



# Memorandum

October 1, 2013

To: Jay Sweeney, Interim Municipal Administrator  
From: Christopher Brewton, Utility Director  
Subject: **Amendment of Professional Services Agreement – Currents Consulting – Takatz Lake**

## Request

This is to request Assembly approval to authorize the Interim Municipal Administrator to amend a Professional Services Agreement (PSA) between Currents Consulting (Engineer) and the City and Borough of Sitka (CBS) for engineering services for the Takatz Lake Hydroelectric Feasibility project. The amendment will fund a Takatz Lake final Appraisal Study which will produce in one singular document, a compilation of all studies and assessments of the project. This stand alone document is a requirement of our Alaska Energy Authority grant that will fully assess the feasibility of the Takatz Lake Project. This amendment will increase the approved budget from \$315,000 to \$365,000. The amended PSA is attached.

## Analysis:

In the course of routine correspondence with the Alaska Energy Authority (AEA), the AEA provided a substantive list of requirements for the final report they expect at the conclusion of the project. This amendment will allow our project team to complete necessary work and analysis to produce a final report acceptable to AEA.

As noted by AEA, the final feasibility study for this \$2M grant will be in the range of 100-150 pages plus large appendices. The document will analyze the prospects for the future project to produce power, while describing the engineering aspects of the selected scheme, economic feasibility, cost of power, environmental constraints, geotechnical, hydrologic, power output, power operations, construction costs, site access, estimated project development and operations & maintenance costs, transmission routing, collected data, with final conclusions and recommendations.

Note that the AEA grant is scheduled to expire in December 2013; however we have requested an extension of the grant through April 2015 which will coincide with the expiration of our 2<sup>nd</sup> FERC Preliminary Permit in January 2015.

## Fiscal Note:

Project funding consists of a \$2,000,000 AEA Renewable Energy grant; a \$770,000 designated legislative grant, and \$231,768 in department matching funds. Approximately \$633,000 in funds remains in the Takatz Lake Feasibility project budget. Estimated costs for this additional work are approximately \$50,000.

## Recommendation:

The expertise and professional knowledge offered by Mr. Carson and the project team will be invaluable to the successful evaluation of the Takatz Lake generation facilities and the rates are very cost effective. I highly recommend approval of the PSA Amendment with Currents Consulting.

CC: Robin Koutchak, Municipal Attorney  
Mike Middleton, Interim Finance Director  
Tori Fleming, Grants Accountant

Alaska Energy Authority  
Grant Agreement  
Amendment



Grant Agreement Number 2195418	CFDA# NA	Amount of Funds \$ 2,000,000
Project Code(s) 407049	PBO No./ Proposal No. PBO00376	Period of Performance: From: August 20, 2008 To: December 31, 2013
Project Title Takatz Lake Hydroelectric Feasibility		
<b>GRANTEE</b>		<b>GRANTOR</b>
Name City and Borough of Sitka		Alaska Energy Authority
Street/PO Box 105 Jarvis Street		Street/PO Box 813 W. Northern Lights Blvd.
City/State/Zip Sitka, Alaska 99835		City/State/Zip Anchorage, AK 99503
Contact Person Christopher Brewton, Utility Director		Contact Person Doug Ott, Project Manager
Phone 907-747-4000	Fax 907-747-3208	Email: chrisb@cityofsitka.com
Phone 907-771-3067	Fax 907-771-3044	Email: dott@aidea.org

**AMENDMENT 3**

**Extend Period of Performance to December 31, 2013**

**Appendix A #1, replace with following:**

**1. Definitions**

In this Grant Agreement, attachments and amendments:

- a) "Authority" means the Alaska Energy Authority, a public corporation of the State of Alaska.
- b) "Authority Project Manager" means the employee of the Authority responsible for assisting the Grantee with technical aspects of the Project and is one of the Grantor's contacts for the Grantee during all phases of the Project.
- c) "Authorized Representatives" means those individuals or entities authorized by an entity to act on its behalf, with delegated authority sufficient to accomplish the purposes for which action is needed.

