

# **Provincial Observation Well Network Review British Columbia**

Volume II of II

**APPENDICES A to K and O**

prepared for

Water Stewardship Division  
BC Ministry of Environment

**Hy-Geo Consulting  
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Victoria, British Columbia

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## **APPENDIX A. Vision Statement and Monitoring Objectives**

### **Vision Statement and Monitoring Objectives for British Columbia's Ministry of Environment Groundwater Observation Well Network**

#### **Vision:**

An effective observation well network that monitors the water level and groundwater chemistry of aquifers and basins to support management, protection and sustainability of our groundwater resource.

#### **Monitoring Objectives**

- 1) Understand local and regional hydrogeological processes and characteristics including:**
  - a) Monitoring groundwater/surface water relationships, recharge and discharge mechanisms/rates/timing in lowland and upland areas and impact of drought and flooding on groundwater,
  - b) Fundamental aquifer or basin characteristics (e.g. groundwater levels, temporal trends, transmissivity, hydraulic conductivity and storativity values, water chemistry, etc.),
  - c) Monitoring impact of short and long term effects of climate and climate change on groundwater levels.
  
- 2) Support effective use of the resource and minimize groundwater conflicts between users by:**
  - a) Helping to assess the impact of groundwater withdrawals in specific areas to determine if further ground water development is possible without adversely affecting sustainability of the resource,
  - b) Helping to resolve water use conflicts, such as interference between wells and ground water withdrawal near fully allocated lakes and streams,
  - c) Assessing the long-term and short-term effects of human-induced activities such as pumping and construction of drainage works on ground water levels, both locally and regionally.

## APPENDIX B. Project Deliverables

### Deliverables:

To properly manage and sustain the Province's groundwater resources, the monitoring and collection of water level data over time is required. Where observation wells need to be located, for how long and for what reasons will vary depending on the need being addressed. The project deliverables are identified both in the RFP and the response to the RFP, basically the key project deliverables include:

- 1) A method to systematically identify where observation well sites should be established in British Columbia;
- 2) A draft of the list of questions that will be presented to provincial staff and other users of the observation well data, will be reviewed by the Observation Well Steering Committee, prior to the interviews;
- 3) The responses to these questions (from deliverable #2 above) will be captured, organized, summarized and written up. This will include a list of groundwater issues identified and a list of our client groups, by region, who use observation well data;
- 4) A review of the BC State of the Environment (SoE) report (Environmental Trends in British Columbia: 2007) where it reported an increase in declining groundwater levels for the 2000 to 2005 reporting period compared to previous reporting periods (Environmental Trends in British Columbia: 1998, 2000 and 2002) and assessing why the decline took place. These findings will be documented;
- 5) Include the results from contacting 3 or more jurisdictions (that include Alberta) to determine their criteria for establishing observation wells;
- 6) A list of criteria, with accompanying weighting scheme for these criteria, to identify where observation well sites should be established (key areas or aquifers) and to assist prioritizing which observation well project will be addressed and in what order;
- 7) A review of current water quality sampling frequency for each observation well and the suite of constituents analyzed. Provide recommendations, if sampling frequency or the suite of constituents analysed needs to be adjusted and document the findings. Note: This is not a detailed analysis of data or trends but rather an overview of each region's current practices;
- 8) A list of the high priority areas or aquifers where observation wells should be established, using the developed strategy (with accompanying criteria) for each of the 5 provincial environment regions. This would include:
  - a) Documenting clear monitoring objectives for each high priority area or aquifer; that is, identify the purpose for each proposed observation well site.

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- b) Identifying if either a single or multilevel observation well should be established at any of these proposed sites.
  - c) Prioritize all these proposed high priority areas or aquifers.
- 9) A review of all existing active provincial observation wells and documenting the purpose for its establishment. This would include:
- a) Note and document if all current active observation wells are in accord with our provincial observation well network's vision statement.
  - b) Note and document if an existing observation well is in accord with provincial monitoring objectives (Appendix A) and which provincial monitoring objectives (Appendix A) pertain to each observation well.
  - c) Note and document if current active observation wells meet the new criteria of the newly developed strategy.
- 10) Establish to what degree, the existing Provincial observation well network corresponds with the above "selected" priority locations and criteria (i.e., are there gaps or overlaps, do they meet provincial observation well objectives, etc.). This would include:
- a) Document where the proposed observation well location matches an existing active observation well site and if the purposes are the same or different.
  - b) Document if there are places where new observation wells are needed or existing observation wells may need to be modified or deactivated.
  - c) Document if an existing active observation well is not located in a proposed priority area or aquifer and yet there is sufficient reason to continue monitoring for the well. Determine if this "sufficient reason" should be added to the location criteria list.
- 11) In British Columbia a subset of 18 observation wells were selected to represent groundwater levels in different geo-climatic environments. The data from these 18 wells are currently being reported through the River Forecast Centre.
- a) Identify and list the criteria that would ensure a representative coverage of British Columbia's different geo-climatic environments in areas of significant groundwater development;
  - b) Assess the existing subset of 18 selected observation wells to establish if they meet these criteria and make recommendations for their continuance or de-activation as a key observation well representing the geo-climatic environment;
  - c) Identify additional geo-climatic environments (if any), in areas of significant groundwater development, that should be represented in the reporting by either an existing active observation well or a new observation well; and
  - d) Prioritize recommendations regarding de-activations or additions, if any, to the current 18 selected observation well subset, to ensure all major geo-climatic environments are represented.
- 12) Make recommendations, for each region, if the existing observation well network is found lacking. This would include:
- a) Identify and document where an observation well needs to be newly established;
  - b) Identify and document where observation well monitoring needs to be terminated (e.g., 2 observation wells found in close proximity to each other in the same aquifer) or have its focus (purpose) realigned (e.g., purpose for observation well to be changed from monitoring water levels to monitoring water quality) and provide rationale for these recommendations;



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- c) Prioritized recommendations where an observation well needs to be newly established.
- 13) Develop and document a strategic monitoring plan for each of the Ministry's 5 regions, identifying priority monitoring areas or aquifers and set clear objectives and targets for these 5 regions.
  - 14) A brief report documenting how the provincial observation well network review was carried out, the strategy (with criteria and the weighting system) developed to conduct this review, the results of the various investigations and consultations identified in the above deliverables, the recommendations for each existing observation wells and the recommendations for future observation well locations. Where appropriate, the results of the review should be tied to each of the 5 Environment regions.
  - 15) Identify the locations of these new suggested areas or aquifers by providing the aquifer number and/or maps with sketches and/or geographic coordinates, and/or BCGS map sheet numbers with verbal descriptions where appropriate in the report. Provide specific locations with geographic coordinates if known.

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## APPENDIX C. Contact List

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Azar & Associates

Business and Organization Design and Management

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## Groundwater Observation Well Network Workshop

24 October 2008

Radisson Airport Hotel, Cambie Room

# Workshop Report

As at: 25 November 2008

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Breakout Session Summaries

#### Appendices:

- A. Participants List
- B. Breakout Groups
- C. Breakout Session (Raw) Feedback



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Appendix D



**Provincial Groundwater Observation Well Network Workshop**

**Report**

**25 November 2008**

*This document is a summary of the material gathered at the 24 October 2008 groundwater observation well network workshop. The report was compiled from information presented on breakout session flip charts and comment sheets with some additional notes taken from participants' oral comments. The report is not intended to be a verbatim record of discussions or a comprehensive set of recommendations. It is an overview document that will provide input to the broader network review and stimulate participants' thinking and allow them to provide additional input to the review.*

*Please provide your comments and additional input on the groundwater observation well network to Al Kohut via e-mail at: [apkohut@telus.net](mailto:apkohut@telus.net)*

**Workshop Purpose, Outcomes and Process**

On Friday October 24, 2008, 30 people gathered at the Radisson Airport Hotel in Richmond, BC to participate in a one-day workshop related to the review of the BC provincial groundwater observation well network. Ministry of Environment staff were joined by other participants representing the interests of federal, regional district and municipal governments, health authorities and the groundwater consulting sector.

**Purpose and Desired Outcomes**

The primary purpose of the workshop was to obtain input on the approach and criteria that should be used to:

- ☞ Plan and prioritize areas for ground water monitoring.

The desired outcome was to develop a consensus on a general approach and strategy.

- ☞ Determine where observation wells should be located.

The desired outcome was to develop a list of key criteria for placing observation wells.

The workshop also provided the opportunity to identify current and potential issues related to network structure and operational management.

**Process**

To achieve the purpose, the workshop was designed around three breakout sessions where the following questions were discussed:



➤ **Breakout Session 1: Identify Groundwater Issues and the Need for Data/Information**

A solid knowledge of groundwater use and related issues is a prerequisite for determining the need for resource management data and information which is a prerequisite for identifying where—and in what numbers—observation wells are required. This session resulted in a comprehensive list of issues and data/information needs for a variety of user groups.

➤ **Breakout Session 2: Identify Planning Criteria and Priorities**

Planning criteria were developed and prioritized based on a sound knowledge of the need for data/information.

➤ **Breakout Session 3: Discuss Processes and Strategies for Network Management and Expansion**

The effectiveness of the output from individual observation wells and the network as a whole to enable appropriate water management decisions is dependent upon the network management processes and infrastructure. Network management issues were identified so their impact on data/information integrity could be assessed as part of the larger network review project.

As it is also quite likely that the funding available for new observations wells may be less than the need, strategies were identified that could be used to encourage and enable network expansion.

## Breakout Session Summaries

The following is a summary of the input provided by workshop participants at each of the three breakout sessions. A detailed listing of the (raw) input from each session is included in Appendix C.

➤ **Breakout Session 1: Groundwater Issues and the Need for Data/Information**

### Questions

- Q? What are the groundwater-related data/information needs of each tier of the community (water user groups; local, provincial and federal governments, consultants and others) and what interest do they have for an adequate observation well network?**
- Q? What are the elements that indicate the number of observation wells needed for specific aquifers and watersheds?**
- Q? What related issues are worth noting?**

### Responses

**A. Groundwater-related data/information needs**

The responses are summarized in Table 1 on the next page in rough priority order. The columns for **User Groups** include:



- **Prime:** residents, agriculture groups, water purveyors, light industry, fish hatcheries, landfill authorities, developers, major industry, etc. (and consultants acting on their behalf)
- **Other:** consultants (research), stewardship groups, university researchers, etc.

**Table 1: Groundwater issues and the need for data/information**

Elements	User Groups		Government			
	Prime	Other	Local	Province		Fed
				Rgns	Vic	
→ Characterizing the resource (incl. gw/sw interactions)				✓	✓	✓
→ Baseline data for environmental assessment (EA) reviews (e.g., mines, transportation, ski resorts)					✓	✓
→ Availability, sustainability and land use/development decisions (quality and quantity)	✓		✓	✓	✓	✓
→ Trends and early warning on potential issues	✓		✓		✓	✓
→ Conflict prevention and resolution (e.g., well interference)	✓			✓		
→ Spill response and contaminated sites	✓		✓	✓	✓	
→ Public awareness and well-owner education	✓		✓			
→ Spacial comparisons			✓			
→ Drought impacts		✓	✓	✓		✓
→ Research and studies (high quality raw data reqd.)		✓			✓	✓
→ State of the Resource reporting					✓	✓
→ Climate change (e.g., water balance, pine beetle impacts, sw/gw interactions)					✓	✓
→ Ambient aquifer conditions (baseline on unimpacted aquifers)				✓		
→ Input to water management plans				✓		
→ Priority watershed issues (e.g., fish needs, sw/gw interactions)				✓		✓
→ Calibration of models						✓
→ Trans-boundary issues						✓
→ Licensing (future) decision-making				✓		



**A. Elements that indicate the number of observation wells needed for specific aquifers and watersheds are:**

**Aquifer Characterization**

- Minimum number of wells for hydrogeologic analysis
  - ↳ Where in the flow system do you need information
- Amount of water use and vulnerability
- Aquifer complexity (e.g., multi-layer vs. single layer requires more wells at different depths)
- Modeling requirements
- Efficiency of operation
- Water management areas: discharge and recharge area
- Size of aquifer
- Water level fluctuation over time
- Well density and the need to locate observation wells away from pumping wells
- Diversity of groundwater (understanding the resource)
- Complexity of geology
- Surface water proximity and interactions
- Location and frequency of measurement will depend upon monitoring objectives (e.g., quality vs. climate change)
- Well completion details, screen depths, elevations, etc. will depend upon what part of the aquifer is being measured
- Amount of historical data available

**Impact Assessment**

- Deviations from baseline
- Complexity of the issues (e.g., ambient monitoring vs. contaminated aquifer monitoring)
- Population served by groundwater
- Well density
- Saltwater intrusion in coastal areas
- Location of high risk activities (e.g., mining, water bottling, future nuclear facility)
- Location of contaminant plumes
- Drinking water protection
- Climate change assessment



- Drought issues — especially in shallow aquifers

**Groundwater Availability**

- Data for water balance assessment at the watershed and basin scale
- Site-specific availability and issues
- Sole-source aquifers are a higher priority
- Safe yield levels and water budget

**Economic Development**

- Impact of future development/growth
- Development plans including zoning approvals

**Other**

- Public interest
- Legal issues
- Political pressure

**A. Related issues worth noting include:**

- Major projects: There is often no or little understanding of the resource before extraction begins
- There is little understanding of the relationships between aquifers and the consequences of extraction
- Data must be correct, current and relevant
- Long-term data with no gaps are required for trends
- Access to raw and interpreted data

## ∞ Breakout Session 2: Planning Criteria Priorities

**Q? If available funding for new observation wells is limited, criteria must be established for determining the optimum placement of the wells that are funded. (Note: funding requirements include installation, operation and maintenance costs.)**

### Responses

Based on the breakout group notes, the following high and medium priority criteria were identified.

#### A. Criteria for determining optimum placement of wells include (in general priority order):

##### High Priority

- Ability to assess impacts and threats to the resource (“hot” spots)
- Areas of proposed significant new development
- Being able to “tell the story” (sufficiently long data sets and amount of data available)
- Population (current & future) served by groundwater and value of uses (higher value if GW is the sole source)
- Regional balance of observation well coverage
- Priority of purpose
- Drought response
- Public health and ecological value
- Obtaining long-term baseline data in un-impacted areas
- Meeting network objectives and vision
- Climate change baseline information
- Linkages to other forms of monitoring

##### Medium Priority

- Cost of capital and operations (seen as a limiting factor) and potential cost-sharing with partners
- Complexity of aquifers
- Ability to monitor with nested piezometers

##### Related Notes and Comments

- Rather than one set of criteria set in stone, there is need for a suite of criteria that can be applied according to local requirements
- There was emphasis on the need to permit local professional judgment and to minimize purely political considerations



**Table 2: Summary of Priority Criteria by Breakout Group**

Table 2 is a brief summary of the top criteria that were presented by each of the breakout groups. These results indicate an overall consensus on the importance of considering the degree of quantity and quality concerns in aquifers, geographical coverage of the network and operational factors such as costs.

Priority	Group 1	Group 2	Group 3	Group 4
1	Quality issues. Needs to be broken down, e.g., population issues.	Quantity and quality threats and risk assessment (e.g., climate change)	Population, severity of aquifer use, growth and urbanization, highly developed aquifers.	Aquifer importance, level of use and development.
2	Quantity issues, consider human health, quality and aquifer vulnerability, e.g., "A" aquifers	Value of water use with a drinking water priority. Need to rank use to have an economic focus.	Public health, ambient networks.	Purpose of monitoring, coverage vs. extent of aquifer.
3	Coverage across regions, geoclimatic zones and important aquifers	Ecological values on an area basis.	Baseline, unimpacted areas close to snow survey network and hydrometric.	Priority of purpose.
4	Economic factors, money talks, include partnerships and other supporters.	New development areas, e.g., agriculture and industry.	Geographical representation, biogeoclimatic zones.	Cost and resources required.
5	Cost of establishing wells, access and equipment, and security of site.	Regional balance, consistent coverage and biogeoclimatic zones.	Cost factors, operating vs. capital costs, long-term investment.	Coverage, especially in the north where expansion is needed.
6	Research and characterization including sustainability and population growth.			Political requests.
7				Professional discretion.



### ∞ Breakout Session 3: Process and Strategies for Network Management and Expansion

#### Questions

- Q?** What are the major concerns (and suggested remedies) in relation to the existing network management and expansion?
- Q?** What are some ways in which network planning could be less reactive to issues, more active and oriented toward outreach and partnership?
- Q?** What mechanisms could be put in place for non-provincial government organizations and groups (e.g., water purveyors, regional districts, university research projects) to install and operate observation wells and share the data?

#### Responses

**A. Network Planning and Management: Concerns (and suggested remedies) related to the existing network planning and management process include:**

Unless resolved, many of the listed issues will have a major impact on the overall effectiveness and value of the observation well network. Introducing new observation wells into a stressed operating system may be a poor use of resources.

**Concerns: The major concerns are listed here—remedies appear in Appendix c.**

- Regional consistency
- Insufficient coverage AND redundancy
- Insufficient budgets for operations (data collection, verification and interpretation) and maintenance
- Unsatisfactory instrumentation (current data loggers are not reliable)
- Recruitment and retention of staff
- Time to travel to observation well sites
- Lack of well characterization and well-specific information
- Lack of time/priority to analyze and interpret data to “tell the story”
- Funds available to close wells
- Impact of land ownership issues on observation well placement

**A. Network Expansion: Ways in which network planning could be less reactive to issues, more active and oriented toward outreach and partnership include include:**

- Secure funding



- Program- vs. project-based funding
- Planning
  - ↳ Assess future trends and identify need
  - ↳ Anticipate where groundwater will be regulated
- Review and assess network distribution with a focus on future requirements
- Raise awareness
  - ↳ Include awareness-building into network objectives
  - ↳ More outreach
  - ↳ Interpreting and publishing groundwater information
- Encourage more NGOs and associations to raise groundwater awareness
- Come to a consensus on criteria
- Partner with local governments and health authorities
- Require monitoring with future licenses

**A. User Community Involvement: Mechanisms for non-provincial government organizations and groups (e.g., water purveyors, regional districts, university research projects) to install and operate observation wells and share the data include:**

- Set standards for data collection
- Include observation well in environmental assessment requirements
- Require monitoring as part of groundwater-related business licenses
- Encourage more groundwater-focused research
- Increase public awareness through outreach
- Provide expertise and assistance to local initiatives

**A. Incentives: Incentives that would encourage the cost-sharing of additional observation wells include:**

- Use of provincial/federal grant programs
- A higher awareness of sustainability issues and threats
- Inform businesses and other organizations of the opportunity to cost-share
- Indicate the R&D and business planning benefits of having appropriate observation well data
- Group discounts for analytical data







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**Groundwater Observation Well Network Workshop**

**24 October 2008**

# **Report Appendices**

**Appendix:**

- A. Participants List and Contact Information**
- B. Breakout Groups**
- C. Breakout Session (Raw) Feedback**

## Groundwater Observation Well Workshop Report

### Appendix A: Participant List and Contact Information

	Name	E-mail	Affiliation
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## Appendix B: Breakout Groups

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Ronneseth, Kevin	MOE Victoria
Staplin, Sean	MOE Smithers
Thompson, Dave	MOE Victoria

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Dixon-Warren, Antigone	Township of Langley
White, Thomas	MOE Victoria
Henderson, Graeme	MOE Nanaimo
Lee, Carl	MOE Victoria
Tamblyn, Dave	MOE Prince George

### Group 3

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Zimmerman, Rod	MOE Victoria
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### Group 4

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Lyons, Laurie	MOE Kamloops
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## Appendix C: Breakout Session (Raw) Feedback

### Breakout Session 1

#### Groundwater issues and the need for data/information

What interest does each of the following have for an adequate observation well network?

##### Water User Groups

(Includes: residents, light industry, fish hatcheries, landfill authorities, developers, major industry, academia, consultants)

- Sustainability
- Trends (quality and quantity)
- Early warning system
- Sound decisions based on high quality science (records)
- Knowledge of what is happening/likely to happen to the aquifer
- Outreach and public awareness
- Research
- Conflict resolution (e.g., well interference)
- Well-owner education
- Spill response
- Farmers: volume and quality
- Subdivision development concerns

##### Municipalities and Regional Districts

- Land use/development planning
- Water supply
  - ↳ Need tools for resource management
  - ↳ Water budgets
- Trends (quality and quantity)
- Spatial comparison
- Drought impacts
- Water quality
- Spill response
- Contaminated sites
- Outreach

## Appendix C: Breakout Session Feedback

### Government

	Province		Fed
	Rgns	Vic	
→ Characterizing the resource (including gw/sw interactions)	✓	✓	✓
→ Baseline data for environmental assessment (EA) reviews (e.g., mines, transportation, ski resorts)		✓	✓
→ Trends (quality and quantity)/SOE reporting		✓	✓
→ Availability and sustainability determination	✓		✓
→ Oversight of the resource	✓	✓	
→ Drought assessment	✓		✓
→ Well interference	✓		
→ Climate change (e.g., water balance, pine beetle impacts, sw/gw interactions)		✓	✓
→ Decision-making on availability (future licensing)	✓		
→ Spill response	✓		
→ Contaminated sites	✓	✓	
→ Conflict prevention and resolution	✓		
→ Ambient aquifer conditions (baseline on unimpacted aquifers)	✓		
→ Input to water management plans	✓		
→ Priority watershed issues (e.g., fish needs, sw/gw interactions)	✓		✓
→ Potential energy issues & impacts (e.g., coal bed methane, geothermal)	✓	✓	
→ State of the resource reporting		✓	✓
→ Calibration of models			✓
→ Research (e.g., impact of extreme precipitation/storm water events)		✓	✓
→ Trans-boundary issues			✓
↳ Contaminant transport			
↳ Water level sustainability			

## Appendix C: Breakout Session Feedback

### ↻ Consultants, Stewardship Groups, University Researchers, etc.

- High quality raw data
- Study-specific data
- Ground/surface water interaction
- Drought impacts

### Elements that indicate the number of observations wells needed for specific aquifers and watersheds include:

#### Aquifer Characterization

- ↻ Minimum number of wells for hydrogeologic analysis
  - ↳ Where in the flow system do you need information
- ↻ Amount of water use and vulnerability
  - ↳ **(1A needs to be revisited!)**
- ↻ Aquifer complexity (e.g., multi-layer vs. single layer requires more wells at different depths)
- ↻ Modeling requirements
- ↻ Efficiency of operation
- ↻ Water management areas: discharge and recharge area
- ↻ Size of aquifer
- ↻ Water level fluctuation over time
- ↻ Well density and the need to locate observation wells away from pumping wells
- ↻ Diversity of groundwater (understanding the resource)
- ↻ Complexity of geology
- ↻ Surface water proximity and interactions
- ↻ Location and frequency of measurement will depend upon monitoring objectives (e.g., quality vs. climate change)
- ↻ Well completion details, screen depths, elevations, etc. will depend upon what part of the aquifer is being measured
- ↻ Amount of historical data available

#### Impact Assessment

- ↻ Deviations from baseline
- ↻ Complexity of the issues (e.g., ambient monitoring vs. contaminated aquifer monitoring)
- ↻ Population served by groundwater



## Appendix C: Breakout Session Feedback

- ∞ Well density
- ∞ Saltwater intrusion in coastal areas
- ∞ Location of high risk activities (e.g., mining, water bottling, future nuclear)
- ∞ Location of contaminant plumes
- ∞ Drinking water protection
- ∞ Climate change assessment
- ∞ Drought issues — especially in shallow aquifers
- ∞

### Groundwater Availability

- ∞ Data for water balance assessment at the watershed and basin scale
- ∞ Site-specific availability and issues
- ∞ Sole-source aquifers are a higher priority
- ∞ Safe yield levels and water budget

### Economic Development

- ∞ Impact of future development/growth
- ∞ Development plans including zoning approvals
- ∞

### Other

- ∞ Public interest
- ∞ Legal issues
- ∞ Political pressure

### Misc. Issues identified during the session:

- ∞ Major projects: There is often no or little understanding of the resource before extraction begins
- ∞ There is little understanding of the relationships between aquifers and the consequences of extraction
- ∞ Data must be correct, current and relevant
- ∞ Long-term data with no gaps are required for trends
- ∞ Access to raw and interpreted data



## Breakout Session 2

### Planning Criteria and Priorities

If available funding for new observation wells is limited, criteria must be established for determining the optimum placement of the wells that are funded. (Note: funding requirements include installation, operation and maintenance costs.)

Criteria for Determining Optimum Placement of Wells	Priority	
	H/M/L	Ranking (1 to 5)
∞ Ability to assess impacts and threats to the resource (“hot spots)	H/H/H/H	1/1/1/1
∞ Population (current & future) served by groundwater and value of uses (higher value if GW is the sole source)  One group thought this was very important but not a high-level criteria	H/H/H	2/2
∞ Public health and ecological value	M - H	2/2/3
∞ Being able to “tell the story” (sufficiently long data sets and amount of data available)	H/H	3/4/4
∞ Areas of proposed significant new development	M/H/H	1/4
∞ Regional balance of observation well coverage	H/H/H	4/5
∞ Priority of purpose	H	2
∞ Drought response	H	
∞ Obtaining long-term baseline data in un-impacted areas	H	3
∞ Meeting network objectives and vision	H	
∞ Climate change baseline information	H	3
∞ Linkages to other forms of monitoring	H	3
∞ Cost of capital and operations (seen as a limiting factor) and potential cost-sharing with partners	M/H	4/5
∞ Complexity of aquifers	M	
∞ Ability to monitor with nested piezometers	M	

**Notes and Comments** (Use additional sheet if necessary)

- ∞ Rather than one set of criteria set in stone, there is need for a suite of criteria that can be applied according to local requirements





## Appendix C: Breakout Session Feedback

- ✧ There was emphasis on the need to permit local professional judgment and to minimize purely political considerations
- ✧ There are some inconsistencies between the priority level and ranking in the above list.



