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Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Aesthetic Resources Study
Study Plan Section 12.6

Initial Study Report
Part C: Executive Summary and Section 7

Prepared for

Alaska Energy Authority

SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by

URS Corporation

June 2014

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EXECUTIVE SUMMARY

Aesthetic Resources Study 12.6	
Purpose	The goals and objectives for the Aesthetic Resources Study are to inventory and document baseline aesthetic (visual and auditory) conditions within the Aesthetic Resources Study Area through photography, field observations, sound monitoring, and desktop research and to evaluate the potential effects to aesthetic resources that may result from construction and operation of the proposed Project. Photography will be used to generate photosimulations and sound monitoring will be used for sound modeling for assessing visual and sound impacts, respectively.
Status	The study completed its first field season and is on schedule. The majority of the field work is complete, with the limited remaining field work planned for the 2015 study season. Photographs have been processed to create panoramas to support future development of photosimulations and analysis. Baseline sound data has been reviewed. Focus Groups have not been implemented and the impact analysis has not yet been initiated for either soundscape or visual components of the study.
Study Components	Study components include: • development of viewshed models for major project features, and both pre- and post-conditions of the Susitna River; • collecting photography and field observations at identified Key Observation Points (KOPs) to determine baseline visual resource conditions; • desktop data collection to assess scenic quality, visual distance zones, and visual sensitivity; collecting long-term and short-term sound data at select locations across all seasons to determine baseline soundscape conditions; • focus groups to gather additional data on visual sensitivity and address visual preference of each alternative; • coordinating with other resource disciplines to obtain data and information relevant to the aesthetics resources study; • generating photosimulations of the proposed project components from select KOPs for assessing impacts to visual resources; • modeling existing and proposed soundscape for assessing potential sound impacts; • and identifying avoidance and mitigation measures based on baseline data, impact analyses and design recommendations.
2013 Variances	No variances occurred in the 2013 study year, however some visual resource study locations that were identified early in the implementation of the study were not accessed in 2013 because permission to access Cook Inlet Retional

	Working Group (CIRWG) lands was not achieved.
Steps to Complete the Study	With regard to this specific study, AEA is not proposing any field work in 2014. Efforts in 2014 will be limited to preparing visual simulations depicting post-Project conditions and further processing and refinement of soundscape data collected in 2013. AEA plans to complete all remaining data collection and analysis in 2015. To complete the study, AEA will complete the field assessment of Analysis Locations (ALs); conduct Project-level sensitivity analysis including focus groups; identify potential design and mitigation options to address potential impacts; refine viewshed models; produce photosimulations; complete impact analysis; complete Visual Resource Inventory analysis; assess potential light and glare; identify changes in viewshed; and assess change in visibility associated with air quality. No modifications to the Study Plan methods are needed to achieve the study objectives; however, the study area has been changed from that described in the RSP (Section 12.6.3). As described in the ISR Overview, AEA has added the Denali East Option road and transmission line alternative corridor to the study area.
Highlighted Results and Achievements	Viewsheds were generated for the major Project features for all proposed corridors, including the proposed reservoir and roads and transmission lines to estimate visibility of the project and identify KOPs for further analysis. Baseline visual data (high quality photographs and observations) were collected over four seasons at a total of 135 visual Analysis Locations. This data was used to establish existing conditions of the landscape, create panoramic photographs, and will be used to generate photosimulations of the proposed Project. Baseline sound data was collected over four seasons at a total of 31 long term sound monitoring locations and at 67 total short term sound monitoring locations. This data will be used to characterize baseline and predicted future conditions for assessing potential soundscape impacts.

7. COMPLETING THE STUDY

7.1. Proposed Methodologies and Modifications

To complete this study, AEA will implement the methods in the Study Plan except as described in Section 7.1.2. These activities include:

- Develop viewshed models for pre- and post-Project conditions of the inundation zone of the Susitna River to depict expected changes in viewshed areas (RSP Section 12.6.4).
- Baseline data collection of basic landscape components (RSP Section 12.6.4).
- Produce photosimulations to illustrate the expected visibility of Project components (RSP Section 12.6.4).
- Modeling of Project sound levels to complete the soundscape analysis (RSP Section 12.6.4).

