



SUSITNA-WATANA HYDRO

REPORT TO THE
LEGISLATURE
2016



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Susitna-Watana Hydro at a Glance

Licensing efforts started: 2011

Location: River mile 184, above Devils Canyon

Size: 705-foot-high dam

Reservoir: ~42 miles long, average width of 1 mile

Estimated Supply: About 50 percent of Railbelt electrical demand

Estimated Cost: \$5.655 billion (2014\$)

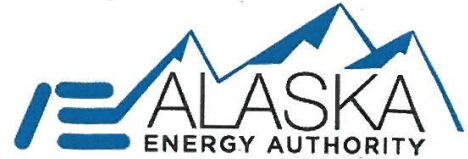
Installed Capacity: 459 MW

Annual Energy: 2,800,000 MWh

Licensing: Federal Energy Regulatory Commission (FERC)

Anticipated Project Life: 100+ years, providing long-term, stable rates

Project closed down: 2016-2017



January 17, 2017

In shutting down the Susitna-Watana Hydro Project, pursuant to the Governor's June 29, 2016 directive, our focus has been on preserving the value of the State's investments, maintaining the public value of the data collected, and advancing the Federal Energy Regulatory Commission (FERC) licensing process to the Study Plan Determination to then be put into a state of abeyance.

In 2016, we held the Initial Study Report (ISR) meetings, a critical milestone in the FERC Integrated Licensing Process, in which all of the environmental licensing study effort completed to date were discussed. AEA reviewed and responded to the ISR comments, study plan modification requests and requests for new studies submitted following the meetings.

We anticipate FERC's Study Plan Determination on the work AEA has completed, the comments submitted by stakeholders, and AEA's responses to those comments on March 10, 2017. We have continued to complete final reporting for studies that were near completion or for which data collection has already been completed to preserve the value of the data collected for both the Susitna licensing effort as well as other potential development projects and enhanced resource management.

As part of closing down the Project, over the summer/fall 2016, we removed remaining field equipment and complied with all permit requirements. All equipment has been inventoried, stored or transferred to other State agencies. The licensing and shutdown work has been done using existing funds; the last capital appropriation was \$20 million in FY 15.

No further work was done in 2016 on engineering and safety, the economic value of the project, or financing. With abeyance, the high value of previous work demonstrating that the project is financeable, and environmentally and technically feasible and could provide low-cost power to the Railbelt for generations of Alaskans is kept intact.

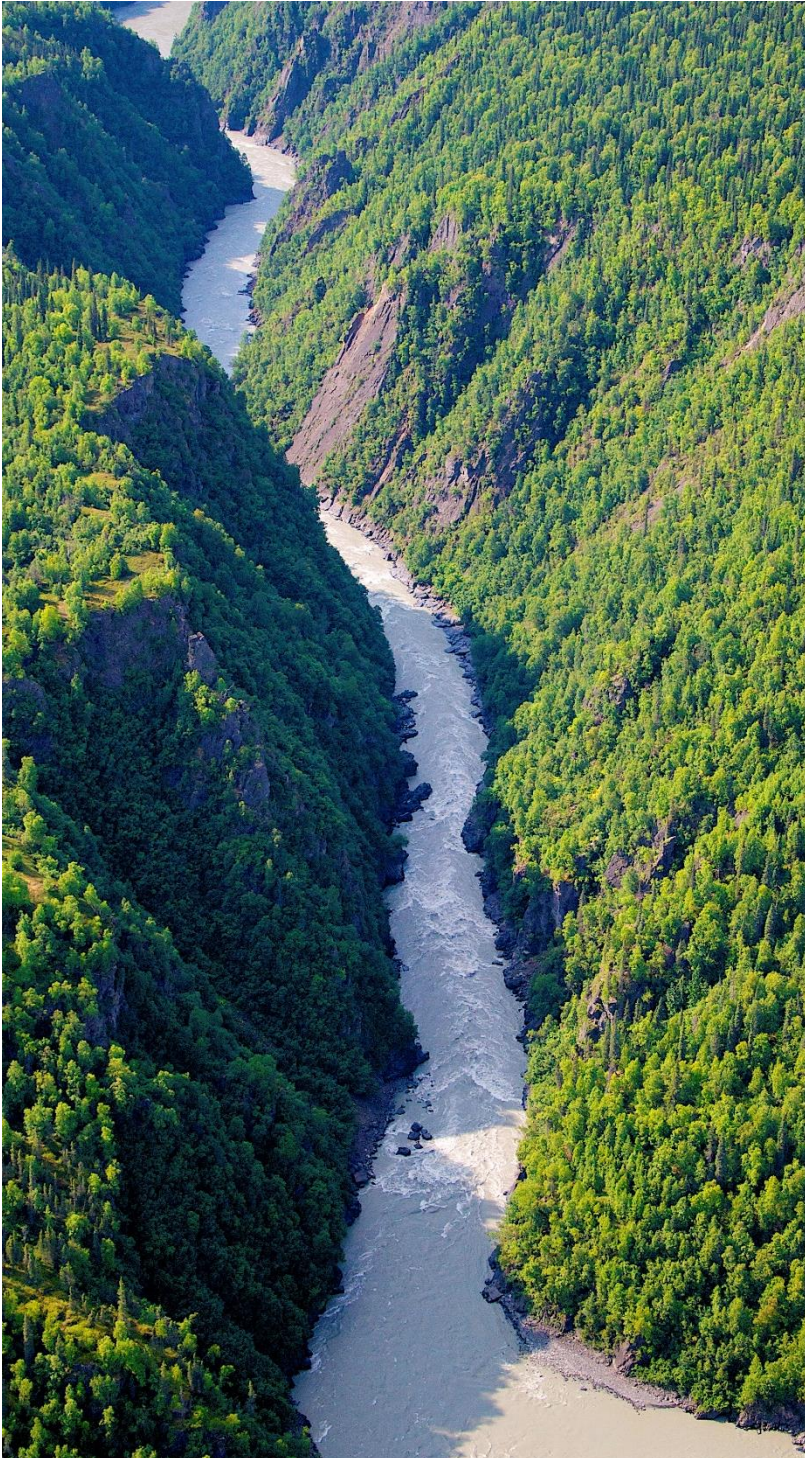
The Susitna-Watana Hydro study effort has provided volumes of information and data about the Susitna basin, the indigenous cultures, fisheries, wildlife, and landscape. This vast, high quality data is of significant value to other resource development efforts and management of fish and wildlife resources. The information has been catalogued and stored online through AEA, ARLIS and GINA, and is publicly available.

