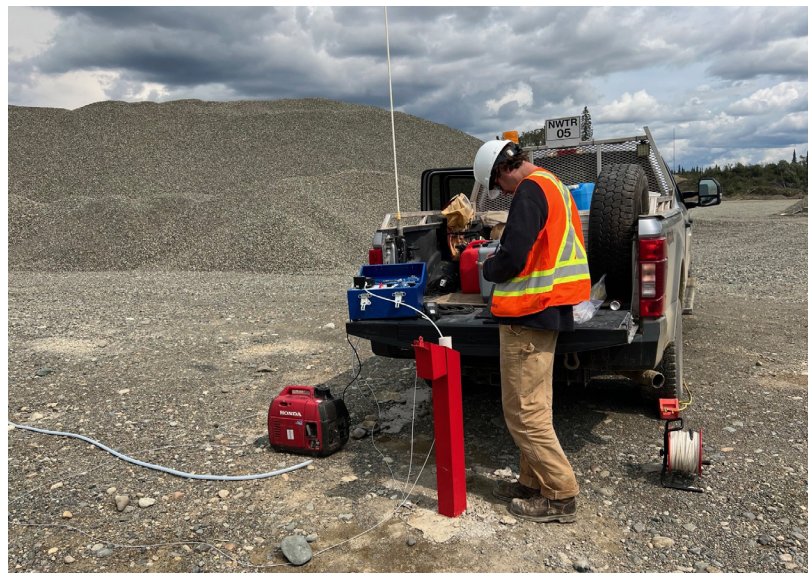
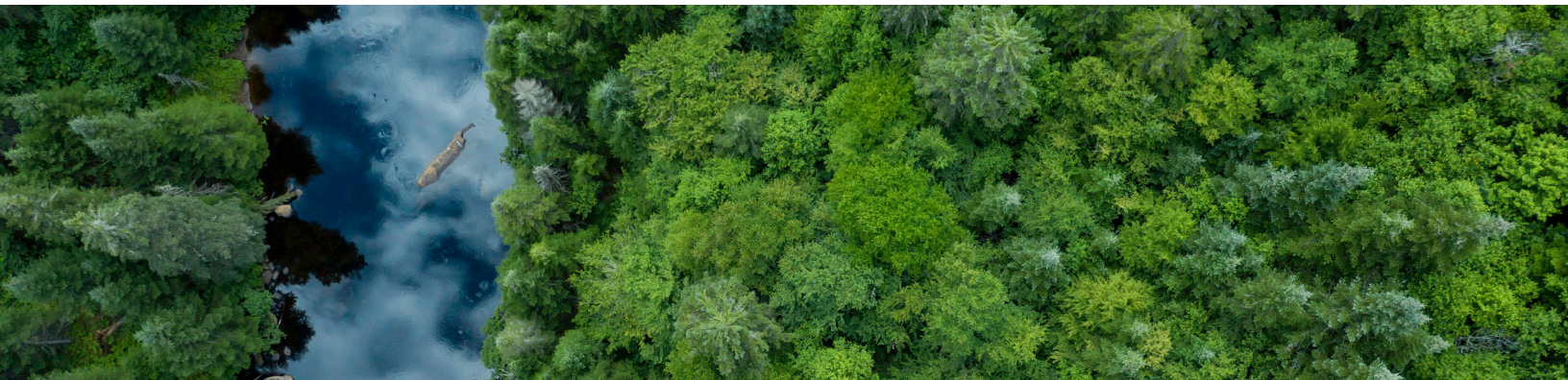