## Breakout Session 3

### Processes and Strategies for Network Management and Expansion

#### Network Planning and Management

Concerns (and suggested remedies) related to the existing network planning and management process include:

**Concern: Regional consistency**

**Remedy:**

- ↳ Standards for establishing observation wells
- ↳ Sampling protocols (including instrumentation, data management and reporting) — flexibility needed

**Concern: Insufficient coverage AND redundancy**

**Remedy:**

- ↳ More wells and more strategic placement

**Concern: Insufficient operations (data collection, verification and interpretation) and maintenance budgets**

**Remedy:**

- ↳ More staff or contractors
- ↳ Telemetry

**Concern: Unsatisfactory instrumentation (current data loggers are not reliable)**

**Remedy:**

- ↳ Develop alternative technology

**Concern: Recruitment and retention of staff**

**Remedy:**

- ↳ Succession planning
- ↳ Engage competent operators to gather data

**Concern: Time to travel to observation well sites**

**Remedy:**

- ↳ Telemetry

**Concern: Lack of well characterization and well-specific information**



## Appendix C: Breakout Session Feedback

### Remedy:

- ↳ A file and “Story book” content for each well
- ↳ Geo-referencing
- ↳ Additional integration with current water well database

### Concern: Lack of time/priority to analyze and interpret data to “tell the story”

### Remedy:

- ↳ Make reporting a priority

### Concern: Funds available to close wells

### Remedy:

- ↳ Funds

### Concern: Impact of land ownership issues on observation well placement

### Remedy:

- ↳ Planning to avoid potential problems
- ↳ Establish easements for access to observation wells

## Network Expansion

### Ways in which network planning could be less reactive to issues, more active and oriented toward outreach and partnership include:

- ∞ Secure funding
- ∞ Program- vs. project-based funding
- ∞ Planning
  - ↳ Assess future trends and identify need
  - ↳ Anticipate where groundwater will be regulated
- ∞ Review and assess network distribution with a focus on future requirements
- ∞ Raise awareness
  - ↳ Include awareness-building into network objectives
  - ↳ More outreach
  - ↳ Interpreting and publishing groundwater information
- ∞ Encourage more NGOs and associations to raise groundwater awareness
- ∞ Come to a consensus on criteria
- ∞ Partner with local governments and health authorities



## Appendix C: Breakout Session Feedback

- ∞ Require monitoring with future licenses

**Mechanisms for non-provincial government organizations and groups (e.g., water purveyors, regional districts, university research projects) to install and operate observation wells and share the data include:**

- ∞ Set standards for data collection
- ∞ Include observation well in environmental assessment requirements
- ∞ Require monitoring as part of groundwater-related business licenses
- ∞ Encourage more groundwater-focused research
- ∞ Increase public awareness through outreach
- ∞ Provide expertise and assistance to local initiatives

**Incentives that would encourage the cost-sharing of additional observation wells include:**

- ∞ Use of provincial/federal grant programs
- ∞ A higher awareness of sustainability issues and threats
- ∞ Inform businesses and other organizations of the opportunity to cost-share
- ∞ Indicate the R&D and business planning benefits of having appropriate observation well data
- ∞ Group discounts for analytical data



## APPENDIX E. Interview Questions for Regional Operations Staff

1. How many observation wells have been established in your region during the last 6 years (2003 to 2007)?
2. How many observation wells have been deactivated in your region during the last 6 years? What are the main reasons for this?
3. Do you have a list of priority locations for establishing new wells (either new sites or replacements for wells deactivated not by MOE choice)?
4. What criteria or factors have you considered for establishing new observation well in your region?
5. What process or steps do you follow for establishing an observation well in your region?
6. Do you have an annual budget for establishing new observation wells?
7. Do you get requests for establishing observation wells from outside agencies? If yes, how are these responded to?
8. Based on your experience, how long (in months) does it usually take to establish a new observation well in your region from the initial concept to completion?
9. Do you have any plans to establish one or more observation wells in fiscal 2008-09 or later?
10. Are there any constraints or factors that limit the number of new observation wells that can be established in your region e.g. budget, staff resources, other priorities?
11. Has your region completed any reviews of the existing network wells in the last 5 years?
12. What top 3 factors or criteria do you consider to be the most important for establishing a new observation well in your region?

## APPENDIX E. Interview Questions for Headquarters Staff

1. Are you involved in assisting regional operations staff in establishing new observation wells? If yes, what is your involvement?
2. Do you receive requests for establishing observation wells from outside agencies? If yes, how are these responded to?
3. What top 3 factors or criteria do you consider to be the most important for establishing any new observation wells in the province?

## Appendix E. Observation Well Network Questionnaire

1. Check the appropriate box or boxes that describe your field of work or responsibility.
- engineering/environmental consulting
  - environmental planning
  - environmental health
  - water supply systems/utilities
  - applied research
2. Are you aware of the availability of groundwater level data and information at the following Ministry of Environment websites?

[http://www.env.gov.bc.ca/wsd/data\\_searches/obswell/index.html](http://www.env.gov.bc.ca/wsd/data_searches/obswell/index.html)

<http://www.env.gov.bc.ca/rfc/>

YES  NO

Comments \_\_\_\_\_

3. Have you accessed any water level information from Ministry offices or the above Ministry websites in the last 12 months ?
- YES  NO

Comments \_\_\_\_\_

4. How often do you require information on ground water levels ?
- Annually  Seasonally  Monthly  Occasionally  Not Required

Comments \_\_\_\_\_

5. For what purposes do you require groundwater level information?
- current trends  historic trends  water conservation/availability
- well yield assessments  well field operation  other \_\_\_\_\_

Comments \_\_\_\_\_

6. Are there any observation wells, aquifers or areas where you have a specific interest? Wells \_\_\_\_\_ Aquifers \_\_\_\_\_ Areas \_\_\_\_\_

7. In your opinion, are there generally sufficient observation well monitoring sites for those areas where you require ground water level information ?
- YES  NO

Comments \_\_\_\_\_

8. Are there any areas or aquifers where you would like to see observation wells established? Aquifers \_\_\_\_\_ Areas \_\_\_\_\_

9. Other comments or suggestions?

Comments \_\_\_\_\_

## Appendix F. Reported Ground Water and Network Issues

### INCREASED GROUND WATER USE

- Urban development and increased reliance on groundwater on east side of Vancouver Island, Gulf Islands and other areas.
- Possible changes in freshwater source from surface water to groundwater due to diminishing surface water quality, tougher (i.e. expensive) treatment regulations and full allocation of surface water sources.
- Agricultural uses of groundwater (particularly irrigation) in areas such as Cowichan Valley. May also be impacted by agricultural intensification.
- Coal bed methane mining and its impact on fresh groundwater resources. (Other mining?) (Exploration for CBM ongoing in Campbell R. area).
- Long-term declines in water level due to unsustainable groundwater use in sand and gravel aquifers (e.g. Parksville area).
- Cumulative impacts of numerous takings in sensitive aquifers not being addressed due to fragmentation of water approval processes.
- Water quantity issues, aquifer 146 IC, historic declining water levels, Obs. Well 88 Scout Island), Williams Lake.
- Water quantity issues at Merritt, Salmon Arm and Westwold, high number of large volume production wells being drilled.
- Declining water levels in the Meadow Creek aquifer in Faulder area near Summerland.
- Assessing quantity impacts and threats.
- Population (current and future) served by ground water and values of uses.
- Drought response.

### GW-SW INTERACTIONS

- Impact of groundwater use on aquatic habitat/ gaining streams (e.g Englishman R. and associated creeks).
- Declining availability of surface water due to climate and full allocation of surface water rights and surface water relationships in more areas.
- Water quantity issues, gw/surface water interaction, delining lake level due to gw extraction, climate, combination (e.g. 108 Mile Ranch subdivision).
- GW and surface water interactions in the Merritt, Little Fort, Salmon River Valley and Westwold areas.



## Appendix F. Reported Ground Water and Network Issues

### **WATER QUALITY**

- Salt water intrusion into coastal aquifers (especially developed SE Vancouver Island and Gulf Islands).
- Naturally-occurring chemical constituents in groundwater (most serious of these is arsenic, but boron, fluoride and manganese may also be issues in some parts of region).
- Contamination due to industrial activity (very localized).
- Increasing nitrate trends in agricultural areas (e.g. Saanich).
- Conflicts between water users particularly “bulk water extractors” (e.g. Gulf Islands).
- Possible impact of failing septic systems in areas of intense development (septics & wells in subdivisions) (Latest reports were in Campbell River, Gulf Islands).
- Water quality issues in Dog Creek Rd subdivision area (Obs Well 261 Dog Creek) and 150 Mile House area.
- Possible water quality issues within City of Merritt.
- Water quality issues around the Shuswap, Obs Well 365 Scotch Creek.
- Questionable water quality data due to sampling procedures, well construction, development or other causes, e.g. turbidity, total metals.
- Changes in analytical suites with time make interpretation difficult, e.g. missing parameters.
- Public health and ecological values.
- Assessing quality impacts and threats.

### **CLIMATE CHANGE**

- Possible climate change impacts and adaptations (related to many of the issues above).
- Declining availability of surface water due to climate and full allocation of surface water rights and surface water relationships in more areas.
- Climatic trends/changes Chilcotin, Bonaparte plateau.
- Long term data in areas not impacted by pumping wells.
- Acquiring baseline information.

### **COAL-BED METHANE**

- Coalbed methane gas development, Princeton area.
- Coal bed methane mining and its impact on fresh groundwater resources. (Other mining?) (Exploration for CBM ongoing in Campbell R. area).

## Appendix F. Reported Ground Water and Network Issues

### **PINE BEETLE INFESTATION**

- Effects of pine beetle kill on ground water recharge.

### **GEOHERMAL**

- Collecting and data basing groundwater temperature data that may be of interest in future geothermal projects.
- Open-loop geothermal wells which discharge to surface – issue in areas where groundwater is at a premium.

### **WELL DRILLING PRACTICES**

- Hydrofracing of marginal to low yielding wells (localized issue but we know very little about the practice which is being carried out in a number of areas in the region (e.g. Gulf Islands (Mayne, Gabriola), Sooke R).

### **OBSERVATION WELL SITING**

- Majority of current observation wells located in “GW discharge areas” – need more data in “GW recharge areas”.
- Complex aquifers, geology and hydrogeology of region (e.g. fractured rock).
- Need a “sub-network” of observation wells in unconfined shallow aquifers to better understand impacts of drought... some of these should be higher up in flow system (i.e. recharge areas).

### **OPERATIONAL**

- Capacity of staff to operate the network.
- How big should the network be?
- Regional balance of observation well coverage.
- How automated should the network be?
- Successful data capture, Thalimedes versus pressure transducers.
- Timely entry of observation well data into OWDE (some sites are months and years behind).
- Infrequent checking of sites, lost data due to battery failure.
- Location co-ordinates missing for some EMS sites.
- Updating of EMS and WELLS with Well ID Plate numbers.
- Linking aquifers to wells in the WELLS database.
- Frequency of well readings recorded and reported vary.

## Appendix F. Reported Ground Water and Network Issues

- Identify really important business needs of the Obs. Well information to support level of data collection.
- Characterization, monitoring, “being on top of” key aquifers.
- Tools needed to deal with non-key aquifers.
- Having sufficient long term data sets.
- Meeting network objectives and vision.
- Links with other forms of monitoring, e.g. climate and hydrometric stations.
- Cost of capital equipment and operations.
- Use of nested piezometers.
- Funding for closing wells.
- Recruitment and retention of staff.
- Time of travel to observation well sites.
- Land ownership issues and site security.

### **REGULATION OF GW USE**

- The ability to develop water budgets for aquifers where ground water may be allocated under the living water smart plan.
- Future regulation of ground water use.
- Need for reporting ground water use.

### **LEGAL**

- Legal issues (easements, agreements, permitting).

### **OUTREACH**

- Lack of understanding of seasonal changes in groundwater levels (e.g. observation wells on Gulf Islands often show natural seasonal changes of 8-10 m/year).

Appendix G. Table 1. Summary of Responses Received to Questionnaire Survey.

ITEM	SOURCE	KNOWLEDGE OF WEBSITE	USE OF WEBSITE	FREQUENCY OF USE	USE	AREAS OF INTEREST	MEETS NEEDS	RECOMMENDATIONS	GENERAL COMMENTS
1	water supply systems & utilities	yes	yes	seasonally	current/historic trends as a reference for water system wells	wells	no		Water table historical levels are helpful in promoting water conservation education
2	engineering environmental consulting, environmental planning, water supply systems utilities, applied research	yes	yes	monthly	current/historic trends water conservation & availability, well field operation		no	Northern/Central BC Similkameen watershed	
3	water supply systems/utilities	yes	no	occasionally	historic trends, water conservation & availability	not at this time	not sure	aquifers	Past Osoyoos north of Highway 3
4	water supply systems/utilities	yes	yes	monthly	current trends/historic trends, water conservation & availability, well field operation	well - #295 aquifers- Berwick	yes		Max-min-Aug plots can be confusing
5	water supply systems/utilities	yes	yes	occasionally	historic trends, well field operation	well - #304 Parksville	yes		
6	engineering environmental consulting	yes	yes	seasonally	current/historic trends	mostly Parksville Qualicum area	yes	Qualicum Bay/Bowser, Horne Lake inland areas, Comox areas (Merville, Black Creek)	A lot of new developments in Qualicum area. More are planned, especially Horne Lake area.
7	applied research	Yes, through Ministry staff.	Yes, we used information on all wells with 30 years of data or more.	occasionally	historic trends - This was for a project using GW levels to study the potential impact of climate change on recharge across Canada.	Not for this Canada-wide study but it always depends on the study area.	Yes, compared to other provinces.		I wish a better characterization could be available on-line for these monitoring wells. I understand that this was available but not necessarily on-line.

ITEM	SOURCE	KNOWLEDGE OF WEBSITE	USE OF WEBSITE	FREQUENCY OF USE	USE	AREAS OF INTEREST	MEETS NEEDS	RECOMMENDATIONS	GENERAL COMMENTS
8	environmental planning	yes	yes	annually	current/historic trends, water conservation & availability	Fraser Valley area	No, highly used aquifers that are not just Class 1A.	Surrey, Langley, Abbotsford areas	Thanks!
9	water supply systems/utilities	yes	yes	occasionally	historic trends, water conservation/availability, well yield assessments, well field operation	Kelowna aquifers, North Kelowna area	no	Kelowna aquifers, North Kelowna & Kelowna International Airport areas	
10	engineering environmental consulting, water supply systems/utilities	yes	yes	monthly seasonally Update of data more often-2 months in dry season or remote readouts	current/historic trends water conservation & availability, correlation of local well water table with MOE well	Mt. Belcher, Scott Point wells on Salt Spring Island	No, Salt Spring could use 3-5 more to cover zones.	North Salt Spring, Fulford, Mt. Maxwell	
11	water supply systems/utilities	no	no	occasionally	current/historic trends, water conservation & availability	aquifers, wells, areas	unsure	unsure	
12	engineering environmental consulting, water supply systems/utilities	yes	yes	occasionally	historic trends	Langley, Abbotsford aquifers	no	Hoppington - north aquifers, Lefevre Road south	
14	engineering environmental consulting	yes	yes	monthly	current/historic trends, water conservation & availability, well yield assessments, well field operation		No, need more in upland areas, near Vernon & Summerland	Vernon and Summerland areas	Need for nested wells in some locations & in some large aquifers more spatial coverage.
15	water supply systems/utilities	no	no	seasonally	current trends, water conservation & availability, well yield assessments	wells, aquifers, areas	yes		

ITEM	SOURCE	KNOWLEDGE OF WEBSITE	USE OF WEBSITE	FREQUENCY OF USE	USE	AREAS OF INTEREST	MEETS NEEDS	RECOMMENDATIONS	GENERAL COMMENTS
13	environmental health	yes	yes	occasionally	historic trends	major producing aquifers on Vancouver Island	no opinion	Quadra, Cortes, Thetis, Malcolm Islands, Errington, Ships' Point	The graph of water level shown on the river forecasting site should be produced for all the OBS wells, or at least have a line between the two. There should be labels for the years where the max & min years. Many OBS wells have had chemistry tested. This data is most important to our uses & should be available on-line. There should be a link to a location map from the OBS well hydrograph.
16	water supply systems/utilities	yes	no	seasonally we checked our static levels Spring & Fall.	current/historic trends, water conservation & availability, well yield assessments. The Southern Gulf Islands have an average drought period of 4 - 5 months. It is critical that that variation between Spring & Fall be noted so that restrictions be put in place if needed.	No observation wells in our area, Bennett Bay aquifer, Miners Bay area - all private wells. Original settlement - all septs. Active Pass (acres for development). Some salt water intrusion indicated on peripheral properties.	No, our 2 wells are inland & salt water intrusion is the main concern at the present time. We have already determined where the arsenic areas are located as well as areas of high iron & manganese.	Aquifers - both as listed as the first move.	As suggested, since the MoE drills the wells, they need more protection for the life & use of the well from the whims of the homeowner. They also need to send qualified and alert, polite staff to do the monitoring. One of our wells was lost because the owners were not advised of the visit, the farm gate was left open & a vehicle was driven onto pastureland. There need to be better communication skills used.

ITEM	SOURCE	KNOWLEDGE OF WEBSITE	USE OF WEBSITE	FREQUENCY OF USE	USE	AREAS OF INTEREST	MEETS NEEDS	RECOMMENDATIONS	GENERAL COMMENTS
17	engineering environmental consulting, water supply systems/utilities	yes, it's very good	yes	annually, weekly	current/historic trends, well yield assessments, well field operation	Thompson - Nicola region	yes		
18	water supply systems/utilities	yes	no	occasionally - becoming more so	current/historic trends, water conservation & availability, well yield assessments, well field operation	Many - need to discuss this.	Many small aquifers are not monitored.	many aquifers	We need to look at using existing wells for observation purposes.
19	academic	yes		occasionally	historic trends and teaching	no comment	no comment	areas everywhere!	Groundwater is a critical resource & will become even more critical with continued climate change. We need to place a high priority on groundwater monitoring & research.
20	engineering environmental consulting	yes	yes	occasionally seasonally	current/historic trends	wells & aquifers on Vancouver Island	no		It seems like many monitoring wells are placed where the MoE can get a "free-for-all" from a developer, etc. rather than at a science-based location.
21	engineering environmental consulting, water supply systems/utilities	yes	yes	occasionally	well yield assessment, well field operation	mid and east coast Vancouver Island	No, suggest additional well in key aquifers.	mid & east coast Vancouver Island	wells should be connected via SCADA system to automate data retrieval & provide real time data (cheaper in the long term) Data loggers can have conductivity sensor for coastal aquifers.

ITEM	SOURCE	KNOWLEDGE OF WEBSITE	USE OF WEBSITE	FREQUENCY OF USE	USE	AREAS OF INTEREST	MEETS NEEDS	RECOMMENDATIONS	GENERAL COMMENTS
22	water supply systems/utilities	Yes, information is next to useless - years out of date.	Yes, information is extremely outdated.	annually occasionally	concern about local aquifer	Cobble Hill area	yes & no, lots of sites and no data.		It would be stupid to have more wells when the current data is so outdated. The MoE cannot keep up with current data collection. This is the main problem.
23	water supply systems/utilities	Yes, does not cover all areas.	no	seasonally Monitor to compare to prior 'safe' usage.	water conservation & availability, well yield assessments	no	no	adjacent areas	Simple way to determine 'recharge'.



## APPENDIX H

### Factors/Criteria Examined and Information Sources

#### *Major Watershed Boundaries*

The location, name and boundaries of major watersheds in British Columbia were obtained from the BC Water Resources Atlas website at <http://webmaps.gov.bc.ca/imf5/imf.jsp?site=wrbc>

#### *Classified Aquifers*

Classified aquifers include unconsolidated and bedrock aquifers identified under the *British Columbia Aquifer Classification System* (BCACS). In bedrock aquifers, groundwater occurs in both primary (intergranular) and secondary (fracture and bedding plane) porosity. In unconsolidated aquifers, groundwater occurs within intergranular porosity. Well drilling and well testing records provide the prime source of data for confirming the presence of an aquifer. Information from geologic mapping studies, soils, topography, and drainage data also assist in the identification of aquifers and location of their boundaries. Further information on the BCACS is provided by Berardinucci and Ronneseth (2002).

Aquifer information is found at the BC Water Resources Atlas website at <http://webmaps.gov.bc.ca/imf5/imf.jsp?site=wrbc> and the aquifer classification database can be queried at [http://a100.gov.bc.ca/pub/wells/public/common/aquifer\\_report.jsp](http://a100.gov.bc.ca/pub/wells/public/common/aquifer_report.jsp)

The classification components of the BCACS include the following:

#### *BCACS-Degree of Development*

This refers to the level of development of an aquifer by assessing demand versus the aquifer's yield or productivity. A high (I), moderate (II), or low (III) level of development can be designated.

#### *BCACS-Vulnerability*

This refers to the intrinsic vulnerability of an aquifer to contamination from surface sources based on aquifer type, thickness and extent of material overlying the aquifer, depth to water (or top of confined aquifers), and type of aquifer materials. A high (A), moderate (B), or low (C) vulnerability can be designated.

#### *BCACS-Ranking Value*

This refers to a numerical measure that considers 7 sub-factors namely:

productivity, aquifer size, vulnerability, demand, type of use, quality concerns (that have health risk implications) and quantity concerns. Possible ranking scores range from a low of 5 to a high of 21. This ranking assists in prioritizing aquifers that may be classified at the same level based on vulnerability and degree of development factors. This factor includes some “double counting” to some degree but its purpose is to assist in fine tuning the classification of the aquifers. Note that the BCACS ranking value is different than the ranking values being developed for determining the priorities for monitoring aquifers.

### *Well Locations and Well Density*

Well locations and individual computer well records are found at the *BC Water Resources Atlas* website at <<http://webmaps.gov.bc.ca/imf5/imf.jsp?site=wrbc>> where the records can be viewed individually or extracted to Excel spreadsheets in batches of up to 500 records for any area. The number of wells in each classified aquifer and BCGS area was provided by R. Hardy of the Water Stewardship Division using the Ministry’s GIS and enabled the calculation of well density for each aquifer. Well densities of aquifers are expressed as the number of wells per square kilometer. The per or “/” sign is implied in the aquifer templates.

### *Community Watersheds*

Community watersheds are natural watershed areas on which a community holds a valid water licence issued under the *Water Act* and where water is used for human consumption. For purposes of this report they are of interest as they are indicative of watershed areas where there are local community interests in protecting and maintaining water availability and water quality.

The location and distribution of community watersheds in the province can be accessed at the *BC Water Resources Atlas* website at <<http://webmaps.gov.bc.ca/imf5/imf.jsp?site=wrbc>>

### *Active Climate Stations*

The locations of active climate stations in the province were obtained from the Environment Canada website at [http://scitech.pyr.ec.gc.ca/climhydro/mainContent/main\\_e.asp?province=bc](http://scitech.pyr.ec.gc.ca/climhydro/mainContent/main_e.asp?province=bc) Information on other stations maintained for example by Farmwest, the Ministry of Forests and Range (MoFR), Protection Branch, Ministry of Environment and the Ministry of Highways and Transportation were not compiled. Some climate stations are also included with active hydrometric sites. It should be noted that there is some overlapping of sites between the agencies and differences in the availability of climate parameters. MoFR stations for example are focused on providing hourly weather observations to support fire weather forecasting during the summer months.

In terms of potential ground water monitoring sites, the proximity of climate stations to ground water monitoring sites facilitates the interpretation of water level fluctuations at the monitoring sites. In establishing new observation well sites, the location of active climate stations may be more important than the location of archived climate sites and historic data.

#### *Active Snow Courses and Snow Pillows*

Information on the location and distribution of active snow courses and snow pillows in the province were accessed at at the *BC Water Resources Atlas* website at <<http://webmaps.gov.bc.ca/imf5/imf.jsp?site=wrbc>>

Most of these sites are situated in the uppermost reaches of the watersheds where they are within community watersheds. These sites are important for assessing inputs from snow melt and runoff that contribute to natural recharge of aquifers and the ground water regime in upland areas.

#### *Active Hydrometric Sites*

Information on the location and distribution of active hydrometric sites in the province were accessed at at the *BC Water Resources Atlas* website at <<http://webmaps.gov.bc.ca/imf5/imf.jsp?site=wrbc>>

#### *Locations of Ground Water Supply System Sources*

Available listings of ground water supply system sources (wells and springs) were provided by Vicki Carmichael, Water Stewardship Division with the Ministry of Environment. M. Zobel, Fraser Valley Health Authority provided information on water systems in the Lower Mainland Region. Ground water supply systems may have more than one ground water source. Springs, while licensed as surface water sources, are regarded as ground water sources for purposes of this report.

Where source locations were adequately known, BCGS 1 : 20 000 mapsheet numbers were determined for each of the sites and added to the listings. Site location information derived from GPS surveys undertaken as part of the *Drinking Water Information Management Project* (DWIMP) for the Okanagan were also examined and *Drinking Water Supply System* sites were also viewed at the iMap BC website, < <http://webmaps.gov.bc.ca/imfx/imf.jsp?site=imapbc>>

Water well records within each BCGS area, primarily in the Kootenay/Okanagan, Thompson Cariboo and Vancouver Island regions were also checked for available information indicating the existence of a water supply system. It is not known however, if all of the systems identified this way are currently active. A complete compilation of all water systems and sources was not completed for this project due to the large number and draft nature of some of the listings

available and indications that not all water systems, particularly smaller ones, have been located.

#### *Reported Ground Water Quantity and Quality Issues*

Current ground water quantity and quality issues were identified through consultation with Ministry staff (Appendix E). Indication of historic water quantity and quality issues for each aquifer are also recorded at the at the *BC Water Resources Atlas* website at <http://webmaps.gov.bc.ca/imf5/imf.jsp?site=wrbc> where concerns are reported as either; isolated, local, regional or none. Wider issues such as the potential effects of climate change and potential effects of mountain pine beetle infestation on ground water availability are discussed elsewhere in this report.

#### *Current or Planned Ground Water Research/Planning Projects*

A number of agencies and water research facilities are conducting or planning ground water research projects or water planning activities in the study area. Scope of the projects ranges from basin wide studies to specific area or watershed studies.

#### *Areas of Mountain Pine Beetle Infestation*

Areas of mountain pine beetle infestation are of interest as deforested areas may result in physical changes to natural water balances, the recharge regimes for ground water in upland areas and subsequently ground water availability.

Information on the severity of infestation where available in each BCGS area was accessed at the Ministry of Forests and Range website [http://www.for.gov.bc.ca/hts/rs/mpb\\_impact.html](http://www.for.gov.bc.ca/hts/rs/mpb_impact.html) >

#### *Estimates of Current Ground Water Use*

Current ground water use for each aquifer based on an averaged rate of use over a year was estimated roughly on the number of reported wells in the aquifer, reported yields of larger capacity wells and the type of water use (e.g. domestic, municipal, irrigation) where known. The number of wells in each aquifer was provided by R. Hardy of the Water Stewardship Division using the Ministry's GIS. Domestic wells were estimated to supply approximately 500 USgpd (1893 L/d) each. Population estimates for some communities were also utilized based on a water use rate of 500 USgpd (1893 L/d) for three persons where it was known that they used ground water in a particular aquifer (e.g. community of Okanagan Falls). While the accuracy of these estimates is not known and may be high the estimates are considered reasonable where used for the ranking of aquifers.

### *Location and Number of Reported Irrigation Wells*

The locations and number of irrigation wells reported for each aquifer was found at the BC Water Resources Atlas website at <http://webmaps.gov.bc.ca/imf5/imf.jsp?site=wrbc> where specific types of well use can be queried and the locations displayed. Irrigation wells are important since they are usually larger capacity wells and may be indicative of significant ground water use during the irrigation period.