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SUSITNA-WATANA HYDRO PROJECT STATUS SUMMARY



At the end of 2016 the project is nearing complete shut-down per Governor Walker's June 2016 directive.

The FERC Study Plan Determination (SPD) is expected March 10, 2017, followed by a licensing abeyance.

The FERC SPD, licensing abeyance, and careful cataloguing of research, data, and reporting, will preserve the State's investment.

The unobligated balance of project funds after June 30, 2017 is estimated to be approximately \$1,002,273.

Project History

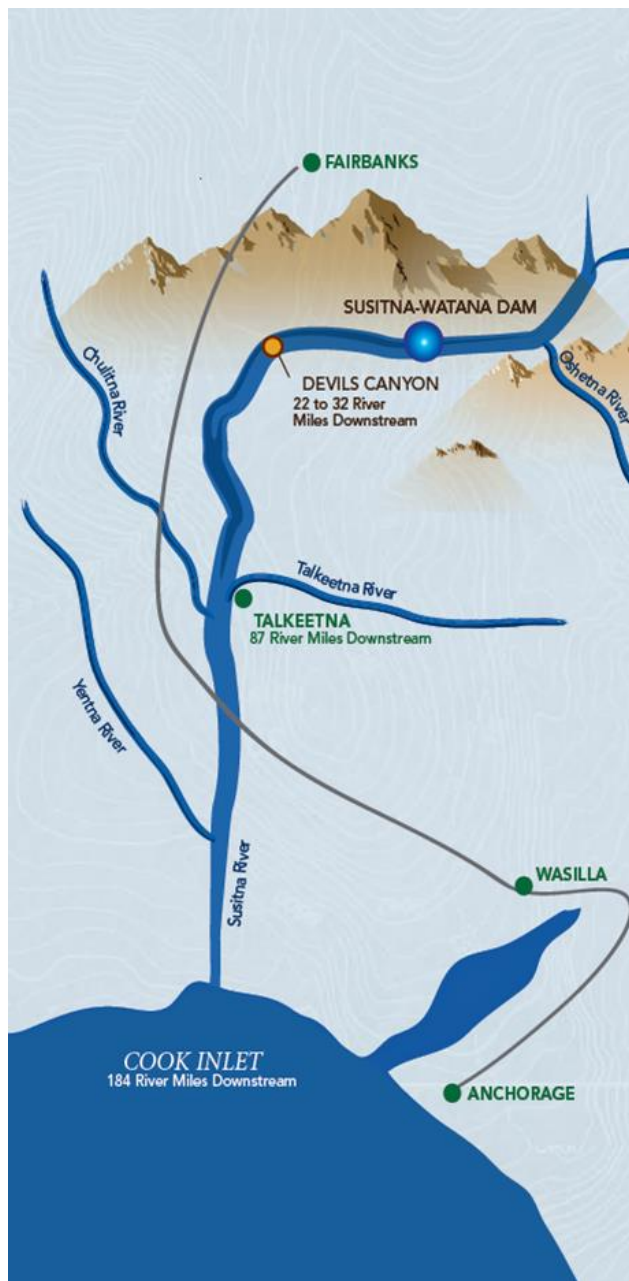
The hydroelectric potential of the Susitna River has been studied since the early 1950s. The first study was completed by the U.S. Bureau of Reclamation and subsequent reviews were completed by the U.S. Army Corps of Engineers in the 1970s. Many Alaskans remember the efforts of the Alaska Power Authority (APA)—now the Alaska Energy Authority—to develop a two-dam project on the Susitna River in the 1980s.