ENVIRONMENTAL AND  
HYDROGEOLOGY CONSULTANTS

**STATEMENT OF  
QUALIFICATIONS**  
WATER RESOURCES



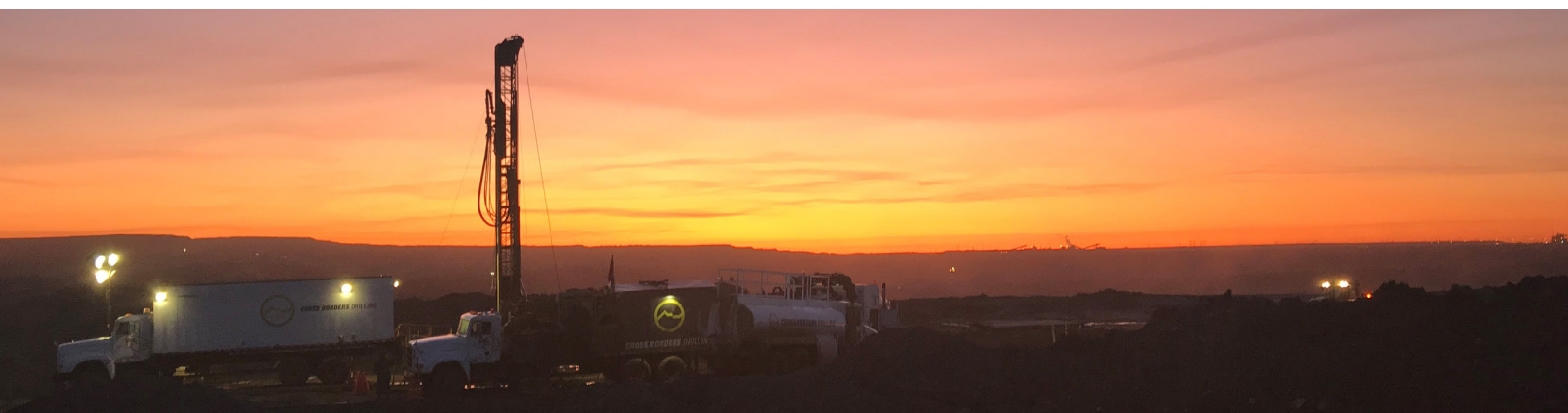


[www.waterlineresources.com](http://www.waterlineresources.com)  
[info@waterlineresources.com](mailto:info@waterlineresources.com)

Calgary, AB 1-888-542-5611  
Nanaimo, BC 1-844-585-0802

## CONTENTS

- 1 Company Profile
- 2 Senior Staff Expertise
- 3 Health, Safety & Conduct Program
- 4 Groundwater Supply Exploration & Development
- 5 Water Well Maintenance & Rehabilitation
- 6 Groundwater - Surface Water Interactions
- 7 Environmental Monitoring & Sampling
- 8 Oil Sands Groundwater Services
- 9 Water Use Licensing in BC
- 10 Data Management with Enviro Web Services
- 11 Additional Services & Expertise
- 12 Current & Recent Clients



## COMPANY PROFILE

Waterline Resources Inc. offers comprehensive groundwater resource and environmental consulting services to the oil and gas/energy sector, government, municipalities, Indigenous groups, local communities, contractors and commercial, agricultural, and industrial operations.



## OUR MISSION

Waterline's mission is to provide practical and scientifically defensible solutions to a diverse range of environmental challenges, delivered by knowledgeable people who are focused on continued professional development, quality service, and being trusted partners with our clients.

## Origins

Waterline was formed in 2000 by Mr. Darren David, (M.Sc., P.Geo.), Mr. Jamie Wills (M.Sc., P.Geo.), and Mr. Steve Foley (M.Sc., P.Geo.) Mr. Eric Pringle (M.A.Sc., P. Eng.) joined Waterline in 2007 and brings over 30 years of environmental and hydrogeological consulting experience to the team. Ms. Michelle Taylor (M.Sc., P.Eng.) joined Waterline in 2016 and brings 25 years of experience in both industry and consulting with a

focus on liability management and environmental site assessments.

Today, Waterline's team consists of over 80 scientists, engineers, and other technical specialists in three main offices and multiple regional offices across Alberta and British Columbia. The Waterline team offers the most comprehensive hydrogeological expertise in Western Canada.

---

## Senior Management

**MICHELLE TAYLOR** M.Sc., P.Eng.  
**President**

**Principal Environmental Engineer**

- 25+ years of experience both in industry and consulting
- Experience focused on contaminated site assessment and liability management, with specific areas of experience covering environmental site assessment, risk management, remediation, regulatory approvals, and regulatory compliance management
- Works with all service teams to achieve strategic plan goals
- Oversees marketing and external relationships that are critical for success including ensuring quality of service and technical excellence