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Grantee		Authority Project Manager		Executive Director or Designee	
Signature	Date	Signature	Date	Signature	Date
			1/23/12		1/23/12
Cheryl Westover, Mayor		Doug Ott, Project Manager		Sara Fisher-Goad AEA Executive Director	

GRANTEE COPY



DEPARTMENT OF COMMERCE, COMMUNITY, AND ECONOMIC DEVELOPMENT  
DIVISION OF COMMUNITY AND REGIONAL AFFAIRS

RECEIVED

JUL 20 2012 Designated Legislative Grant Program  
Grant Agreement

Grant Agreement Number 13-DC-420		Amount of State Funds \$770,000.00	
Encumbrance Number/AR/Lapse Date / 9239 / 06/30/2017		Project Title Takatz Lake Hydroelectric Project Planning and Analysis	
<b>Grantee</b>		<b>Department Contact Person</b>	
Name City and Borough of Sitka		Name Robin Park	
Street/PO Box 100 Lincoln Street		Title Grant Administrator II	
City/State/Zip Sitka, AK 99835		Street/PO Box P.O. Box 110809	
Contact Person John Sweeney, Finance Director		City/State/Zip Juneau, AK 99811	
Phone 907-747-1808	Fax 907-747-7403	Phone 907-465-4731	Fax 907-465-5867

**AGREEMENT**

The Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs (hereinafter 'Department') and **City and Borough of Sitka** (hereinafter 'Grantee') agree as set forth herein.

**Section I.** The Department shall pay the Grantee for the performance of the project work under the terms outlined in this agreement. The amount of the payment is based upon project expenses incurred, which are authorized under this Agreement. In no event shall the payment exceed **\$770,000.00**.

**Section II.** The Grantee shall perform all of the work required by this Agreement.

**Section III.** The work to be performed under this agreement begins 7/1/2012 and shall be completed no later than 06/30/2017.

**Section IV.** The agreement consists of this page and the following:

ATTACHMENTS

- Attachment A: Scope of Work
1. Project Description
  2. Project Budget
  3. Project Narrative
  4. Project Management/Reporting
  5. Forms Packet
- Attachment B: Payment Method  
Attachment C: Standard Provisions

APPENDICES

- Appendix A: Audit Regulations  
Appendix B: Audit Compliance Supplement  
Appendix B2: Insurance  
Appendix C: State Laws and Regulations  
Appendix D: Special Requirements and Assurances for Federally Funded Projects (if applicable)  
Appendix E: Site Control  
Appendix F: State Fire Marshal Review

AMENDMENTS: Any fully executed amendments to this Agreement

Grantee	Department
Signature <i>James E. Dinley</i>	Signature <i>Jolene Julian</i>
Printed Name and Title James E. Dinley, City Administrator	Printed Name and Title Jolene Julian, Grants Administrator III
Date 7-18-12	Date <i>July 20, 2012</i>

Reviewed by: *JM*

## **Appendix (G) Takatz Lake Appraisal Study**

### **Scope of Work**

This study effort will define a recommended arrangement of Project Generating Facilities for the Takatz Lake Hydroelectric Project, FERC Project No. 13234-000. This study seeks to confirm the specific arrangement of the Project's power intake, tunnel-penstock, powerhouse, and support facilities in the powerhouse area. The study will confirm, to the extent possible, whether the project can be developed in a phased approach, using a lake tap of Takatz Lake for the power intake. The study will document past work on environmental, hydrology, power studies and the transmission system so that a single document will be in place to summarize the engineering studies in the 2009 to 2014 time frame.

A comparative cost evaluation will be performed, using cost records from three recent or on-going southeast Alaska projects. These will include the Blue Lake, Ketchikan Lakes, and Allison Creek projects. From these recent project unit prices for the major cost elements of the work such as rock excavation, tunneling, concrete, generating equipment etc. will be developed. These unit prices will be applied to the recommended development plan for Takatz, in order to define a possible cost range for the Takatz Development.

The study work will also include development of draft FERC Exhibit A (Project Description) and Exhibit B (Project Operations) sections of a draft preliminary license application document (PAD). This work will not include Exhibit F or G drawings, but will provide pre-feasibility level drawings that could be used to develop the Exhibit F drawings.

Information for the Project transmission line to Sitka will be taken from selected transmission line feasibility studies as prepared by Commonwealth Associates, Inc.