At that time, the APA submitted a license application to FERC in 1983 for the Watana-Devils Canyon Project on the Susitna River. The license application was withdrawn in 1986, largely due to the relatively low cost of gas-fired electricity in the Railbelt and the declining price of oil throughout the 1980s and its impact on the State budget. The APA concluded that the project's environmental impacts could be mitigated, but the project was not financially feasible at that time.

In 2011, recognizing the potential of a hydroelectric project on the Susitna River as a solution to the continued need for long-term, stable sources of energy, the Alaska Legislature authorized and funded the Alaska Energy Authority (AEA) to once again explore project feasibility and move through the FERC licensing process.

Over the last six years, AEA completed data gap analyses, building on the quality data from the 1980s, and completed several important milestones in the FERC Integrated Licensing Process. AEA's studies have shown the project to still be technically, and economically feasible. The 459-megawatt project would be capable of producing 2,800 gigawatt hours of energy annually, or about half of the Railbelt's energy needs.

Today, AEA waits for the FERC Study Plan Determination (SPD) expected in early March of 2017, the last action to be taken on the project in this 2011-2017 period. Significant State budget challenges prompted Governor Walker, in June 2016, to call for the project to be shut down, though in such a way as to ensure preservation of the State's investment made to date. AEA spent the second half of 2016 doing just that, and following the anticipated move into abeyance status after FERC's SPD, will finalize all project activity by June 30, 2017.



Engineering & Safety Milestones

In January 2015, Susitna-Watana Hydro completed the [Engineering Feasibility Report](#), concluding the large majority of engineering work necessary to file for a FERC hydropower license. This effort is the result of several years of collaboration among engineering contractors, dam-safety experts, utilities, FERC and AEA to design a safe and cost-effective project, as well as the results from: drilling and geotechnical investigations to test the quality of rock and measure bedrock for a solid foundation; studies and modeling for maximum probable flood and seismic events; and modeling to simulate the projected electrical generation to meet Railbelt demand.

The report is a critical milestone and concludes that the project is technically feasible. Noteworthy conclusions are summarized below.

SAFETY

Active faults have not been found within the dam site. Drilling conducted during the summer of 2014 confirmed that there is no “Watana lineament” along the Susitna River channel, supporting results from investigations conducted during the 1980s licensing effort. In addition, the Alaska Division of Geological and Geophysical Surveys (DGGs) conducted extensive geologic mapping in the Talkeetna mountains and found no active faults directly in the project area. Further, the current dam design, once constructed, would be able to withstand a 50-year flood without having to open spillway gates and pass the 10,000-year flood with one spillway gate inoperable.

DESIGN

The structure is designed as a curved gravity dam, constructed using Roller Compacted Concrete (RCC) methodology with a straight gravity (thrust) section on each abutment. The height of the dam has been optimized to 705 feet above bedrock, lowered from approximately 730 feet. The nominal crest elevation is 2,065 feet and the crest length is approximately 2,810 feet. The reservoir would be approximately 42-miles long with an average width of 1.25 miles.

AEA worked with the Railbelt utilities to ensure that the generators are appropriately sized for Railbelt demand, modeling potential operations and integrating into the Railbelt system to ensure maximum long-term benefits to the Railbelt. As part of this effort, the overall nominal capacity rating of the three proposed turbines has been reduced to 459 megawatts while maintaining the same energy output of 2,800 gigawatt hours of annual power, or 50 percent of the Railbelt’s current demand.

The potential access and transmission routes were narrowed down to two alternative north-south routes that extend from the Denali Highway and the Gold Creek Route that runs east-west and would connect with the Alaska Railroad (unconnected to the state highway system).

COST

The anticipated project cost is estimated to be \$5.655 billion (2014\$ and based on oil prices at \$105 per barrel), including licensing, design and construction, but excluding escalation and interest during construction.