**ERIC PRINGLE** M.A.Sc., P.Eng.

**Chief Operating Officer**

**Principal Hydrogeological Engineer**

- 30+ years of environmental and hydrogeology consulting experience
- Environmental site assessment, impact assessment, compliance based monitoring programs
- Contaminant fate and transport modelling, natural attenuation assessments, landfill siting, landfill operation and design, remedial design and liability assessment and management
- Contributions to physical hydrogeology projects include aquifer testing and evaluation, well performance testing, municipal well head protection, well capture delineation and analytical/numeric modelling of groundwater flow



www.waterlineresources.com  
info@waterlineresources.com

Calgary, AB 1-888-542-5611  
Nanaimo, BC 1-844-585-0802

## SENIOR STAFF EXPERTISE

Waterline's senior staff have completed thousands of successful projects in the hydrogeological and environmental disciplines, and provide continual technical mentorship to Waterline's project-level staff. Simply put, **the Waterline team offers the most comprehensive hydrogeological expertise in Western Canada.**

## Executive Team

**MICHELLE TAYLOR** M.Sc., P.Eng.  
**President**  
Principal Environmental Engineer  
**Experience:** 25+ Years

**ERIC PRINGLE** M.A.Sc., P.Eng.  
**Vice President & COO**  
Principal Hydrogeological Engineer  
**Experience:** 30+ Years

**DARREN DAVID** M.Sc., P.Geo.  
**Vice President Mining**  
Principal Hydrogeologist  
**Experience:** 35+ Years  
**Technical Expertise:** Aquifer mapping, water budgets, mine water management, WSA licensing, ML/ARD assessment, and groundwater surface water interactions.

**STEVE FOLEY** M.Sc., P.Geo.  
**Chairman, Board of Directors**  
Principal Hydrogeologist  
**Experience:** 35+ Years  
**Technical Expertise:** Groundwater resource development, site characterization and contaminant assessments, and numerical analysis.

## Key Personnel

**BRENT LENNOX** M.Sc., P.Geol.  
**Division Manager**  
Senior Hydrogeologist  
**Experience:** 15+ Years

**Technical Expertise:** Compliance and due diligence based soil and groundwater assessment and monitoring, risk/remedial action plan and conceptual site model development, in-situ and ex-situ remediation.

**DALTON PAJAK** B.Sc., P.Geo.  
**Division Manager**  
Senior Hydrogeologist  
**Experience:** 12+ Years

**Technical Expertise:** Groundwater supply evaluation, source water exploration drilling, well design and construction, aquifer testing and analysis, groundwater monitoring and regulatory compliance.

**STEVE STURROCK** M.Sc., P.Geo.  
**Division Manager**  
Senior Hydrogeologist  
**Experience:** 15+ Years

**Technical Expertise:** Analysis and evaluation of aquifer test data, well efficiency, borehole geophysics, groundwater geochemistry and environmental isotopes.

**BLAKE HIEBERT** B.Sc., P.Geo.  
**Team Lead**  
Senior Hydrogeologist  
**Experience:** 13+ Years

**Technical Expertise:** Water resources development and management including groundwater exploration, aquifer management, and environmental compliance.

**SIMON WING** B.Sc., P.Geo.  
**Team Lead**  
Senior Hydrogeologist  
**Experience:** 12+ Years

**Technical Expertise:** Water resources development and management including stormwater infiltration, aquifer management, and environmental compliance.



www.waterlineresources.com  
info@waterlineresources.com

Calgary, AB 1-888-542-5611  
Nanaimo, BC 1-844-585-0802

## HEALTH, SAFETY & CONDUCT PROGRAM

Waterline believes a strong culture of safety is an essential part of the services we provide clients. As such, we have developed a Health, Safety, and Conduct Program that all employees and contractors follow when involved with Waterline’s projects. Our Program is COR Alberta certified, and audited by ISNetworld, Avetta, and Complyworks. Waterline is registered and in good standing with WorkSafeBC.



## Key Components

### Safe Work Practices and Job Procedures

Waterline works with clients, contractors, and colleagues to identify and mitigate hazards in the workplace. Our policies and guidelines are reviewed and updated annually to remain current with regulatory updates and operational changes.

### Health and Safety Statistics

We believe in making decisions based on data. Waterline’s Project health and safety statistics are compiled quarterly and reported through monthly H&S meetings and third-party health and safety management systems.

### Environmental Sustainability

Waterline strives to minimize our impact on the environment in all aspects of our work and supports environmental initiatives in our communities.

### First Nations Relationship Building

Waterline is committed to working with Indigenous peoples in a respectful and communicative manner and embraces the Truth and Reconciliation Commission of Canada’s Calls to Action.