Information for the environmental setting and constraints will be taken from the selected environmental resource studies completed in the 2010 to 2013 time frame. Narrative regarding how the Takatz Project might fit in with the SE Alaska Integrated Resource Plan and the possible Sitka to Kake transmission line, will be based on the SEIRP and recent study reports regarding the Sitka to Kake transmission line.

### **TASKS**

#### **1. Review of Existing Documents (MCM – Matt and Heidi)**

Review of the following existing (and forthcoming) documents:

- a. Alaska Power Administration. Plan of Development, Takatz Creek Project, Alaska. US Department of Interior, January 1968 62 pages

- b. Alaska Power Administration. Takatz Creek Project, Alaska, Appendix A – Water and Power, Appendix B – Designs and Estimates. US Department of Interior, September 1967. 80 and 82 pages.
- c. US Department of Interior. Geologic Reconnaissance of a Possible Powersite at Takatz Creek, Southeastern Alaska. Geological Survey Bulletin 1211-D. 22 pages. US Bureau of Reclamation.
- d. Commonwealth Associates, Inc. Takatz Overhead Transmission Line Alternative Feasibility Review Report Summary. February 2011, 49 pages.
- e. Currents Consulting. Project Capacity Analysis, March 2011, 87 pages.
- f. Preliminary topographic and bathymetric maps as prepared by TerraSond, 2012.
- g. Currents Consulting, Request for Proposal for Completion of Bathymetric Survey and Geophysical Survey, December 2012, 10 pages.
- h. Bathymetric Survey and Geophysical Survey Reports (David Evans and Associates, 2013).
- i. Kent Bovee, Final 2011 Wildlife Investigations Report July 2012. 66 pages.
- j. Corvus Designs, Inc., Takatz Lake Hydroelectric Project: Scenery Resources Report, August 2013, 65 pages.
- k. Karl Wolfe, Final Fisheries Investigations Report 2011, Takatz Lake Hydroelectric Project (FERC No. 13234), July 2012, 62 pages.
- l. HDR, Lazy Mountain, Botanical Resources Studies, Interim Report: 2011 Studies, February 2012, 45 pages.
- m. Anderson Land Planning, Agnew Beck, Final Recreational Resources Study Report, May 18, 2012, 94 pages (plus appendices 117 pages).
- n. Dr. George Karady and F. Mike Carson Sitka-Kake-Petersburg Intertie Study Update, February 2011, 53 pages
- o. Black & Veatch, HDR, Southeast Alaska Integrated Resource Plan, Volume 1 – Summary, July 2012, 74 pages.
- p. Black & Veatch, HDR, Southeast Alaska Integrated Resource Plan, Volume 2 – Technical Report, December 2011, 625 pages.
- q. Paleo Logics, Archaeological and Cultural Resources Report, May 2012, 32 Pages.

Deliverables:

- a. Annotated bibliography of reviewed documents. Annotation shall include a short discussion of the primary information taken from each reference.

**2. Team Meeting – Concept Review, Site Visit Planning (completed)**

Meeting preparation: Following review of existing data, prepare sketches and drawing markups (from prior studies) of proposed generating facilities locations and arrangements. Coordinate input from geotechnical and civil-structural staff to arrive at a tentative arrangement of facilities.

Team meeting: Meet in Seattle area to finalize sketches and drawing markups. Plan the summer 2013 site visit. Develop itinerary, site work tasks, and schedule of the 2013 site visit.

**3. Hydrology Development (Mike and Paul)**

Assemble and review recent USGS final and provisional flow data for USGS gage no. 15099900, Takatz C at Takatz Lake Outlet NR Baranof AK, and USGS gage no. 15100000, Takatz C NR Baranof AK. Gage no. 15099900 includes data from November 25, 2008, continuing to present, gage no. 15100000 includes data from September 26, 2010 to present. Combine this recent 4.8 years data with the hydrology developed in the Currents Consulting 2011 capacity analysis report. Comment on variations between the recent flow records and the prior hydrology data set. Assemble an overall 28 year hydrologic data set for Takatz Lake inflows, using the recent 4.8 years data and the 23 year record documented in the 2011 report.