### *Estimates of Population Served by Ground Water*

This was determined by checking the number and type of wells over an aquifer and the number and type of water systems. The number of wells in each aquifer was provided by R. Hardy of the Water Stewardship Division using the Ministry's GIS. It was assumed that each private domestic well would serve an average of 3 persons. Current population figures available for some communities from their community websites and BC Stats website <http://www.bcstats.gov.bc.ca/> were also considered where it was known that they used ground water in a particular aquifer (e.g. community of Okanagan Falls). While the accuracy of these population estimates is not known and may be high, the estimates are considered reasonable where used for the ranking of aquifers.

### *Number of Parks and Protected Areas*

Information on parks and protected areas was accessed at the *Habitat Wizard* website at <http://www.env.gov.bc.ca/habwiz/> . Parks and protected areas are often associated or in proximity to wetlands, streams, lakes and fisheries habitat where there is potential for interactions with and dependence upon ground water. Some noted examples are the Roderick Haig-Brown Park along the Adams River (Aquifer 234) at Shuswap Lake and South Okanagan Wildlife Management Area (Aquifer 254) at north end of Osoyoos Lake.

### *Potential Areas for Future Ground Water Licensing*

These include aquifers where there is high ground water use, a dependence on ground water, large capacity wells and significant quantity or quality issues. Under British Columbia's Water Plan, entitled *Living Water Smart*, the province plans to regulate ground water use in priority areas and large groundwater withdrawals (Ministry of Environment, 2009c).

Appendix I. Table 1. Classified aquifers in the Vancouver Island Region.

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
1	155		Unconsolidated	Walker Hook / SSI	II	B	8	1.24	Drinking Water
2	156		Unconsolidated	Ganges Harbour / SSI	II	B	8	3.52	Drinking Water
3	157		Unconsolidated	Fulford Harbour / SSI	II	B	8	3.42	Drinking Water
4	159	Lost Shoe Creek	Unconsolidated	Ucluelet	II	A	14	12.39	Drinking Water
5	160	Lower Cassidy	Unconsolidated	Cassidy	III	C	10	5.96	Drinking Water
6	161	Cassidy	Unconsolidated	Cassidy	II	A	14	29.95	Drinking Water
7	162		Bedrock	Cedar, Yellow Point, N. Oyster (Ladysmith)	II	A	16	79.23	Drinking Water
8	163		Unconsolidated	Cedar North Holden Lake	II	B	9	1.64	Drinking Water
9	164		Bedrock	Extension (Nanaimo)	III	B	8	6.25	Drinking Water
10	165		Bedrock	South Wellington	II	B	10	17.10	Drinking Water
11	166		Bedrock	Stevenson Point, Nanaimo	III	B	7	12.02	Drinking Water
12	167		Unconsolidated	Westwood Lake / Nanaimo	III	B	9	2.36	Drinking Water
13	168		Bedrock	Ladysmith	III	B	6	3.90	Drinking Water
14	169		Unconsolidated	Saltair South Ladysmith	III	C	8	9.94	Drinking Water
15	170		Bedrock	Panorama Ridge / Chemainus	I	B	10	1.92	Drinking Water
16	171		Bedrock	Mt. Sicker / Crofton - Chemianus	III	C	8	14.53	Drinking Water
17	172		Unconsolidated	Chemainus and Crofton	I	A	14	7.53	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
18	173		Bedrock	Maple Mtn. / Crofton - Maple Bay	III	A	10	34.06	Drinking Water
19	174		Unconsolidated	North Duncan	II	C	8	1.48	Drinking Water
20	175		Bedrock	North Duncan	II	B	10	42.91	Drinking Water
21	176		Bedrock	East Duncan - Maple Bay	III	A	9	15.55	Drinking Water
22	177		Bedrock	East Duncan - Maple Bay	III	A	9	7.72	Drinking Water
23	178		Unconsolidated	Skutz Falls / Lake Cowichan, Paldi	III	C	8	19.04	Drinking Water
24	179		Unconsolidated	Sahtlam	III	A	10	7.59	Drinking Water
25	180		Unconsolidated	Sahtlam	II	C	9	8.42	Drinking Water
26	181		Bedrock	West Duncan	I	C	8	1.27	Drinking Water
27	182		Bedrock	Paldi - Sahtlam	III	C	9	31.64	Drinking Water
28	183		Unconsolidated	West Duncan	II	C	9	6.28	Drinking Water
29	184		Unconsolidated	West Duncan	III	A	9	2.65	Drinking Water
30	185		Unconsolidated	Deerholm, South Duncan	II	C	10	14.92	Drinking Water
31	186	Lower Cowichan	Unconsolidated	Duncan	I	A	14	16.95	Multiple
32	187	Lower Cowichan	Unconsolidated	Duncan	II	B	12	11.40	Multiple
33	188	Lower Cowichan	Unconsolidated	Duncan	III	C	10	8.67	Multiple
34	189		Unconsolidated	Honeymoon Bay	II	A	12	10.47	Multiple
35	190		Unconsolidated	Youbou	III	A	10	1.94	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
36	191		Unconsolidated	North Lake Cowichan	II	A	10	3.15	Drinking Water
37	192		Unconsolidated	North Lake Cowichan	III	C	9	5.38	Drinking Water
38	196		Bedrock	Deerholm / Duncan	III	C	8	45.98	Drinking Water
39	197		Unconsolidated	Cowichan Bay / Cobble Hill	II	C	11	39.48	Multiple
40	198		Bedrock	Cowichan Station / Duncan	III	C	7	6.18	Multiple
41	199		Unconsolidated	Cowichan Station	II	C	9	3.40	Drinking Water
42	200		Bedrock	Cobble Hill/Duncan	III	B	9	26.94	Drinking Water
43	201		Unconsolidated	Cobble Hill	II	C	8	2.11	Drinking Water
44	202		Bedrock	Shawnigan Lake / Cobble Hill	II	B	10	21.00	Multiple
45	203		Bedrock	Shawnigan Lake / Cobble Hill	II	A	12	31.02	Multiple
46	204		Bedrock	Cobble Hill / Mill Bay	II	B	11	16.58	Multiple
47	205		Unconsolidated	Cobble Hill / Shawnigan Lake	II	C	9	2.73	Multiple
48	206		Unconsolidated	Mill Bay	II	A	11	2.57	Multiple
49	207		Bedrock	Mill Bay / Shawnigan Lake	II	B	12	25.10	Multiple
50	208		Bedrock	Spectacle Lake / Malahat	III	A	10	20.55	Drinking Water
51	209		Unconsolidated	Errington	III	C	8	8.52	Drinking Water
52	210		Bedrock	Nanoose Bay	II	C	7	3.35	Drinking Water
53	211		Bedrock	Nanaimo	III	C	7	13.39	Drinking Water
54	212		Bedrock	Parksville	III	C	6	5.91	Drinking Water



Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
55	213		Bedrock	Lantzville	II	C	11	41.95	Multiple
56	214		Bedrock	Madrona Point/Parksville	III	B	10	5.62	Drinking Water
57	215		Unconsolidated	Lantzville	II	C	10	14.34	Multiple
58	216		Unconsolidated	Parksville	I	B	14	24.85	Multiple
59	217		Unconsolidated	Qualicum	I	B	14	42.01	Multiple
60	218		Bedrock	Nanoose Hill	II	B	9	13.63	Drinking Water
61	219		Unconsolidated	Nanoose Creek	II	C	9	27.42	Drinking Water
62	220		Bedrock	Errington	II	B	9	26.58	Drinking Water
63	221		Unconsolidated	Parksville	II	A	12	4.03	Multiple
64	320		Bedrock	Galiano Island	II	B	14	58.15	Multiple
65	407		Unconsolidated	Point Holmes, east of the Town of Comox.	II	A	10	1.87	Drinking Water
66	408		Unconsolidated	Comox Harbour to 10 km north of Merville	II	C	13	147.72	Multiple
67	409		Unconsolidated	Little River	III	A	8	1.29	Drinking Water
68	410		Unconsolidated	Southern bank of Oyster River delta	II	A	11	1.69	Drinking Water
69	412		Unconsolidated	Kahusham / North bank of Oyster River	II	A	11	3.23	Multiple
70	413		Bedrock	West of Royston, north to Puntledge River	II	A	12	18.38	Drinking Water
71	414		Unconsolidated	Mouth of Rosewall Creek	II	A	13	1.45	Multiple
72	415		Unconsolidated	Tsable River Delta	III	A	10	0.80	Drinking Water
73	416		Unconsolidated	Thames River to Maplegaurd Point	II	B	12	13.74	Drinking Water
74	417		Unconsolidated	North of Cumberland, to Puntledge R.	III	A	11	16.93	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
75	419		Unconsolidated	Wilfred Creek south of Fanny Bay	III	B	12	4.33	Multiple
76	420		Bedrock	1 km south of Oyster River mouth	II	B	9	0.38	Drinking Water
77	421		Unconsolidated	Nile Creek to Thames Creek	III	B	8	6.16	Drinking Water
78	435		Bedrock	Whaling Station Bay / Hornby Island	I	A	15	3.79	Multiple
79	436		Bedrock	Shingle Spit-Phipps Point, Hornby Island	II	A	13	4.93	Drinking Water
80	437		Bedrock	Ford Cove - Norman Point / Hornby Island	III	A	11	2.20	Drinking Water
81	438		Bedrock	Mt. Geoffrey / Hornby Island	II	A	15	19.00	Drinking Water
82	447		Bedrock	Georgina Point - Hall Hill / Mayne Island	II	A	11	3.74	Multiple
83	449		Bedrock	West of Sooke at Orveous Bay	III	C	10	28.13	Drinking Water
84	599		Unconsolidated	Sooke R floodplain, west to Kemp Lk	III	A	11	19.25	Drinking Water
85	604		Unconsolidated	East of Sooke around Young Lake	III	C	6	2.03	Multiple
86	605		Unconsolidated	South of Broom Hill NE of Sooke Bay	III	C	6	0.13	Multiple
87	606		Bedrock	Colwood / Langford / Metchosin / Sooke	III	A	12	537.61	Drinking Water
88	607		Bedrock	North end of Saanich Peninsula	III	B	8	9.06	Multiple
89	608		Bedrock	North Saanich to Elk Lake	II	B	13	81.27	Multiple
90	609		Unconsolidated	Littlewood Road North of Vic Airport	III	B	7	0.55	Multiple
91	610		Unconsolidated	North Saanich / Bazan Bay	II	B	9	1.04	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
92	611		Unconsolidated	Saanichton, Central Saanich	II	B	8	2.09	Multiple
93	612		Unconsolidated	Central Saanich / Keating	II	B	9	8.48	Multiple
94	613		Unconsolidated	Durrance Road / Saanich	II	C	7	0.09	Multiple
95	614		Bedrock	Saanich between Cordova and Brentwood Bay	III	B	7	15.71	Multiple
96	615		Unconsolidated	East side of Saanich Peninsula	III	B	8	3.39	Multiple
97	616		Unconsolidated	Elk Lake to Cordova Bay	II	C	11	7.84	Multiple
98	617		Unconsolidated	West Saanich Rd at Wallace Dr	II	C	7	0.11	Multiple
99	618		Bedrock	Port Renfrew, south side of San Juan River	III	C	8	5.84	Multiple
100	619		Bedrock	Mayne Island	II	B	13	7.99	Multiple
101	620		Bedrock	Mayne Island	I	B	13	7.74	Multiple
102	632		Bedrock	Navy Channel, S. Mayne Is.	II	B	10	3.90	Drinking Water
103	661		Unconsolidated	Spider Lk nr Horne Lk	III	A	10	3.75	Drinking Water
104	662		Unconsolidated	Between Big & Little Qualicum Rivers	II	C	12	53.02	Multiple
105	663		Unconsolidated	Upper reaches of Whisky Creek	III	A	13	9.63	Multiple
106	664		Unconsolidated	Little Qualicum R. valley & delta	I	A	13	4.96	Multiple
107	665		Unconsolidated	Between Big Qualicum R. & Thames Ck.	III	B	9	22.79	Drinking Water
108	680		Bedrock	Victoria S of Elk Lake, E of Finlayson Arm	II	B	12	209.01	Multiple
109	681		Bedrock	Willis Point, SE side of Saanich Inlet	II	A	10	7.87	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
110	682		Unconsolidated	Colwood, Langford, Metchosin	III	B	11	24.08	Multiple
111	683		Unconsolidated	Metchosin, from Parry Bay inland 3 km	III	C	8	8.96	Drinking Water
112	684		Unconsolidated	Goldstream River mouth, Finlayson Arm	III	A	10	0.25	Drinking Water
113	685	Pacheedaht	Unconsolidated	San Juan River floodplain, Port Renfrew	III	A	14	41.18	Multiple
114	686		Unconsolidated	Gordon Head, Saanich	III	C	7	7.29	Non-Drinking Water
115	691		Bedrock	East of Ash River	III	B	7	29.31	Non-Drinking Water
116	692		Unconsolidated	Bear Creek; N of Stamp River Falls	III	A	7	1.57	Non-Drinking Water
117	693		Unconsolidated	Stamp River; d/s from Great Central Lake	II	A	12	0.27	Multiple
118	694		Unconsolidated	Stamp River; E side of Stamp Falls	II	B	8	0.19	Drinking Water
119	695		Unconsolidated	N shore of Sproat Lake; close to Kleecoot	III	C	7	1.23	Drinking Water
120	696		Bedrock	East of Stamp Falls	II	C	8	4.31	Drinking Water
121	697		Bedrock	East side of Alberni Valley	II	B	12	42.21	Drinking Water
122	698		Bedrock	North shore of Sproat Lake at Kleecoot	II	C	10	5.61	Drinking Water
123	699		Bedrock	N sh of Sproat Lk; 8 km W of Port Alberni	III	C	6	1.21	Drinking Water
124	700		Unconsolidated	N shore of Sproat Lake at Kleecoot	III	C	7	0.38	Drinking Water
125	701		Bedrock	Eagle Point SW of Kleecoot	II	B	11	2.42	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
126	702		Bedrock	McCoy Lake; W of Port Alberni	I	B	11	18.03	Multiple
127	703		Unconsolidated	W bank of Somass River	III	B	8	0.71	Drinking Water
128	704		Unconsolidated	E bank of Somass River	III	B	7	0.61	Drinking Water
129	705		Unconsolidated	Polly Point; 4km S of Port Alberni; E side	III	C	6	0.24	Drinking Water
130	706		Bedrock	Gabriola; Northern area	I	A	15	5.87	Drinking Water
131	707		Unconsolidated	China Cr; E Alb. In; 8km S of Pt Alberni	III	C	5	0.63	Non-Drinking Water
132	708		Bedrock	E side Alberni In; 8 km S of Port Alberni	II	B	10	1.56	Multiple
133	709		Bedrock	Gabriola; excluding northern portion	II	A	15	46.78	Drinking Water
134	710		Bedrock	South Pender	II	B	11	9.13	Drinking Water
135	711		Bedrock	North Pender; northern area	II	A	13	11.34	Drinking Water
136	712		Bedrock	North Pender; Port Browning	II	A	13	6.29	Drinking Water
137	720		Bedrock	North Pender; southern portion	II	B	11	9.50	Drinking Water
138	721		Bedrock	Saltspring Island; north part	II	B	14	47.04	Multiple
139	722		Bedrock	Saltspring Is; central part; Ganges area	II	A	15	84.36	Multiple
140	723		Bedrock	Saltspring Island	III	B	12	51.30	Drinking Water
141	729		Bedrock	South Thetis Island	I	A	13	0.64	Drinking Water
142	730		Bedrock	Thetis Island	II	B	10	2.66	Drinking Water
143	731		Bedrock	Thetis Island	II	B	11	4.98	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
144	732		Bedrock	Thetis Island	I	A	12	1.24	Drinking Water
145	733		Bedrock	Norway Island	I	B	9	0.14	Drinking Water
146	734		Bedrock	Dayman Island	II	B	8	0.14	Multiple
147	735		Bedrock	Saturna Island - east	I	A	11	1.37	Drinking Water
148	736		Bedrock	Saturna Island - north	II	B	8	2.61	Multiple
149	737		Bedrock	Saturna Island - west	I	B	11	2.87	Drinking Water
150	738		Bedrock	Saturna Island - west	II	B	8	0.27	Drinking Water
151	739		Unconsolidated	Denman Island - east	II	B	8	3.96	Drinking Water
152	740		Bedrock	Denman Island	II	A	13	47.70	Drinking Water
153	741		Bedrock	Hudson Island	I	B	9	0.15	Drinking Water
154	742		Bedrock	Scot Island	I	B	9	0.07	Drinking Water
155	750		Unconsolidated	Mayne Island, east of Village Bay	II	C	7	0.14	Non-Drinking Water
156	751		Unconsolidated	Quadra Island	II	B	9	1.13	Drinking Water
157	752		Unconsolidated	Quadra Island	II	C	9	1.14	Drinking Water
158	753		Unconsolidated	Quadra Island	II	C	8	1.10	Drinking Water
159	754		Bedrock	Quadra Island	II	B	8	0.94	Drinking Water
160	755		Unconsolidated	Quadra Island	II	C	8	2.15	Drinking Water
161	756		Bedrock	Quadra Island	II	A	8	0.73	Drinking Water
162	757		Bedrock	Quadra Island	II	B	8	0.35	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
163	758		Bedrock	Quadra Island	I	B	9	0.16	Drinking Water
164	759		Bedrock	Quadra Island	I	B	9	0.22	Drinking Water
165	760		Bedrock	Quadra Island	II	B	9	0.51	Drinking Water
166	761		Unconsolidated	Quadra Island	II	A	11	0.10	Multiple
167	762		Unconsolidated	Quadra Island	I	C	8	0.62	Drinking Water
168	763		Bedrock	Port McNeil	II	B	7	0.83	Drinking Water
169	764		Unconsolidated	Port McNeil - east	II	B	11	3.56	Multiple
170	778		Bedrock	Pym Island, N of Swartz Bay	II	B	7	0.03	Drinking Water
171	779		Bedrock	Knapp Island, N of Swartz Bay	II	B	7	0.15	Drinking Water
172	780		Bedrock	Goudge Island, east of Swartz Bay	II	C	6	0.15	Drinking Water
173	781		Bedrock	Kolb Island, East of Swartz Bay	I	A	10	0.01	Drinking Water
174	782		Bedrock	Fernie Island, East of Swartz Bay	II	A	8	0.06	Drinking Water
175	783		Bedrock	Coal Island, N of Swartz Bay	II	A	8	1.41	Drinking Water
176	784		Bedrock	Forrest Island, East of Sidney	II	A	8	0.25	Multiple
177	785		Bedrock	Comet Island, East of Sidney	II	A	8	0.05	Non-Drinking Water
178	786		Unconsolidated	Sidney Island, North End	III	B	11	2.29	Multiple
179	787		Bedrock	Sidney Island, South End	III	C	9	4.13	Drinking Water
180	841		Unconsolidated	S Cortes Island	II	C	9	9.48	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
181	842		Bedrock	Cortes Island	II	A	10	2.60	Drinking Water
182	843		Bedrock	Cortes Island	II	B	9	1.56	Drinking Water
183	844		Bedrock	Cortes Island	II	B	9	2.39	Drinking Water
184	845		Bedrock	Cortes Island	II	A	9	0.26	Drinking Water
185	846		Bedrock	Cortes Island	III	B	8	2.95	Drinking Water
186	847		Unconsolidated	Campbell River (south)	II	B	8	12.86	Drinking Water
187	848		Bedrock	Black Creek S of Campbell River	II	C	7	4.72	Drinking Water
188	852		Unconsolidated	Simms Creek S of Campbell River	II	B	9	1.31	Drinking Water
189	853		Unconsolidated	Willow Pt/Shelter Pt S of Campbell River	II	B	8	3.39	Drinking Water
190	854		Unconsolidated	Oyster Bay S of Campbell River	II	C	8	1.30	Drinking Water
191	856		Unconsolidated	Oyster Bay S of Campbell River	II	C	8	0.92	Drinking Water
192	857		Unconsolidated	Campbell River Airport	III	C	9	2.40	Multiple
193	858		Unconsolidated	Alert Bay – Cormorant Island	I	B	12	4.47	Drinking Water
194	859		Unconsolidated	Mitchell Bay / Malcolm Island	III	C	7	2.73	Drinking Water
195	865		Unconsolidated	Heber R. and Gold R.	I	A	13	0.29	Multiple
196	900		Unconsolidated	Sointula / Malcolm Island	III	C	7	3.29	Drinking Water
197	901		Unconsolidated	Sointula / Malcolm Island	III	B	8	0.30	Drinking Water
198	902		Unconsolidated	Pt. McNeil	III	B	8	5.08	Drinking Water
199	904		Bedrock	Pt. Hardy	II	A	9	0.95	Drinking Water



Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
200	905		Bedrock	Ft. Rupert	II	B	9	4.82	Drinking Water
201	906		Unconsolidated	Ft. Rupert	II	B	8	2.22	Drinking Water
202	907		Bedrock	Coal Harbour S of Pt. Hardy	III	B	8	1.10	Drinking Water

Appendix I. Table 2. Classified aquifers in the Lower Mainland Region.

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
1	1		Unconsolidated	Floods	III	A	10	7.12	Drinking Water
2	2		Unconsolidated	Chawathil	III	A	11	7.14	Drinking Water
3	3		Unconsolidated	Laidlaw	III	A	11	9.29	Drinking Water
4	4		Unconsolidated	Aggasiz/Sea Bird Island	III	A	13	63.33	Multiple
5	5		Unconsolidated	Chehalis	III	A	12	16.13	Multiple
6	6		Unconsolidated	Chilliwack / Rosedale	III	A	13	141.52	Multiple
7	7		Unconsolidated	Harrison Mills	III	A	8	6.2	Other
8	8	Vedder River Fan	Unconsolidated	Veddar Crossing	I	A	14	53.76	Multiple
9	9		Unconsolidated	Chilliwack River	II	A	12	13.91	Multiple
10	10		Unconsolidated	Mouth of Slease Creek	II	C	8	2.12	Other
11	11		Unconsolidated	Lake Erroch/Deroche Creek	III	A	11	13.17	Multiple
12	12	Nicomen Slough	Unconsolidated	Nicomen Slough	III	A	12	60.22	Multiple
13	13		Unconsolidated	Norrish Creek	II	A	12	2.33	Multiple
14	14	Hatzic Prairie	Unconsolidated	Hatzic Prairie	III	A	10	9.84	Drinking Water
15	15	Abbotsford-Sumas	Unconsolidated	Abbotsford	I	A	20	90.8	Multiple
16	16		Unconsolidated	Mount Lehman	III	A	11	5.77	Drinking Water
17	17		Unconsolidated	Mission Floodplain	III	A	10	6.26	Drinking Water
18	18		Bedrock	Mission	II	A	10	17.78	Drinking Water
19	19	Grant Hill Bedrock	Bedrock	Grant Hill	II	A	12	18.37	Drinking Water
20	20	Columbia Valley	Unconsolidated	Columbia Valley	II	B	12	15.55	Multiple
21	21	Sumas Prairie	Unconsolidated	Sumas Prairie	III	B	11	97.83	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
22	22		Unconsolidated	Matsqui Prairie	III	B	11	45.89	Multiple
23	23		Unconsolidated	North of Abbotsford	III	B	8	3.29	Drinking Water
24	24		Unconsolidated	Glen Valley	III	B	10	18.01	Multiple
25	25		Unconsolidated	Miracle Valley	III	C	8	13.09	Drinking Water
26	26		Unconsolidated	Kanaka/Whonnock Creek	II	C	9	13.03	Drinking Water
27	27	Aldergrove	Unconsolidated	Aldergrove	II	C	14	91.77	Multiple
28	28		Unconsolidated	Northwest of Clearbrook	II	C	8	4.26	Multiple
29	29		Unconsolidated	North of Mt. Lehman	III	C	8	3.35	Multiple
30	30		Unconsolidated	North of Dennison	III	C	6	2.2	Drinking Water
31	31		Unconsolidated	Glen Valley (Lower)	III	C	10	9.08	Multiple
32	32		Unconsolidated	Beaver River	II	C	11	21.93	Multiple
33	33		Unconsolidated	West of Aldergrove	III	C	12	34.71	Multiple
34	34		Unconsolidated	South of Aldergrove	III	C	10	10.77	Multiple
35	35	Hopington	Unconsolidated	Hopington	I	A	21	50.59	Multiple
36	36		Unconsolidated	Fort Langley	II	A	12	6.97	Drinking Water
37	37		Unconsolidated	Fort Langley (Uplands)	III	A	8	1.88	Drinking Water
38	38		Unconsolidated	Allouette	III	A	12	13.56	Multiple
39	39		Unconsolidated	East Pitt River	III	A	10	84.1	Drinking Water
40	40		Unconsolidated	Barston Island	III	A	9	6.22	Drinking Water
41	41		Unconsolidated	Langley	I	A	17	38.69	Drinking Water
42	42		Unconsolidated	South Fraser River Delta	III	A	10	142.92	Other
43	43		Unconsolidated	Annacis Island	III	A	9	5.45	Other
44	44		Unconsolidated	Lulu Island	III	A	10	109.85	Other
45	45		Unconsolidated	North Arm / Delta	III	A	9	16.27	Other
46	46		Unconsolidated	Coquitlam River Floodplain	III	A	9	9.89	Other

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
47	47		Unconsolidated	Boundary Avenue near Border Sand & Gravel	II	B	11	4.82	Drinking Water
48	48		Unconsolidated	Fraser River Junction	III	B	8	9.03	Other
49	49		Unconsolidated	Vancouver-Quadra Sands	III	B	9	195.05	Multiple
50	50		Unconsolidated	South of Hopinton	I	C	12		Multiple
51	51		Unconsolidated	South of Murrayville	III	C	10	11.29	Multiple
52	52		Unconsolidated	Langley Upland/Inter-till	II	C	11	44.03	Multiple
53	53		Unconsolidated	Hazelmere Valley	III	C	9	18.34	Multiple
54	54		Unconsolidated	Hazelmere	III	C	8	2.64	Multiple
55	55		Unconsolidated	Grandview	III	C	10	20.11	Multiple
56	56		Unconsolidated	NE of Whiterock	II	C	10	1.66	Multiple
57	57		Unconsolidated	Whiterock	II	C	12	40.22	Multiple
58	58	Nicomekl-Serpentine	Unconsolidated	Nicomekl-Serpentine	II	C	11	194.14	Multiple
59	59		Unconsolidated	Clayton Upland (Upper)	II	C	11	35.25	Multiple
60	60		Unconsolidated	Clayton Upland (Lower)	II	C	10	13.77	Multiple
61	61		Unconsolidated	Newton Upland	III	C	11	137.38	Multiple
62	62		Unconsolidated	Twawassen	III	C	8	6.78	Drinking Water
63	63		Unconsolidated	Westham Island	III	A	9	10.43	Other
64	64		Unconsolidated	Mitchell Island	III	A	8	1.38	Other
65	65		Unconsolidated	Sea Island	III	A	9	15.43	Other
66	66		Unconsolidated	Capilano River	III	A	10	5.4	Other
67	67		Unconsolidated	Seymour River / Lynn Creek	III	A	10	5.21	Other
68	68		Bedrock	Belcarra	I	A	10	1.77	Drinking Water
69	69		Unconsolidated	Port Moody	III	A	7	2.81	Other
70	70		Unconsolidated	Coquitlam River	III	A	10	25.11	Other
71	71		Unconsolidated	West Pitt River	III	A	9	14	Other
72	72		Unconsolidated	McMillian Island	III	A	10	2.48	Other
73	73		Unconsolidated	Matsqui Island	III	A	8	3.73	Other