## GROUNDWATER SUPPLY EXPLORATION & DEVELOPMENT

At Waterline, we draw on our collective experience as one of the largest physical hydrogeology groups in Western Canada to find and develop long-term groundwater supply sources for our clients. Waterline has built a strong reputation for leading groundwater supply exploration and aquifer testing programs.



## Expertise

### Water Supply Exploration

Waterline uses our proprietary geospatial mapping application, Enviro Web Services (EWS), to interactively view aquifer information and identify groundwater targets.

### Drilling Supervision

Waterline has strong working relationships with qualified drilling contractors and provides wellsite supervision to ensure drilling programs are conducted in accordance to applicable regulations, and selects the best drilling methods based on expected borehole conditions and desired outcomes.

### Water Supply Well Design and Installation

Our wellsite hydrogeologists log drill core and cuttings, collect samples, and complete grain size analyses and well screen designs.

### Maximizing Well Yields

Waterline designs and monitors comprehensive well development programs that are critical to maximize well yields and optimize the life of a supply well.

### Aquifer Testing

Waterline designs and supervises aquifer testing programs required to predict long-term sustainable well and aquifer yields for water supply well groundwater licensing.



## Groundwater Licensing

Waterline supports our clients on most aspects of groundwater licensing under the Alberta Water Act, including diversion applications, licence renewals, Water Use Reporting System submissions and Temporary Diversion Licences.

## WATER WELL MAINTENANCE & REHABILITATION

Water wells have a life cycle and they require regular maintenance similar to other industrial equipment and infrastructure. Performance monitoring can help detect the early signs of well deterioration, and a well maintenance plan will address these issues before they become critical. Wells showing signs of deterioration can be rehabilitated using a variety of techniques. **Waterline routinely helps our clients extend the operational lifespan of their wells and reduce overall operating costs.**

### Performance Monitoring

#### Well Water Levels and Flow Rates

The pumping capacity of a well may decrease over time as the well ages and the screen becomes plugged by sediment, mineral scaling, or bacterial growth. Waterline can identify decreasing well capacity by evaluating pumping levels, flow rates, and the water quality over time.

#### Water Quality

The water chemistry in a well system should remain relatively stable. Monitoring key water quality parameters allows Waterline to identify changes occurring in the system that increase the possibility of mineral scaling that plugs the well screen, filter pack, and aquifer.



### Well Maintenance & Rehabilitation

#### Downhole Camera Surveys

A quick method to assess downhole well conditions and determine if rehabilitation is required.

#### Rehabilitation and Down-Hole Equipment

Waterline routinely manages, maintains, and troubleshoots water level, water quality, and water flow measurement devices on behalf of our clients. Waterline is capable of maintenance and replacement of standard water well instruments and works with local industry product and service providers to offer measurement and datalogging solutions.



## GROUNDWATER - SURFACE WATER INTERACTIONS

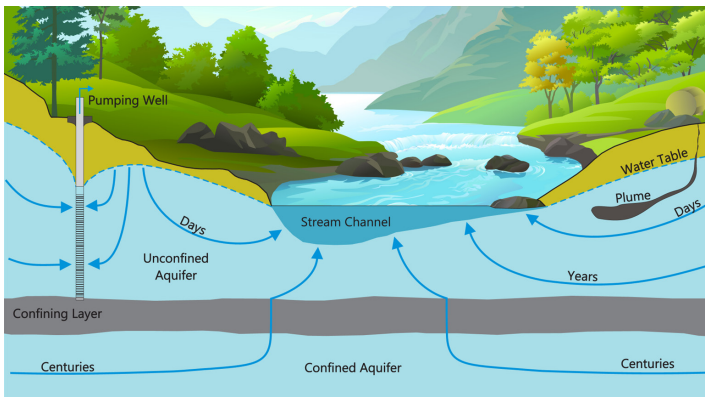
Groundwater and surface water systems are intrinsically connected and impacts to one system often results in impacts to the other. Understanding the interaction between these systems is critical to the successful management of water resources. **Waterline** has extensive experience measuring, identifying, and assessing interactions between groundwater and surface water and evaluating how these systems affect or are effected by environmental change.



## Expertise

### Low Impact Development and Pre-Development Hydrogeological Assessments

Waterline works with municipalities and developers to ensure groundwater and surface water conditions are understood prior to (and during) development construction. Natural drainage and infiltration features, storm water ponds and water supply reservoirs tie into shallow groundwater systems and need to be understood and managed appropriately.