**4. Review of Environmental Constraints (MCM – Heidi)**

Review and summarize the recent environmental studies completed by CBS under the recent FERC preliminary permits. Define the environmental constraints that may affect project development. Develop appendices that document the environmental study reports.

**5. Review of Historical Project Development Plans (MCM-Matt, Paul help)**

Review and summarize the historical project development plans. This will primarily include the alternatives studies completed by the USBR. Review past evaluations of alternative development plans described by the USBR. Comment on the USBR's ranking and selection of their preferred alternative. Provide recommendation for any revision of the preferred alternative based on present Sitka and SE Alaska power grid and markets. Review alternative development plans described in the 2011 Currents Consulting "Capacity Analysis Report". Compare the lake tap and phased development alternatives to the historical USBR development alternatives.

**6. Preliminary Facilities Layout – Phased Development (Matt and Paul-complete)**

Prepare revised sketches and preliminary drawings showing consultant's preliminary preferred arrangement of the power intake, tunnels, powerhouse and local support facilities. This layout shall be based on reviews of the information existing in early 2013 and the team's concept review meeting. These drawings and sketches may be used in the field for orientation, markup and review of the site layout, during the site visit.

Deliverables:

- a. Site plan drawings and graphics suitable for use in the field. Intent shall be to have drawings that can serve as a guide for the site inspection and which can be marked up during the site visit.
- b. List of physical locations that the study team wants to visit.
- c. Proposed schedule and itinerary for site work.

**7. Site Visit – visit complete, report pending.**

Travel to Sitka and the Project site in August or September 2013. Visit the site and observe conditions in the following areas: a) upper lake sediment delta; b) power intake area; c) dam site; d) tunnel alignment including valve chamber; e) lower tunnel alignment; f) powerhouse site including dock and support facilities area; g) transmission corridor – (overflight only to observe the transmission corridor).

Deliverables:

- a. Site visit – general report;
- b. Photographs and narrated video of site observation (on electronic media).

**8. Geotechnical Assessment – (Kim).**

Review and summarize the historical geotechnical investigations work completed in the 1960's. Describe the geologic setting of the project. Describe the geotechnical setting and conditions in the dam, tunnel, and powerhouse areas.

Evaluate the geotechnical feasibility of a lake tap development for the power conduit. Provide opinion on the risk of slumping or underwater landslides of the sediment delta. Evaluate the suitability of the dam site for a single dam constructed to el. 990. (i.e., no saddle dam). Evaluate the risk of landslides and avalanches in the powerhouse area and areas with exposed project facilities.

Summarize the existing geotechnical data and the information gained during the site visit. Provide a recommendation for the general scope of future geotechnical

site investigations that may be needed to prove the feasibility of the Phased development of the project.

Deliverables:

- a. Geotechnical report, draft and final versions. Include pertinent drawings and text from prior geotechnical reports such that this 2013 report can serve as a stand-alone document for CBS and general readers.
- b. Drawing showing geotechnical findings, based on surface observations.
- c. Recommended geotechnical field explorations and associated phasing required for the project development.
- d. Clear identification of geotechnical risks and measures required to mitigate these risks.

**9. Bathymetric and Sub-Bottom Geophysical Surveys (MCM, help from Kim)**

Review and summarize the bathymetric and sub-bottom geophysical work by DEA. Provide new area-capacity curve and tables, from el. 717 up to the USBR limit of el. 1040. Summarize the sub-bottom geophysical work. Include graphical maps of the lake and surrounding area.

**10. Power Operations Studies (Mike and Paul)**

Complete power operations studies for the USBR recommended plan, and the Phase 1, Phase 2, and full development options for the Project as described in the 2011 Capacity Analysis report. Power studies will document estimates of firm power, average power for all development options using the revised 28 year hydrologic record.

Provide narrative discussion of the benefits of increased project storage with the larger storage alternatives and discussion of how Sitka might best integrate the Takatz power into its grid. Also, describe how the value of greater storage in Takatz might vary with differing regional power grid configurations.