7.1.1. Decisions Points from Study Plan

RSP Section 12.6.3 indicates that if the 2013 study results indicated that the Project may affect aesthetic conditions in the lower Susitna River, AEA would make a decision regarding extending the study effort further downstream.

In 2013 AEA collected information on river recreation use and experience and coordinated with the study teams for the Instream Flow Study (Study 8.5), Ice Processes in the Susitna River Study (Study 7.6), Geomorphology Study (Study 6.5), River Recreation and Flow Study (Study 12.7), and Aesthetics Resources Study (Study 12.6). The first year results from these studies indicate that Project operations will only slightly influence river flows and river morphology, such that projected changes will be within the range of normal variation downstream of the Parks Highway Bridge (PRM 88.9) under existing, baseline conditions, and therefore will not adversely affect aesthetic conditions in the lower river. These data, which are summarized below, support AEA's decision not to extend the aesthetics studies below the George Parks Highway Bridge.

On January 31, 2013, the results of the Open Water HEC-RAS Flow Routing Model were filed with FERC. This report included in part, simulated flow releases from the Watana Dam to the Susitna River for a maximum load-following operational scenario (OS-1) using historical flows recorded during the calendar year 1984. OS-1 is based on the assumption that the entire load fluctuation of the Railbelt would be provided by the Susitna-Watana Project, and that all other sources of electrical power in the Railbelt would be running at base load. This assumed condition is conservative with respect to assessing downstream impacts of load-following and represents an extreme condition that would not occur for an entire year. The year 1984 was selected because USGS gaging records were available for the entire year for the Susitna, Chulitna, and Talkeetna Rivers, and 1984 is representative of average conditions on both an annual and monthly basis. OS-1 flow and stage hydrographs are illustrated for the entire year on the Susitna River at a number of locations including the end of River Reach 3 at the Parks Highway Bridge.

This location is referred to in the January 2013 report as the Sunshine gage (USGS 15292780). The results of the January 31, 2013 report indicate that OS-1 changes in both stage and flow are minimal at the end of Reach 3.

The report concludes that modeled changes in stage in flow at the end of Reach 3 are exaggerated as the Susitna River is confined to an unusually narrow channel in the vicinity of the George Parks Highway Bridge. A wider and more typical channel location just downstream of Reach 3 at PRM 87.1 was also measured as part of the study. The river at this location is about twice as wide as the wetted channel at the USGS gage. A comparison of stage changes at the end of River Reach 3 and the wider transect at PRM 87.1 under pre-Project conditions and OS-1 resulted in 12 to 19 percent less stage change in response to flow fluctuations than observed at the more narrow location at the end of Reach 3. When taken into consideration, the results of the January 31, 2013 Open Water HEC-RAS Flow Routing Model do not support increasing the longitudinal scope of the aesthetic studies below the George Parks Highway Bridge.

In April of 2014 AEA reviewed the preliminary results of the Version 2 HEC-RAS Open-water Flow Routing Model to determine if the results and potential impacts to aesthetics downstream of the Parks Highway Bridge were different than the results of the January 31, 2013 Open Water HEC-RAS Flow Routing Model. The Version 2 HEC-RAS Open-water Flow Routing Model includes simulated flow releases from the Watana Dam to the Susitna River during a representative dry year (1976) and a representative wet year (1981). The results of Version 2 HEC-RAS Open-water Flow Routing Model support the determination made based on the results January 31, 2013 Open Water HEC-RAS Flow Routing Model indicating that even during representative dry and wet years the Project will not alter flows in a way that will impact aesthetic conditions downstream of the Parks Highway Bridge. The results of the Version 2 HEC-RAS Open-water Flow Routing Model are provided in Section 7 of the Instream Flow Study ISR (ISR Study 8.5).