### Effects of Groundwater Diversion on Streamflow

Productive aquifers are often located in groundwater discharge areas close to sensitive streams that may rely on groundwater to maintain essential streamflow. Separating the effects of groundwater pumping from seasonal variability or climatic factors on stream discharge rates is challenging and requires considerable experience in hydrogeology and geochemistry. Waterline uses specialized instrumentation and techniques to help our clients understand how groundwater diversion may impact the nearby surface water environment.

### Contaminant Groundwater Pathways

Groundwater flow pathways are common routes for spilled or improperly stored contaminants to enter stream or lake environments. Waterline has extensive experience conducting environmental impact assessments to determine if or when a contaminant plume will move towards a nearby surface water environment.

## ENVIRONMENTAL MONITORING & SAMPLING

A considerable number of Waterline's clients use our monitoring and sampling expertise to fulfill regulatory monitoring obligations. **Waterline has coordinated and completed over a thousand environmental monitoring programs** to meet site regulatory compliance objectives over 20+ years of operations.



## Expertise

### Groundwater and Surface Water Data Collection

Waterline routinely measures groundwater levels and collects groundwater and surface water chemistry samples for monitoring programs across Western Canada.

### Quality Assurance Quality Control (QA/QC)

Data collected from field programs must be of high quality to allow for defensible and meaningful interpretations. Waterline's sampling protocols conform to the most stringent regulatory QA/QC requirements in British Columbia and Alberta.

### Data Management

All monitoring and sampling data is stored in Waterline's proprietary online data management and geospatial mapping application, Enviro Web Services (EWS). Our system allows for easy online access, interactive mapping, and graphical visualizations for all your project data.





www.waterlineresources.com  
info@waterlineresources.com

Calgary, AB 1-888-542-5611  
Nanaimo, BC 1-844-585-0802

## OIL SANDS GROUNDWATER SERVICES

Waterline offers extensive experience managing groundwater compliance programs under the Environmental Protection and Enhancement Act (EPEA), groundwater source development programs and compliance for thermal operators, and development and expansion of pit dewatering efforts for open-pit mine operations. Our experience, proprietary online database management system and data visualization tools streamline decision making and reporting efforts.



## Expertise

### EPEA Groundwater Compliance

Waterline successfully works with SAGD project operators to establish meaningful, efficient groundwater monitoring programs at active facilities. Our expertise has resulted in numerous successful, year-after-year compliance groundwater monitoring programs resulting in the protection of ecosystems in Alberta's oil sands areas.

### Thermal Monitoring

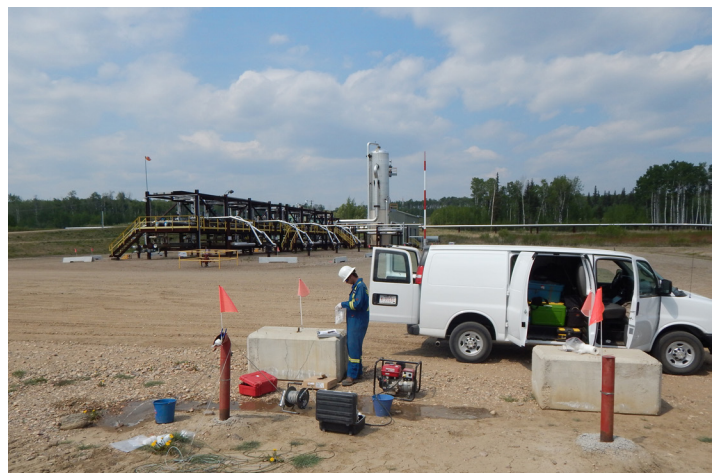
Waterline successfully implements practical groundwater monitoring programs for Alberta's Thermal Directive. Our expertise includes project assessments, thermal monitoring reporting, detection of impacts, management of impacts and subsequent regulator correspondence.

### Source Water Development

Waterline works with EPEA Approval holders to identify and develop groundwater sources for facility operations. Our expertise includes aquifer mapping, source well drilling, development and testing, and groundwater diversion licensing for industrial purposes and steam injection. Our extensive experience with Alberta's Guide to Groundwater Authorization, Water Conservation Policy and Water Wells and Ground Source Heat Exchange Systems Directive has led to numerous successful groundwater diversion applications and licence renewals.