**11. Comparative Cost Analysis (MCM)**

Review and summarize construction costs for recent SE Alaska hydroelectric developments including Blue Lake Expansion, Allison Creek, Ketchikan Lakes and the Tyee-Swan Lake transmission line intertie. Break down the cost information available to estimate cost ranges for the major construction elements expected at Takatz.

For the Takatz development, develop unit price cost ranges for tunnels, shafts, surface rock excavation, mass concrete, structural concrete, generating equipment (\$/MW), transmission (\$/mile), general conditions costs, roads, (\$/mile), etc.



Develop estimated construction quantities for Takatz. Develop an estimated cost range for Takatz in 2014 dollars.

This section will include a “cost of power” discussion, that describes the cost of power for the Phase 1, Phase 2 and Full Development alternatives at Takatz.

## **12. Recommended Development Plan (MCM with help from Paul)**

Evaluate up to three development alternatives, based on cost range and estimated energy output. Define the estimated range of energy costs. Describe the recommended development plan.

## **13. Finalize Facilities Layout**

Prepare drawings similar to FERC Exhibit F drawings showing general arrangement plans, sections and elevations of the power generating facilities. Include the dock and powerhouse support facilities. AutoCAD format. Use topographic and bathymetric survey drawings as backgrounds for site plans and layouts. Include up to 3 drawing sheets showing the transmission corridor plan and typical structure drawings, as provided by Commonwealth Associates.

Deliverables:

- a. Draft drawings
- b. Final Drawings
- c. Electronic files in AutoCAD format

## **14. Operations and Maintenance Plan and Costs (Paul)**

Describe a preliminary O&M staffing plan for the selected project alternative, with description of on-site equipment, facilities and staff. Estimate the annual O&M cost. Describe facilities and possible staffing for major maintenance events.

## **15. Report**

Prepare draft report summarizing the study effort. Provide a clear description of the recommended project arrangement, with options considered, but discarded, etc. Provide clear statements regarding how the preferred arrangement was selected. Include a statistical summary of main project dimensions, capacities, etc. Meet with City and Borough staff to review draft report. Revise draft report and provide final report.

Report will include a narrative on the integration of the Takatz project with other regional resources and potential transmission line segments with SE Alaska. The

2012 SEIRP and 2011 Sitka – Kake transmission line feasibility study will be referenced in this narrative.

Deliverables:

- a. Draft report
- b. Meeting in Sitka with CBS staff to review draft report
- c. Final draft report.
- d. Final report
- e. Electronic copies of report, drawings, figures, photos, etc. in native format (MS Word, AutoCAD, jpg, etc).
- f. Electronic copies of report in .pdf format, with bookmarking.

#### **16. Draft FERC Exhibits A and B**

Prepare draft Exhibit A and B for the recommended Project arrangement in a format suitable for submission to the FERC as part of a Preliminary Application Document. This will not include drawings.

Deliverables:

- a. Preliminary draft Exhibits
- b. Final Draft Exhibits.
- c. Electronic copies of text, drawings, figures, photos, etc. in native format (MS Word, AutoCAD, jpg, etc).
- d. Electronic copies of draft Exhibits in .pdf format, with bookmarking.

#### **17. Support by Commonwealth Associates**

Commonwealth Associates will provide support for this study in the following areas:

- a. Provide draft report text for description of transmission facilities.
- b. Provide draft text for the FERC Exhibits A and B.
- c. Review final draft of overall report to ensure consistency of our report with past reports and studies provided by Commonwealth Associates.

#### **18. Study Costs**

See attached.

#### **SCHEDULE**

1. April 10, 2013 – submit price proposal for work
2. June 1, 2013 – Notice to Proceed, begin office studies
3. August, 2013 – Site visit
4. December, 2013 – Draft report

5. January, 2014 – Review meeting with City staff
6. February 28, 2014 – Submit final report.

#### PROJECT TEAM

Project Engineer – Paul Carson, Currents Consulting  
Lead Civil Engineer – Matt Moughamian, McMillen LLC  
Environmental Review – Heidi Wahto  
Hydrology and Power Operations – Mike Frantz  
Geotechnical Engineer – Kim de Rubertis  
Lead CADD technician - Robert Guerrero, McMillen LLC  
Transmission Line Support – Dean Scott, Commonwealth Associates