Economic Milestones

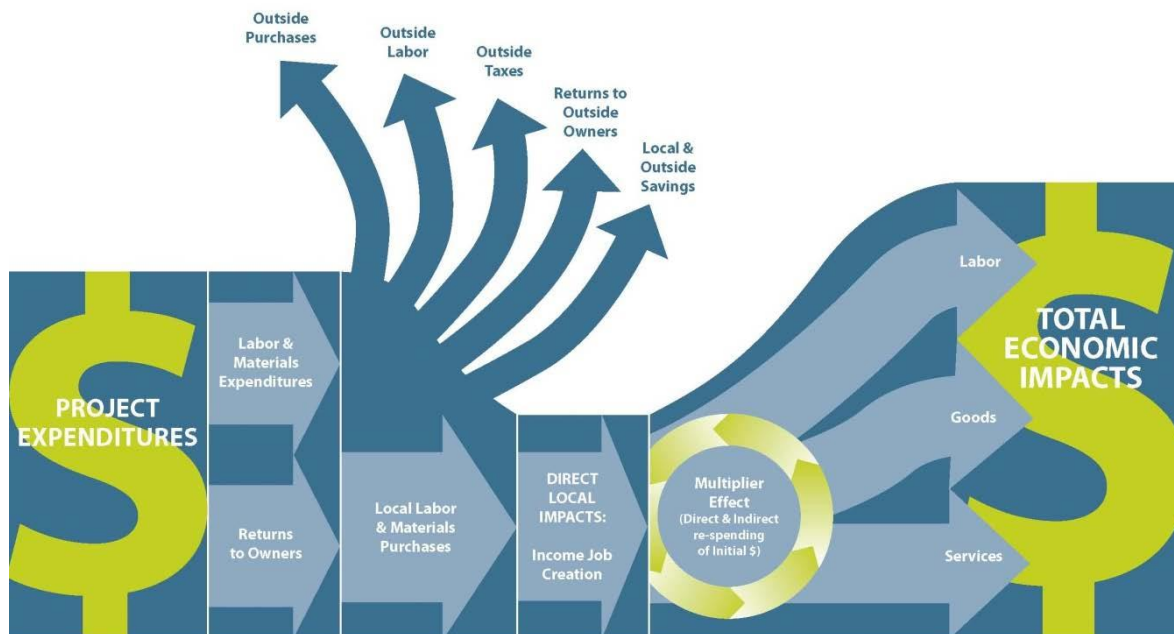
To understand the potential economic impacts from licensing, constructing and operating the Susitna-Watana Hydro and future workforce needs, AEA worked with Northern Economics on the [Benefit-Cost and Economic Impact Analysis](#). The report, published in March 2015, concluded that, if constructed, the project would generate billions of dollars in energy savings for the Railbelt and would be a significant, long-term benefit to the economy.

Based on the 2014 projection of natural gas prices, the analysis estimated a total energy savings of \$11.2 billion (2014\$) during the first 50 years of the project, an annual average of nearly \$225 million. When additional benefits of the dam were factored in, including the retirement of older generation facilities, reduction in greenhouse gas emissions and a reduction in the frequency of power outages, the energy cost savings surpassed \$14 billion. The benefit-cost ratio from the energy savings and retirement of older, unneeded generation facilities alone is 2.46.

Project Spending Category	Local Spending (million \$)	Multiplier Effects		
		Business Sales (million \$)	Jobs	Labor Income (million \$)
Licensing/Design; Other Program Costs	814.1	551.2	3,870	204.3
Construction	2,658.5	1,837.1	11,305	627.3
Operation	26.5	18.5	105	6.4

Table uses 2014 dollars

Construction of the Susitna-Watana Hydro Project would also provide thousands of direct and indirect jobs for many decades. The project would support an average of approximately 200 non-construction jobs annually during both pre-construction and construction phases as well as an annual construction workforce of approximately 1,200 people during construction of the project.



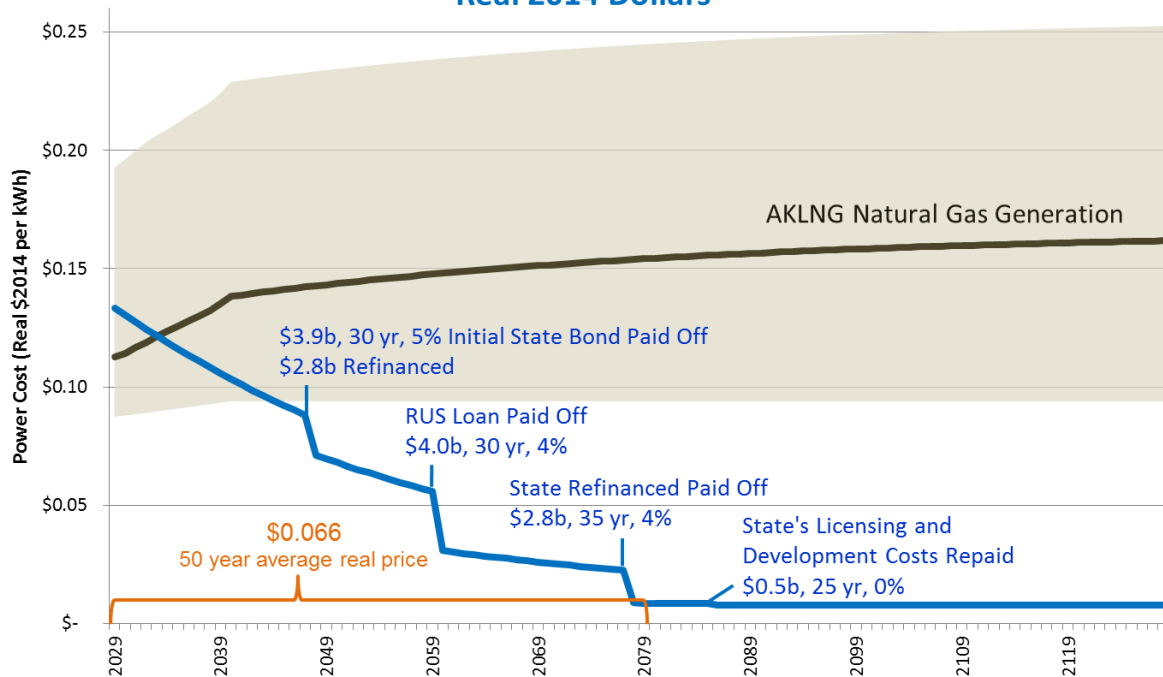
In addition, Susitna-Watana Hydro would generate more than \$800 million (2014\$) in local spending pre-construction and a projected \$2.6 billion (2014\$) in local spending during construction. During operation of the project, an estimated \$26.5 million (2014\$) would be spent annually for operations, significantly boosting local and regional economies.