### Open Pit Mine Depressurization

Waterline has worked with Oil Sand operators to successfully depressurize aquifers in advance of open pit mining. Our expertise involves depressurization well drilling, well design, development and testing to ensure the depressurization objectives are met and the stability of the pit floor and walls are not compromised. Waterline tailors each depressurization system to the specific site and geological conditions and has experience successfully utilizing both vertical and horizontal well designs.



# WATER USE LICENSING IN BC

Under the British Columbia Water Sustainability Act, a water use authorization (licence or use approval) is required for the diversion, storage, and use of water from a stream or aquifer for non-domestic purposes. **Waterline has considerable experience in water supply assessment and preparing water use applications for a wide range of clients** such as regional districts, municipalities, stratas, Indigenous groups, farmers, developers, golf courses, and small businesses.



## Groundwater Use Applications

Applications scale in complexity with the amount of groundwater needed and water availability, the length of time you want to divert and use groundwater, the type and number of aquifers that may be affected by your groundwater withdrawal, the presence of surface water sources and if there is potential for groundwater - surface water interactions, the sensitivity of the hydraulic system, etc. Complex applications may require a technical assessment and/or monitoring to demonstrate that the proposed water use will not adversely affect existing water users or the environment.

## WSA Licensing Information

### Using Groundwater

The WSA came into law on February 29, 2016. After this date, WSA approval is now required for non-domestic use of groundwater. WSA approval must be applied for and received prior to extracting and using groundwater. Non-domestic water uses commonly include commercial, industrial, agricultural, and waterworks operations.

### Licensing Services

We work with our clients to compile required WSA application information. For complex projects we also liaise with the BC Government to determine additional application requirements, such as level of technical assessment and/or monitoring programs.

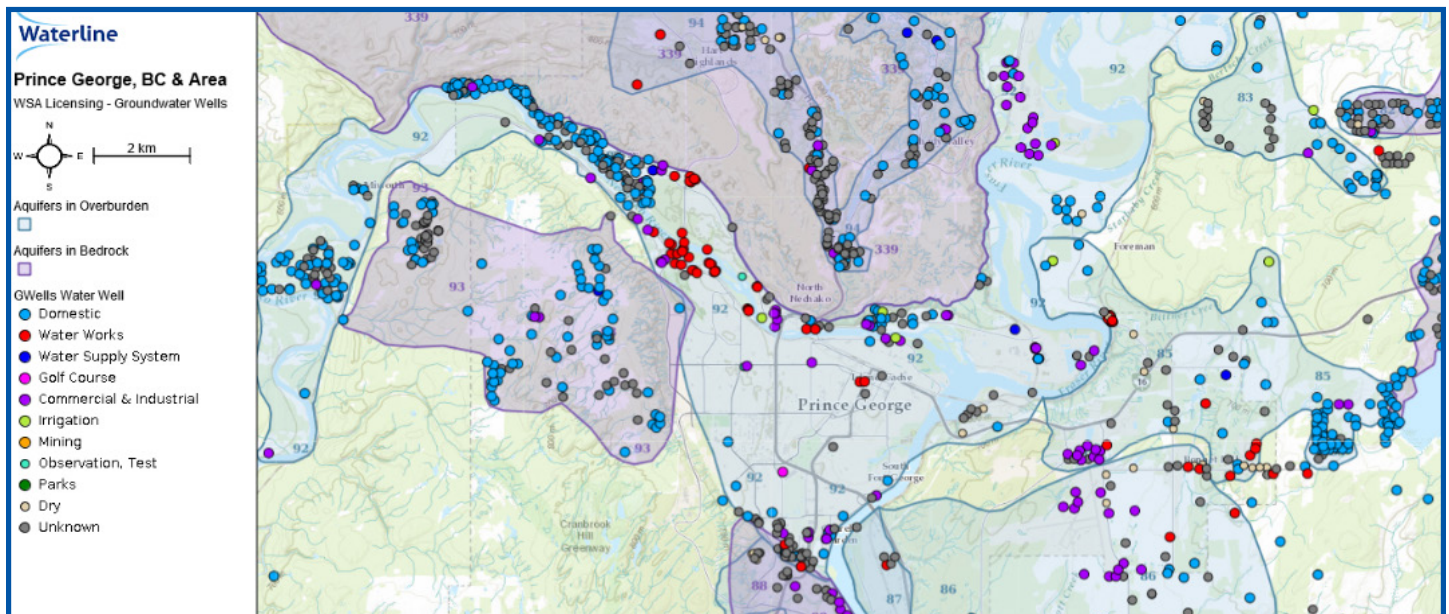


Image created using Waterline's Enviro Web Services mapping application.

