community members in the study, which is still a goal for the study program. Ms. Brofman stated that hiring community members may be a long process.

Mr. Felipe Farley (BBNA) stated that there are burial sites all over Alaska and asked if the Cooperative plans to walk the Project site with local Tribal elders. Mr. Will Chaney (Nushagak Cooperative) responded that they can do that, and stated that he expects Koliganek may be most affected due to their village's proximity to the Project site.

Mr. Cody Larson (BBNA) asked if there were variances in the cultural studies from the Revised Study Plan (RSP), because the RSP was more detailed with respect to the Cultural Resources study than the ISR. Mr. Mike Yarborough (CRC Alaska) said he didn't think there were any variances. Mr. Larson stated that local knowledge and mapping usage of the area is important. He stated that comprehensive efforts to communicate and engaging with the Tribal governments is important. Mr. Warnock stated that the Cooperative is committed to all of the aforementioned items and plans to conduct the study as described in the RSP.

Ms. Ingrid Brofman (FERC) asked about the Area of Potential Effects (APE) as described in the RSP, stating that it seemed to be different in the ISR. In RSP, it was stated that the APE will be defined by consultation with FERC, SHPO, and Tribes. Ms. Brofman inquired as to the changes to the APE and the process that was used to revise it. Also, Ms. Brofman stated that the RSP says that the APE will be signed off on by SHPO prior to field surveys, but FERC is not aware of correspondence with SHPO. Mr. Mike Yarborough (CRC Alaska) responded saying that formal definition of the APE still needs to be completed which will include the appropriate consultation. Mr. Yarborough stated that the SHPO commented on the study plan and their comments were incorporated, but SHPO did not formally sign off on the APE following the RSP. Mr. Yarborough stated that the Cultural Resources Technical Working Group will be convened and will discuss the APE definition.

Ms. Ingrid Brofman (FERC) asked about the high and low sensitivity zones described in the Section 106 Evaluation and how those were identified. Ms. Aubrey Morrison (CRC Alaska) described the initial desktop analysis using LiDAR data, followed by an on-site evaluation of the site topography and characteristics via pedestrian transects, and how those were used for testing. Ms. Brofman asked for additional explanation about the low sensitivity areas and their characteristics in the USR. Ms. Brofman requested that the Cooperative host a call prior to January 30 to discuss the APE and Cultural Resources study. Mr. Cory Warnock (McMillen) confirmed that the Cooperative would organize a call as requested and would include both Ms. Brofman and Mr. Matt Cutlip (FERC).

### Recreation and Aesthetic Studies

Mr. Dave Jones (SLR Consulting) presented the Noise Study. The study measured ambient sound levels at four locations near the proposed Project, modeled future sound levels, and investigated potential noise impacts from the Project including construction and operations. The study results show that the proposed Project is expected to have increased sound levels during the daytime only, near the Project site. No change in noise level is expected at the Royal Coachman Lodge. The study also evaluated the construction blasting noise and the aircraft operations associated with the proposed Project. Noise impacts due to blasting are anticipated to be infrequent and during daytime hours. Noise impacts due to aircraft operations will be significantly lower at the Royal Coachman Lodge compared to existing activities. The noise impacts due to long-term operations is expected to be extremely minimal.

Ms. Taryn Oleson-Yelle (R&M Alaska) provided a summary of the Recreation Inventory that was conducted during 2023. Recreation and intercept surveys were conducted in 2023. In 2024, study efforts will focus on resident surveys, based on paper and online surveys, as well as community visits to conduct in-person interviews in Spring 2024. Recreational business operator surveys will also be conducted in 2024.

### Recreation and Aesthetic Studies Questions and Discussion

Ms. Ingrid Brofman (FERC) stated that the RSP listed objectives including identifying existing noise levels, sensitive wildlife habitats, and existing trails. Mr. Dave Jones (SLR) responded that the noise impacts were evaluated across the study area, which includes a noise model of the existing environment. Ms. Brofman stated that FERC was looking for the study to identify the sensitive wildlife, subsistence, or other locations in the ISR. Mr. Cory Warnock (McMillen) stated that he envisions a refinement of the noise study data to complete FERC's request for the noise study which will be presented in the USR. Ms. Brofman asked that the caribou habitat be mapped relative to noise impacts in the USR. If the noise impacts do not overlap caribou habitat, FERC would appreciate clear discussion of that finding. Ms. Brofman asked about noise impacts on the transmission line corridor, including construction. Mr. Jones responded that transmission line corridor noise impacts will be evaluated in 2024 and addressed in the USR.