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
74	154		Bedrock	NW of Whonnock Lake	II	C	6	4.69	Drinking Water
75	321		Unconsolidated	Birken	III	A	9	4.6	Multiple
76	322		Unconsolidated	D'Arcy	III	B	9	7.06	Drinking Water
77	326		Unconsolidated	Pemberton	III	A	13	36.58	Multiple
78	387		Unconsolidated	Alluvial Fan of Fitzsimmons Cr., Whistler	II	B	12	2.56	Multiple
79	388		Unconsolidated	SW end of Green Lake at Nineteen Mile Cr.	II	B	12	1.25	Other
80	389		Unconsolidated	Valley from Alta Lk to Green Lk, Whistler	III	C	9	3.21	Other
81	390		Unconsolidated	W side of Green Lk opposite Parkhurst	I	A	13	0.1	Other
82	391		Bedrock	Bdrk aq above and on the NW side of valley	III	C	9	45.64	Drinking Water
83	392		Bedrock	Bdrk aq above and on the SW side of valley	III	C	10	74.01	Other
84	393		Unconsolidated	At Whistler Cr between Nita Lk and Alpha L	I	B	12	0.39	Other
85	394		Unconsolidated	Sproatt Cr Fan, w end of Alpha Lk, Whistler	III	B	7	0.12	Other
86	395		Unconsolidated	Appr 2km w of Alpha Lk at Sproatt	I	B	12	1.15	Other
87	396		Unconsolidated	Cheekye Fan	III	A	9	5.13	Other
88	397		Unconsolidated	Powerhouse Springs Mamguan R E of Squamish	III	B	9	0.18	Other
89	398		Unconsolidated	Mamquam Valley	III	A	9	6.04	Other
90	399		Unconsolidated	Squamish River Squamish to Brackendale	III	A	10	11.98	Other
91	400		Unconsolidated	Confluence - Squamish, Cheakamus, Cheekye	III	B	12	8.7	Other

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
92	401		Unconsolidated	22 km north along the Cheakamus River	II	A	13	6.42	Other
93	402		Unconsolidated	Stawamus R valley, Squamish	III	A	8	2.27	Other
94	403		Unconsolidated	Shannon Falls, south of Squamish	II	C	9	0.43	Other
95	404		Unconsolidated	Furry Creek	II	B	11	0.52	Other
96	405		Unconsolidated	D'Arcy Creek Alluvial Fan	III	A	11	1	Other
97	422		Unconsolidated	Porteau Cove, Howe Sound	II	B	9	0.14	Other
98	547		Unconsolidated	SE portion of Keats Island	III	B	11	0.72	Other
99	548		Bedrock	Keats Island	III	B	10	6.22	Multiple
100	549		Bedrock	Southwestern portion of Gambier Island	II	C	8	4.08	Multiple
101	550		Bedrock	Carmelo Point, Gambier Island	I	B	9	2.76	Multiple
102	551		Bedrock	Northeast portion of Gambier Island	III	B	8	5.77	Multiple
103	552		Unconsolidated	Langdale	II	B	10	0.6	Multiple
104	553		Unconsolidated	Soames Point	III	B	8	0.22	Drinking Water
105	554		Unconsolidated	Gibsons Landing	II	B	10	0.47	Drinking Water
106	555		Bedrock	Sechelt	II	B	12	24.74	Multiple
107	556		Unconsolidated	Chapman Creek	III	B	9	0.86	Multiple
108	557		Unconsolidated	Sargeant Bay	III	C	7	1.67	Drinking Water
109	558		Bedrock	Halfmoon Bay	II	A	13	10.32	Drinking Water
110	559		Bedrock	Mixel Lake	II	A	12	8.79	Drinking Water
111	560		Unconsolidated	Chaster Creek	II	C	9	10.04	Drinking Water
112	561		Bedrock	Kleindale	II	A	12	4.18	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
113	562		Bedrock	Sechelt	II	B	12	4.12	Drinking Water
114	563		Unconsolidated	Sechelt	III	C	7	0.36	Drinking Water
115	564		Bedrock	Porpoise Bay	II	A	10	0.42	Drinking Water
116	565		Bedrock	Francis Peninsula	III	A	8	3.71	Drinking Water
117	566		Unconsolidated	Angus Creek	III	A	9	1.26	Drinking Water
118	743		Unconsolidated	Bowen Island, Gafton Lake Valley	II	B	9	0.31	Drinking Water
119	744		Unconsolidated	Bowen Island - SW	I	B	12	0.19	Drinking Water
120	745		Bedrock	Bowen Island - North	II	A	10	10.4	Drinking Water
121	746		Bedrock	Central Bowen Island	II	B	10	14.94	Drinking Water
122	747		Bedrock	Bowen Island - South and SE	III	B	10	15.11	Drinking Water
123	748		Bedrock	Bowen Island - west	III	B	11	5.77	Drinking Water
124	749		Bedrock	Bowen Island - SW	I	B	12	4.09	Drinking Water
125	776		Bedrock	Egmont	II	A	10	1.3	Drinking Water
126	834		Unconsolidated	Savary Island	I	A	15	4.93	Multiple
127	835		Bedrock	Mermaid Cove / E of Powell River	II	B	10	2.16	Drinking Water
128	836		Unconsolidated	Powell River	II	C	8	19.65	Multiple
129	837		Unconsolidated	Powell River East	III	C	6	2.13	Drinking Water
130	838		Unconsolidated	Powell River	II	C	9	11.88	Multiple
131	839		Unconsolidated	Powell River	II	C	8	12.85	Multiple
132	840		Bedrock	Powell River	III	C	11	30.83	Multiple
133	880		Unconsolidated	Silverdale Cr, W of Mission City	II	C	10	2	Multiple
134	881		Unconsolidated	NE of Mission City	II	C	8	3.36	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
135	882		Bedrock	NE of Mission City	III	B	12	16	Multiple
136	883		Bedrock	Iron Mt, E of Whonnock Lk	II	A	8	3.87	Drinking Water
137	884		Unconsolidated	Northshore Hayward Lake to Stave Lake	II	C	10	6.64	Multiple
138	885		Bedrock	Northshore of Hayward Lake	II	C	7	1.69	Multiple
139	886		Bedrock	E of Hayward Lake, N of Hairsine Creek	II	C	7	1.92	Drinking Water
140	887		Bedrock	E of Stave Falls, Steelhead Creek	II	B	8	1.24	Drinking Water
141	888		Unconsolidated	Steelhead Valley	II	B	10	2.89	Drinking Water
142	889		Unconsolidated	N end of Hatzic Valley	II	A	9	3.04	Drinking Water
143	890		Bedrock	Mt Tom area, SE of Chilliwack	II	C	9	12.59	Multiple
144	891		Bedrock	Upper Young Cr. SE of Chilliwack	III	C	8	6.5	Drinking Water
145	892		Unconsolidated	N side of Chilliwack River Valley	II	C	10	1.07	Drinking Water
146	893		Unconsolidated	N side of Chilliwack River Valley	II	C	9	1.2	Drinking Water
147	894		Unconsolidated	N side of Chilliwack River Valley	II	C	8	1.71	Drinking Water
148	895		Unconsolidated	N side of Chilliwack River Valley	II	C	8	1.23	Drinking Water
149	896		Bedrock	E of Steelhead	II	B	7	0.75	Drinking Water
150	897		Bedrock	N shore Allouette River	II	C	6	1.33	Drinking Water
151	898		Bedrock	Westside N Allouette River	II	C	6	0.38	Drinking Water
152	899		Bedrock	Ford Creek area, SE of Chilliwack	III	B	11	8.34	Drinking Water
153	909		Unconsolidated	Indian Point - Savary Island	I	A	13	0.23	Drinking Water
154	924		Unconsolidated	Mossum Creek area near Anmore	II	C	8	3.99	Drinking Water



Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
155	925		Bedrock	Partington Creek near Port Coquitlam	II	C	9	5.42	Drinking Water
156	926		Unconsolidated	N side of Pitt River Valley	II	C	8	2.62	Drinking Water
157	927		Unconsolidated	W side of Burk Mt, E Coquitlam R. Valley	II	C	6	2.33	Drinking Water

Appendix I. Table 3. Classified aquifers in the Thompson/Cariboo Region.

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
1	74		Unconsolidated	Merritt	I	A	16	6.6	Multiple
2	75		Unconsolidated	Joeyaska	II	C	8	1.4	Drinking Water
3	76		Unconsolidated	Stumbles Creek	III	A	10	8.5	Drinking Water
4	77		Unconsolidated	Lower Nicola	II	C	8	3.6	Multiple
5	78		Unconsolidated	West End of Nicola Lake	III	A	9	1.2	Drinking Water
6	79		Unconsolidated	Lower Clapperton Cree	III	A	10	4.5	Multiple
7	80		Unconsolidated	Nicola	III	C	8	1.3	Multiple
8	96		Bedrock	Spa Creek	III	C	7	1.1	Multiple
9	97		Unconsolidated	Falkland to southwest of	II	A	13	35.9	Multiple
10	98		Unconsolidated	Lower Salmon River Valley	II	C	12	96.5	Multiple
11	99		Bedrock	Switsemalph	II	B	8	2.8	Drinking Water
12	100		Unconsolidated	Gleneden	III	C	8	6.3	Drinking Water
13	101		Bedrock	Mount Tappen	III	C	6	0.6	Drinking Water
14	108		Unconsolidated	4 kilometres southeast of	III	A	11	10.8	Multiple
15	109		Unconsolidated	Highway 97B	III	C	10	35.4	Multiple
16	110		Bedrock	Grandview Bench	III	B	8	13.5	Drinking Water
17	115		Unconsolidated	Northeast of Quesnel	II	A	14	2.5	Multiple
18	116		Unconsolidated	West of Dragon Lake	I	C	11	8.6	Multiple
19	117		Unconsolidated	Red Bluff	I	A	12	0.9	Drinking Water
20	118		Bedrock	South of Quesnel	II	B	9	6.6	Drinking Water
21	119		Unconsolidated	Higdon Creek	II	C	9	1.0	Multiple
22	120		Unconsolidated	Rich Bar to Kersley	II	C	11	33.4	Multiple
23	121		Unconsolidated	Kersley	III	A	9	1.4	Multiple
24	122		Unconsolidated	Sardine Flats	III	C	8	10.4	Drinking Water
25	123		Bedrock	Northwest of Dale Lake	III	C	7	1.2	Drinking Water
26	124	Fraser Plateau Lava	Bedrock	70 Mile House to 108 Mile Lake	III	B	11	6545.7	Multiple
27	125		Unconsolidated	Pressy Lake	III	A	10	5.4	Drinking Water
28	126	108 Mile Limestone	Bedrock	Simon Lake	III	B	13	250.7	Multiple
29	127		Bedrock	Buffalo Creek	III	B	9	17.1	Drinking Water
30	128		Unconsolidated	West end of Horse Lake	II	C	9	5.7	Drinking Water
31	129		Unconsolidated	South central shore of Horse Lake	II	B	9	1.2	Drinking Water
32	130		Unconsolidated	East end of Horse Lake	III	C	9	9.3	Drinking Water
33	131		Unconsolidated	105 Mile House	III	B	10	10.0	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
34	132		Unconsolidated	Buffalo Creek	III	C	8	22.9	Drinking Water
35	133		Unconsolidated	Cache Creek to Scottie Creek	I	C	12	16.6	Multiple
36	134		Unconsolidated	Cache Creek to north of Maiden Creek	I	A	14	15.2	Multiple
37	135		Unconsolidated	Semlin Valley	I	C	14	10.0	Multiple
38	136		Unconsolidated	Mauvais Rocher IR#5	III	C	8	3.6	Non-Drinking Water
39	137		Unconsolidated	Minton Creek	III	C	7	1.1	Drinking Water
40	138		Bedrock	Upper Missioner/Minton Creek Valleys	II	B	9	0.8	Drinking Water
41	139	Missioner Creek	Unconsolidated	Missioner Creek Valley	II	C	9	2.1	Multiple
42	140		Bedrock	North side of lower Missioner Creek Valley	II	C	7	2.6	Drinking Water
43	141		Bedrock	Between Williams Lake and Missioner Creek	III	C	8	18.1	Drinking Water
44	142		Bedrock	Southwest side of Williams Lake	II	C	7	1.6	Drinking Water
45	143		Unconsolidated	Southwest side of Williams Lake	II	C	8	0.9	Drinking Water
46	144		Unconsolidated	Southeast side of Williams Lake	II	C	7	0.4	Drinking Water
47	145		Unconsolidated	Northeast side of Williams Lake	III	C	7	1.1	Drinking Water
48	146	Williams Lake	Unconsolidated	West and northwest side of Williams Lake	I	C	11	3.0	Multiple
49	147		Unconsolidated	Hill southwest of Williams Lake townsite	I	C	9	0.4	Drinking Water
50	148		Bedrock	Between Chimney Creek and Williams Lake	III	C	9	30.7	Drinking Water
51	149		Unconsolidated	Chimney Creek Valley	III	C	8	6.8	Drinking Water
52	150		Unconsolidated	South of Williams Lake on Dog Creek Road	II	C	8	1.0	Drinking Water
53	151		Unconsolidated	Frost Creek	II	C	8	1.4	Drinking Water
54	152		Unconsolidated	South of Williams Lake on Dog Creek Road	I	C	9	0.3	Drinking Water
55	153		Bedrock	Lower Pablo Creek	III	C	7	3.8	Drinking Water
56	222		Unconsolidated	Sorrento / Notch Hill	III	C	9	14.7	Multiple
57	223		Unconsolidated	Celista	II	C	10	13.7	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
58	224		Bedrock	Eagle Bay	III	B	9	21.5	Drinking Water
59	225		Unconsolidated	Sicamous (Mara Lake)	I	B	12	1.0	Multiple
60	226		Bedrock	Scotch Creek to Anglemont	III	C	9	75.0	Multiple
61	227		Bedrock	Sorrento / Notch Hill	III	C	8	18.8	Multiple
62	228		Unconsolidated	Celista	II	A	12	2.9	Multiple
63	229		Unconsolidated	Scotch Creek	II	A	13	11.3	Multiple
64	230		Unconsolidated	Squilax / Tappen	III	A	11	17.5	Multiple
65	231		Unconsolidated	Tappen	II	C	9	6.8	Drinking Water
66	232		Unconsolidated	Tappen	III	C	10	33.8	Multiple
67	233		Bedrock	Blind Bay / White Lake	III	B	9	52.4	Drinking Water
68	234		Unconsolidated	Squilax	III	A	12	19.1	Multiple
69	235		Unconsolidated	Whitcroft	III	C	8	2.1	Multiple
70	236		Unconsolidated	Chase	III	B	10	11.9	Multiple
71	237		Unconsolidated	Chase	III	C	9	7.1	Multiple
72	249		Bedrock	Duck Range / Pritchard / Monte Lake	III	B	10	198.3	Multiple
73	250		Bedrock	Pinantan Lake / Pritchard	II	B	11	132.9	Multiple
74	251		Unconsolidated	Pritchard	III	C	9	12.3	Multiple
75	252		Unconsolidated	Monte Creek	III	C	9	4.0	Multiple
76	253		Unconsolidated	Monte Lake	III	B	9	3.1	Multiple
77	271		Unconsolidated	North Thompson River floodplain	III	A	11	7.5	Drinking Water
78	272		Bedrock	North-east of Kamloops	III	B	9	672.4	Drinking Water
79	273		Bedrock	Rose Hill / Barnhartvale / Shumway Lake	III	B	10	172.8	Multiple
80	274		Bedrock	Brigade Lake	III	B	9	76.1	Drinking Water
81	275		Bedrock	Knutsford	II	C	7	1.0	Drinking Water
82	276		Bedrock	Sugarloaf Hill southwest of Kamloops	III	B	10	64.8	Multiple
83	277		Unconsolidated	Davidson Creek	II	B	9	1.0	Drinking Water
84	278		Unconsolidated	Peterson Creek	III	A	9	2.2	Drinking Water
85	279		Unconsolidated	Buse Lake	III	C	8	5.4	Drinking Water
86	280		Unconsolidated	2 km west of Barnhartvale	II	C	8	1.4	Drinking Water
87	281		Unconsolidated	Paul Lake	II	C	8	1.3	Drinking Water
88	282		Unconsolidated	Kamloops Airport	III	A	12	23.1	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
89	283		Unconsolidated	North Thompson River north of Kamloops	III	B	11	79.2	Multiple
90	284		Unconsolidated	Pulpmill southwest of Kamloops	II	A	11	2.2	Multiple
91	285		Unconsolidated	Campbell Creek	II	B	10	3.1	Multiple
92	286		Unconsolidated	Lower South Thompson River	II	B	13	33.3	Multiple
93	287		Unconsolidated	Heffley and Edward Creek confluence	II	C	8	0.7	Drinking Water
94	288		Unconsolidated	Louis and Fraser Creek Valleys	III	C	9	26.0	Drinking Water
95	289		Unconsolidated	Westwold, Salmon River Valley	II	B	12	31.1	Multiple
96	290		Unconsolidated	Dixon and Sargent Creek Valleys	III	C	8	5.3	Drinking Water
97	291		Bedrock	Dixon, Sargent and Jet Creek Valleys	III	B	9	50.3	Drinking Water
98	292		Unconsolidated	Louis Creek and North Thompson confluence	II	B	10	2.3	Multiple
99	293		Unconsolidated	North Thompson River; north of Barriere	III	B	11	51.6	Multiple
100	294		Unconsolidated	Lower Barriere River Valley	II	B	11	11.7	Multiple
101	295		Unconsolidated	Christian Creek Valley	III	B	10	5.2	Multiple
102	296		Unconsolidated	Little Fort	II	B	9	5.4	Multiple
103	307		Unconsolidated	Malakwa	II	A	13	45.6	Drinking Water
104	308		Bedrock	West of Sicamous	III	B	7	4.7	Drinking Water
105	309		Unconsolidated	South of Sicamous	II	A	9	0.3	Drinking Water
106	323		Unconsolidated	Seton Portage	II	B	9	1.8	Drinking Water
107	324		Unconsolidated	Lillooet	III	C	9	7.3	Multiple
108	325		Unconsolidated	Lillooet	II	B	10	4.4	Multiple
109	337		Unconsolidated	Timothy Lake	II	B	9	1.7	Drinking Water
110	354		Unconsolidated	O'Keefe Valley and Grandview Flats	II	A	13	20.1	Multiple
111	359		Unconsolidated	Quesnel, west side of Fraser River	II	C	9	5.1	Drinking Water
112	360		Unconsolidated	West of Bouchie Lake, northwest of Quesnel	III	C	7	14.2	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
113	361		Unconsolidated	East of Milburn Lake and northwest of Quesnel	II	B	9	1.6	Drinking Water
114	362		Unconsolidated	North of Quesnel and south of Strathnaver	III	B	9	5.1	Drinking Water
115	363		Unconsolidated	Northwest of Quesnel and north of Bouchie Lake	III	C	8	8.7	Drinking Water
116	364		Unconsolidated	Northwest of Quesnel and west of Moose Heights	III	C	7	3.8	Drinking Water
117	365		Unconsolidated	Northwest of Quesnel and East shoreline of Bouchie L	II	C	10	9.5	Multiple
118	366		Unconsolidated	Northwest of Quesnel and east of Bouchie Lake	II	C	8	2.3	Drinking Water
119	367		Unconsolidated	Northwest of Quesnel	II	B	8	1.6	Drinking Water
120	368		Bedrock	2 km. north of Quesnel	III	C	8	33.0	Drinking Water
121	369		Unconsolidated	2 km. north of Quesnel Airport	II	C	8	1.6	Drinking Water
122	370		Unconsolidated	Area north of Quesnel	II	A	12	6.7	Multiple
123	371		Unconsolidated	East of Quesnel Airport and South of Ten Mile Lake	III	C	10	26.3	Multiple
124	372		Unconsolidated	Northwest of Ten Mile Lake, Quesnel	III	C	8	29.8	Drinking Water
125	379		Unconsolidated	Horsefly, B.C.	III	C	7	6.2	Drinking Water
126	380		Unconsolidated	14 km North of Willams Lake	III	C	8	6.7	Drinking Water
127	381		Unconsolidated	McLeese Lake. 30 km north of Willams Lake	II	C	10	6.4	Drinking Water
128	382		Unconsolidated	Soda Creek, 26 km north of Willams Lake	III	A	10	5.1	Drinking Water
129	383		Unconsolidated	Dugan Lake, 7 km north of 150 Mile House	III	B	9	14.1	Drinking Water
130	384		Unconsolidated	150 Mile House, B.C.	II	C	9	12.2	Drinking Water
131	386		Bedrock	Miocene, Northeast of 150 Mile House	III	B	9	65.6	Drinking Water
132	406		Unconsolidated	Approximately 11 km Northeast of 150 Mile House	II	C	8	1.2	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
133	423		Unconsolidated	North shore of La Hache Lake	II	B	9	12.3	Drinking Water
134	424		Unconsolidated	eastside of Bridge Lake	III	B	9	6.6	Drinking Water
135	425		Bedrock	south of Bridge Lake	III	B	10	45.5	Multiple
136	426		Unconsolidated	Eagle Creek	III	C	7	5.8	Drinking Water
137	427		Unconsolidated	southern tip of Canim Lake	II	B	9	15.7	Drinking Water
138	428		Unconsolidated	San Jose River and Knife Creek	II	C	8	1.4	Drinking Water
139	429		Unconsolidated	near Ruth Lake	III	B	8	4.3	Drinking Water
140	430		Unconsolidated	West shore of Canim Lake	III	C	7	0.9	Drinking Water
141	713		Unconsolidated	Quilchena Cr; S shore of Nicola Lake	II	A	11	3.5	Multiple
142	714		Unconsolidated	Nicola Lake Indian Reserve	II	A	10	3.2	Drinking Water
143	715		Unconsolidated	mouths of Moore and Stumplake Creeks	III	C	9	4.3	Multiple
144	716		Unconsolidated	confluence of Nicola and Thompson Rivers	III	A	13	0.8	Multiple
145	717		Unconsolidated	S of Ashcroft; E side of Thompson River	II	C	10	0.6	Multiple
146	718		Unconsolidated	Ashcroft; Ashcroft Ranch	III	B	9	3.6	Multiple
147	719		Unconsolidated	Ashcroft; W side of Thompson River	III	B	10	7.5	Drinking Water
148	724		Unconsolidated	Nicola R fldpln between Canford & Coyle	III	A	10	9.7	Drinking Water
149	725		Bedrock	s of Nicola R & Spius Cr con; W of Canford	III	B	8	8.4	Drinking Water
150	726		Unconsolidated	Nicola R & Spius Cr con; w of Canford	III	C	8	3.0	Multiple
151	727		Bedrock	Cherry Cr valley; SW of Kamloops	II	B	12	29.8	Drinking Water
152	728		Unconsolidated	Cherry Cr valley; SW of Kamloops	I	B	14	8.4	Multiple
153	766		Unconsolidated	Anahim- E of Tweedsmuir Park	III	C	8	2.5	Drinking Water
154	767		Bedrock	Anahim – east of Tweedsmuir Park	II	B	9	0.7	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
155	768		Unconsolidated	Anahim – east of Tweedsmuir Park	II	C	8	0.7	Drinking Water
156	769		Unconsolidated	Clearwater – North of Kamloops	II	A	12	9.6	Drinking Water
157	770		Unconsolidated	Clearwater – North of Kamloops	I	A	13	2.6	Multiple
158	771		Bedrock	Clearwater – North of Kamloops	II	B	8	11.3	Drinking Water
159	772		Bedrock	Clearwater – North of Kamloops	II	B	8	2.8	Drinking Water
160	773		Unconsolidated	Clearwater – North of Kamloops	II	C	9	1.7	Drinking Water
161	777		Unconsolidated	Deadman Valley NW of Kamloops	III	B	11	7.2	Drinking Water
162	807		Unconsolidated	N Thompson River	II	B	12	16.6	Drinking Water
163	819		Unconsolidated	Highland Valley – W. of Logan Lk	I	C	12	6.1	Multiple
164	820		Unconsolidated	Highland Valley – W of Logan Lk	I	C	12	6.0	Multiple
165	821		Unconsolidated	Highland Valley – W of Logan Lk	I	C	12	14.1	Multiple
166	822		Unconsolidated	Logan Lake / SW of Kamloops	I	C	11	0.6	Multiple
167	823		Unconsolidated	Logan Lake / SW of Kamloops	III	C	7	0.8	Drinking Water
168	824		Unconsolidated	Highland Valley near Award Creek	II	C	10	0.8	Multiple
169	825		Unconsolidated	Blue River- S of Valemont	II	A	11	8.5	Multiple
170	826		Unconsolidated	Guichon Creek –S of Kamloops	II	A	10	0.7	Drinking Water
171	827		Unconsolidated	South of Mamit Lake	III	C	8	2.1	Drinking Water
172	829		Unconsolidated	Wells	III	C	8	0.9	Drinking Water
173	830		Unconsolidated	S of Bella Coola R./ E of Bella Coola	II	A	10	2.8	Drinking Water
174	831		Unconsolidated	S of Bella Coola R./ E of Bella Coola	II	A	12	1.1	Multiple
175	832		Unconsolidated	S of Bella Coola R./ E of Bella Coola	II	A	11	3.5	Multiple



Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
176	833		Unconsolidated	S of Bella Coola R. /E of Nusatsum R.	II	A	9	2.2	Drinking Water
177	866		Bedrock	Ashby Point, Shuswap Lake	II	B	8	1.9	Multiple
178	867		Unconsolidated	Ashby Point, Shuswap Lake	II	A	11	0.3	Multiple
179	868		Unconsolidated	W of Paradise Point, Shuswap Lake	II	C	9	0.2	Drinking Water
180	869		Bedrock	W of Paradise Point, Shuswap Lake	II	B	9	0.5	Multiple
181	870		Unconsolidated	Knight Cr. at Paradise Point, Shuswap Lake	I	B	11	0.2	Drinking Water
182	871		Bedrock	Lower Canoe Cr, E side of valley	III	B	8	2.1	Drinking Water
183	872		Unconsolidated	Canoe Creek, at Shuswap Lake	II	B	8	0.8	Multiple
184	911		Bedrock	N of Deka Lake and E of 100 Mile House	II	C	7	1.7	Drinking Water
185	912		Unconsolidated	W of Bridge Lk /SEof 100 Mile House	II	C	8	1.0	Drinking Water
186	913		Unconsolidated	S of Deka Lake and E of 100 Mile House.	II	C	8	1.6	Drinking Water
187	914		Unconsolidated	SW of Deka Lake and E of 100 Mile House.	II	C	8	0.8	Drinking Water
188	915		Bedrock	Sulphurous Lake / E of 100 Mile House	II	C	7	1.2	Drinking Water
189	916		Unconsolidated	N of Sulphurous Lake/ E of 100 Mile House	II	C	9	0.4	Multiple
190	918		Unconsolidated	N of Bridge Lake / E of 100 Mile House	III	C	7	4.8	Drinking Water
191	919		Bedrock	NE of Bridge Lake/ E of 100 Mile House	II	C	8	0.8	Drinking Water
192	920		Unconsolidated	Kelly Lake/ SWof Clinton	II	B	9	6.6	Drinking Water
193	921		Unconsolidated	Clinton	III	C	8	4.1	Drinking Water
194	922		Bedrock	3 Mile Lake / SE of Clinton	II	A	9	0.6	Drinking Water

**Appendix I. Table 4. Classified unconsolidated aquifers in the Kootenay/Okanagan Region.**

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
1	102		Unconsolidated	Hullcar	II	C	11	15.1	Multiple
2	103		Unconsolidated	Parkinson Lake	II	A	12	11.7	Drinking Water
3	104		Bedrock	1 kilometre northwest of Hullcar	II	B	9	1.0	Domestic
4	105		Bedrock	Hillcrest	III	B	6	1.7	Domestic
5	106		Bedrock	Southwest of Leduc Creek	III	C	7	16.9	Domestic
6	107		Bedrock	Gardom Lake to Enderby	II	B	9	21.4	Domestic
7	108		Unconsolidated	4 kilometres southeast of Salmon Arm	III	A	11	10.8	Multiple
8	109		Unconsolidated	Highway 97B	III	C	10	25.4	Multiple
9	110		Bedrock	Grandview Bench	III	B	8	13.5	Domestic
10	111		Unconsolidated	Lower Shuswap River Valley	II	C	11	140.0	Multiple
11	112		Bedrock	2 kilometres northeast of Enderby	III	C	7	2.7	Domestic
12	113		Unconsolidated	Ashton Creek	III	C	9	11.5	Multiple
13	114		Unconsolidated	South of Mara Lake	III	A	9	3.5	Domestic
14	158		Unconsolidated	Grand Forks	I	A	17	38.0	Multiple
15	193	Osoyoos West	Unconsolidated	Osoyoos West	II	A	16	13.3	Multiple
16	194	Osoyoos East	Unconsolidated	Osoyoos East	II	A	15	4.0	Multiple
17	195	Osoyoos East Confined	Unconsolidated	Osoyoos East	II	B	10	0.53	Drinking Water
18	225		Unconsolidated	Sicamous(Mara Lake)	I	B	12	1.0	Multiple
19	238		Bedrock	Spotted Lake, Osoyoos	III	C	7	0.62	Domestic
20	248		Bedrock	Spotted Lake, Osoyoos	III	C	7	0.52	Domestic

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
21	254		Unconsolidated	Osoyoos Lake to southwest of Tug Lake	I	A	16	22.3	Multiple
22	255		Unconsolidated	North of Tug Lake to Vaseux Lake	I	A	15	10.7	Multiple
23	256		Unconsolidated	Testalinden Creek to Reed Creek	III	C	9	15.9	Drinking Water
24	257		Unconsolidated	Meyers Flat	II	A	14	5.2	Multiple
25	258		Unconsolidated	Richter Pass	II	C	10	7.6	Multiple
26	259		Unconsolidated	US Border to Princeton	II	A	14	119.8	Multiple
27	260		Bedrock	Marron Valley northwest of Okanagan Falls	II	B	11	54.7	Domestic
28	261		Unconsolidated	Marron Valley northwest of Okanagan Falls	II	B	11	3.1	Multiple
29	262		Unconsolidated	White Lake Basin 35 km south of Penticton	III	A	9	1.2	Non-Drinking Water
30	263		Bedrock	North of Okanagan Falls/ shore of Skaha Lk	II	A	9	8.4	Domestic
31	264		Unconsolidated	Okanagan Falls and east of Okanagan Falls	II	B	11	9.1	Multiple
32	265		Unconsolidated	Between OK Falls and Vaseux Lk	II	B	11	4.7	Multiple
33	266		Unconsolidated	Stafford Creek southwest of Penticton	III	C	8	2.7	Drinking Water
34	267		Unconsolidated	Shingle Creek	II	B	11	6.8	Drinking Water
35	268		Bedrock	Penticton East and east shore of Skaha Lk.	II	B	10	26.0	Domestic

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
36	269		Bedrock	Ellis Creek	II	B	9	10.5	Domestic
37	270		Unconsolidated	Ellis Creek	II	B	12	4.7	Multiple
38	297		Unconsolidated	Summerland, Trout Creek	III	B	11	2.6	Drinking Water
39	298	Naramata	Bedrock	Naramata	II	B	10	203	Domestic
40	299	Faulder	Unconsolidated	Faulder (Meadow Valley)	III	C	10	7.8	Multiple
41	300	Faulder	Bedrock	Faulder (Eneas Creek)	II	C	12	55.1	Domestic
42	301	Shannon Lake	Unconsolidated	Shannon Lake	II	B	10	1.1	Drinking Water
43	302	South of Westbank, B.C.	Unconsolidated	South of Westbank adjacent to Okanagan Lk.	II	B	10	1.6	Drinking Water
44	303	Southeast of Westbank	Unconsolidated	Southeast of Westbank adj. to Okanagan Lk.	III	B	8	2.1	Drinking Water
45	304	Westbank	Bedrock	West side of Okanagan Lk, west of Kelowna	II	B	9	19.4	Domestic
46	305	Westbank	Bedrock	West side of Okanagan Lk, west of Kelowna	II	B	9	23.3	Domestic
47	306	East of Westbank	Unconsolidated	East of Westbank, parallel to Mt. Boucher	II	C	8	3.6	Drinking Water
48	310		Unconsolidated	Creighton Valley, Southeast of Lumby	III	B	8	3.4	Domestic
49	311		Unconsolidated	South of Cherryville	II	C	9	5.9	Domestic
50	312		Bedrock	Cherryville	III	C	8	45.6	Domestic
51	313		Bedrock	Cherryville	III	B	8	14.7	Domestic
52	314		Unconsolidated	Lumby	III	C	10	6.4	Multiple
53	315		Unconsolidated	Bessette Creek Southwest of Lumby	II	A	10	4.1	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
54	316		Unconsolidated	Lumby	III	A	9	23.6	Drinking Water
55	317		Unconsolidated	Lumby	III	C	9	25.2	Multiple
56	318		Unconsolidated	Northeast of Lumby	III	C	9	21.2	Multiple
57	319		Unconsolidated	North of Lumby	II	B	11	7.4	Multiple
58	344		Unconsolidated	Ellison Lake to Wood Lake	I	B	13	8.7	Multiple
59	345		Unconsolidated	Oyama	II	A	14	1.8	Multiple
60	346		Unconsolidated	Kalamalka Lake to Vernon	I	A	13	0.91	Multiple
61	347		Unconsolidated		I	C	12	6.0	Multiple
62	348		Unconsolidated	Just north of Vernon to north of Swan Lake	II	C	10	11.1	Multiple
63	349		Unconsolidated	Northeast of Vernon along BX Creek	II	C	8	15.6	Multiple
64	350		Bedrock	NE of Vernon and to the south of BX Creek	II	C	9	4.4	Multiple
65	351		Bedrock	NE of Vernon and to the north of BX Creek	II	C	9	21.8	Multiple
66	352		Unconsolidated	Coldstream Valley. E of Lavington to W	II	C	11	15.0	Multiple
67	353		Unconsolidated	SE of Armstrong	I	A	14	6.8	Multiple
68	354		Unconsolidated	O'Keefe Valley and Grandview Flats	II	A	13	14.5	Multiple
69	355		Bedrock	West of Deep Creek, NW of Armstrong	III	C	6	15.1	Domestic
70	356		Unconsolidated	Mouth of Deep Creek	III	B	7	3.4	Multiple
71	357		Unconsolidated	Whiteman Creek Fan	II	A	11	2.6	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
72	358		Unconsolidated	Fintry Fan, Short Creek	II	A	11	0.95	Drinking Water
73	439		Unconsolidated	Jim Smith Lake	I	C	9	0.7	Domestic
74	445		Unconsolidated	NW of Cranbrook; near Hospital Creek	II	C	8	2.9	Domestic
75	446		Unconsolidated	Booth Creek, NW of Cranbrook	II	C	8	1.6	Domestic
76	450		Unconsolidated	Nicholson; Stacey Ck. Fan and South	II	B	8	3.3	Domestic
77	452		Unconsolidated	E. of Invermere; E. side of Columbia R.	II	C	8	1.0	Multiple
78	453		Unconsolidated	Windermere; E. side of Windermere LK.	II	B	10	5.8	Multiple
79	454		Unconsolidated	S. of Golden; across R. from Nicholson	II	A	10	4.0	Domestic
80	455		Unconsolidated	Hospital Creek near Golden	II	B	8	0.9	Domestic
81	456		Unconsolidated	Golden, confluence of 2 rivers	II	B	12	10.2	Multiple
82	457		Unconsolidated	NE of Invermere; E. side of River	II	C	8	0.5	Multiple
83	458		Unconsolidated	Fairmont Hotsprings; W. side of R.	III	C	9	2.0	Domestic
84	459		Unconsolidated	Fairmont Hot Springs	II	A	12	3.3	Multiple
85	460		Unconsolidated	Madias Ck.; N. of Fairmont Hotsprings	II	B	8	1.6	Domestic
86	461		Unconsolidated	Upper Mission Creek	III	B	9	15.1	Drinking Water
87	462		Unconsolidated	1 km south of Mission Ck	III	A	9	3.7	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
88	463		Unconsolidated	S, E, NE of Kelowna; S & E side of valley	I	C	14	64.2	Multiple
89	464		Unconsolidated	Valley bottom S, E, NE of Kelowna	I	C	14	68.0	Multiple
90	465		Unconsolidated	S. Kelowna; possibly E. to Rutland	III	C	5	0.32	
91	466		Unconsolidated	6 km SE of Kelowna	III	A	10	0.23	Drinking Water
92	467		Unconsolidated	East Kelowna and Rutland area	II	A	13	10.3	Multiple
93	468		Unconsolidated	2 km N of Kelowna; Clifton Rd. area	I	C	12	0.15	Drinking Water
94	469		Unconsolidated	Glenmore Valley, N. of Kelowna	III	C	9	12.4	Multiple
95	470		Bedrock	Kelowna north to Ellison Lake	III	B	10	3.7	Multiple
96	471		Bedrock	West of Ellison Lake	III	B	9	7.4	Multiple
97	472		Bedrock	Southeast of Ellison Lake	III	B	9	4.1	Domestic
98	473		Bedrock	Mission, Daves & Cardinal Ck area	II	C	8	39.4	Domestic
99	474		Unconsolidated	Kettle Valley - Rock Creek	III	A	11	0.7	Multiple
100	475		Bedrock	Bedrock slope north of Rock Creek	III	C	7	0.7	Domestic
101	476		Unconsolidated	Low lying area northeast of Rock Creek	II	C	8	0.4	Domestic
102	477		Unconsolidated	Kettle R., eastward from Rock Ck.	II	A	13	5.8	Multiple
103	478		Unconsolidated	Midway	II	A	13	3.6	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
104	479		Unconsolidated	Kettle River Valley near Christina Lake	III	B	9	9.7	Domestic
105	480		Unconsolidated	South end of Christina Lk.	III	A	11	0.9	Multiple
106	481		Unconsolidated	Kettle River Valley at West ridge	III	B	11	6.1	Multiple
107	482		Unconsolidated	Kettle river Valley near Beaverdell	III	A	11	15.9	Multiple
108	483		Unconsolidated	Trail Townsite	II	B	10	1.3	Domestic
109	484		Unconsolidated	Waneta Junction/southeast of Trail	II	C	9	0.6	Domestic
110	485		Unconsolidated	Southwest of the Village of Montrose	II	B	9	0.1	Domestic
111	486		Bedrock	Columbia Gardens northwards to Kelly Ck.	II	B	9	21.1	Domestic
112	487		Unconsolidated	Goat River Floodplain near Creston	III	A	11	12.1	Multiple
113	488		Bedrock	Lister, South of Creston	II	C	8	77.2	Domestic
114	489		Unconsolidated	Canyon, SE of Creston	IIIC	C	7	2.1	Domestic
115	490		Unconsolidated	Rykerts Lake	II	A	11	0.7	Multiple
116	491		Unconsolidated	Southern area of the Moyie R.	III	A	11	3.3	Domestic
117	492		Unconsolidated	Yahk	II	A	11	1.4	Multiple
118	493		Bedrock	Ross Spur, North	II	B	10	6.7	Domestic
119	494		Bedrock	Ross Spur, South	II	B	10	20.4	Domestic
120	495		Bedrock	Fruitvale Creek	II	B	9	11.1	Domestic
121	496		Unconsolidated	Salmo River	II	A	10	15.0	Domestic



Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
122	497		Unconsolidated	Erie 1, Salmo	II	B	10	1.3	Domestic
123	498		Unconsolidated	Erie 2, Salmo	III	B	9	1.0	Domestic
124	499		Bedrock	Alice Siding, north of Creston	II	B	9	12.0	Domestic
125	500		Bedrock	Blueberry, between China Ck. and Kinnaird	III	B	8	14.0	Domestic
126	501		Unconsolidated	Lower China Creek	III	A	11	1.3	Domestic
127	502		Unconsolidated	Robson - North	II	B	9	1.4	Domestic
128	503		Unconsolidated	Robson - South	II	B	11	0.3	Multiple
129	504		Unconsolidated	Raspberry Village	II	A	10	1.2	Domestic
130	505		Unconsolidated	Castlegar Townsite North	II	B	9	1.9	Domestic
131	506		Unconsolidated	Brilliant - North	III	B	10	0.8	Multiple
132	507		Unconsolidated	Airport Creek	II	A	12	1.9	Domestic
133	508		Unconsolidated	Selkirk Colledge, Southeast of Castlegar	II	B	11	1.3	Multiple
134	509		Unconsolidated	Castlegar - South	II	B	10	2.1	Domestic
135	510		Unconsolidated	Castlegar - Airport	II	B	10	6.6	Domestic
136	511		Bedrock	Fortynine Creek	III	B	9	11.1	Domestic
137	512		Bedrock	Falls Creek near West Arm, Kootenay Lake	III	B	10	28.8	Domestic
138	513		Bedrock	Krestova B. R.	III	B	7	5.1	Domestic
139	514		Unconsolidated	Crescent Valley	II	B	11	13.8	Multiple
140	515		Unconsolidated	Krestova - Surficial	III	A	8	0.8	Domestic
141	516		Unconsolidated	Willow Point	II	A	12	0.8	Multiple
142	517		Unconsolidated	Roberts Bay - Cedar Point	II	B	10	2.8	Multiple
143	518		Bedrock	Mt. Nelson	III	C	7	1.6	Domestic

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
144	519		Unconsolidated	Baynes Lake - East 1	III	C	9	3.6	Domestic
145	520		Unconsolidated	Baynes Lake - East 2	III	A	11	4.9	Domestic
146	521		Unconsolidated	Jaffray	I	A	12	5.2	Domestic
147	522		Unconsolidated	Rosen Lake - South	III	A	10	0.3	Domestic
148	523		Bedrock	Cranbrook S., B. R.	I	B	11	28.5	Domestic
149	524		Unconsolidated	Cranbrook, Surficial	II	A	13	12.7	Domestic
150	525		Unconsolidated	Cranbrook - West	II	C	11	13.3	Multiple
151	526		Unconsolidated	Cranbrook - East	II	B	11	10.8	Multiple
152	527		Unconsolidated	Bull River	II	B	11	2.4	Multiple
153	528		Unconsolidated	Wardner	III	A	13	5.9	Domestic
154	529		Bedrock	Wardner B.R.	III	B	9	5.1	Domestic
155	530		Unconsolidated	Rosen Lake - North	II	C	9	0.3	Domestic
156	531		Unconsolidated	Tie Lake	II	B	10	0.2	Domestic
157	532		Unconsolidated	Elk River	II	C	9	2.6	Domestic
158	533		Unconsolidated	Fernie - South	II	C	9	2.9	Domestic
159	534		Bedrock	Fernie S. B. R.	III	C	7	1.2	Domestic
160	535		Bedrock	Cranbrook N., B. R.	III	B	10	84.8	Domestic
161	536		Bedrock	Wycliffe	II	B	10	32.4	Domestic
162	537		Bedrock	Kimberley, B.R.	II	B	10	21.9	Domestic
163	538		Unconsolidated	St. Mary River IR	III	A	13	10.3	Domestic
164	539		Unconsolidated	Mather Creek	III	C	8	0.4	Domestic
165	540		Unconsolidated	Wasa Lake	I	A	12	10.6	Multiple
166	541		Unconsolidated	Ta Ta Creek	III	C	9	3.0	Multiple
167	542		Unconsolidated	North of Wasa Lake	III	B	7	4.1	Domestic
168	543		Unconsolidated	Skookumchuk S.	III	B	11	23.0	Multiple
169	544		Unconsolidated	Skookumchuk E.	II	A	10	0.5	Domestic
170	545		Unconsolidated	NE of Skookumchuck	III	B	10	6.3	Domestic

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
171	546		Unconsolidated	Moyie River - South near Glenlily	III	A	10	3.2	Domestic
172	567		Unconsolidated	Madias Ck. Fan; N. of Fairmont Hotsprings	II	C	8	0.5	Multiple
173	568		Unconsolidated	Shuswap Ck. area; NE of Invermere	II	B	8	0.8	Domestic
174	600		Unconsolidated	Horse Creek Fan S. of Nicholson	II	A	10	2.4	Domestic
175	601		Unconsolidated	5 km S. of Radium Hot Springs	II	B	7	0.1	Multiple
176	602		Unconsolidated	from Radium towards Columbia River	II	A	10	1.5	Multiple
177	603		Unconsolidated	Invermere 3km N and S	II	A	12	4.9	Multiple
178	801		Unconsolidated	Revelstoke – West	II	C	8	0.8	Domestic
179	802		Unconsolidated	Revelstoke – South	II	A	12	2.2	Multiple
180	803		Unconsolidated	Revelstoke – Townsite	III	A	8	0.6	Non-Drinking Water
181	804		Bedrock	Shuswap River-east of Enderby	II	C	7	5.7	Domestic
182	805		Bedrock	West of Mabel Lake – East of Enderby	II	B	9	2.3	Domestic
183	806		Unconsolidated	Shuswap River - east of Enderby	II	B	8	1.7	Domestic
184	808		Bedrock	East of Osoyoos, Anarchist Mountain	II	B	11	10.8	Multiple
185	809		Unconsolidated	East of Osoyoos, Nine Mile Creek	III	C	7	2.9	Multiple
186	810		Bedrock	East of Osoyoos	II	C	6	2.8	Domestic

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
187	811		Unconsolidated	North of Grand Forks	II	B	11	2.0	Multiple
188	812		Bedrock	North of Grand Forks	II	B	9	1.7	Multiple
189	813		Bedrock	North of Grand Forks	III	B	8	1.5	Domestic
190	814		Bedrock	North of Grand Forks	II	B	7	0.8	Domestic
191	815		Unconsolidated	North of Grand Forks	III	A	12	3.0	Multiple
192	816		Unconsolidated	Canal Flats	II	A	13	7.3	Multiple
193	817		Unconsolidated	NE of Edgewater, Columbia River Valley	II	C	8	2.7	Domestic
194	849	Fortune Creek	Unconsolidated	NE of Armstrong	II	B	9	13.9	Domestic
195	860		Unconsolidated	Mouth of Peachland Creek, SW of Peachland	I	A	12	0.1	Multiple
196	861		Bedrock	Lower Peachland Creek watershed	II	B	10	7.0	Domestic
197	862		Unconsolidated	Mouth of Trepanier Creek NE of Peachland	III	C	9	1.5	Domestic
198	863		Bedrock	N Trepanier Creek Valley N of Peachland	II	B	11	8.8	Multiple
199	864		Unconsolidated	Trepanier Cr. and Jack Cr, N of Peachland	II	C	10	1.1	Multiple
200	873		Unconsolidated	Edgewood	II	A	11	3.9	Multiple
201	874		Unconsolidated	Edgewood	II	B	11	1.8	Multiple
202	875		Unconsolidated	S of Radium, E side of Columbia Valley	II	C	8	0.2	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
203	876		Unconsolidated	Dry Gulch Creek, E side of Columbia Valley	III	C	8	0.9	Multiple
204	877		Unconsolidated	Stoddart Creek, E side of Columbia Valley	III	C	7	1.7	Domestic
205	878		Unconsolidated	Wilmer	II	C	8	0.7	Domestic
206	879		Bedrock	Lillian Lake, NW of Wilmer Creek	III	B	9	12.2	Domestic

Appendix I. Table 5. Classified aquifers in the Skeena/Omineca/Peace Region.

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
1	82		Unconsolidated	12 kilometres northeast of Prince George	II	C	7	1.97	Drinking Water
2	83		Unconsolidated	10 kilometres northeast of Prince George	III	C	8	3.08	Drinking Water
3	85		Unconsolidated	West of South end of Tabor Lk.	III	C	7	5.14	Drinking Water
4	86	Pineview	Unconsolidated	Pineview to Buckhorn	III	C	11	84.38	Drinking Water
5	87		Unconsolidated	Miller to Tabor	III	B	9	9.84	Drinking Water
6	90		Unconsolidated	Beaverley	III	C	10	46.66	Multiple
7	92		Unconsolidated	Lower Nechaco River Valley	I	A	15	50.68	Multiple
8	94		Unconsolidated	Hart Highlands	III	A	9	11.03	Multiple
9	95		Unconsolidated	Shady Valley	III	C	7	2.11	Drinking Water
10	240		Unconsolidated	Vanderhoof	III	A	11	28.36	Drinking Water
11	242		Unconsolidated	Vanderhoof	III	C	11	332.15	Drinking Water
12	244		Unconsolidated	Vanderhoof	III	A	11	40.19	Drinking Water
13	245		Unconsolidated	Vanderhoof	III	C	8	18.24	Drinking Water
14	246		Unconsolidated	Vanderhoof	III	C	9	184.93	Drinking Water
15	247		Unconsolidated	Vanderhoof	III	C	8	7.04	Drinking Water
16	327		Unconsolidated	Prince George	II	A	9	3.38	Drinking Water
17	328		Unconsolidated	Prince George	III	C	8	20.44	Drinking Water
18	329		Unconsolidated	Prince George	III	C	7	45.77	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
19	330		Unconsolidated	Prince George	III	C	8	5.94	Drinking Water
20	331		Unconsolidated	Prince George	III	C	8	7.68	Drinking Water
21	332		Unconsolidated	Prince George	III	C	10	309.67	Drinking Water
22	333		Unconsolidated	Hixon	III	A	10	23.44	Multiple
23	334		Unconsolidated	Hixon	III	A	9	0.61	Drinking Water
24	335		Unconsolidated	Hixon	III	C	9	108.02	Multiple
25	336		Unconsolidated	Hixon	III	C	7	3.23	Drinking Water
26	338		Unconsolidated	McLeod Lake	III	C	8	5.54	Drinking Water
27	340		Unconsolidated	East of Vanderhoof / north of PG	III	A	7	1.54	Other
28	341		Unconsolidated	East of Vanderhoof / north of PG	III	B	8	3.61	Drinking Water
29	342		Unconsolidated	East of Vanderhoof / north of PG	III	A	10	2.65	Drinking Water
30	343		Unconsolidated	East of Vanderhoof / north of PG	II	C	8	34.73	Drinking Water
31	362		Unconsolidated	North of Quesnel and south of Strathnaver	III	B	9	5.07	Drinking Water
32	373		Unconsolidated	Ft. St. James at mouth of Stuart Lk.	II	C	15	14.08	Drinking Water
33	376		Unconsolidated	Ft. St. James south of Stuart Lk.	II	C	6	2.06	Drinking Water
34	377		Unconsolidated	Ft. St. James west of Stuart Lk.	III	C	7	11.92	Drinking Water
35	378		Unconsolidated	Ft. St. James - east of Stuart River	II	C	5	0.9	Drinking Water
36	385		Unconsolidated	4.5 km. sw of McKenzie	I	C	12	20.35	Multiple
37	431		Unconsolidated	McKenzie	I	A	12	1.45	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
38	432		Unconsolidated	McKenzie	II	A	11	3.08	Multiple
39	433		Unconsolidated	McLeod Lake	II	B	11	10.26	Multiple
40	434		Unconsolidated	Appr 6km NE of Tudyah Lakes	III	B	9	15.2	Drinking Water
41	440		Unconsolidated	Hudson Hope	III	C	8	9.01	Drinking Water
42	442		Unconsolidated	3.5 km west of Taylor	II	A	12	1.94	Drinking Water
43	443		Unconsolidated	Taylor townsite N. of Peace R.	III	B	6	11.93	Other
44	444		Unconsolidated	2 km west of Ft. St. John	III	B	8	1.52	Drinking Water
45	569		Unconsolidated	Confluence of Telkwa and Bulkley Rivers	II	C	7	2.4	Drinking Water
46	570		Unconsolidated	Terrace - SE; Jack Pine Flats	II	A	10	4.92	Drinking Water
47	571		Unconsolidated	E. of Terrace - Thornhill; E. of River	II	A	11	6.81	Drinking Water
48	572		Unconsolidated	E. of Terrace - Thornhill; E. side of R.	II	C	9	6.36	Drinking Water
49	573		Unconsolidated	Terrace North	II	C	9	13.57	Drinking Water
50	574		Unconsolidated	Gossan Creek; E. of Terrace	II	A	9	1.07	Drinking Water
51	575		Unconsolidated	Terrace South	I	B	10	9.87	Drinking Water
52	576		Unconsolidated	S. of Telkwa; SE side of Telkwa River	II	C	11	4.99	Multiple
53	577		Unconsolidated	E. of Smithers; E. side of Bulkley River	II	C	9	13.7	Drinking Water



Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
54	581		Unconsolidated	S of Telkwa & Bulkley R. confluence	III	C	9	26.64	Drinking Water
55	582		Unconsolidated	Confluence of Telkwa & Bulkley R	II	B	9	0.83	Drinking Water
56	583		Unconsolidated	East side of Telkwa River	II	A	10	2.47	Drinking Water
57	584		Unconsolidated	Smithers - North; E. side of Bulkley River	II	C	10	20.74	Drinking Water
58	585		Unconsolidated	Smithers - South; W. side of Bulkley River	II	C	10	9.8	Drinking Water
59	586		Unconsolidated	Smithers; Between Beavery & John Brown Cks	II	C	7	0.58	Drinking Water
60	587		Unconsolidated	Smithers - East; E. side of Bulkley River	III	C	7	2.68	Drinking Water
61	588		Unconsolidated	Terrace - West; Kitsumkalum I.R	II	A	11	0.64	Drinking Water
62	590		Unconsolidated	South Groundbirch	III	C	11	49.28	Drinking Water
63	592		Unconsolidated	Willow Valley near Sunset Prairie	III	C	11	56.74	Drinking Water
64	594		Unconsolidated	Groundbirch Buried Channel	III	C	10	53.14	Drinking Water
65	596		Unconsolidated	Progress	III	C	14	125.2	Drinking Water
66	597		Unconsolidated	Arras Buried Channels	III	C	10	40.46	Drinking Water
67	598		Unconsolidated	Pouce Creek	III	A	9	2.49	Drinking Water
68	624		Unconsolidated	Wildmore Ck.; Chetwind - Groundbirch	II	C	8	0.86	Drinking Water
69	625		Unconsolidated	Bissett Ck. SW of Chetwynd	II	B	9	0.84	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
70	626		Unconsolidated	N. of Pine River; Chetwynd area	II	C	8	2.88	Other
71	628		Unconsolidated	Chetwyn; N. of Pine R.	II	B	8	1.55	Drinking Water
72	629		Unconsolidated	Chetwynd area	II	B	8	0.53	Drinking Water
73	630		Unconsolidated	Jackfish Lake	III	C	8	7.02	Multiple
74	635		Unconsolidated	SW of Tumbler Ridge townsite	II	A	15	1.71	Multiple
75	636		Unconsolidated	Goodlow; E. of Ft. St. John	III	C	8	3.9	Drinking Water
76	637		Unconsolidated	Between Prespatou & Umbach Cks.	III	B	11	48.54	Drinking Water
77	638		Unconsolidated	Between Snyder & Buic Cks.	III	C	8	20.35	Drinking Water
78	640		Unconsolidated	E. of Tumbler Ridge; N. of Flatbed Ck.	III	A	11	2.55	Drinking Water
79	641		Unconsolidated	Between Francois and Tchesinkut Lakes	III	C	7	15.77	Drinking Water
80	643		Unconsolidated	Endako; N. of Endako R.	II	C	10	2.69	Multiple
81	645		Unconsolidated	Gerow Isl. and South shore of Burns Lk.	I	C	11	2.97	Multiple
82	647		Unconsolidated	East shore of Decker Lake	II	C	8	3.62	Drinking Water
83	648		Unconsolidated	N. of Decker Lake	II	C	9	7.12	Drinking Water
84	649		Unconsolidated	N. shore of Burns Lk.	I	B	13	3.76	Drinking Water
85	653		Unconsolidated	Rose Lk.; NW of Burns Lk.	II	B	9	1.72	Drinking Water
86	655		Unconsolidated	NE of Huston; W. of Topley	II	B	11	12.46	Multiple
87	656		Unconsolidated	Topley Landing west of Babine Lk.	III	C	8	0.87	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
88	657		Unconsolidated	Confluence of Nechako & Cheslatta Rivers	III	B	10	0.82	Other
89	659		Unconsolidated	S. of Bulkley R. nr. Houston	I	A	15	11.84	Multiple
90	660		Unconsolidated	S. of Bulkley R. nr. Houston	II	C	10	6.05	Multiple
91	666		Unconsolidated	N. shore Stuart Lk.; NW of Ft. St. James	II	C	8	2.66	Drinking Water
92	667		Unconsolidated	W. end of Fraser Lk.; W. bank of Perry Ck.	III	C	6	0.82	Drinking Water
93	668		Unconsolidated	Stellako; W. end of Fraser Lk.	III	C	6	2	Drinking Water
94	669		Unconsolidated	W. end of Fraser Lk.; S. bank of Endako R	III	C	6	4.54	Drinking Water
95	670		Unconsolidated	SW side of Fraser Lake	III	C	6	2.92	Drinking Water
96	671		Unconsolidated	SW side of Dry William Lk; S of Fraser Lk	III	C	6	0.2	Drinking Water
97	676		Unconsolidated	South of Mathews Lk. west of Houston	III	C	6	1.13	Drinking Water
98	677		Unconsolidated	North of Houston / NW of Bulkley River	II	C	8	4.84	Drinking Water
99	679		Unconsolidated	N. of Cheslatta R.; S. of Francois Lk.	III	C	8	19.64	Drinking Water
100	687		Unconsolidated	Taylor Flats; SE of Ft. St. John	II	B	10	1.03	Drinking Water
101	690		Unconsolidated	Clayhurst area	III	B	9	23.79	Drinking Water
102	774		Unconsolidated	Upland area SW of Houston	II	C	8	3.51	Drinking Water
103	789		Unconsolidated	SW of Terrace along Skeena River	III	A	9	1.08	Drinking Water
104	790		Unconsolidated	South of Terrace	III	A	9	0.64	Multiple

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
105	791		Unconsolidated	South of Terrace, near Terrace Airport	III	C	9	3.13	Multiple
106	792		Unconsolidated	West shore of Lakelse Lk.	III	C	7	0.65	Drinking Water
107	793		Unconsolidated	East shore of Lakelse Lake	III	A	9	2.15	Drinking Water
108	794		Unconsolidated	South of Lakelse Lake	III	A	11	11.71	Drinking Water
109	795		Unconsolidated	Two Mile NW of New Hazelton	II	B	10	0.63	Multiple
110	796		Unconsolidated	New Hazelton	II	C	11	0.57	Multiple
111	797		Unconsolidated	Kispiox Village	II	A	10	1.21	Other
112	798		Unconsolidated	North of Kispiox Village	III	C	7	0.37	Drinking Water
113	799		Unconsolidated	Valemont	III	C	9	7.48	Multiple
114	800	South Valemont	Unconsolidated	Valemont	II	B	9	17.64	Multiple
115	818		Unconsolidated	South of Lakelse Lake	III	C	9	0.63	Multiple
116	828		Unconsolidated	Dease Lake	III	B	10	6.54	Multiple
117	81		Bedrock	14 kilometres northeast of Prince George	III	C	8	6.61	Drinking Water
118	84		Bedrock	North and west of Tabor Lake	II	C	8	4.88	Drinking Water
119	88		Bedrock	College Heights	III	B	6	3.22	Drinking Water
120	89		Bedrock	Vanway South	II	C	8	7.54	Drinking Water
121	91		Bedrock	Northwest of Beaverley	II	C	8	4.61	Drinking Water
122	93		Bedrock	Cranbrook Hill	III	B	8	9.59	Multiple
123	239		Bedrock	Fraser Lake	III	C	9	48.93	Drinking Water
124	241		Bedrock	Vanderhoof	III	C	8	15.61	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
125	243		Bedrock	Vanderhoof	III	C	9	374.99	Drinking Water
126	339		Bedrock	East of Vanderhoof / north of PG	III	C	7	29.03	Drinking Water
127	374		Bedrock	Ft.St.James bounded by Stuart Lk.and Pitka	II	C	6	19.15	Drinking Water
128	375		Bedrock	Ft St James bound by Necoslie R and Stuart	II	C	6	3.56	Drinking Water
129	441		Bedrock	Lynx Ck.; 7 km NE of Hudson Hope	III	B	10	10.17	Drinking Water
130	448		Bedrock	Clayhurst	III	B	11	90.07	Drinking Water
131	451		Bedrock	Between Ft. St. John and Blueberry Creek	III	C	12	1776.15	Multiple
132	578		Bedrock	E. of Smithers; E. side of Bulkley River	II	C	8	159.87	Drinking Water
133	579		Bedrock	E. of Smithers; E. side of Bulkley River	II	C	8	62.32	Drinking Water
134	580		Bedrock	Smithers - North; W. side of Bulkley River	III	C	7	5.95	Drinking Water
135	589		Bedrock	East of Pine and Murray River confluence	III	B	8	19.12	Drinking Water
136	591		Bedrock	Groundbirch, Willow Valley, Sunset Prairie	III	B	13	519.67	Drinking Water
137	593		Bedrock	Bear Mountain, Dawson Creek area	III	B	9	113.84	Drinking Water
138	595		Bedrock	North of Sunset Creek, Sunset Prarie	III	C	10	69.26	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
139	621		Bedrock	Kelly Lake	III	B	10	27.5	Drinking Water
140	622		Bedrock	South of Pouce Coupe	III	C	10	65.44	Drinking Water
141	623		Bedrock	N. and W. of Swan Lake	III	C	13	34.69	Drinking Water
142	627		Bedrock	Chetwynd area; W. of Dokie Siding	III	B	10	6.45	Multiple
143	631		Bedrock	S. of the Peace R.	III	C	10	43.72	Drinking Water
144	633		Bedrock	South of the Peace River	III	C	9	47.99	Drinking Water
145	634		Bedrock	Taylor; S. of Peace River	III	C	9	51.3	Drinking Water
146	639		Bedrock	NW of Rose Prairie; N. of Blueberry R.	III	C	10	196.48	Drinking Water
147	642		Bedrock	Between Francois and Tchesinkut Lakes	III	B	10	41.44	Drinking Water
148	644		Bedrock	NE of Burns and Decker Lakes	III	B	8	19.05	Drinking Water
149	646		Bedrock	Between Burns and Tchesinkut Lakes	III	B	8	9.42	Drinking Water
150	650		Bedrock	Simon Bay / North shore of Fraser Lake	II	C	7	3.11	Drinking Water
151	651		Bedrock	North shore of Burns Lake	II	C	7	3.07	Drinking Water
152	652		Bedrock	NW of Burns Lk.; S. of Old Woman Lk	III	C	7	4.13	Drinking Water
153	654		Bedrock	NE of Houston; W. of Topley	III	C	8	15.27	Drinking Water
154	658		Bedrock	S. of Bulkley R. nr. Houston	II	C	8	9.19	Drinking Water
155	672		Bedrock	SW side of Fraser Lake	III	C	7	15.16	Drinking Water
156	673		Bedrock	S. side of Fraser Lake	III	C	8	61.73	Drinking Water

Item	Aquifer Number	Aquifer Name	Aquifer Type	Location Description	Level of Development	Intrinsic Vulnerability	Ranking Value	Area km <sup>2</sup>	Type of Water Use
157	674		Bedrock	NW side of Fraser Lake	III	C	7	13.62	Drinking Water
158	675		Bedrock	Dunalter Lake; NW. of Houston	III	C	7	10.66	Drinking Water
159	678		Bedrock	S. & SW of Francois Lk.; W. of Fraser Lk.	III	C	9	110.04	Drinking Water
160	688		Bedrock	E. of Chetwynd; N. of Pine R.	II	C	9	15.11	Drinking Water
161	689		Bedrock	SE of Chetwynd; S. of Pine R.	II	C	7	1.75	Drinking Water
162	775		Bedrock	NE of Houston	II	C	6	1.59	Drinking Water
163	788		Bedrock	SW of Terrace / northshore of Skeena River	III	B	7	1.93	Drinking Water

Appendix J. Table 1. List of active observation wells in Vancouver Island Region.

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet)**	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
1	58	20142	092B.063.2.4.2	21	610	IIB (9)	Surficial	Saanich	5386450	469250	1966	48	6.0	85	To monitor developed aquifers	Thalimedes	MoE	1966 -2009
2	60	20143	092B.063.4.2.1	42	609	IIIB (7)	Surficial	Saanich	5389300	468300	1966	54	6.0	89	To monitor developed aquifers	Thalimedes	MoE	1966 -2009
3	61	21783	092B.054.3.1.1	8	612	IIB (9)	Surficial	Saanich	5378200	471150	1966	90	8.0	100	To monitor developed aquifers	Thalimedes	Municipality of Central Saanich	1966 -2009
4	65	25891	092B.063.2.4.4	5	608	IIB (13)	Bedrock	Saanich	5406965	469518	1975	505	6.0	53	Initially established as groundwater research project	Thalimedes	Sidney Waterworks (CRD)	1975 -2009
5	71	2133	092B.054.1.3.2	3	616	IIC (11)	Surficial	Saanich	5375200	472400	1976	55	8.0	113	To monitor developed aquifers	Thalimedes	Mun. of Saanich	1976 -2009
6	125	20721	092B.084.2.3.4	14	620	IB (13)	Bedrock	Mayne Isl	5409850	479850	1971	100	4.0	77	Ground water research project	Thalimedes	Fed. Govrt.	1971 -2009
7	128	24845	092B.084.4.1.3	19	447	IIA (11)	Bedrock	Mayne Isl	5412700	479250	1972	225	6.0	45	To monitor developed aquifers	Thalimedes	Skana Dev.	1972 -2009
8	196	26709	092G.011.4.2.4	4	709	IIA (15)	Bedrock	Gabriola Isl	5446400	441900	1973	325	6.0		Initially established as groundwater research project	Thalimedes	MoE	1973 -2009
9	197	37811	092G.012.3.1.2	3	709	IIA (15)	Bedrock	Gabriola Isl	5445150	443550	1973	280	6.0	210	Initially established as groundwater research project	Thalimedes	MoE	1973 -2009
10	201	29505	092L.056.3.4.2	2	858	IB (12)	Surficial	Alert Bay	5605100	646850	1975	130	6.0		To monitor developed aquifers	Thalimedes / telemetry	Village of Alert Bay	1975 -2009
11	204	33436	092B.072.4.1.3	37	186	IA (14)	Surficial	Duncan	5401950	449150	1976	31	6.0		To monitor developed aquifers	Thalimedes	MoE	1977 -2009
12	211	33651	092B.072.4.1.3	46	187	IIB (12)	Surficial	Duncan	5401950	449750	1976	104	6.0		To monitor developed aquifers	Thalimedes	MoE	1977 -2009
13	212	32493	092B.063.4.4.1	12	608	IIB (13)	Bedrock	Saanich	5391900	467100	1977	135	6.0	142	To monitor developed aquifers	Thalimedes	Private	1977 -2009
14	228	23186	092G.001.2.3.4	16	160	IIIC (10)	Surficial	Cassidy	5432700	436250	1978	218	8.0	210	To monitor developed aquifers	Thalimedes / Telemetry	Harmac Mill	1954 -2009
15	232	32217	092F.030.2.3.3	2	213	IIC (11)	Surficial	Lantzville	5455250	421450	1979	62	8.0		To monitor developed aquifers	Thalimedes	Lantzville I.D.	1979 -2009
16	233	21169	092B.072.2.4.2	27	197	IIC (11)	Surficial	Cowichan Bay	5398300	454200	1979	190	6.0		To monitor developed aquifers	Thalimedes	Cowichan Bay WW	1979 -2009



Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet)**	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
17	240	31523	092B.063.2.3.2	121	608	IIB (13)	Bedrock	Saanich	5387050	465800	1979	500	6.0		To monitor developed aquifers	Thalimedes	Ardmore Golf Course	1979 - 2009
18	258	44593	092B.084.3.2.4	30	320	IIB (14)	Bedrock	Galiano Isl	5413505	476093	1980	300	6.0		To monitor developed aquifers	Thalimedes	MoE	1980 - 2009
19	265	30098	092B.062.2.3.4	145	608	IIB (13)	Bedrock	Saanich	5388103	465958	1980	100	6.0		To monitor developed aquifers	Thalimedes	Private	1980 - 2009
20	268	62734	092E.057.1.3.2	24	740	IIA (13)	Bedrock	Denman Isl	5488250	371900	1981	140	6.0		To monitor developed aquifers	Thalimedes	MoE	1981 - 2009
21	281	62732	092B.083.4.1.2	77	721	IIB (14)	Bedrock	Saltspring Isl	5411182	466481	1983	350	6.0		To monitor developed aquifers	Thalimedes	Scott Pt. WW.	1983 - 2009
22	283	51834	092B.084.1.2.4	56	711	IIA (13)	Bedrock	Pender Isl	5406700	477050	1983	304	6.0		To monitor developed aquifers	Thalimedes	MoE	1983 - 2009
23	284	51833	092B.074.2.3.4	15	720	IIB (11)	Bedrock	Pender Isl	5399600	481200	1983	305	6.0		To monitor developed aquifers	Thalimedes	MoE	1983 - 2009
24	287	53360	092F.038.2.2.2	13	220	IIB (10)	Bedrock	Coombs	5461759	397226	1984	303	6.0		To monitor developed aquifers	Thalimedes	MoE	1984 - 2009
25	288	53370	092F.057.2.2.1	83	438	IIA (15)	Bedrock	Hornby Isl	5484800	380700	1984	253	6.0		To monitor developed aquifers	Thalimedes	MoE	1984 - 2009
26	290	48780	092B.085.1.1.1	8	737	IB (11)	Bedrock	Saturna Isl	5405100	486950	1985	140	6.0		To monitor developed aquifers	Thalimedes	OAKWOOD PROPERTIES	1985 - 2009
27	295	13653	092F.038.2.4.1	5	217	IB (14)	Surficial	Qualicum	5465300	395500	1986	91	10.0		To monitor developed aquifers	Thalimedes	Town of Qualicum	1986 - 2009
28	303	43750	092F.039.1.3.3	13	217	IB (14)	Surficial	Parksville	5466250	399300	1988	175	8.0	327	To monitor developed aquifers	Diver	MoE (transferred from RDN)	1988 - 2009
29	304	58215	092F.039.1.2.1	26	216	IB (13)	Surficial	Parksville	5462550	403500	1988	73	6.0		To monitor developed aquifers	Thalimedes	MoE and City of Parksville (cost shared)	1988 - 2009
30	310	37367	092F.047.1.1.4	1	416	IIB (12)	Surficial	Bowser	5478600	375900	1990	83	8.0		To monitor developed aquifers	Thalimedes	Deep Bay WW	1990 - 2009
31	312	59559	092G.001.4.1.4	24	161	IIA (14)	Surficial	Cassidy (Boat Hrb)	5434850	436100	1991	78	6.0		To monitor developed aquifers	Thalimedes	O.C.I. Boat Harbour	1991 - 2009
32	314	59923	092F.039.1.2.1	30	216	IB (13)	Surficial	Parksville	5462750	402000	1992	105	8.0		To monitor developed aquifers	Thalimedes	HILLS OF COLUMBIA/Breakwater Enterprises	1992 - 2009

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet)**	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
33	316	7895	092G.012.1.3.4	14	709	IIA (15)	Surficial	Gabriola Isl	5442950	444100	1992	43	6.0		To monitor developed aquifers	Thalimedes	unknown	1992 - 2009
34	318	59654	092B.072.4.1.3	53	186	IA (14)	Surficial	Duncan	5402400	449600	1992	54	6.0		To monitor developed aquifers	Thalimedes	Duncan Hatchery	1993 - 2009
35	319	59381	092B.075.4.3.2	22	735	IA (11)	Bedrock	Saturna Isl	5403100	495600	1992	360	6.0		To monitor developed aquifers	Thalimedes	Private	1992 - 2009
36	320	41479	092B.063.3.3.3	17	197	IIC (11)	Surficial	Cobble Hill	5393750	456900	1992	119	6.0	108	To monitor developed aquifers	Manual	Braithwaite I.D.	1992 - 2009
37	321	48458	092F.039.1.3.3	17	217	IB (14)	Surficial	Qualicum	5466750	399950	1992	138	6.0	39	To monitor developed aquifers	Thalimedes	Breakwater Enterprises	1992 - 2009
38	327	14582	092B.084.3.4.1	5	320	IIB (14)	Bedrock	Galiano Isl	5414755	475457	1995	99	6.0	150	To monitor developed aquifers	Thalimedes	School District	1995 - 2009
39	329	62731	092C.093.3.3.3	4	159	IIA (14)	Surficial	Ucuelet	5429500	310700	1995	60	8.0		To monitor developed aquifers	Thalimedes / Telemetry	Village of Ucluelet	1995 - 2009
40	337	75584	092G.001.2.4.1	23	162	IIA (16)	Bedrock	Ladysmith	5431325	438887	1998	610	6.0		To monitor developed aquifers	Diver	CENAM CONSTRUCTION	1998 - 2009
41	338	34371	092B.053.4.2.4	2	608	IIB (13)	Bedrock	Saanich	5380020	469211	1998	700	8.0		Special - Hagan Creek Watershed Study	Thalimedes	Private	1998 - 2009
42	340	75044	092F.030.1.4.3	28	215	IIC (10)	Surficial	Lantzville	5455645	418002	1999	168	6.0		To monitor developed aquifers	Thalimedes	Lantzville I.D.	1999 - 2009
43	343	56374	092B.053.4.4.3	17	608	IIB (13)	Bedrock	Saanich	5382976	467131	1999	500	6.0		Special - Hagan Creek Watershed Study	Thalimedes	Private	1998 - 2009
44	345	75531	092B.063.3.3.4	85	197	IIC (11)	Surficial	Arbutus Ridge	5392814	459322	2000	284	6.0		To monitor developed aquifers	Thalimedes	Arbutus Ridge Utility	1999 - 2009
45	351	81653	092F.076.1.2.3	23	408	IIC (13)	Surficial	Comox	5508982	360882	2001	80	6.0		To monitor developed aquifers	Thalimedes	Private	2001 - 2009
46	355	81682	092B.082.3.2.4	12	172	IA (14)	Surficial	Chemainus	5413768	448407	2004	58	6.0		To monitor developed aquifers	Diver	MoE	2004 - 2009
47	368	83156	092F.084.4.3.2	1	not mapped	not mapped	Bedrock	Oyster River	5527592	337352	2006	482	6.0		monitoring well related to coal bed methane extraction	Troll	MoE/MEM	2006 - 2009
48	369	83157	092F.084.4.3.2	2	not mapped	not mapped	Surficial	Oyster River	5527562	337352	2006	24	6.0		monitoring well related to coal bed methane extraction	Thalimedes	MoE/MEM	2006 - 2009

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet)**	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
49	371	83159	092F.056.2.2.3	6	415	IIIA (10)	Surficial	Fanny Bay	5486736	366864	2005	36	6.0		monitoring well related to coal bed methane extraction	Thalimedes	MoE/MEM	2006 - 2009
50	372	83045	092B.053.1.2.1	47	680	IIB (12)	Bedrock	Highlands	5373355	460662	2007	490	6.0		To monitor developed aquifers	Diver	FIRST NATIONAL PROPERTIES CO.	2007 - 2009
51	373	85621	092B.083.1.4.4	39	722	IIA (15)	Bedrock	Saltspring Isl	5409648	462522	2006	320	6.0		To monitor developed aquifers	Thalimedes	MoE	2006 - 2009
52	383	93755	092K.005.3.1.1	3	not mapped	not mapped	Surficial	Quadra Isl	5547108	343300	2008	258	6.0	469	To monitor developed aquifers	Diver	MoE	2008 - 2009

Appendix J. Table 2. List of active observation wells in the Lower Mainland Region.

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet) **	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
1	2	26787	092G.009.1.2.3	10	15	IA (20)	Surficial	Fraser Valley	5429300	548400	1962, redrilled in 1972	63	6.0	193	To monitor developed aquifers	Thalamedes Telemetry	MoE	1962 - present
2	8	26549	092G.009.2.1.3	47	15	IA (20)	Surficial	Fraser Valley	5429584	551957	1962, redrilled in 1972	86	6.0	156	To monitor developed aquifers	Thalamedes datalogger	MoE	1962 - present
3	15	24415	092G.009.2.1.4	23	15	IA (20)	Surficial	Fraser Valley	5429892	553067	1972	200?	8.0	75	To monitor developed aquifers	Thalamedes datalogger	Fraser Valley Fish Hatchery	1972 - present
4	255	42266	092G.010.4.1.4	13	6	IIIA (13)	Bedrock	Yarrow	546120	68824	1979	120	8.0	22	To monitor developed aquifers	Thalamedes datalogger	Yarrow WW	1979 - present
5	259	44644	092G.028.2.1.2	63	26	IIC (9)	Surficial	Whonnock	5449890	538714	1980	120	6.0	476	To monitor developed aquifers	Thalamedes datalogger	MoE	1980 - present
6	272	49293	092G.009.2.1.2	24	15	IA (20)	Surficial	Abbotsford	5428669	552984	1981	119	6.0	74	To monitor developed aquifers	Thalamedes datalogger	District of Abbotsford	1981 - present
7	275	44939	092G.007.4.1.3	20	41	IA (17)	Surficial	Surrey	5435012	523053	1981	93	8.0	154	To monitor developed aquifers	Thalamedes datalogger	Ministry of Forests	1981 - present
8	292	54586	092F.078.4.4.2	8	Not classified	Not classified	Surficial	Powell River (Victory Rd)	5514622	399126	1985	89	6.0	217	To monitor developed aquifers	Thalamedes / Telemetry	MoE	1985 - present
9	299	23948	092G.009.1.3.3	8	15	IA (20)	Surficial	Matsqui	5432325	545202	1987	35	8.0	181	To monitor developed aquifers	Thalamedes datalogger	District of Matsqui / now Abbotsford	1987 - present
10	301	58399	092G.008.2.4.1	41	15	IA (20)	Surficial	Matsqui	5431086	541321	1988	85	6.0	329	To monitor developed aquifers	Thalamedes datalogger	MoE	1988 - present
11	349	81565	092G.036.1.2.4	83	68	IA (10)	Bedrock	Belcarra	5463081	507097	2001	269	6.0	260	To monitor developed aquifers	Thalamedes datalogger	MoE	2001 - present
12	352	84690	092J.016.3.2.1	11	390	IA (13)	Surficial	Whistler	5556533	505278	2003	50	8.0	2087	To monitor developed aquifers	Thalamedes datalogger	MoE	2003 - present

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet) **	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
13	353	84689	092G.007.4.1.3	43	41	IA (17)	Surficial	Langley	5434972	523377	2004	47	6.0	152	To monitor developed aquifers	Thalamedes datalogger	MoE	2004 - present
14	354	84688	092G.008.3.3.4	178	35	IA (21)	Surficial	Langley	5437988	531776	2004	85	6.0	276	To monitor developed aquifers	Thalamedes datalogger	MoE	2004 - present
15	357	84687	092G.019.1.1.3	20	29	IIIC (8)	Surficial	Abbotsford	5440792	544721	2004	64	6.0	250	To monitor developed aquifers	Thalamedes datalogger	MoE	2004 - present
16	359	84686	092G.008.3.1.4	81	35	IA (21)	Surficial	Langley	5434499	532202	2004	138	6.0	308	To monitor developed aquifers	Thalamedes datalogger	MoE	2004 - present
17	360	84697	092G.007.2.3.4	147	41	IA (17) Brookwood Aquifer	Surficial	Langley	5432036	544017	2004	50	6.0	165	To monitor developed aquifers	Thalamedes datalogger	MoE	2004 - present
18	361	84691	092G.008.4.1.2	49	27	IIC (14) Aldergrove Aquifer	Surficial	Aldergrove	5433202	539228	2005	76	6.0	310	To monitor developed aquifers	Thalamedes datalogger	MoE	2005 - present

\* UTM coordinates may vary and include those listed from query of the Well Tag Number at MOE website <<http://a100.gov.bc.ca/pub/wells/public/common/wellsreport7.jsp>> and figures reported by Carl Lee (2009).

