

**Matanuska Susitna Borough Hydrogeology Assessment
Phase 2 of 3**

**FY2011 Request: \$295,000
Reference No: 45272**

AP/AL: Appropriation

Project Type: Research / Studies / Planning

Category: Natural Resources

Location: Mat-Su Areawide

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Contact Phone: (907)465-3379

Estimated Project Dates: 07/01/2010 - 06/30/2011

Brief Summary and Statement of Need:

Water resource allocations are an exclusive mandate of DNR. Management of water resources for protection of Alaskans requires knowledge of controlling hydrology. In portions of the Matanuska-Susitna Borough (MSB), increasing demands on groundwater are causing concern for the aquifer's ability to provide sufficient high-quality water to meet demand. This study's ultimate goal is to provide DNR water management with knowledge to manage MSB ground water resources effectively.

Funding:	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	Total
Gen Fund	\$295,000	\$345,000					\$640,000
Total:	\$295,000	\$345,000	\$0	\$0	\$0	\$0	\$640,000

<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:	30,000	0
Ongoing Operating:	30,000	0
One-Time Startup:	0	
Totals:	60,000	0

Additional Information / Prior Funding History:

SLA2008/CH29 \$ 295,000 Implemented

Project Description/Justification:

Population projections for the Matanuska-Susitna Borough (MSG) estimate a doubling of the existing population over the next twenty years. Unlike municipalities that utilize large, quantifiable surface water sources, MSB's primary water source has been extraction of groundwater from a poorly understood aquifer system. The current forecast is that MSB will continue to utilize this source for economic/industrial expansion and domestic water uses. While sufficient groundwater supplies are currently available for most areas in the MSB, areas exist where the demand for ground water has apparently exceeded availability. Unfortunately, our current understanding of the subsurface in much of the anticipated MSB growth areas is very limited. What little is now known indicates the area is underlain by a complex composite of glacial deposits that can serve as both excellent aquifer sources of plentiful ground water, or conversely as poor sources with limited or seasonal variations that make them of little use as a potable water source. The interrelations between various confined and unconfined aquifers, and the effects of existing and future uses of water from these same aquifers on existing and future potential users of the ground water resource, are currently unknown.

The purpose of this project is to address the hydrogeology of areas of the MSB where localized use of ground water has taxed the aquifer's ability to meet demand. Specifically, these areas include Devon Wood, Ravenview, Village Park, Prospect Park and Wasilla Acres subdivisions. DNR relies on

the best available scientific data and analysis to allocate water resources. The likely consequence of continued water management with insufficient hydro-geologic data will be under- or over-appropriation of groundwater. Management and allocation of the critical groundwater resource without proper information will have adverse impact on the economic development of the MSB, and threaten the health and safety of MSB residents.

In Phase 1 of this project, existing sources of subsurface geologic data and hydrologic data were reviewed and analyzed to identify the locations and extent of the multiple confined aquifer systems. Areas currently experiencing water problems along with those that are expected to expand and stress the ground water resource were identified. Data on existing water wells in DNR's WELTS (Well Log Tracking System) will be supplemented with a thorough effort to retrieve well logs from wells in the vicinity not currently part of the database. In addition, water levels were recorded in over 100 wells, water levels recorders were installed in 10 major lakes, and two stream gauges were installed. Data contained in the USGS National Water Inventory System (NWIS) will be integrated with the WELTS data to complete as thorough a compendium of known data available.

Work under this project will be designed to characterize and document the subsurface near areas already experiencing water availability problems, and those areas now identified that are likely to experience water availability issues in the near future. During the second year FY2011 (Phase 2) all of the geologic and hydrologic data will be compiled and analyzed into a single product that presents the best available picture of the subsurface hydro-geologic conditions that will allow for water allocation based on the best science available. Due to the spatial nature of the data used, a geographic data structure is necessary for project success. Geographic information system (GIS) representation of the data, accompanied with a thorough data set will be further supplemented with additional field collected data, and applied to ground water modeling software to allow for rapid estimates and retrieval of information. In the third year FY2012 (Phase 3) of the project known locales with sparse or non-existent data that do not allow sufficient resolution to accurately depict subsurface hydrogeology will be equipped with monitoring wells. Computer models produced will be verified during this final phase of the product with field collected monitoring data. Anticipated monitoring well installation expense will require additional funding in the final year of the project. Data from monitoring stations installed will continue to be downloaded after project completion and applied to models verified during the study to assess the continued health and availability of water from MSB aquifers.

The Division of Mining Land and Water (DMLW) and the Division of Geological and Geophysical Surveys (DGGS) will cooperate with the MSB and the public in this multi-year study to gain an understanding of the complex hydro-geologic systems underlying portions of the MSB. This joint study brings together the hydrologic and water resource expertise of the DMLW and the geological and geophysical expertise of the DGGS. The DMLW and DGGS are the primary divisions of DNR with statutory mandates (AS 41.08; AS 46.15) to collect and analyze both geologic and hydrologic data. This project meets the statutory responsibilities of both divisions, and meets the goals and objectives of CIP projects through the protection offered MSB residents offered by access to a high quality and sufficient water supply that affords continued economic expansion, all while reducing long term state operating expenses through the judicious allocation of water resources. This project also will tap the resources and expertise of the U.S. Geological Survey (USGS) and the University of Alaska to both ensure that the most knowledgeable staff is providing leadership to the study, and that cooperative use of funding maximizes the return on investment. Additional funding sources will be pursued during each phase of the project. Data and products of this project will be made available on

line through the DNR website to allow for wide use and distribution of the results. In addition to supporting a central function and mandate of DNR, this project would also serve multiple other State management and development functions. Results would likely be used by the Department of Transportation and Public Facilities and the Department of Environmental Conservation.

Why is this Project Needed Now?

Insufficient ground water supplies at multiple locations within the MSB are now documented. Anticipated population growth within the MSB will very likely result in increased stress on the aquifer systems already incapable of meeting demand. For DNR to address and manage these ground water sources to facilitate continued economic expansion while protecting the health and safety of MSB residents this project is imperative now.

Specific Spending Detail:

LINE ITEM	DOLLAR AMOUNT	DESCRIPTION
Personal Services	\$ 75,000	Hydrologist II, III
Travel	\$ 5,000	Fieldwork costs
Services	\$ 205,000	Coop with USGS/University of Alaska
Commodities	\$ 10,000	Field equipment

Provide estimated annual ongoing operating and maintenance costs after project completion/implementation:

<u>Dollar Amount & Fund Source</u>	<u>Number of Positions FT/PT</u>	<u>Description</u>
\$ 30,000 Fund Source: GF	Full time: Part time:	To continue to pay for part of an existing hydrologist position

Project Support:

As established, this is a cooperative project between two of the six management divisions of DNR. Recognition of the lack of ground water data for the MSB is a repeated issue in annual meetings of the Interagency Hydrology Committee for Alaska (IHCA). IHCA is a consortium of Federal, State and local government agencies that coordinate efforts in all fields of hydrology. IHCA acknowledgement of the need for groundwater data is documentation of the need recognized by all participating Federal, State and local government management agencies, and is a clear indicator of project support. John Duffy, the MSB Manager, Douglas Kane, Director of the Water and Environmental Research Center at the University of Alaska Fairbanks, and Steven Frenzel, Chief, Office of Water Resources of the USGS have all pledged their support and cooperation for this project.

Project Opposition:

None.