

**Gas Pipeline Corridor Geologic Hazards and Resources - Final Phase**      **FY2012 Request: \$200,000**  
**Reference No: 41415**

**AP/AL:** Appropriation      **Project Type:** Gasline  
**Category:** Natural Resources  
**Location:** Statewide      **House District:** Statewide (HD 1-40)  
**Impact House District:** Statewide (HD 1-40)      **Contact:** Jean Davis  
**Estimated Project Dates:** 07/01/2011 - 06/30/2016      **Contact Phone:** (907)465-2422

**Brief Summary and Statement of Need:**

In anticipation of construction of a natural gas pipeline, the Division of Geological and Geophysical Surveys (DGGs) is evaluating the geology, geologic hazards and resources of the proposed corridor from Delta Junction to the Canada border. Maps and reports already published have provided critical data to pipeline companies and state/federal regulatory agencies. The requested funding will support final geologic mapping, hazard assessment and resource evaluation for the corridor via analyzing newly-acquired Light Detection and Ranging (LiDAR) data to identify and characterize additional potential hazards, follow-up field work, and data synthesis for the entire project.

<b>Funding:</b>	<b>FY2012</b>	<b>FY2013</b>	<b>FY2014</b>	<b>FY2015</b>	<b>FY2016</b>	<b>FY2017</b>	<b>Total</b>
Gen Fund	\$200,000						\$200,000
<b>Total:</b>	<b>\$200,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$200,000</b>

<input type="checkbox"/> State Match Required	<input type="checkbox"/> One-Time Project	<input type="checkbox"/> Phased - new	<input checked="" type="checkbox"/> Phased - underway	<input type="checkbox"/> On-Going
0% = Minimum State Match % Required		<input type="checkbox"/> Amendment	<input type="checkbox"/> Mental Health Bill	

**Operating & Maintenance Costs:**

	<u>Amount</u>	<u>Staff</u>
Project Development:	0	0
Ongoing Operating:	0	0
One-Time Startup:	0	0
<b>Totals:</b>	<b>0</b>	<b>0</b>

**Additional Information / Prior Funding History:**

SLA2005/CH03      \$ 2,000,000      Completed geophysics, reconnaissance geologic mapping  
SLA2006/CH82      \$ 350,000      Completed Delta Jct. to Dot Lake  
SLA2007/CH30      \$ 600,000      Completed Dot Lake to Tetlin Jct.; published multiple reports and maps for work completed to date  
SLA2008/CH29      \$ 600,000      Completed field work Tetlin Jct. to Canadian border; multiple maps and reports in press  
SLA 2010/CH43      \$ 300,000      Continuing map and report preparation; data analysis, follow-up field work, report writing, and map compilation.

**Project Description/Justification:**

The Alaska Highway corridor between Delta Junction and the Canada border is the epicenter of intense interest as the State of Alaska and two major pipeline companies prepare for construction of a proposed natural gas export pipeline. Contractors are conducting field work in preparation for this project, which will be the largest construction project in the history of North America. The highly detailed geotechnical work required for proper design of a natural gas pipeline, which will be buried along most of its length, relies heavily on a background of geologic information at a broader scale than that likely to be collected by the contractors, in contrast to the highly detailed public and private information available along the existing Trans-Alaska Pipeline corridor. The Division of Geological and

Geophysical Surveys' (DGGS) multi-year program to evaluate the geology, geologic hazards and resources in this portion of the proposed natural gas pipeline corridor is providing valuable information to ensure that the more detailed geotechnical data collection by the companies will address areas critical to the safe and viable development of the planned infrastructure.

With FY2005 supplemental funding, DGGS initiated geologic hazards and resources evaluations along this route by conducting airborne geophysical surveys of a 16-mile-wide corridor between Delta Junction and the Canada border. This geophysical survey data served as a starting point for the ground-based 1:63,360-scale geologic mapping. The mapping provides the basis for evaluation of geologic hazard risks, construction-materials sources, and potential mineral resources that may provide additional economic benefit along the corridor.

Prior to this project, existing publicly available geologic map coverage along this corridor was discontinuous, at different scales, and inconsistent in terminology, approach, and content. This project makes use of existing data in planning and analysis, but combines all viable existing data with new data in a single, seamless GIS database using state-of-the-art methodology and standardized terminology. Planners and designers will be able to layer the resulting GIS maps of geology, geophysics, hazards, and resources with proposed alignments of the gas pipeline, railroad extension, and other infrastructure to facilitate efficient engineering, construction, and risk management.