Financing Milestones

In 2014, AEA worked with PFM, an international financial advisory firm, to develop financing models for Susitna-Watana Hydro. AEA received confirmation that Rural Utilities Service (RUS), a division of the U.S. Department of Agriculture that provides low-cost financing for infrastructure improvements, could provide financing for 50 percent of the project costs. AEA and PFM developed scenarios that included combinations of state investment, bonds and federal financing programs (RUS) and private financing. In developing the scenarios, AEA kept three goals in mind: 1) provide affordable power to Alaskans, 2) protect investments made by the State of Alaska and 3) investigate ways that the State would be repaid its initial investment.

The scenario in which a combination of AEA Revenue Bonds (30 years, 5% interest, refinanced) and federal RUS financing for the remainder of construction (35 years, 4% interest) resulted in a \$0.066/kWh 50-year average real price (2014\$).

Susitna-Watana vs. Natural Gas Power Costs Real 2014 Dollars



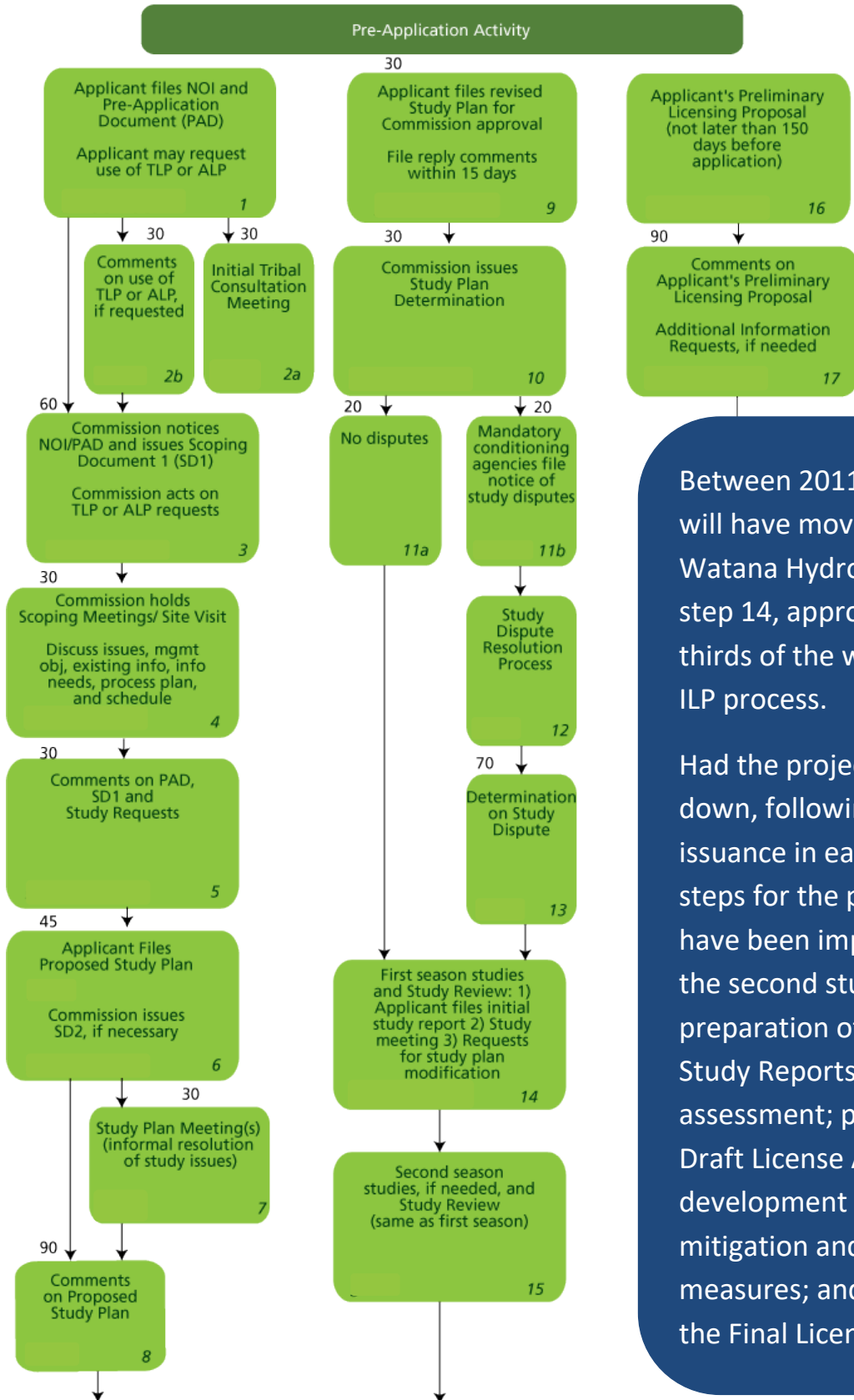
Licensing Milestones & Timeline

Following authorization in 2011 to advance the Susitna-Watana Hydroelectric Project, AEA determined the FERC Integrated Licensing Process (ILP), the default licensing process, was the most appropriate process for the project. The ILP is a front-loaded, iterative, milestone-driven process that provides a defined structure, including timeframes for licensing activities, study plan development, formal study plan determination, reporting on study implementation, stakeholder engagement and early National Environmental Policy Act (NEPA) scoping.

2016 licensing efforts effectively wrapped up the project as per Governor Walker's June 2016 directive. Pending FERC's final Study Plan Determination, due in March 2017, the project will be put into abeyance, allowing the State to preserve the investment already made, and no further movement toward licensing is planned at this time.

Susitna-Watana Hydro 2016 FERC Licensing Activities	
March 22-30, 2016	AEA held Initial Study Report Meetings – 5 days
April 24, 2016	AEA filed ISR Meeting Summary
June 23, 2016	Participants filed comments/disagreements with meeting summary and recommendations for modified or new studies
October 24, 2016	AEA filed responses to disagreements and recommendations for modified or new studies
March 10, 2017	Updated Study Plan Determination (SPD) expected from FERC
	Project is put into abeyance; no further action planned at this time

FERC Integrated Licensing Process (ILP)



Between 2011 and 2017 AEA will have moved the Susitna-Watana Hydro project through step 14, approximately two-thirds of the way through the ILP process.