Ms. Ingrid Brofman (FERC) asked about the schedule for recreation field work. Ms. Taryn Oleson-Yelle (R&M Alaska) discussed several variances based on schedules or schedule constraints with respect to the recreation surveys, and that the recreation surveys will be aligned with subsistence surveys to avoid survey fatigue. Ms. Brofman asked if paper and online surveys would be conducted, and Ms. Oleson-Yelle confirmed that both methods would be utilized to improve response success. Ms. Brofman stated that FERC would like to see metrics in the USR regarding response rates. Ms. Brofman asked about the consistency of non-recreation staff taking observations. Ms. Oleson-Yelle responded that the other study leads had been instructed to note recreation when observed and confirmed that only the one observation was reported via non-recreation staff. No recreation-specific surveys are planned for 2024. Mr. Cory Warnock (McMillen) added that a camp manager is on-site during the entire study period and will observe recreational activities in the area.

Mr. Pat Vermillion (Royal Coachman Lodge) asked about recreation hotspots and noise impact overlaps. Mr. Dave Jones (SLR Consulting) stated that a 3-decibel impact is barely perceptible. Ms. Taryn Oleson-Yelle (R&M Alaska) pointed out that the South Eddy recreation site would be most impacted by proposed Project noise. Mr. Jones added that sound attenuators can be added to the fans installed on the powerhouse to reduce noise impacts from the proposed Project.

Ms. Ali Eskelin (ADNR) stated that 2023 was abnormal due to the recreation season being very rainy which may have affected recreation use. Ms. Eskelin stated that next year's survey should ask about modifications to the state park and how recreation use would change due to Project implementation. Ms. Eskelin suggested that the Recreation Inventory should be a Recreation Study. Also, Ms. Eskelin stated that recreational use is very different during moose hunting season.

Mr. Pat Vermillion (Royal Coachman Lodge) asked how you quantify the loss of such a rare and beautiful spot and how the Cooperative will report on that impact in the USR. Ms. Taryn Oleson-Yelle (R&M Alaska) responded that survey data collection will inquire about the current value of the recreation resources, and once impacts are identified, then loss is quantified for the development of mitigation measures. Mr. Will Chaney (Nushagak Cooperative) responded that it is a rare and beautiful spot and impacts will be identified. The Cooperative's goal is to reduce impacts to the degree possible and provide mitigation measures as necessary.

## Conceptual Project Design and Operations

Mr. Sean Ellenson (McMillen) described two alternatives that have been evaluated for design of the proposed Project. Alternative 1 will utilize 30% of the flow in the Falls for generation purposes (estimated at 9 MW peak), and Alternative 2 is based on projected future regional power needs (estimated at 14 MW peak). Mr Chaney and Mr. Ellenson emphasized that these scenarios were conducted to accurately document potential and were in no way meant to imply that the Cooperative was not cognizant of and adhering to the current Senate Bill 91 flow allowance. Mr. Ellenson showed summary graphs showing the potential power output of each alternative and flow remaining in the Falls in an average year. Mr. Ellenson also presented the variation in flow between dry, average, and wet years.

## Conceptual Project Design and Operations Questions and Discussion

Ms. Ali Eskelin (ADNR) asked what the definition of a mature hydro project is. Mr. Will Chaney (Nushagak Cooperative) responded that maturity is achieved when the Project installation cost is paid off. The length of time for this to occur depends on grants, funding, and construction costs.

Ms. Leah Ellis (ADF&G) asked about the groin and under what conditions it would be needed. Mr. Ellenson responded that the groin, if needed, would only be visible during low flow conditions.

Ms. Ingrid Brofman (FERC) stated that the ISR indicated that data for the Environmental Justice study was collected but not yet analyzed. Ms. Brofman stated that new American Community Survey (ACS) datasets will be coming out in January 2024, and the Cooperative should utilize these data in their Environmental Justice study. Mr. Cory Warnock (McMillen) confirmed that the Cooperative will use the most recent datasets available.

## Meeting Conclusion

Mr. Cory Warnock (McMillen) stated that Technical Working Groups for Terrestrial, Cultural, and Recreation resources will be started shortly, and people that are interested in these resources should sign the sheets in the entryway (if attending in-person) or email [ljohnson@mcmillen.com](mailto:ljohnson@mcmillen.com) (if attending virtually) to be included in the respective TWGs.

Mr. Cory Warnock (McMillen) provided an overview of the ILP timeline and milestones. Mr. Warnock described the FERC comment period associated with the ISR and ISR meeting, and also the ability to file comments about the Project at any time. Mr. Warnock described the community survey that the Cooperative has launched to gather additional input on the proposed Project. Mr. Will Chaney (Nushagak Cooperative) provided a conclusion statement to the meeting participants, including the need for the proposed Project and the cost and risks to Cooperative members of continuing to use diesel generation. The meeting adjourned at 5:58pm Alaska Time.

## References

Walsh, P., D. Kaufman, T. McDaniel, and J. Chowdhry Beeman. 2015. Historical Retreat of

Alpine Glaciers in the Ahklun Mountains, Western Alaska. Journal of Fish and Wildlife Management, Vol. 6, Issue 1. June 2015.

**Attachment A**  
**ISR Meeting Participant Lists (Sign-in Sheet and Virtual Attendees)**





**Attachment B**  
**Initial Study Report Meeting Presentation**

**Attachment C**  
**Federal Energy Regulatory Commission Presentation**