## DATA MANAGEMENT WITH ENVIRO WEB SERVICES

Waterline’s proprietary online database management system Enviro Web Services (EWS) provides Waterline staff and our clients with easy online access to a compiled and mapped suite of publicly-available environmental datasets from across Western Canada. EWS also provides clients with a secure and private platform to store, manage, and visualize project-specific datasets.

## Enviro Web Services (EWS) Applications

### Data Integration

Waterline has combined public datasets from across western Canada into one integrated online mapping

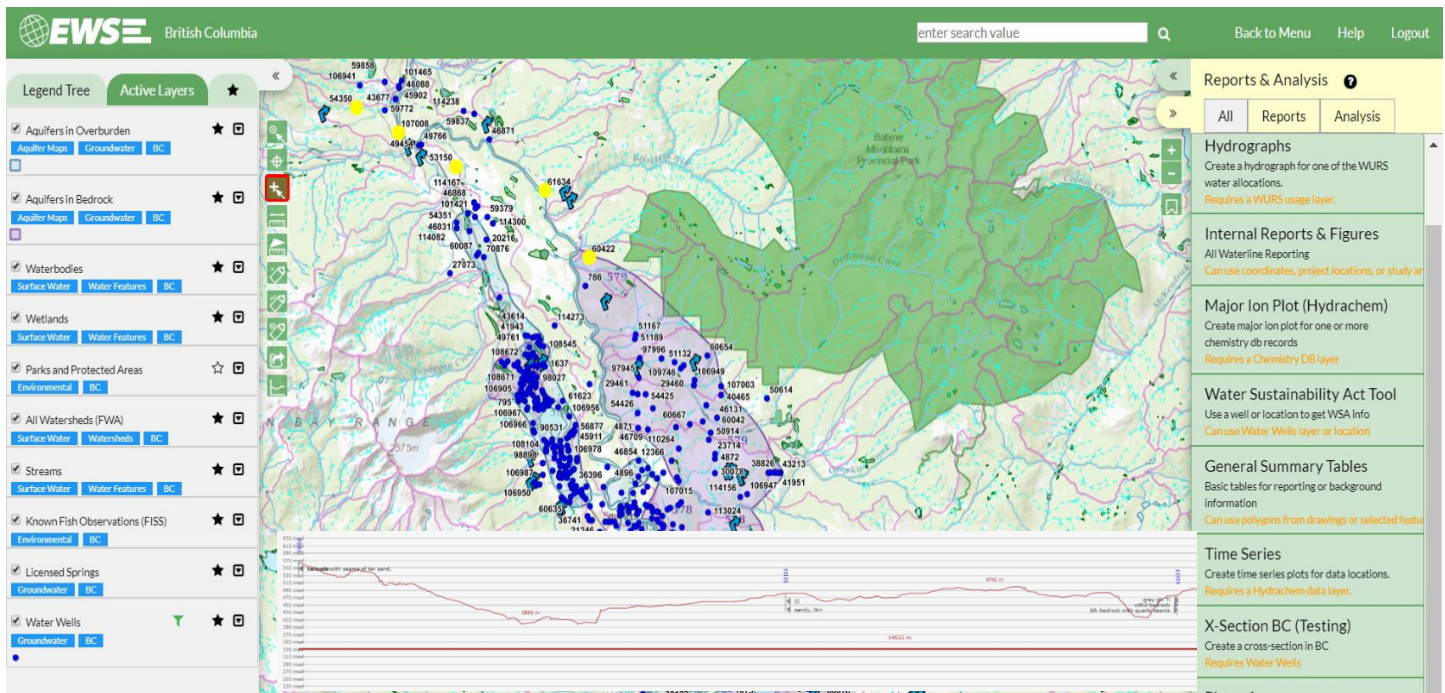
application. Data sources in AB include: GIC Water Well Database (including water levels, test rates and chemistry results), Groundwater and Surface Water Diversion Licences, AGS SAOS Aquifer Mapping, Regulated Basins, Buried Channel Mapping, Base of Groundwater Protection, Groundwater Yield mapping, municipal boundaries, surficial deposit mapping, surface water features, bedrock geology mapping, and many more.