Had the project not been shut down, following the SPD issuance in early 2017, next steps for the project would have been implementation of the second study season; preparation of the Updated Study Reports; impact assessment; preparation of the Draft License Application; development of protection, mitigation and enhancement measures; and preparation of the Final License Application.

Susitna-Watana Licensing Activities 2011-2017

2011

AEA reviewed existing information, identified potential natural resource issues, performed data gap analyses and held preliminary discussions with agencies, Alaska Native entities and other stakeholders.

In October, AEA filed the Preliminary Permit Application (PPA) with FERC, which provided AEA priority status for licensing the project. The Integrated Licensing Process (ILP) was initiated with AEA filing the Notice of Intent (NOI) and the Pre-Application Document (PAD) at the end of the year.

2012

Public scoping meetings were held in Anchorage, Wasilla, Glennallen, Talkeetna, Cantwell and Fairbanks.

AEA jumpstarted the licensing process by initiating 18 studies designed to gather critical environmental data, and to help inform the scope and methods of the proposed licensing studies.

A significant amount of the 2012 licensing effort was spent developing the study plan with stakeholders for FERC's approval. The study plan is a key part of the licensing process and outlines the studies that will be conducted to provide a better understanding of the Susitna Basin to assess potential impacts and develop protection, mitigation and enhancement measures.

AEA performed extensive public outreach with resource agencies, Alaska Native entities, non-governmental organizations and other stakeholders, holding 34 days of technical meetings to develop the study plan.

The Proposed Study Plan was submitted to FERC in July. Following further collaboration with stakeholders, AEA submitted an Interim Revised Study Plan and finally, in December, a Revised Study Plan, consisting of 58 studies, to FERC for approval.

2013

FERC approved the Susitna-Watana Hydro environmental study plan with a Study Plan Determination (SPD), which included 58 studies in resource areas such as geology and soils, water quality, geomorphology, groundwater, ice processes, instream flow, fish and aquatic, wildlife, botany, recreation, cultural resources, subsistence, socioeconomics, transportation, and safety.

AEA consulted with stakeholders and prepared and provided all supplemental information as ordered by FERC in its SPD. AEA also filed 29 technical reports summarizing results from the 2012 studies.

AEA commenced the implementation of the Susitna-Watana Hydro study plan, an unprecedented environmental study of the Susitna Basin, with an estimated 350 biologists, engineers, hydrologists, archeologists, and scientists of many other disciplines in the field gathering data.

AEA held 22 days of technical meetings from June through December 2013, keeping licensing participants up-to-date on the results of the 2012 studies and the licensing studies as they were being implemented.