Ice Processes (Study 7.6) utilized the Lower River HEC-RAS modeling for estimates of what the "normal" range of stage would be at the beginning of and following the establishment of an ice cover at Sunshine (PRM 80 to 86.3) in the vicinity of the Parks Highway Bridge. At Sunshine, at the beginning of freeze-up, the discharge ranges from 5,000 to 28,000 cfs with corresponding representative stage (within the Sunshine modeled reach) of 243.8 to 250.2 ft., respectively. Following the establishment of an ice cover in this reach, the discharge ranges from 3,000 to 8,000 cfs with a corresponding stage of 246.2 to 249.1 ft., respectively. Increases in discharge to 10,000 and 12,000 cfs result in stages (with an ice cover) of 249.8 to 250.4 ft., respectively. The modeling indicates that even if proposed operational scenarios increase the discharge (during freeze-up and throughout the winter), the resulting stages would only be increased by a maximum of about 1 ft. over the naturally occurring stage range just prior to freeze-up. During freeze-up 2013, the Sunshine gage recorded an increase in stage of approximately 5 ft. with the progression of the ice cover through the gage location. These results do not indicate that the Project will affect winter aesthetic conditions of the Susitna River downstream of the Parks Highway Bridge (PRM 88.9). The complete first year results of the Ice Processes Study are provided in the Ice Processes ISR (ISR Study 7.6).

7.1.2. Modifications to Study Plan

No modifications to the Study Plan methods are needed to complete the study and meet the Study Plan objectives. However, the study area has changed from that described in the RSP (Section 12.6.3). As described in the ISR Overview and depicted in Figure 1, AEA has added the Denali East Option road and transmission line corridor to the study area. For this study, the modified study area showing the Denali East Option is depicted on Figure 7.1-1 and Figure 7.1-2. Figure 7.1-1 illustrates the project viewshed (primary study area), with the viewshed for the Denali East Option overlaid. The addition of the Denali East Option viewshed adds approximately 95,000 acres to the primary study area. Figure 7.1-2 illustrates the location of ALs surveyed during the 2013 study year in relation to the Denali East Option road and transmission line corridor viewshed. Though several ALs will remain suitable support the analysis of the Denali East Option, additional ALs will be surveyed along the Denali Highway, at Brushkana campground, or at identified trails-based viewer locations east of the access road or north of the Denali Highway. These locations will be addressed during the 2015 study year, when other baseline data collection efforts occur.

7.2. Schedule

In general, the schedule for completing the FERC-approved Study Plan is dependent upon several factors, including Project funding levels authorized by the Alaska State Legislature, availability of required data inputs from one individual study to another, unexpected weather delays, the short duration of the summer field season in Alaska, and other events outside the reasonable control of AEA. For these reasons, the Study Plan implementation schedule is subject to change, although at this time AEA expects to complete the FERC-approved Study Plan through the filing of the Updated Study Report (USR) by February 1, 2016, in accordance with the ILP schedule issued by FERC on January 28, 2014.

With regard to this specific study, AEA is not proposing any field work in 2014. Efforts in 2014 will be limited to preparing visual simulations depicting post-Project conditions and further processing and refinement of soundscape data collected in 2013. AEA plans to complete all remaining data collection and analysis in 2015.

7.3. Conclusion

Implementation of the Aesthetic Resources Study is planned for 2014 and 2015, with no modification of the methods in the FERC-approved Study Plan. This study is interrelated with the Recreation Resources Study (Study 12.5) and Recreation River Flow and Access Study (Study 12.7). AEA expects the approved Study Plan objectives for both this study and Studies 12.5 and 12.7 will be achieved, as AEA proposes no modifications to the methods of this study. The results of this study will be reported in the USR.

