Pebble Project

NORTHERN DYNASTY MINES INC.

DRAFT ENVIRONMENTAL BASELINE STUDIES
PROPOSED 2007 STUDY PLANS

CHAPTER 19
DATA MANAGEMENT AND
GEOGRAPHIC INFORMATION SYSTEM

DRAFT

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ACRONYMS AND ABBREVIATIONS

CQM   comment and question management

GIS   geographic information system

GPS   global positioning system

HGM   hydrogeomorphic

NDM   Northern Dynasty Mines Inc.

19. DATA MANAGEMENT AND GEOGRAPHIC INFORMATION SYSTEM

19.1 Introduction

Resource Data Inc. (RDI) is providing GIS (geographic information system) and data management services to support the Pebble Project. The GIS and scientific data generated as part of the permitting process are a valuable asset to Northern Dynasty Mines Inc. (NDM). In the short term, NDM will make the data available to the environmental baseline project team. In the long term, the data will support the permitting process and development of an environmental impact statement, and ultimately will support monitoring throughout the life of the mine.

A sound data management plan ensures that the data are accurate, timely, and integrated into a multidisciplinary database and, thus, available when needed. The project strategy calls for a data management process that is completely automated. The plan is to provide data sources with clear requirements for data deliverables and to provide the tools for the data sources to verify compliance prior to delivery.

The data management and GIS scope of work is divided into two sections:

- Support for wetlands program.
- Website and data management.

19.2 Support for Wetlands Program

Support for the wetlands program covers managing all the mapping data collected during the baseline studies, creating and loading basemap and Pebble-specific data, providing GIS support, and providing cartographic services.

19.2.1 Objectives

The data management and GIS program in 2007 is intended to accomplish the following in support of the wetlands program:

- Support the wetlands mapping team.
- Support the 2007 field season.
- Maintain the project wetlands website and software.

19.2.2   Major Activities

The scope of services includes professional services in GIS and data management to support the 2007 wetlands program.

19.2.2.1   Ongoing Support for Wetlands Mapping Program

The following activities will be performed to support the wetlands mapping team in the wetland delineation program:

- Conduct habitat-data scrubbing (close polygons, remove slivers, etc.).

- Provide analysis of wetlands mapping, such as presentation-quality summary tables showing acreage of disturbance, jurisdictional wetland mapping, vegetation type, and hydrogeomorphic (HGM) classification.

- Provide ongoing support for alternative impact analysis as needed.

- Maintain the master data set throughout the mapping process.

- Provide ongoing documentation of GIS data sets and load to the Pebble Project website. Ensure documentation is compliant with current Federal Geographic Data Committee standards.

- Provide support for the wetlands mapping team for agency meetings (to be held in October or November). Attend meetings and provide reports.

- Modify global positioning system (GPS) camera scripts to the specifications developed by the wetlands mapping team, supporting the collection of additional wetland data.

- Create field maps to support the wetlands field surveys and data analysis.

- Process photos and photo locations and create a single-point data set which links the digital photos to the associated sample location.

- Produce photo reports for the habitat team as needed.

- Provide printing services.

19.2.2.2   Support for 2007 Wetlands Field Work

The following tasks will be performed in support of the 2007 field work for the wetlands program:

- Ship and install computers for mapping (digitizing) of wetlands by wetlands technical personnel in Iliamna.

- Train wetlands technical personnel in digitizing wetland boundaries.

19.2.2.3   Maintenance of Wetlands Website and Data

General site maintenance will be conducted to keep the wetlands website environments (development, test, and production) operating properly and to protect the integrity of the wetlands data contained in the database and website. The following tasks will be performed:

- Modify the wetlands application as specified by the wetlands mapping team, including the following:

  – Modifications to the plant community report.

  – Functional assessment updates and modifications.

  – Updates to the soils report.

- Institute minor changes in the wetlands website source code.

- Maintain documentation:

  – Update the wetlands database entity relationship diagrams (ERDs).

  – Updates wetlands website diagrams.

  – Create/modify supporting technical wetlands documents.

- Set up access to wetlands data for statisticians.

19.2.3   Approach

The established NDM GIS environment will be maintained. Digital and hardcopy data will continue to be acquired and loaded into the GIS for distribution to the project team. ArcInfo will continue to be used to create coverages, output as shape (SHP) files. This is the most expedient method to process data, and SHP files are the preferred format for the environmental team. Most of the data loaded into the GIS are available in digital format; data available only in hardcopy will be digitized. Distribution will be accomplished using transferring media such as CDs and portable hard drives. Smaller files will be published on the project website for download.

19.3   Data and Website Management

Website and data management includes maintaining a central data repository for the project, providing web-based tools to enter and report on project data, and providing tools to upload data into the project database. The website and database have been designed to provide long-term storage of and access to baseline data throughout the life of the mine.

In 2007, the project website will be further developed with added functionality in managing comments and responses, web mapping and analysis tools, supporting increased weather stations, map production, and cross-referencing field and laboratory data and with increased security of the Pebble Project data.

19.3.1   Objectives

The website and data management activities described in this document are intended to accomplish the following:

- Enhance the functionality for managing Pebble Project comments from agencies and private individuals.

- Better support web-based mapping, data analysis, and reporting.

- Increase the security of the Pebble Project data.

- Create cartographic map products (aside from those related to wetlands).

- Maintain the website, database, and software.

19.3.2   Major Activities

A wide range of activities are necessary to enhance the website and data management system. These activities are described below.

19.3.2.1   Comment and Question Management (CQM) System

The following requested enhancements will be made to the CQM system:

- Create a user manual and an administrator's manual.

- Train NDM personnel in the systems' use.

19.3.2.2   Web Mapping Analysis Tool

Under the guidance of NDM, the existing wetlands and other location-based information (sample locations) will be refined.

19.3.2.3   Security of Pebble Project Data

A detailed security report and plan to increase the security of all data and documents will be developed under the guidance of NDM.

19.3.2.4   Cross-referencing for Field and Sample Data

All GPS data regarding samples and locations that have been collected by various contractors throughout the years will be captured, and the ability to reference these to the analytical laboratory data will be verified.

19.3.2.5   Cartographic Services and GIS Data Management

Maps and graphics will be provided as needed for use in meetings with agencies and for use inclusion in project documents. The collection and distribution of GIS data from the consultants also will be managed. Map printing will be provided.

19.3.2.6   General Maintenance of Website and Data

In addition to the tasks described above, the following maintenance activities will be performed:

- Institute minor changes in non-wetlands website source code.

- Conduct performance tuning and maintenance of the Oracle 9i database.

19.3.2.7   Annual Software Maintenance

The following software licenses and network connections will be renewed as necessary:

- ESRI ArcIMS
- ESRI ArcView
- Oracle
- DSL line
- Domain name registration
- SSL (Secured Socket Layer) license

19.3.3   Approach

General data and website management also will employ the methods described in Section 19.2.3. In addition, the project team will develop the new functionalities using the technology for the existing website and database. Processes to facilitate capturing data in the master NDM repository will be refined. Cartographic products will be generated in ArcGIS and will be available in digital format via the project website.