

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

**FY2012 Request: \$345,000
Reference No: 45272**

AP/AL: Appropriation

Project Type: Research / Studies / Planning

Category: Natural Resources

Location: Mat-Su Areawide

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Estimated Project Dates: 07/01/2011 - 06/30/2012

Brief Summary and Statement of Need:

Water resource allocations are an exclusive mandate of DNR, and 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 is the final phase of funding for an assessment/study with an ultimate goal to provide DNR's Water Management section with knowledge to effectively manage MSB ground water resources for the long-term.

Funding:	<u>FY2012</u>	<u>FY2013</u>	<u>FY2014</u>	<u>FY2015</u>	<u>FY2016</u>	<u>FY2017</u>	<u>Total</u>
Gen Fund	\$345,000						\$345,000
Total:	\$345,000	\$0	\$0	\$0	\$0	\$0	\$345,000

<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:	0	0
Ongoing Operating:	25,000	0
One-Time Startup:	0	
Totals:	25,000	0

Additional Information / Prior Funding History:

SLA2010/CH43 \$295,000 Assessment continues
SLA2008/CH29 \$ 295,000 Completed

Project Description/Justification:

Portions of the Matanuska Susitna Borough (MSB) are experiencing the greatest population growth rate within the state. Population projections for the MSB 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 ground water from a poorly understood aquifer system. The current forecast is that MSB will continue to utilize this source for economic/industrial expansion and the allied domestic water uses. While sufficient ground water supplies are currently available for most areas in the MSB, there exist areas where the demands for groundwater have 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. Further complicating the issue are the unknowns of 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.

The purpose of this project is to address the hydro-geology of areas of the MSB where localized use of ground water has taxed the aquifers ability to meet demand. Specifically, these areas include Devon Wood, Ravenview, Village Park, Prospect Park, and Wasilla Acres subdivisions. Projected population increase in these areas will only stress the aquifers further. DNR is mandated to manage and allocate all water resources within the state to the maximum benefit of all users. Management of water as a resource in Alaska is unique. No other natural resource within the state is under the exclusive management authority of the state. In order to meet its unique mandate, DNR relies on the best available scientific data and analysis to allocate water resources. In portions of the MSB, the data and information needed to properly administer the management of the increasingly important ground water resource is unavailable. The likely consequence of continued water management with insufficient hydro-geologic data is the under or over appropriation of ground water. Such poor use and 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.

Work under this project will be designed to characterize and document the subsurface in the vicinity of areas already experiencing water availability problems, and those areas now identified that are likely to experience water availability issues in the foreseeable future.

The Division of Mining Land and Water (DMLW) 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 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) to ensure that the most knowledgeable staff are providing leadership to the study, and that cooperative use of funding maximizes the return on investment.

In the first year (**Phase I**) of the project initiated in FY09, 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 level recorder were installed in 10 major lakes, and two stream gages 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. In FY10 the project was not funded. DNR and USGS continued minor data collection, and USGS continued development of groundwater model.

In FY11 (**Phase II**) was fully funded and 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. 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 FY12 (**Phase III**) of the project known locales with sparse or non-existent data that do not allow for sufficient resolution to accurately depict subsurface hydro-geology 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.

Data and products of this project will be made available on line through the DNR web site 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 Public Facilities (ADOTPF) and the Department of Environmental Conservation (ADEC).

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 (text)
Personal Services	\$ 75,000	Hydrologist II
Travel	\$ 5,000	Field data collection
Services	\$ 255,000	Contract with USGS
Commodities	\$ 10,000	Replace and maintain field equipment

State Match Required:

- NO**
- YES**

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 ground water data is documentation of the need recognized by all participating Federal, State, and local government management agencies is a clear indicator of the 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.