### Improved Desktop Study Efficiency

The first step of many hydrogeological studies (e.g., a Phase I Assessment) is to search for and compile available public data in the project area. With EWS, this work has already been completed. When combined with uploaded project-specific data, EWS allows us to quickly develop an understanding of a project site and results in cost savings for our clients.

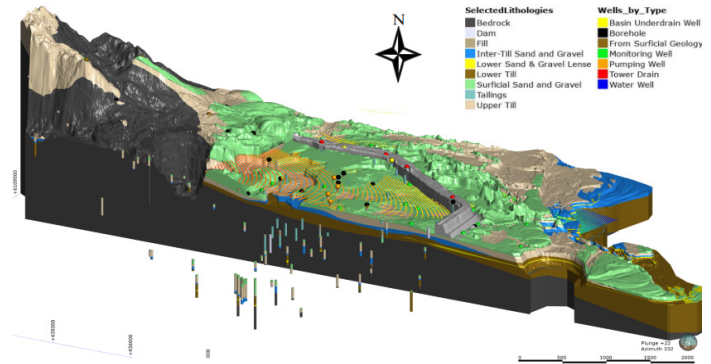
### Project Database

EWS serves as the client database for many projects Waterline works on, which provides important continuity for long-term studies as Waterline or client staff join or leave a project. Proprietary client data is stored securely and privately, and remains accessible as long as required by the client.



## ADDITIONAL SERVICES & EXPERTISE

Waterline combines the collective experience of thousands of successfully completed projects to offer a diverse selection of client services in disciplines ranging from groundwater resources to environmental reclamation to geographic information data management.



Groundwater Model Cross-Section

## Commonly Provided Services

- Phase I & II Hydrogeological Assessments
- Expert Witness and Third-Party Review
- Groundwater Under Direct Influence of Surface Water Assessment (GWUDI)
- Low Impact Development and Pre-Development Groundwater Assessments
- Well Decommissioning
- Desktop Groundwater Potential Investigations
- Environmental Site Assessment
- Groundwater Modelling
- Aquifer Mapping
- Midstream and Pipeline Hydrogeological Assessments
- Soil Monitoring and Sampling
- Domestic Well Complaints
- Project Data Storage and Data Management
- Aggregate Exploration and Permitting
- Alternative Water Source Assessments



## OUR CLIENTS

Waterline has built a strong reputation for providing high-quality, on-time, and cost-effective solutions to domestic and international clients. **Our success is ultimately dependent on the success of our clients, and on the long-term relationships we build with our clients.** Below are some examples of current and recent clients across various regional and local districts, commercial and industrial operations, and Indigenous groups who rely upon our expertise.



### Commercial Development

Cermaq Canada  
Crown Isle Resort & Golf Community  
EPCOR Water (West) Inc.  
Mount Washington Alpine Resort  
Neptune Bulk Terminals  
Safety-Kleen Canada Inc.  
Seward Developments Inc.  
Stoddart Creek Water Services Ltd.

### Oil & Gas

Canadian Natural Resources Ltd.  
Canlin Energy Corporation  
Cenovus Energy  
Shell Canada Ltd.  
Strathcona Resources Ltd.  
Tidewater  
Whitecap Resources Inc.

### Municipal

Capital Regional District  
City of Campbell River  
City of Delta  
City of Okotoks  
City of Prince George  
Cowichan Valley Regional District  
District of Squamish  
District of Wells  
Regional District of Nanaimo  
South Central Regional District  
Sunshine Coast Regional District  
Town of Cochrane  
Town of Gibsons  
Town of Golden  
Town of Sparwood  
Town of Squamish

### Pulp & Paper

Brisco Wood Preservers Ltd.  
Canfor Pulp Ltd.  
Catalyst Paper  
Confex Inc.

### Indigenous Groups

Gitwankak Band  
Halalt First Nation  
Ktunaxa Nation Council  
Mowachaht/Muchalaht First Nation  
Nadleh Whut'en First Nation

### Mining

Artemis Gold Inc.  
Avanti Kitsault Mining  
Barkerville Gold Mines Ltd.  
Centerra Gold  
Conuma Coal Resources Ltd.  
KGHM Ajax Mining Inc.  
Lafarge Boulder Creek  
Lundin Mining  
Mount Polley Mining Corp.  
New Gold Inc.  
Thompson Creek Metals Company