7.4. Figures

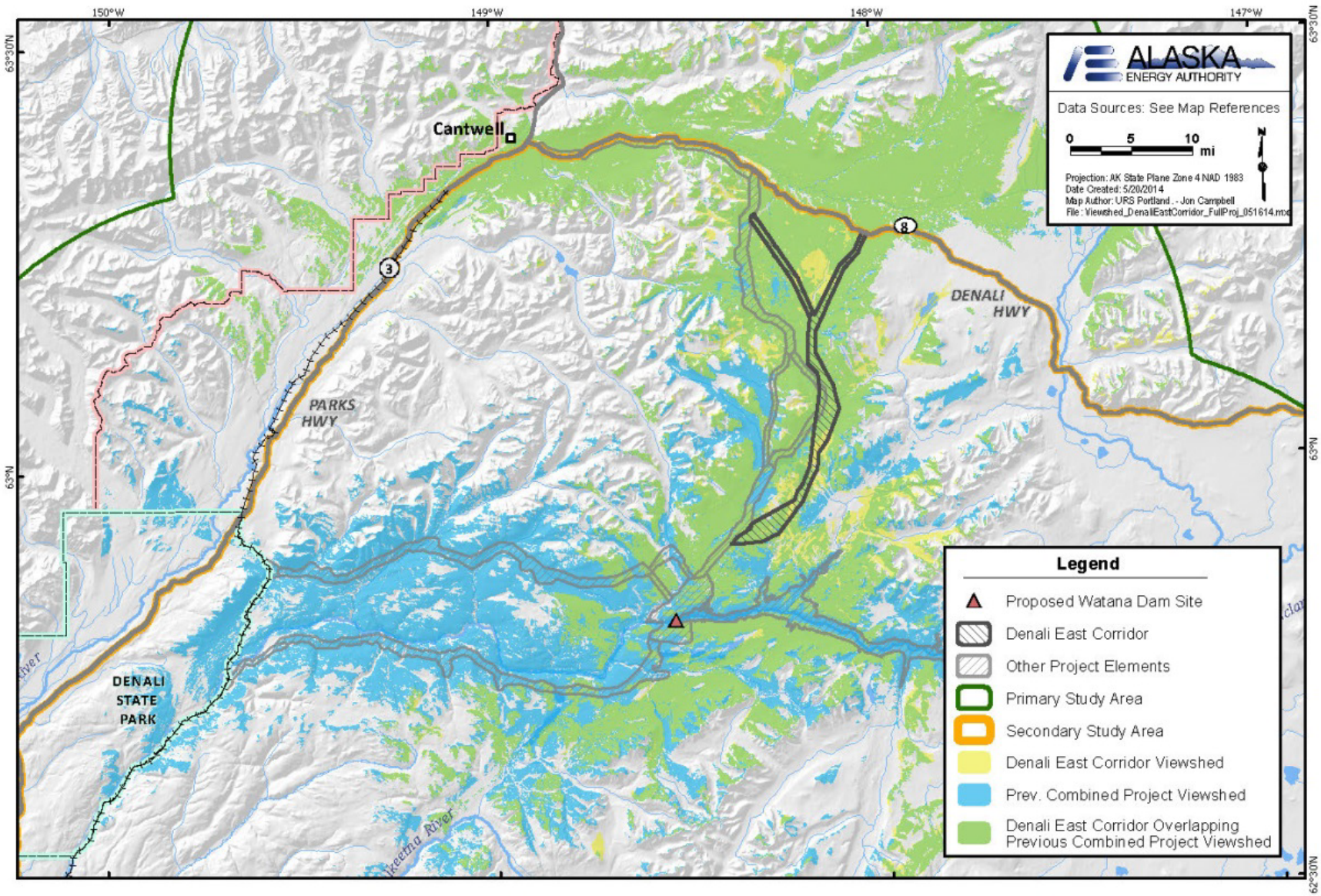

Figure 7.1-1. Updated Primary Study Area, including Denali East Option