With support from the Office of the Federal Coordinator and the Alaska Gas Pipeline Office, DGGS recently contracted Watershed Sciences Inc. to collect high resolution LiDAR (Light Detection and Ranging) data, which will cover a minimum one-mile width for the entire proposed gas pipeline system and, in this portion of the corridor, is centered along the Alaska Highway. LiDAR is a remote sensing technology that uses laser scanning to collect height or elevation data that can be used to produce highly accurate three dimensional computer models of the ground surface. LiDAR has proven to be one of the most useful forms of remotely sensed data for identification and characterization of potentially active faults and many other surficial-geologic landforms and hazards, especially in areas of heavy vegetative cover. LiDAR data will provide new information critical for evaluating active faulting, slope instability, thaw settlement, erosion, and other engineering constraints along the proposed pipeline corridor.

These data, together with airborne geophysics and new high-resolution orthorectified satellite panchromatic and multispectral imagery, provide new tools for detailed geologic mapping and terrain analysis that are being used to the greatest extent possible in conducting this project and generating products. These tools were not available to the engineers and scientists who surveyed this route in the 1970s and 1980s.

Staffing of this project includes an existing DGGS project manager, two or three existing DGGS geologists (part-time), and student interns. The project makes extensive use of contract geologists from the private sector, and University of Alaska Fairbanks faculty from the Department of Geology and Geophysics.

Products of this project to date have been multiple preliminary reports and maps that have been of great interest to pipeline companies and state/federal regulatory agencies. Upon completion of the last of the preliminary maps and reports for the three segments between Delta Junction and the Canada border, this CIP funding will provide the funding for review and consolidation of the data acquired thus far for use by the State, Federal authorities, and those interested pipeline companies. LiDAR data, currently being acquired, will provide critical new information for the final report. Field work during 2010 re-examined important issues throughout the corridor and we anticipate limited field work in 2011 to address additional questions that will likely arise upon analysis of the LiDAR data. A

comprehensive final map series will be prepared for the Alaska Highway corridor, incorporating consistently interpreted data from all three map segments. This is an indispensable step in order to revise preliminary interpretations that may have changed as a result of the continuing data collection during this multi-year project. This final product will be a milestone contribution to the geologic knowledge base, and will address DGGs' mandate in Alaskan statute to "...determine the ... locations and supplies of groundwater and construction material, and the potential geologic hazards to buildings, roads, bridges, and other installations and structures" (AS 41.08.020). This project contributes to the State's Geological Development Strategy A2, Target 3, and Geological Development Strategy B1, Target 1. All map data will be made available in digital GIS formats in conformance with national standards.

The proposed cost and duration of this project are based on our historic costs of field-geologic mapping projects and our experience on this project to date, which has confirmed that our estimates are accurate. CIP funding to date, not including the cost of the geophysical survey, has allowed us to map the length of the corridor at a preliminary level. In order to finish the project, there are areas that need to be augmented with additional field observations, and additional analytical results are needed to answer remaining uncertainties in our interpretations. This FY12 CIP will fund the necessary follow-up field work, map geologic hazards map creation, final geologic interpretive work, and the reporting and publication of the findings of interest thus far.

**Why is this Project Needed Now?:**

As plans unfold to move the construction of this important natural gas pipeline forward, the pipeline designers, builders, and regulators need objective and timely geologic hazards and resource information. The maps and reports being produced by this project between Delta Junction and the Canada border will be used to guide pipeline design and on-site modification planning, locate prospective sources for construction materials, and guide site-specific hazards and engineering studies. Consequently, potential risks can be identified prior to construction, problems can be avoided, delays will be reduced, and future operation will be safer. The same kind of geologic analysis and resultant engineering that prevented catastrophic failure of the TAPS during the 2002 Denali fault earthquake will help prevent future interruption of service of the natural gas pipeline. If this request is not funded, the project will only be partially completed and critical new data will not be analyzed. Pipeline companies and regulatory agencies will lack data necessary to permit and safely construct the pipeline.

**Specific Spending Detail:**

LINE ITEM	DOLLAR AMOUNT	DESCRIPTION
Personal Services	\$ 50,000	Partial funding for existing geologists and student interns
Travel	\$ 15,000	Travel/per diem for field work, monitoring of contracts
Services	\$ 125,000	Contract geologists, laboratory analyses, helicopters
Commodities	\$10,000	Field supplies, office supplies

**State Match Required:**

- NO**  
 **YES**

**Project Support:**

Office of the Federal Coordinator, State Pipeline Coordinator's Office, Department of Transportation and Public Facilities, Division of Mining, Land and Water, pipeline companies, oil and gas industry, engineering community, geological consulting community, sand and gravel companies, Alaska Railroad, University of Alaska, Alaska Miners Association, local communities, and Native corporations in the project area

**Project Opposition:**

No opposition anticipated.