Licensing activities and all documents were made publicly available via the project website and more than 100 public meetings and presentations about Susitna-Watana Hydro were held, demonstrating the commitment of an open, accurate and collaborative approach to managing stakeholder expectations.

2014

The next important step in the FERC ILP was submittal of the Initial Study Report (ISR), which serves as a progress report on the implementation of each of the 58 studies and accounts for any variances from the approved plan; describes plans and schedule for the second year of study; and describes AEA's proposed modifications of the FERC-approved plan. As part of the Initial Study Report process, a series of meetings were held to discuss the findings and requested modifications, by both AEA and other stakeholders, in order to lead to a Study Plan Determination by FERC.

However, budgetary constraints precluded AEA from being able to provide a schedule for completing the second year of study and finalizing AEA's proposed modifications to the study plan. Accordingly, AEA adhered to the existing FERC ILP schedule at the time, and filed a Draft ISR in February 2014, which described the 2013 implementation of the FERC-approved study plan, any variances and presented results. Once the FY15 capital budget was approved, AEA was able to prepare and file the 8,600-page Final ISR in June 2014, which included AEA's proposed study modifications and plans to complete the second year of study for each of the 58 studies, per the FERC regulations. In October 2014, AEA held 6 days of ISR Meetings with stakeholders to review the ISR.

In the spring, AEA reached a critical land-access agreement with Cook Inlet Region Inc. and six Cook Inlet village corporations (CIRWG), allowing AEA access to CIRWG-owned land in order to further Susitna-Watana Hydro licensing studies.

2014 marked another year of intensive and specific research involving more than 200 field scientists. Data collection efforts were prioritized based on the level of funding received, relative importance of the study, sequencing of interrelated studies, and need for continuous data collection with the goals of preserving the value of the work completed to date and maintaining as tight a licensing timeline as possible. Prior to initiating field work, AEA held 12 days of technical meetings with stakeholders to describe AEA's plan for 2014 activities and to consult with resource agencies on AEA's proposed modifications to the FERC-approved study plan.

By the end of the 2014 season, data collection was completed for 13 of the FERC-approved studies. AEA filed 33 technical memoranda describing 2014 study implementation, proposed study modifications for consideration in FERC's Study Plan Determination, and additional information as requested during the October ISR Meetings.

In addition to technical meetings, AEA presented information gathered as part of the environmental field effort and provided updates on the licensing status during regular meetings with CIRWG; public meetings in the communities of Wasilla, Fairbanks, Glennallen, Kenai, Anchorage and Talkeetna; and to numerous professional groups, associations and NGOs.

2015

Administrative Order 271, issued by Governor Walker in December 2014, halted discretionary spending on the Susitna-Watana Hydro, and to comply, AEA essentially pressed pause in the midst of the Initial Study Report process in early 2015. FERC granted AEA's request for an abeyance from the licensing process. In July 2015, AEA received clarification on discretionary spending from the Office of Management and Budget director, which allowed existing funds to be used to complete the ISR process and advance to the next ILP milestone, the FERC Study Plan Determination, as a logical point to pause licensing.

In August, AEA filed a request with FERC to lift the licensing abeyance and to submit additional Initial Study Reports covering all work completed to-date for consideration in FERC's Study Plan Determination, and proposed a new schedule. AEA's plan was supported by members of CIRWG,

Railbelt utilities, the Alaska Department of Fish and Game, Alaska Department of Natural Resources, and the Alaska Ratepayers.

Following public comments from both proponents and opponents of AEA's plan, FERC ultimately ordered that the vast amount of material filed from 2013 through 2015 in the form of numerous technical memoranda and Initial Study Reports met the ILP requirements for the Initial Study Report and that AEA satisfactorily provided a roadmap linking the reports for each study; and therefore, the reports would collectively be considered the Initial Study Report for purposes of the ILP and FERC's Study Plan Determination.

The 2015 study implementation was limited to finishing studies near completion; continuing surveys of collared moose, caribou and other animals; completing analysis of data already gathered; and removing field equipment installations where possible.

At the end of 2015, AEA filed more than 8,000 pages of reports summarizing implementation of the FERC-approved study plan during 2014 and 2015 in the form of Study Completion Reports for studies that had been completed or 2014-2015 Study Implementation Reports for incomplete studies. AEA also filed an Initial Study Report for each of the 58 studies, summarizing the status of implementation, all variances and AEA's proposed modifications to the study plan and referencing/linking all related documents.

2016

Project emphasis in 2016 was to advance the licensing process to FERC's Study Plan Determination and shut down the project while preserving the State's investment.

In March 2016, AEA held 5 days of Initial Study Report Meetings with FERC and stakeholders, reviewing all of the technical memoranda and Initial Study Reports filed by AEA between 2013 and 2015 for each of the 58 studies, describing implementation of the FERC-approved study plan, any variances, AEA's proposed modifications, and steps to complete the study.