\*\* Well depth reported as the completed depth of the well and not the total drilled depth.

Appendix J. Table 3. List of active observation wells in Thompson / Cariboo Region.

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet) **	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
1	35	20598	092I039.3.4.4	2	not mapped	not mapped	Surficial	Stump Lake	5585500	690050	1967	79	6.0	2574 (ground)	Forecasting and obtaining baseline data	Diver Pressure Transducer	MoE	1968-2009
2	45	19522	082L.042.3.1.4	30	289	II B (12)	Surficial	Westwold	5595900	304400	1965	55	1.25	2023	Forecasting and obtaining baseline data	Diver Pressure Transducer	MoE	1965-2009
3	78	20630	092P.054.4.2.2	12	124	III B (11)	Bedrock	Lone Butte	5712850	624400	1967	31	6.0	3742	To monitor developed aquifers	Thalimedes	MoE	1967 - 2008
4	80	20593	092P.003.3.1.3	1	921	IIIC (8)	Surficial	Clinton	5658800	598800	1967	50	6.0	3050	To monitor developed aquifers	Diver Pressure Transducer	MoE	1967 - 2009
5	81	20697	092P.044.1.3.1	1	124	III B (11)	Bedrock	83 Mile	5699000	613000	1967	498	8.0	4000	To monitor developed aquifers	Diver Pressure Transducer	MoE	1967 - 2009
6	82	20904	093H.003.4.1.1	2	not mapped	not mapped	Bedrock	Barkerville (Lower)	5879250	601500	1967	95	6.0	5000	Forecasting and obtaining baseline data	Diver Pressure Transducer	MoE	1967 to present
7	88	21023	093B.02.1.2.4	9	146	IC (11)	Surficial	Williams Lake	5774500	560500	1969/71	199	6.0	1866	To monitor developed aquifers	Diver Pressure Transducer	MoE	1969 - 2009
8	185	30438	082L.054.1.1.2	3	97	II A (13)	Surficial	Salmon R	5597850	333100	1974	32	8.0	1386	Ground water research project	Diver Pressure Transducer	MoE	1974 - 2009
9	260	44608	093B.098.4.1.4	37	116	IC (11)	Surficial	Quesnel	5869900	536050	1980	245	6.0		To monitor developed aquifers	Thalimedes Telemetry	MoE	1980 - 2009
10	261	45972	093B.010.3.4.4	18	148	IIIC (9)	Bedrock	Williams Lake	5771950	560300	1980	260	8.0	2576 (ground)	To monitor developed aquifers	Diver Pressure Transducer	MoE	1980 - 2009
11	289	53339	093B.020.4.3.1	26	139	IIC (9)	Surficial	Williams Lake	5780900	563000	1984	95	6.0	2667 (ground)	To monitor developed aquifers	Diver Pressure Transducer	MoE	1984 - 2009
12	296	56918	092I.017.1.1.1	11	74	IA (16)	Surficial	Merritt	5552700	658200	1987	56	6.0		To monitor developed aquifers	Diver Pressure Transducer	MoE	1987 - 2009
13	344	38901	092I.084.1.2.4	5	133	IC (12)	Surficial	Cache Cr	5630863	617780	2000	108	8.0		To monitor developed aquifers	Diver Pressure Transducer	Village of Cache Creek	2000 - 2009
14	346	41306	092I.084.1.2.4	4	134	IA (14)	Surficial	Cache Cr	5630818	617775	2001	33.5	12.0		To monitor developed aquifers	Diver Pressure Transducer	Village of Cache Creek	2001 - 2009

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet) **	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
15	364	84694	093G.008.1.2.2	29	370	IIA (12)	Surficial	Quesnel	5872741 (Nad 83)	532840 (Nad 83)	2005	255	6.0	1719 (ground)	To monitor developed aquifers	Diver Pressure Transducer	MoE	2006 - 2009
16	365	85623	082L.093.2.2.1	21	229	IIA (13)	Surficial	Scotch Creek	5642431	328823	2006	91	6.0	1193 (ground)	To monitor developed aquifers	Diver Pressure Transducer	MoE	2006 - 2009
17	374	86843	092P.074.1.3.3	3	124 / 126	IIIB (11) / IIIB (13)	Bedrock	108 Mile	5734348	612012	2007	248	6.0	2822 (ground)	To monitor developed aquifers	Diver Pressure Transducer	Cariboo RD	2007- 2009
18	375	85622	083D.014.1.2.4	1	825	II A (11)	Surficial	Blue R	5776481	341603	2006	72.8	8.0	2287 (ground)	To monitor developed aquifers	Diver Pressure Transducer	Thompson-Nicola Regional District	2006 - 2009
19	376	51227	92O.078.4.3.4	1	not mapped	not mapped	Bedrock	Junction Sheep Rg Park	5738839	537892	2006	205	6.0	2100 (ground)	To monitor climate influence on undeveloped aquifer	Diver Pressure Transducer	MoE	2006 - 2009
20	381 (D)	90213	082L.064.4.2.2	36	109(deep)	IIIC (10)	Surficial	Canoe Cr	5613513	344350	2007	315	6.0		To monitor developed aquifers	Diver Pressure Transducer	MoE	2008 - 2009
21	381 (S)	90213	082L.064.4.2.2	36	108(shallow)	IIIA (11)	Surficial	Canoe Cr	5613513	344350	2007	315	6.0		To monitor developed aquifers	Diver Pressure Transducer	MoE	2008 - 2009

\* UTM coordinates may vary and include those listed from query of the Well Tag Number at MOE website <<http://a100.gov.bc.ca/pub/wells/public/common/wellsreport7.jsp>> and figures reported by Carl Lee (2009).

\*\* Well depth reported as the completed depth of the well and not the total drilled depth.

Appendix J. Table 4. List of active observation wells the Kootenay/Okanagan Region.

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet)**	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
1	47	49951	082L035.4.1.2	4		not mapped	Bedrock	Silver Star Mt., Vernon	5581659	352422	1965	58	1	5960	Established for forecasting and to obtain baseline data	Manual	MOE	1965 - Present
2	53	19772	082L014.1.3.3	2		not mapped	Bedrock	Carrs Landing	5557647	328506	1966	50	1	3169	Established for forecasting and to obtain baseline data	Manual	MOE	1966 - Present
3	54	22692	082L014.1.3.3	3		not mapped	Bedrock	Carrs Landing	5557514	328466	1969	45	6	3186	Established for forecasting and to obtain baseline data	Stevens F 68 Recorder	MOE	1969 - Present
4	74	20128	082F.032.2.2.4	1	507	IIA (12)	Surficial	Castlegar	5462100	455350	1966	122	1.25	1907	To monitor developed aquifers	Manual	MoE	1966 - Present
5	75	20533	082E021.2.2.2	20	259	IIA (14)	Surficial	Keremeos	5454238	294216	1967	89	6 (3.25 opening in cap)	1357	Initially established as groundwater research project	Thalamedes Telemetry	Village of Keremeos	1967 - Present
6	76	22585	082E021.2.2.1	19	259	IIA (14)	Surficial	Keremeos	5453948	293988	1969	74	6 (1.25 opening in cap)	1362	Initially established as groundwater research project	Manual	Keremeos Irrigation District	1969 - Present
7	77	22625	082E021.2.2.2	42	259	IIA (14)	Surficial	Keremeos	5454459	295118	1969	112	6 (1.25 opening in cap)	1409	Initially established as groundwater research project	Manual	Keremeos Irrigation District	1969 - Present
8	96	22769	082E003.2.3.1	12	193	II A (16)	Surficial	Osoyoos	5433551	318971	1969	35	2	1006	Initially established as groundwater research project	Manual	MOE	1969 - Present
9	101	22731	082E003.3.2.2	2	193	II A (16)	Surficial	Osoyoos	5436980	316592	1969	64	2	1049	Initially established as groundwater research project	Manual	MOE	1969 - Present
10	105	22702	082E003.3.2.2	9	193	II A (16)	Surficial	Osoyoos	5436454	317001	1969	42.5	2	1044	Initially established as groundwater research project	Manual	MOE	1969 - Present
11	107	22706	082E003.3.2.2	11	193	II A (16)	Surficial	Osoyoos	5436717	317166	1969	32	2	972	Initially established as groundwater research project	Manual	MOE	1969 - Present
12	115	23980	082E096.1.4.3	1		not mapped	Bedrock	Mission Ridge	5534490	360315	1970	72	6	6000	Established for forecasting and to obtain baseline data	Pressure Transducer/Telemetry	MOE	1970 - Present



Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet)**	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
13	117	24062	082L044.2.4.1	12	111	II C (11)	Surficial	Armstrong	5588510	341721	May-71	1225	7 (liner)	1227	Initially established as groundwater research project	Thalimedes Datalogger	MOE	1972 - Present
14	118	24080	082L045.3.2.3	13	111	II C (11)	Surficial	Armstrong	5593141	348876	1971	1026	4 (liner)	1261	Initially established as groundwater research project	Thalimedes Datalogger	MOE	1972 - Present
15	119	24104	082L044.2.4.2	2	111	II C (11)	Surficial	Armstrong	5588360	342521	1971	280	4 (liner)	1281	Initially established as groundwater research project	Thalimedes Datalogger	MOE	1972 - Present
16	122	24093	082L055.1.2.1	1	111	II C (11)	Surficial	Enderby	5597110	349072	1971	730	4 (liner)	1213	Initially established as groundwater research project	Thalimedes Datalogger	MOE	1972 - Present
17	154	22792	082E052.4.4.1	1	297	IIIB (11)	Surficial	Summerland	5495010	309500	1969	78	2	1142	Initially established as groundwater research project	Manual	MOE	1969 - Present
18	162	26248	082L004.3.1.4	1		not mapped	Bedrock	Kalawoods	5549052	330229	1972	13.5	6	1723	Initially established as groundwater research project	Thalimedes Datalogger	MOE	1969 - Present
19	172	8596	082L014.1.1.2	26	345	IIA(14)	Surficial	Kalawoods	5553762	331485	1972	61	6	1343	Initially established as groundwater research project	Thalimedes Datalogger	MOE	1972 - Present
20	173	8374	082L014.1.1.2	6	345	IIA(14)	Surficial	Kalawoods	5553183	331202	1972	62	6	1332	Initially established as groundwater research project	Manual	MOE	1972 - Present
21	174	8608	082L014.1.1.2	17	345	IIA(14)	Surficial	Kalawoods	5552806	330827	1972	133	6	1404	Initially established as groundwater research project	Thalimedes Telemetry	MOE	1972 - Present
22	176	8533	082L004.3.3.1	4		not mapped	Surficial	Kalawoods	5550884	329986	1972	161	6	1426	Initially established as groundwater research project	Manual	MOE	1972 - Present
23	180	32340	082L044.2.2.2	12	353	IA (14)	Surficial	Eagle Rock Waterworks, Armstrong	5585857	342421	1972	123	6	1377	To monitor developed aquifers	Thalimedes Telemetry	Eagle Rock Waterworks, Armstrong	1975 - Present
24	203	33378	082E012.3.2.3	6	259	IIA (14)	Surficial	Cawston	5450469	300589	1975	199	8		To monitor developed aquifers	Thalimedes Datalogger	Fairview Heights Irrigation District	1975 - Present

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet)**	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
25	217	14947	082E.008.2.2.3	4	158	IA (17)	Surficial	Grand Forks	5431007	395168	1977	29	6.0	1688	To monitor developed aquifers	Thalmedes Telemetry	MoE	1977 - Present
26	236	41865	082E084.3.3.1	1	464	IC(14)	Surficial	Rutland	5527947	327608	1979	140	6		To monitor developed aquifers	Thalmedes Logger	MOE	1979 - Present
27	262	44358	082E083.4.2.2	1	463	IC(14)	Surficial	Kelowna (S.E.K.I.D.)(Mc Culloch)	5525886	325956	1980	277	6		To monitor developed aquifers	Thalmedes Datalogger	SE Kelowna Irrigation District	1980 - Present
28	279	49745	082L100.3.3.3	3	803	IIIA (8)	Surficial	Revelstoke	5649200	417250	1982	35	4	1454	Effects of river levels during ice jamming	Thalmedes Datalogger	BC Hydro	1982 - Present
29	282	51824	082E023.3.1.3	5	257	IIA (14)	Surficial	Willow Brook/Meyers Flats	5459940	311446	1983	55	6		To monitor developed aquifers	Thalmedes Telemetry	MOE	1983 - Present
30	291	54568	082G.042.3.2.4	20	523	IB (11)	Bedrock	Cranbrook	5480700	592750	1985	250	6.0		To monitor developed aquifers	Thalmedes Telemetry	MoE	1985 - Present
31	294	55834	082L025.2.2.4	27	315	IIA(10)	Surficial	Lumby	5564993	357037	1986	54	6	1710	To monitor developed aquifers	Thalmedes Datalogger	MOE	1986 - Present
32	302	57976	082L.097.1.3.1	8	307	IA (13)	Surficial	Malakwa	5643750	374100	1988	75	12.0		To monitor developed aquifers	Diver pressure transducer	MoE	1988 - Present
33	305	53654	082E083.2.1.3	19	463	IC(14)	Surficial	Okanagan Mission	5520854	320533	1988	134	8		To monitor developed aquifers	Manual	MOE	1988 - Present
34	306	58685	082E.045.2.3.3	9	482	IIIA (11)	Surficial	Beaverdell	5478279	348736	1989	69.2	6.0		To monitor developed aquifers	Thalmedes datalogger	MoE	1989 - Present
35	308	48403	082N.026.3.3.4	12	456	IIB (12)	Surficial	Golden	5682750	502650	1989	80	12.0		To monitor developed aquifers	Manual	MoE	1989 - Present
36	309	59115	082N.026.3.2.2	21	450	IIB (8)	Surficial	Golden	5678450	505750	1989	148	6.0		To monitor developed aquifers	Thalmedes Telemetry	MoE	1989 - Present
37	311	59305	082L034.2.2.4	7	351	IIC(9)	Bedrock	Vernon-BX Creek	5576559	343234	Oct. 1991	307	4 (liner)		To monitor developed aquifers	Thalmedes	Private	1991 - 2001, 2006-present

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet)**	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
38	322	60266	082L035.1.1.3	38	349	IIC(9)	Surficial	Vernon (Falcon Rd. Silver Star)	5576229	344177	1993	100.4	6		To monitor developed aquifers	Stevens F 68 Recorder	MOE	1993 - Present
39	332	62966	082E013.1.3.4	23	254	1A (16)	Surficial	Oliver	5445955	312613	1997	91.4	6		To monitor developed aquifers	Thalimedes Datalogger	Private	1997-Present
40	356	81678	082L004.1.1.1	23	344	1B (13)	Surficial	Winfield	5542310	328625	2004	40	6		To monitor developed aquifers	Thalimedes Datalogger	MOE	2004-Present
41	362	84692	082G.034.3.2.4	11	521	IA (12)	Surficial	Jaffray	5470072	623185	2005	37	6.0	2717	To monitor developed aquifers	Thalimedes datalogger	MoE	2005 - Present
42	363	84693	082G.072.3.4.3	48	540	IA (12)	Surficial	Wasa Lake	5516118	590075	2005	45	6.0	2566	To monitor developed aquifers	Thalimedes datalogger	MoE	2005 - Present
43	366	85744	082E.052.3.4.3	2	299	IIIC(10)	Surficial	Summerland, Rodeo Grounds/KVR Station	5496316	302309	2005	322	8		To monitor developed aquifers	Thalimedes Datalogger	District of Summerland	2005-Present
44	367	85742	Not reported		299	IIIC (10)	Surficial	Summerland	5496595	302448	2006	162	6.0		To monitor developed aquifers	Thalimedes datalogger	Private	2006 - Present
45	379	52546	082E052.3.3.4	2	299	IIIC (10)	Surficial	Faulder	5497403	299879	2007	118.5	6.0		To monitor developed aquifers	Thalimedes datalogger	Private	2007 - Present
46	384	93924	not reported		102	IIC (11)	Surficial	Spallumcheen	5596568	343125	2008	295	6.0	1641	To monitor developed aquifers	Diver pressure transducer	MoE	2008 - Present
47	Osoyoos 1	A1(P-1) and (P-2)	082E003		193	II A (16)	Surficial	Osoyoos	5435391	318890	1989	35.2 21.9	2 2	935		Manual	MOE	1993-Present
48	Osoyoos 2	B-1A,	082E003		193	II A (16)	Surficial	Osoyoos	5434122	319539	1989	43.9	2	944		Manual	MOE	1993-Present
49	Osoyoos 3	B-1B(P-2) and B1B(P-3)	082E003		193	II A (16)	Surficial	Osoyoos	5434122	319539	1989	34.7 28.3	2 2	944		Manual	MOE	1993-Present
50	Osoyoos 4	B-5	082E003		193	II A (16)	Surficial	Osoyoos	5433685	318756	1989	22.6	2	1104		Manual	MOE	1993-Present

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet)**	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
51	Osoyoos 5	B-7 (P-1) and (P-2)	082E003		193	II A (16)	Surficial	Osoyoos	5433866	318910	1989	35.1 28.5	2 2	1000		Manual	MOE	1993-Present
52	Osoyoos 6	B-8 (P-1) and (P-2)	082E003		193	II A (16)	Surficial	Osoyoos	5433311	319071	1989	23.7 20.0	2 2	1001		Manual	MOE	1993-Present

\* UTM coordinates may vary and include those listed from query of the Well Tag Number at MOE website <<http://a100.gov.bc.ca/pub/wells/public/common/wellsreport7.jsp>> and figures reported by Carl Lee (2009).

\*\* Well depth reported as the completed depth of the well and not the total drilled depth.

Note UTM coordinates for Osoyoos piezometers items 47 to 52 obtained from matching locations shown in Holmes and Madsen (1989) with cursor locations on Osoyoos area mapping at BC Water Resources Atlas.

Appendix J. Table 5. List of active observation wells in the Skeena/Omineca/Peace Region.

Item No.	MOE Obs. Well No.	Well Tag No.	BCGS No.	Well No.	Aquifer Classification No.	Aquifer Classification and Ranking	Aquifer Type	Location	UTM Northing Nad 27*	UTM Easting Nad 27	Date Established	Well Depth (feet) **	Well Diameter (inches)	Collar Elevation (feet)	Initial Objective of Observation Well	Recorder Type	Owner of Well	Period of Record
1	89	21245	093L.085.1.1.1	15	584	IIC (10)	Surficial	Smithers	6074100	616100	1969	250	1.25	1636 (ground elev.)	To Monitor developed aquifers	Manual	MoE	1969 to 2006
2	124	25272	094A.036.1.3.2	2	451	IIIC (12)	Bedrock	Ft.St. John (Charlie Lake)	6244200	627050	1971	272	5.5	2330	Forecasting and obtaining baseline data	Thalamedes datalogger	MoE	1971 to present
3	199	36506	093K.010.2.3.2	1	242	IIIC (11)	Surficial	Vanderhoof	5986800	431200	1972	335	3.0	2171	Forecasting and obtaining baseline data	Thalamedes datalogger	private	1972 to present
4	200	27532	104I.041.1.3.3	10	828	IIIB (10)	Surficial	Dease Lake	6478450	442250	1973	113	6.0	2644	Pollution Monitoring	Manual	MoE	1973 to present
5	286	52975	093P.015.2.2.3	1	635	IIA (15)	Surficial	Tumbler Ridge	6109800	626400	1983	127	8.0		To Monitor developed aquifers	Thalamedes telemetry	Town of Tumbler Ridge	1983 to present
6	293	55786	093J.006.2.4.4	14	332	IIIC (10)	Surficial	Prince George (Ferguson Lake)	5988500	513000	1986	129	6.0		To Monitor developed aquifers	Thalamedes datalogger	MoE	1986 to present
7	377				585	IIC (10)	Surficial	Smithers	6070311	619486	2008	189	8.0	1608 (ground)	To Monitor developed aquifers	Diver Pressure Transducer	Town of Smithers	2008 to present
8	378	86618	093G.097.1.1.3		92	IA (15)	Surficial	Prince George	5974650 (Nad 83)	513606 (Nad 83)	2007	155	6.0	1980.8 (ground elev.)	To Monitor developed aquifers	Diver Pressure Transducer	MoE	2007 to present

\* UTM coordinates may vary and include those listed from query of the Well Tag Number at MOE website <<http://a100.gov.bc.ca/pub/wells/public/common/wellsreport7.jsp>> and figures reported by Carl Lee (2009).

\*\* Well depth reported as the completed depth of the well and not the total drilled depth.

Appendix K. Table 1. Summary review of active observation wells in the Vancouver Island Region

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement*	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record (years)	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
1	58	610	IIB (9)	Surficial	Saanich	None found	1966	48	6.0	85	Thalimedes	MoE	road right of way, Municipality	1966 -2009	42	Seasonal and rise since 1980 - very few gaps	Discharge	Shallow	Excellent	Retain	1 a,b,c and 2 a,b,c	Long period of excellent record. Rise in water level since 1980 caused from less gw use.
2	60	609	IIIB (7)	Surficial	Saanich	None found	1966	54	6.0	89	Thalimedes	MoE	road right of way, Municipality	1966 - 2009	42	Seasonal	Recharge	Shallow	Excellent	Retain	1 a,b,c and 2 a,b,c	Long period of record. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
3	61	612	IIB (9)	Surficial	Saanich	None found	1966	90	8.0	100	Thalimedes	Municipality of Central Saanich	road right of way, Municipality	1966 - 2009	42	Seasonal and rise since late 1970s - very few gaps	Discharge	Shallow	Excellent	Retain	1 a, b,c and 2 a,b,c	Long period of record
4	65	608	IIB (13)	Bedrock	Saanich	None found	1975	505	6.0	53	Thalimedes	Sidney Waterworks (CRD)	Victoria Airport Authority	1975 - 2009	33	Seasonal	Discharge	Deep	Excellent	Retain	1 b, c and 2 a,b,c	Long period of record. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
5	71	616	IIC (11)	Surficial	Saanich	Yes	1976	55	8.0	113	Thalimedes	Mun. of Saanich	Macarthur Park estates ltd, and Sayward Hill Developments Ltd.	1976 - 2009	32	Seasonal and pumping	Discharge	Shallow	Excellent	Retain	1 b, c and 2 a,b,c	Long period of record. Concern of slightly declining water level. May have been subject to dewatering for construction project.
6	125	620	IB (13)	Bedrock	Mayne Isl	None found	1971	100	4.0	77	Thalimedes	Fed. Govrt.	road right of way	1971 - 2009	37	Seasonal and pumping, regional decline	Discharge	Shallow	Excellent	Retain	1 a, b,c	Long period of record. Concern of slightly declining water level affected by pumping wells.
7	128	447	IIA (11)	Bedrock	Mayne Isl	None found	1972	225	6.0	45	Thalimedes	Skana Dev.	Skana WW Ltd.	1972 - 2009	36	Seasonal	Discharge	Deep	Excellent	Retain	1 b, c and 2 a,b,c	Long period of record
8	196	709	IIA (15)	Bedrock	Gabriola Isl	Yes	1973	325	6.0		Thalimedes	MoE	road right of way MoTH	1973 - 2009	35	Seasonal	Discharge	Deep	Excellent / few gaps	Retain	1 b,c and 2 a,b,c	Long period of record, slight rising trend since 2005.
9	197	709	IIA (15)	Bedrock	Gabriola Isl	Yes with Weldwood of Canada Ltd.	1973	280	6.0	210	Thalimedes	MoE	Weldwood of Canada Ltd.	1973 - 2009	35	Seasonal	Discharge	Deep	Excellent, some gaps	Retain	1 b, c and 2 a,b,c	Long period of record
10	201	858	IB (12)	Surficial	Alert Bay	Yes with Village	1975	130	6.0		Thalimedes / telemetry	Village of Alert Bay	Private landowner	1975 - 2009	33	Seasonal / Regional Decline	Discharge	Deep	Excellent, some gaps	Retain	1 a, b, c	Long period of record
11	204	186	IA (14)	Surficial	Duncan	Yes	1976	31	6.0		Thalimedes	MoE	Private landowner	1977 - 2009	31	Seasonal and pumping, regional decline	Discharge	Shallow	Excellent / few gaps	Retain	1 b,c and 2 a,b,c	Long period of record subject to pumping effects, shows slight long-term decline
12	211	187	IIB (12)	Surficial	Duncan	Yes	1976	104	6.0		Thalimedes	MoE	Private landowner	1977 - 2009	31	Seasonal and pumping	Discharge	Shallow	Excellent / very few gaps	Retain	1 b,c and 2 a,b,c	Long period of record subject to pumping effects, shows slight long-term decline
13	212	608	IIB (13)	Bedrock	Saanich	Yes	1977	135	6.0	142	Thalimedes	Private	Private landowner	1977 - 2009	31	Seasonal and pumping	Discharge	Deep	Excellent / few gaps	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping wells.
14	228	160	IIIC (10)	Surficial	Cassidy	Yes with Nanaimo Airport Authority	1978	218	8.0	210	Thalimedes / Telemetry	Harmac Mill	Nanaimo Airport Authority	1954 - 2009	55	Seasonal and Haslam Ck.	Discharge	Deep	Excellent	Retain	1 b,c and 2 a,b,c	Historic long period of record, appears to respond to flows on Haslam Creek. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement*	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record (years)	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
15	232	213	IIC (11)	Surficial	Lantzville	Yes	1979	62	8.0		Thalimedes	Lantzville I.D.	Lantzville I.D.	1979 - 2009	29	Seasonal / Regional Decline	Discharge	Shallow	Excellent / few gaps	Retain	1 b,c and 2 a,b,c	Long period of record, declining trend.
16	233	197	IIC (11)	Surficial	Cowichan Bay	signed agreement not available	1979	190	6.0		Thalimedes	Cowichan Bay WW	Cowichan Bay WW with possible	1979 - 2009	29	Seasonal and pumping/ rise since 86.	Discharge	Deep	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, well strongly affected by nearby pumping wells.
17	240	608	IIB (13)	Bedrock	Saanich	None found	1979	500	6.0		Thalimedes	Ardmore Golf Course	Ardmore Golf Course	1979 - 2009	29	Seasonal and pumping	Discharge	Deep	Excellent / few gaps	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping wells.
18	258	320	IIB (14)	Bedrock	Galiano Isl	Highways Permit	1980	300	6.0		Thalimedes	MoE	MoTH	1980 - 2009	28	Seasonal and pumping	Discharge	Deep	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, shows tidal response and pumping effects from wells.
19	265	608	IIB (13)	Bedrock	Saanich	verbal record on file	1980	100	6.0		Thalimedes	Private	Private	1980 - 2009	28	Seasonal	Recharge	Shallow	Excellent, some gaps	Retain	1 b,c and 2 a,b,c	Long period of record, slight declining trend
20	268	740	IIA (13)	Bedrock	Denman Isl	Highways Permit	1981	140	6.0		Thalimedes	MoE	MoTH	1981 - 2009	27	Seasonal and pumping	Discharge	Deep	Excellent / fair correlation to CPD	Retain	1 b,c and 2 a,b,c	Long period of record.
21	281	721	IIB (14)	Bedrock	Saltspring Isl	Highways Permit	1983	350	6.0		Thalimedes	Scott Pt. WW.	MoTH	1983 - 2009	25	Seasonal and pumping	Discharge	Deep	Good large gap between 1985 and 1990.	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
22	283	711	IIA (13)	Bedrock	Pender Isl	Highways Permit	1983	304	6.0		Thalimedes	MoE	MoTH	1983 - 2009	25	Seasonal and pumping	Discharge	Deep	Excellent / sharp decline in 2000 - 2002.	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
23	284	720	IIB (11)	Bedrock	Pender Isl	Highways Permit	1983	305	6.0		Thalimedes	MoE	MoTH	1983 - 2009	25	Seasonal and pumping	Discharge	Deep	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping, slight decline since 2003.
24	287	220	IIB (10)	Bedrock	Coombs	Highways Permit	1984	303	6.0		Thalimedes	MoE	MoTH	1984 - 2009	24	Seasonal and pumping	Discharge	Deep	Excellent / fair correlation to CPD	Retain	1 b,c and 2 a,b,c	Long period of record, slight overall decline
25	288	438	IIA (15)	Bedrock	Hornby Isl	Highways Permit	1984	253	6.0		Thalimedes	MoE	MoTH	1984 - 2009	24	Seasonal and pumping	Discharge	Deep	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
26	290	737	IB (11)	Bedrock	Saturna Isl	Yes	1985	140	6.0		Thalimedes	OAKWOOD PROPERTIES	OAKWOOD PROPERTIES	1985 - 2009	23	Seasonal and pumping	Discharge	Deep	Excellent, some gaps	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
27	295	217	IB (14)	Surficial	Qualicum	letters with Town of Qualicum, possible easement	1986	91	10.0		Thalimedes	Town of Qualicum	Province?	1986 - 2009	22	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
28	303	217	IB (14)	Surficial	Parksville	Yes with RDN	1988	175	8.0	327	Diver	MoE (transferred from RDN)	Province	1988 - 2009	20	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping with long term decline.
29	304	216	IB (13)	Surficial	Parksville	Yes with City of Parksville	1988	73	6.0		Thalimedes	MoE and City of Parksville (cost shared)	City of Parksville	1988 - 2009	20	Seasonal and pumping	Discharge	Shallow	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping with significant long term decline.
30	310	416	IIB (12)	Surficial	Bowser	Yes with Deep Bay WWD	1990	83	8.0		Thalimedes	Deep Bay WW	right of way	1990 - 2009	19	Seasonal	Discharge	Shallow	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record
31	312	161	IIA (14)	Surficial	Cassidy (Boat Hrb)	letters with OCI Boat Harbour Inc.	1991	78	6.0		Thalimedes	O.C.I. Boat Harbour	O.C.I. Boat Harbour	1991 - 2009	16	Seasonal, pumping and Haslam Ck.	Discharge	Shallow	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping and Haslam Creek.
32	314	216	IB (13)	Surficial	Parksville	Yes with Breakwater and RDN	1992	105	8.0		Thalimedes	HILLS OF COLUMBIA / Breakwater Enterprises	HILLS OF COLUMBIA / Breakwater Enterprises	1992 - 2009	16	Seasonal and pumping	Discharge	Shallow	Excellent / fair correlation to CPD	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping with significant long term decline.
33	316	709	IIA (15)	Surficial	Gabriola Isl	None found	1992	43	6.0		Thalimedes	unknown	right of way	1992 - 2009	16	Seasonal and pumping	Discharge	Shallow	Fair / lots of gaps	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
34	318	186	IA (14)	Surficial	Duncan	letters on file	1992	54	6.0		Thalimedes	Duncan Hatchery	Duncan Hatchery	1993 - 2009	15	Seasonal, pumping and Cowichan R.	Discharge	Shallow	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping and Cowichan R.

