

Final Report

Real-Time Access to Water Information for NorthEast BC

SCEK Recipient Agreement: EI-2014-04

British Columbia Oil and Gas Commission
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May 30, 2014

Background and Objectives: Access to water-related monitoring and information, and the ability to store and retrieve water-related information, is critical to enhancing and supporting resource development in NorthEast British Columbia. The information is required by statutory decision-makers and by oil and gas operators working in the region. In addition, and not to be under-valued, publically-accessible information on surface and groundwater resources is critical to help foster public acceptance and support for resource development.

The objectives of this project are:

- To create a web-based GIS interface that provides free and open public access to an array of water-related data that have been collected by government agencies and external groups, and that has flexible charting and analytical tools allowing users to understand and use the data for a variety of purposes;
- To create a repository and database for various or miscellaneous surface water and ground water quality and quantity data that are collected by industry, the Commission, and others, enabling those data to be accessed publically.

An abundance of water-related data and information have been collected in northeast British Columbia over many decades. Much of the information is stored in various provincial or federal government databases and is difficult to access. Also, because it is difficult to access, the depth and breadth of data available are not widely known. It is the intent of the Water Portal to bring the wide array of available water information to the fore, by making it available in an easy to use, public access.

The Water Portal system was completed in April, 2014, and was brought on-line in early May, 2014, after a period of testing. The Water Portal resides on an Oil and Gas Commission server and is linked and publically-available through the BC Oil and Gas Commission website at the following URL: <http://www.bcogc.ca/public-zone/water-information>.

Outcomes and Benefits: The primary outcomes are:

1. A modern, easy to use, web-based GIS interface with analytical/reporting tools, allowing public access to surface water and ground water data and water information for NorthEast BC;
2. A database and repository for miscellaneous water-related data collected by industry, the Commission, and others.
3. Real-time measurements are overlain on historic data to provide the context for adaptive environmental management and short term water management planning.

The system provides access to:

- **Hydrometric Data:**
 - Water Survey of Canada archive data;
 - Water Survey of Canada “real-time” data;
 - Geoscience BC / HRBPG Horn River Basin data;
 - Data reported to OGC as condition of permit;
 - Data reported to FLNRO as condition of water licence;
 - Industry-operated station data.
- **Weather / Climate Data:**
 - Environment Canada archive and active station data;

- FLNRO Fire Weather data;
- MOTH Road Weather data;
- Geoscience BC / HRBPG Horn River Basin data;
- Industry-operated station data.
- **Groundwater:**
 - MOE observation well data;
 - Groundwater level/quality data reported to OGC as condition of permit;
 - Miscellaneous Commission, industry or government groundwater level and quality data.

Methods: The database was established in a standard Postgresql format, and allows URL-based access. Interactive, database driven charting capabilities are provided using php, javascript and the AJAX methodology. The map interface uses the openlayers mapping framework to deliver high quality cartography built using the Mapnik rendering engine. The use of UTF grids along with AJAX programming methodology reduces or eliminates wait time to load data from the database by pre-processing data in the browser.

The project improves access to and understanding of environmental monitoring data related to water management in Northeast British Columbia. This is done through the use of clean, clear and concise map and chart based visualizations using several cutting edge technologies.

The database technology is Postgresql, a leading open source product spatially enabled by PostGIS and suitable for delivering information via the web. Interactive, database driven charting capabilities are to be provided using php, javascript and the AJAX methodology. The map interface uses the openlayers mapping framework to deliver high quality cartography built using the Mapnik rendering engine. The use of UTF grids along with AJAX programming methodology reduces the wait time to load data from the database by pre-processing data in the browser.

The project database includes publically available monitoring information from numerous federal and provincial public agencies, along with related water information collected by the Commission and industry. These data are automatically updated in the project database using either direct feeds provided by the agencies or through screen-scraping methods. This reduces load on data providers servers, removes the reliance on availability of third party database providers, and also improves responsiveness by allowing for analytic views of the data to be pre-generated in the Oil and Gas Commission database.

Project Team and Organization:

Oil and Gas Commission (Allan Chapman, MSc, PGeo): Allan is the Commission's Hydrologist, and is a Regional Water Manager under the *Water Act*. Allan is the lead on various surface water and ground water initiatives of the Commission, and was the lead in the development of NEWT, the NorthEast Water Tool.

Allan was the overall project manager. He oversaw the project from initial development, planning, execution, monitoring, implementation, and final review.

Oil and Gas Commission (Jon Boyd, GIT): Jon is the Commission's Hydrology Technician, and is the lead on water data management and reporting.

Ministry of Forests, Lands and Natural Resource Operations (Dave Wilford, PhD, RPF): Dave is the senior Research Hydrologist for the Ministry of Forests, Lands and Natural Resource Operations, and provided design and review assistance.

Foundry Spatial Ltd (Ben Kerr, and colleagues): Ben is the President of Foundry Spatial Ltd., and led the technical development of the Water Portal.

Primary Contractor:

Foundry Spatial Ltd., a Victoria, BC based provider of natural resource development services led by Ben Kerr, was the primary contractor for the Water Portal. Ben and his team at Foundry Spatial did the majority of the technical work for this project. They developed the database structures to store relevant data from federal and provincial agencies, developed and tested the map based interface, developed and refined information-graphics, and integrated the tool with existing BCOGC web ecosystem.

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Deliverables: Deliverables for the project are:

- A web-based GIS interface installed and operating on an OGC server, with flexible and interactive charting and analysis tools. Linked to the interface is a database. The Water Portal resides on an Oil and Gas Commission server and is linked and publically-available through the BC Oil and Gas Commission website at the following URL: <http://www.bco.gc.ca/public-zone/water-information>
- A data repository that can be used for various surface water and groundwater quality and quality data.
- A final summary report on the project, for publishing on the SCEK website; a final administrative report on the execution of the project.
- A guide to offer instructions on how to use the map interface, explain the various data sources reliability, and view and understand the various graphs and analysis.

Project Extension: The Water Portal was completed in April 2014. The Commission has just started to publicize its development and use. However, a formal media release is being postponed to a date later in 2014, due to a number of external considerations. The tool will be presented at various public forums, including:

- LNG First Nation Summit, Fort Nelson, BC, April 2014;
- City of Fort St John Council Meeting, Fort St John, BC, May 2014;
- Peace River Regional District Board Meeting, Dawson Creek, May 2014;
- Treaty 8 First Nation Training and Orientation Session, Fort St John, BC, May 2014.

The Water Portal will be presented at upcoming events, including:

- Canwell (Canadian Groundwater Symposium), Kelowna, BC , June 2014;
- CAPP Environmental Seminar, summer 2014.

Conclusion: The Water Portal system was completed in April, 2014, and was brought on-line in early May, 2014, after a period of testing. The Water Portal resides on an Oil and Gas Commission server and is linked and publically-available through the BC Oil and Gas Commission website at the following URL: <http://www.bcogc.ca/public-zone/water-information>

For more information about the Water Portal, contact Allan Chapman, BC Oil and Gas Commission, allan.chpman@bcogc.ca

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