As the next step of the ILP, stakeholders may file comments with FERC on the Initial Study Reports and can make recommendations for modifications to the FERC-approved study plan or request new studies. In June, nearly 1,600 pages of comments and recommendations for modifications to the Study Plan or requests for new studies were filed with FERC. Of note, the State of Alaska resource agencies supported the FERC-approved study plan, AEA's implementation of the study plan and AEA's proposed modifications to the study plan.

As part of the ILP, AEA responded to all commenters and on October 24, 2016 filed over 1,000 pages refuting the vast majority of the requested study plan modifications or new studies. The estimated cost of implementing all of the modifications and new studies requested by stakeholders would add between \$262 million and \$370 million to the cost of completing the environmental studies in the ILP process. Some of the recommendations had been previously submitted to FERC during the study planning phase and had already been considered by FERC in approving the licensing study plan. Some recommendations would be extensive and costly, such as expanding studies into the lower river downstream to Cook Inlet, extending the number of years of study, and modeling climate change and including it as a future without-project scenario for impact assessment. AEA presented evidence refuting the necessity of these study plan modifications.

- Data gathered indicates that there is no need to expand the study program in the lower Susitna River beyond the FERC-approved study plan because the project would likely cause minimal or negligible effects on water levels, groundwater, ice conditions, and water quality, as well as other environmental, recreational and socioeconomic resources in the Lower River.

- The variability of hydrologic, water quality, geomorphic and fisheries data collected between 2011 and 2015 is sufficient, particularly when combined with the historic environmental data collected in the 1980s, to understand the existing baseline and determine Project effects without the need to collect additional years of data beyond the FERC-approved study plan.
- AEA's proposed approach to climate change capitalizes on FERC's conventional hydrological approach, the climate change study already conducted by AEA, and an assessment of future trends based on planned sensitivity analyses and common sense. Thus, there is no need for a modified or new study on climate change.

Limited data was collected in 2016, concerning only: ice thickness and water surface elevation to fill data gaps for the ice processes model; final aerial surveys of collared moose, caribou and ptarmigan and aquatic furbearers to finish those nearly complete studies; and final data acquisition and maintenance/removal of hydrology equipment installations to support project shutdown.

To preserve the value of the State's investment and provide the data in the most usable format for future licensing, resource managers, researchers, developers of other projects, and the public, analysis of all gathered data was completed and associated final reporting is underway.

Of the 58 studies in the environmental study plan, 19 have been completed as required by FERC, and many study components or tasks of the remaining 39 studies have also been completed. In 2016, final analysis was completed for 8 FERC-approved wildlife and botanical studies, three of which were conducted by the Alaska Department of Fish and Game (moose, caribou, ptarmigan). Calibration and validation reports are being prepared for each of the riverine physical process models, as well as a model integration report, to support the feasibility of the approach in the FERC-approved study plan for assessing project impacts and developing protection, mitigation and enhancement measures.

By October 2016, all field equipment installations had been removed from the field or transferred to other State agencies. Removal of equipment adhered to all relevant permits, and where applicable, sites were restored to pre-installation conditions. At the end of 2016, permit close-out reports had been submitted for 16 of the 23 permits. All equipment has been inventoried and stored at the AEA warehouse or transferred to other State agencies.

2017

FERC has been reviewing the ISR comments and AEA's responses and is expected to issue an updated Study Plan Determination (SPD) on March 10, 2017. As requested by Governor Walker in his August 4, 2016 letter to FERC, the licensing will be put into abeyance following FERC's SPD. FERC's SPD will provide the State with certainty on what FERC believes is needed to file a defensible license application should the project someday be restarted. The abeyance will allow the investment made to date to be preserved.

By June 30, 2017, all work on the Susitna-Watana Hydro Project will have come to a full stop. All final reports will be filed with FERC, and all research and data will be catalogued and stored in publicly accessible databases on AEA's project website, ARLIS and GINA.

Summary of Project Funding

Below is a summary of project funding as of Jan. 13, 2016 (\$ in thousands)

Authorized Funds - State of Alaska Appropriations			
	FY2009		1,528.1
	FY2011		9,644.7
	FY2012		65,700.0
	FY2014		95,200.0
	FY2015		20,000.0
Total Authorized Funds - State of Alaska Appropriations			192,072.8
Expenditures to Date, Encumbered and Committed Funds			(190,235.0)
Remaining Funds Required to Complete Essential Tasks			(306.8)
Remaining Budget Estimate- Direct & Indirect Personnel, Legal Support, Contractual Support Services, Project Office Costs through June 30, 2017			(528.7)
Estimated Balance of Authorized Funds			1,002.3



Information about the Susitna-Watana Hydroelectric Project is archived and publicly available:

www.susitna-watanahydro.org

www.gis.suhydro.org

www.arlis.org/susitnadocfinder/

This publication of the Susitna-Watana Hydroelectric Project status and financial condition is submitted by AEA in accordance to AS 44.83.085. This document was designed and created in-house and distributed in electronic format.