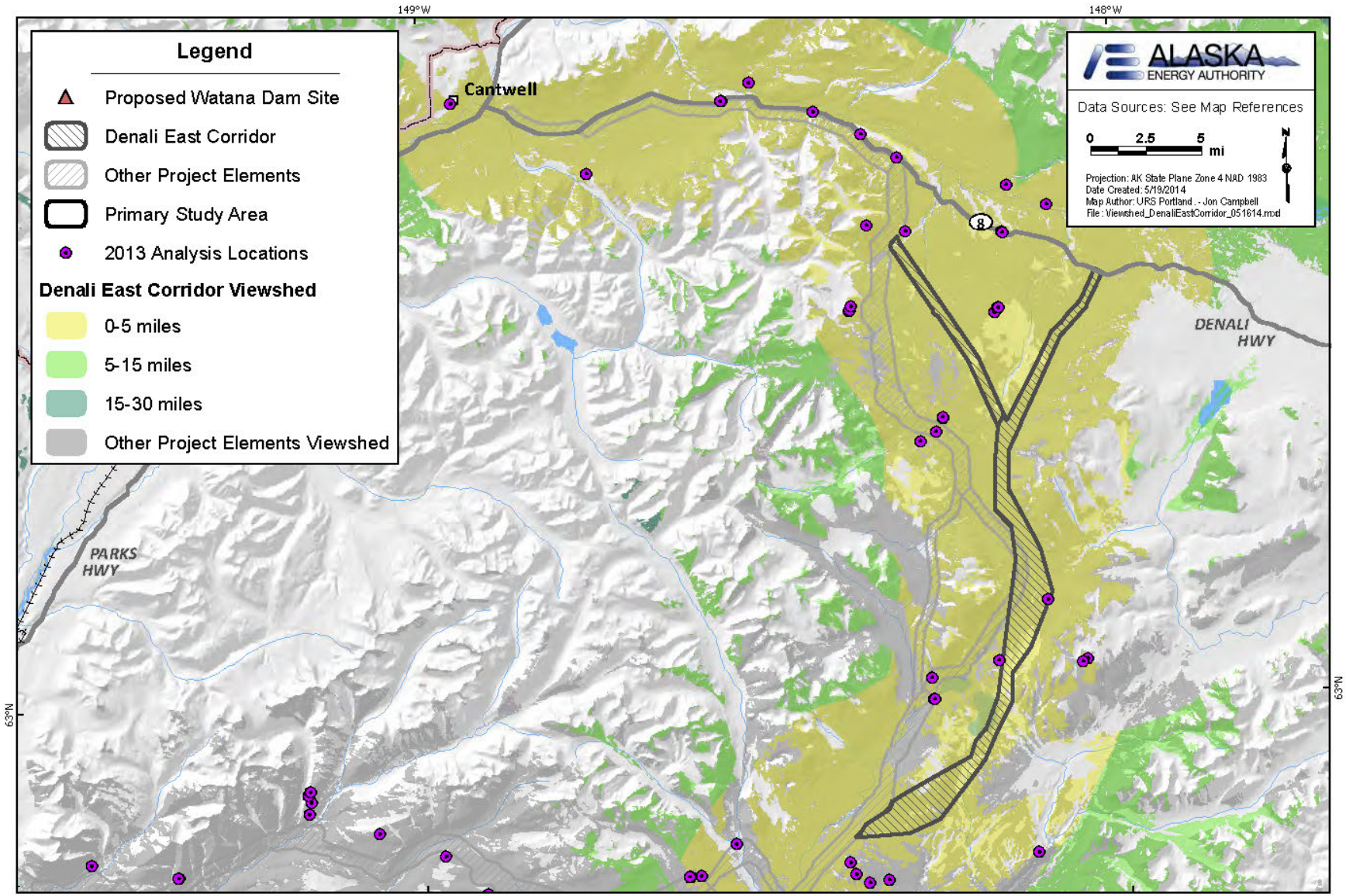

Figure 7.1-2. Relationship between ALs surveyed during the 2013 study year and the Denali East Option Viewshed