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement*	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record (years)	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
35	319	735	IA (11)	Bedrock	Saturna Isl	YES	1992	360	6.0		Thalimedes	Private	B. Hunter	1992 - 2009	16	Seasonal and pumping	Discharge	Deep	Fair / lots of gaps	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
36	320	197	IIC (11)	Surficial	Cobble Hill	letters on file	1992	119	6.0	108	Manual	Braithwaite I.D.	Braithwaite I.D.	1992 - 2009	16	Seasonal and pumping	Recharge	Shallow	Excellent	Retain and consider installing Diver	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
37	321	217	IB (14)	Surficial	Qualicum	letters on file	1992	138	6.0	39	Thalimedes	Breakwater Enterprises	Breakwater Enterprises / RDN ?	1992 - 2009	16	Seasonal and pumping	Discharge	Shallow	Good with some gaps	Retain	1 b,c and 2 a,b,c	Long period of record, strongly affected by pumping.
38	327	320	IIB (14)	Bedrock	Galiano Isl	None found	1995	99	6.0	150	Thalimedes	School District	School District	1995 - 2009	13	Seasonal and pumping	Discharge	Shallow	Excellent, some gaps	Retain	1 b,c and 2 a,b,c	Long period of record
39	329	159	IIA (14)	Surficial	Uculet	with Village of Ucluelet	1995	60	8.0		Thalimedes / Telemetry	Village of Ucluelet	Village of Ucluelet	1995 - 2009	13	Seasonal and pumping	Recharge	Shallow	Excellent / fair correlation to CPD	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
40	337	162	IIA (16)	Bedrock	Ladysmith	signed agreement with Cenam not available	1998	610	6.0		Diver	CENAM CONSTRUCTION	GENAM CONSTRUCTION	1998 - 2009	10	Seasonal and pumping	Discharge	Deep	Fair / lots of gaps	Retain	1 b,c and 2 a,b,c	Long period of record, significant declining trend
41	338	608	IIB (13)	Bedrock	Saanich	letters on file	1998	700	8.0		Thalimedes	Private	Private	1998 - 2009	10	Seasonal and pumping	Discharge	Deep	Excellent	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
42	340	215	IIC (10)	Surficial	Lantzville	letters Lantzville I.D.	1999	168	6.0		Thalimedes	Lantzville I.D.	right of way, Lantzville I.D.	1999 - 2009	9	Seasonal and pumping	Discharge	Deep	Good with some gaps	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
43	343	608	IIB (13)	Bedrock	Saanich	None found	1999	500	6.0		Thalimedes	Private	Private	1998 - 2009	10	Seasonal and pumping	Discharge	Deep	Excellent / few gaps	Retain	1 b,c and 2 a,b,c	Long period of record, affected by pumping.
44	345	197	IIC (11)	Surficial	Arbutus Ridge	signed agreement with CRC not available	2000	284	6.0		Thalimedes	Arbutus Ridge Utility	CRC Dev. Ltd.	1999 - 2009	9	Seasonal and pumping	Discharge	Deep	Good with some gaps	Retain, consider installing diver	1 b,c and 2 a,b,c	Long period of record, strongly affected by pumping and declining.
45	351	408	IIC (13)	Surficial	Comox	None found	2001	80	6.0		Thalimedes	Private	Private	2001 - 2009	7	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1 b,c and 2 a,b,c	Good period of record, affected by pumpin with rising trend since 2006, replacement well for 280 with record prior to 2001
46	355	172	IA (14)	Surficial	Chemainus	Highways Permit	2004	58	6.0		Diver	MoE	MoTH	2004 - 2009	4	Seasonal and effects of Chemainus R.	Discharge	Shallow	Fair with some data gaps	Retain	1 b,c and 2 a,b,c	Installed Diver will improve continuity of record.
47	368	not mapped	not mapped	Bedrock	Oyster River	Highways Permit	2006	482	6.0		Troll	MoE/MEM	MoTH	2006 - 2009	2	Seasonal and pumping	Discharge	Deep	Excellent	Retain	1 b,c and 2 a,b,c	
48	369	not mapped	not mapped	Surficial	Oyster River	Highways Permit	2006	24	6.0		Thalimedes	MoE/MEM	MoTH	2006 - 2009	2	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1 b,c and 2 a,b,c	
49	371	415	IIIA (10)	Surficial	Fanny Bay	Highways Permit	2005	36	6.0		Thalimedes	MoE/MEM	MoTH	2006 - 2009	2	Seasonal and effects of T'sable R.	Discharge	Shallow	Excellent	Retain	1 b,c and 2 a,b,c	
50	372	680	IIB (12)	Bedrock	Highlands	letters on file	2007	490	6.0		Diver	FIRST NATIONAL PROPERTIES CO.	?	2007 - 2009	1	Seasonal and pumping	Discharge	Deep	Excellent	Retain	1 b,c and 2 a,b,c	
51	373	722	IIA (15)	Bedrock	Saltspring Isl	Highways Permit	2006	320	6.0		Thalimedes	MoE	MoTH	2006 - 2009	2	Seasonal and pumping	Discharge	Deep	Poor, large data gaps in 2007 and 2008	Retain , consider using diver for site.	1 b,c and 2 a,b,c	
52	383	not mapped	not mapped	Surficial	Quadra Isl	None found	2008	258	6.0	469	Diver	MoE	?	2008 - 2009	<1	Affected by pumping.	Recharge	Deep	Excellent	Retain	1 b,c and 2 a,b,c	Decling trend due to pumping.

\* Note: Some original agreements have lapsed and landowners may have changed.



Appendix K. Table 2. Summary review of active observation wells in the Lower Mainland Region

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
1	2	15	1A (20)	Surficial	Fraser Valley	none found	1962, redrilled in 1972	63	6.0	193	Thalamedes datalogger (previous telemetry instrumentation)	MoE	Transport Canada, Airport Authority	1962 - present	46	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1a,b,c and 2a	Long period of record, water quality concerns, located within 1A Aquifer. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
2	8	15	1A (20)	Surficial	Fraser Valley	yes	1962, redrilled in 1972	86	6.0	156	Thalamedes datalogger	MoE	private	1962 - present	46	Seasonal and pumping, general decline since 1975	Recharge	Shallow	Excellent	Retain	1a,b,c and 2a	Long period of record, water quality concerns, located within 1A Aquifer, general decline since 1975
3	15	15	1A (20)	Surficial	Fraser Valley	none found	1972	200?	8.0	75	Thalamedes datalogger	Fraser Valley Fish Hatchery	Fraser Valley Fish Hatchery	1972 - present	36	Pumping	Discharge	Deep	Excellent	Retain	1a,b,c and 2a	Long period of record, water quality concerns, located within 1A Aquifer, concern over general declining water level up to 1995 with slight recovery thereafter
4	255	not mapped	not mapped	Bedrock	Yarrow	none found, verbal record on file	1979	120	8.0	22	Thalamedes datalogger	Yarrow WW	private	1979 - present	29	Seasonal and pumping	Discharge	Shallow	Excellent	Retain	1a,b,c and 2a	Long period of record.
5	259	26	IIC (9)	Surficial	Whonnock	yes	1980	120	6.0	476	Thalamedes datatrapp	MoE	right of way, Maple Ridge	1980 - present	28	Seasonal and pumping, declining trend	Recharge	Shallow	Excellent	Retain	1a,b,c and 2a	Long period of record. Concern of slightly declining water level.
6	272	15	IA (20)	Surficial	Abbotsford	yes	1981	119	6.0	74	Thalamedes datalogger	District of Abbotsford	District of Abbotsford	1981 - present	27	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1a,b,c and 2a	Long period of record. Located within IA Aquifer. Rising trend since end of 1994.
7	275	41	1A (17)	Surficial	Surrey	none found	1981	93	8.0	154	Thalamedes datalogger	Ministry of Forests	Ministry of Forests	1981 - present	27	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1a,b,c and 2a	Long period of record. Located within IA Aquifer. Declining trend during 1980's, relatively stable thereafter.
8	292	839	IIC (8)	Surficial	Powell River (Victory Rd)	yes	1985	89	6.0	217	Thalamedes / Telemetry	MoE	right of way, MOTH	1985 - present	23	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1a,b,c and 2a	Long period of record, water quality concerns, overall decline since 1980's.
9	299	15	IA (20)	Surficial	Matsqui	yes	1987	35	8.0	181	Thalamedes datalogger	District of Matsqui / now Abbotsford	District of Matsqui / now Abbotsford	1987 - present	21	Seasonal and pumping	Discharge	Shallow	Excellent	Retain	1a,b,c and 2a	Long period of record. Located within IA Aquifer
10	301	15	IA (20)	Surficial	Matsqui	yes	1988	85	6.0	329	Thalamedes datalogger	MoE	right of way, District of Abbotsford	1988 - present	20	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1a,b,c and 2a	Long period of record. Located within IA Aquifer
11	349	68	IA (10)	Bedrock	Belcarra	Written agreement between Village of Belcarra and MoE	2001	269	6.0	260	Thalamedes datalogger	MoE	Village of Belcarra	2001 - present	7	Seasonal and pumping	Discharge	Deep	Excellent, large gap n 2006	Retain	1a,b,c and 2a	Located within IA Bedrock Aquifer. Significant groundwater usage in Belcarra
12	352	390	IA (13)	Surficial	Whistler	none found	2003	50	8.0	2087	Thalamedes datalogger	MoE	Mun. of Whistler	2003 - present	5	Seasonal, pumping and surface flows	Recharge	Shallow	Excellent, some gaps	Retain	1a,b,c and 2a	Located within IA Aquifer. Significant groundwater usage in Whistler
13	353	41	IA (17)	Surficial	Langley	none found	2004	47	6.0	152	Thalamedes datalogger	MoE	Private property	2004 - present	4	Seasonal and pumping	Recharge	Shallow	Good with some gaps	Retain	1a,b,c and 2a	Located within IA Aquifer. Concern over water quality. Well replaces observation well 13.

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
14	354	35	IA (21)	Surficial	Langley	none found	2004	85	6.0	276	Thalamedes datalogger	MoE	Private property	2004 - present	4	Seasonal	Recharge	Shallow	Excellent with one gap in 2006	Retain	1a,b,c and 2a	Located within 1A Aquifer. Concern over water quality. Well replaces observation well 328
15	357	29	IIIC (8)	Surficial	Abbotsford	none found	2004	64	6.0	250	Thalamedes datalogger	MoE	Private property	2004 - present	4	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1a,b,c and 2a	Replaces observation well 3
16	359	52	IIC (11)	Surficial	Langley	none found	2004	138	6.0	308	Thalamedes datalogger	MoE	Private property	2004 - present	4	Seasonal and pumping	Discharge	Deep	Good with large gap late 2005 and 2006	Retain	1a,b,c and 2a	Replaces observation well 7. Overall declining trend since 2005.
17	360	41	IA (17) Brookwood Aquifer	Surficial	Langley	none found	2004	50	6.0	165	Thalamedes datalogger	MoE	Private property	2004 - present	4	Seasonal and pumping	Recharge	Shallow	Excellent	Retain	1a,b,c and 2a	Replaces observation well 12
18	361	27	IIC (14) Aldergrove Aquifer	Surficial	Aldergrove	none found	2005	76	6.0	310	Thalamedes datalogger	MoE	Municipal property	2005 - present	3	Seasonal and pumping	Discharge	Shallow	Fair with strong pumping effects	Retain	1a,b,c and 2a	Strongly affected by pumping.

Appendix K. Table 3. Summary review of active observation wells in the Thompson / Cariboo Region

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record (years)	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
1	35	not mapped	not mapped	Surficial	Stump Lake	right of way and Fed-Prov. agreement not found	1967	79	6.0	2574 (ground)	Diver Pressure Transducer	MoE	Crown	1968-2009	40	Seasonal	Discharge	shallow	Excellent / few gaps	Retain	1a,b and 2a	Long period of record, declining trend since late 1990s. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
2	45	289	II B (12)	Surficial	Westwold	right of way	1965	55	1.25	2023	Diver Pressure Transducer	MoE	MOTH, not found	1965-2009	43	Seasonal, pumping and streamflow effects	Discharge	shallow	Excellent / few gaps	Retain	1a,b and 2a, b	Long period of record, declining trend since 1980. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
3	78	124	III B (11)	Bedrock	Lone Butte	not found	1967	31	6.0	3742	Thalimedes	MoE	PGE station property	1967 - 2009	41	Seasonal and pumping	Discharge	shallow	Excellent / few gaps	Retain	1a,b and 2a	Long period of record
4	80	921	IIIC (8)	Surficial	Clinton	Yes, map reserve with Fed-Prov. agreement ?	1967	50	6.0	3050	Diver Pressure Transducer	MoE	Crown land reserve	1967 - 2009	41	Pumping Interference	Recharge	shallow	Excellent	Retain	1a, b and 2a	Long period of record, long-term declining trend. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
5	81	124	III B (11)	Bedrock	83 Mile	Yes	1967	498	8.0	4000	Diver Pressure Transducer	MoE	Crown land reserve	1967 - 2009	41	Seasonal and long term climatic fluctuations	Discharge	deep	Excellent / few gaps	Retain	1a, b, c and 2a	Long period of record, responds to longer term climatic fluctuations. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
6	88	146	IC (11)	Surficial	Williams Lake	not found	1969/71	199	6.0	1866	Diver Pressure Transducer	MoE	Wms. Lake Town park	1969 - 2009	39	Pumping Interference, with long-term decline	Discharge	deep	Good some missing data	Retain	1a,b and 2a	Long period of record, declining trend, influenced by well field
7	185	97	II A (13)	Surficial	Salmon R	Yes	1974	32	8.0	1386	Diver Pressure Transducer	MoE	private	1974 - 2009	34	Seasonal and streamflow effects	Recharge	shallow	Excellent / few gaps	Retain	1a,b and 2a, b	Long period of record, declining trend since late 1990s
8	260	116	IC (11)	Surficial	Quesnel	Yes, right of way	1980	245	6.0		Thalimedes Telemetry	MoE	MoTH	1980 - 2009	28	Pumping Interference, rising since 1988	Discharge	deep	Excellent	Retain	1a,b and 2a	Long period of record, rising trend since 1990. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
9	261	148	IIIC (9)	Bedrock	Williams Lake	Yes	1980	260	8.0	2576 (ground)	Diver Pressure Transducer	MoE	Crown/MoTH	1980 - 2009	28	Seasonal and pumping	Discharge	deep	Excellent, with some gaps	Retain	1a,b and 2a	Long period of record
10	289	139	IIC (9)	Surficial	Williams Lake	Yes	1984	95	6.0	2667 (ground)	Diver Pressure Transducer	MoE	MOTH	1984 - 2009	24	Pumping Interference	Discharge	shallow	Excellent, with some gaps	Retain	1a,b and 2a	Long period of record
11	296	74	IA (16)	Surficial	Merritt	Yes, right of way, not found	1987	56	6.0		Diver Pressure Transducer	MoE	BCBC?	1987 - 2009	21	Seasonal, pumping and streamflow effects	Recharge	shallow	Excellent, minor gaps	Retain	1a,b and 2a, b	Long period of record, declining trend since late 1990s
12	344	133	IC (12)	Surficial	Cache Cr	Yes	2000	108	8.0		Diver Pressure Transducer	Village of Cache Creek	Village of Cache Creek	2000 - 2009	8	Pumping Interference	Recharge	shallow	Fair, several gaps in record	Retain	1a,b and 2a, b	Village of Cache Creek depends on aquifer.

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record (years)	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
13	346	134	IA (14)	Surficial	Cache Cr	Yes	2001	33.5	12.0		Diver Pressure Transducer	Village of Cache Creek	Village of Cache Creek	2001 - 2009	7	Pumping Interference	Discharge	shallow	Good, some gaps in record	Retain	1a,b and 2a, b	Village of Cache Creek depends on aquifer.
14	364	370	IIA (12)	Surficial	Quesnel		2005	255	6.0	1719 (ground)	Diver Pressure Transducer	MoE	City of Quesnel	2006 - 2009	2	Seasonal and pumping	Discharge	deep	Excellent	Retain	1a,b and 2a, b	City of Quesnel depends on aquifer.
15	365	229	IIA (13)	Surficial	Scotch Creek	Yes, Park use permit	2006	91	6.0	1193 (ground)	Diver Pressure Transducer	MoE	Crown	2006 - 2009	2	Seasonal	Discharge	shallow	Good, large gap in 2006	Retain	1a,b and 2a, b	Long term record needed.
16	374	124 / 126	IIIB (11) / IIIB (13)	Bedrock	108 Mile	Agreement with CRD	2007	248	6.0	2822 (ground)	Diver Pressure Transducer	Cariboo RD	Cariboo Regional District	2007 - 2009	1	Seasonal and pumping, declining trend	Discharge	deep	Excellent	Retain	1a,b and 2a, b	Long term record needed, decling trend evident.
17	375	825	II A (11)	Surficial	Blue R	Agreement with NRD	2006	72.8	8.0	2287 (ground)	Diver Pressure Transducer	Thompson Nicola Regional District		2006 - 2009	2	Seasonal	Recharge	shallow	Excellent	Retain	1a,b and 2a, b	Long term record needed.
18	376	not mapped	not mapped	Bedrock	Junction Sheep Rg Park		2006	205	6.0	2100 (ground)	Diver Pressure Transducer	MoE	Crown	2006 - 2009	2	Seasonal	Recharge	deep	Excellent	Retain	1c	Long term record needed for effects of climate change
19	381 (D)	109 (deep)	IIIC (10)	Surficial	Canoe Cr	Lease	2007	315	6.0		Diver Pressure Transducer	MoE	Private	2008 - 2009	1	Seasonal and pumping, declining	Recharge	shallow	Excellent	Retain	1a,b and 2a, b	Long term record needed, declining trend
20	381 (S)	108 (shallow)	IIIA (11)	Surficial	Canoe Cr	Lease	2007	315	6.0		Diver Pressure Transducer	MoE	Private	2008 - 2009	1	Seasonal	Discharge	deep	Excellent	Retain	1a,b and 2a, b	Long term record needed

Appendix K. Table 4. Summary review of active observation wells in the Kootenay/Okanagan Region.

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
1	47	not mapped	not mapped	Bedrock	Silver Star Mt., Vernon	Agreement expired in 1989? No record of renewal.	1965	58	1	5960	Manual	MOE	Crown	1965 - Present	43	Evident seasonal recharge effects to snowmelt	Recharge	Shallow	Excellent	Retain	1a and c	High elevation recharge area, long period of record, climate response monitoring,
2	53	not mapped	not mapped	Bedrock	Carrs Landing		1966	50	1	3169	Manual	MOE	Private	1966 - Present	42	Responds to snowmelt and precipitation	Recharge	Shallow	Good to Excellent	Mirrors Well 54, suspend monitoring but maintain as backup well to 54.	1a and c	High elevation recharge area, long period of record, climate response monitoring, downward trend since 2001
3	54	not mapped	not mapped	Bedrock	Carrs Landing	R/W agreement was dissolved in 1977	1969	45	6	3186	Stevens F 68 Recorder	MOE	Private	1969 - Present	39	Responds to snowmelt and precipitation	Recharge	Shallow	Excellent	Retain	1a and c	High elevation recharge area, long period of record, climate response monitoring, downward trend since 2001
4	74	507	IIA (12)	Surficial	Castlegar	not found	1966	122	1.25	1907	Manual	MoE	Ootichenia ID	1966 - Present	42	Pumping effects	Recharge	Deep	Fair, several gaps	Retain	1a, b and 2a	Long period of record
5	75	259	IIA (14)	Surficial	Keremeos		1967	89	6 (3.25 opening in cap)	1357	Thalamedes Telemetry	Village of Keremeos		1967 - Present	41	Recharge during freshet and pumping effects,	Discharge	Deep	Good to Excellent	Retain	1a, b and 2a	Long-term record, high ground water use area, recharged during freshet possibly from Keremeos Creek. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
6	76	259	IIA (14)	Surficial	Keremeos		1969	74	6 (1.25 opening in cap)	1362	Manual	Keremeos Irrigation District		1969 - Present	39	Recharge during freshet and pumping effects,	Discharge	Shallow	Good to Excellent	Retain	1a, b and 2a	Long-term record, high ground water use area, recharged during freshet possibly from Keremeos Creek
7	77	259	IIA (14)	Surficial	Keremeos		1969	112	6 (1.25 opening in cap)	1409	Manual	Keremeos Irrigation District		1969 - Present	39	Recharge during freshet and pumping effects,	Discharge	Deep	Good to Excellent	Retain	1a, b and 2a	Long-term record, high ground water use area, recharged during freshet possibly from Keremeos Creek
8	96	193	II A (16)	Surficial	Osoyoos	Agreement with original land owner on file	1969	35	2	1006	Manual	MOE	Private	1969 - Present	39	Shows pumping and climatic effects and recharge from irrigation	Recharge	Shallow	Excellent to Good	Retain	1a and c	Recharge area, long period of record, climate response monitoring,
9	101	193	II A (16)	Surficial	Osoyoos		1969	64	2	1049	Manual	MOE		1969 - Present	39	Shows pumping and climatic effects and recharge from irrigation	Recharge	Shallow	Excellent to Good	Retain	1a and c	Recharge area, long period of record, climate response monitoring,

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
10	105	193	II A (16)	Surficial	Osoyoos	Agreement with original land owner on file	1969	42.5	2	1044	Manual	MOE	Private	1969 - Present	39	Shows pumping and climatic effects and recharge from irrigation	Recharge	Shallow	Excellent to Good	Consider for closure as it mirrors Well 107, unless required for quality monitoring	1a and c	Response mirrored in other wells.
11	107	193	II A (16)	Surficial	Osoyoos	Agreement with original land owner on file	1969	32	2	972.06	Manual	MOE	Private	1969 - Present	39	Shows pumping and climatic effects and recharge from irrigation	Recharge	Shallow	Excellent to Good	Retain	1a and c	Recharge area, long period of record, climate response monitoring.
12	115	not mapped	not mapped	Bedrock	Mission Ridge		1970	72	6	6000	Pressure Transducer/ Telemetry	MOE	Crown	1970 - Present	38	Evident seasonal recharge effects to snowmelt	Recharge	Shallow	Excellent	Retain	1a and c	High elevation recharge area, long period of record, climate response monitoring. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
13	117	111	II C (11)	Surficial	Armstrong	No written agreement	May-71	1225	7 (liner)	1227	Thalimedes Datalogger	MOE	Otter Lake Water District	1972 - Present	36	Shows pumping effects	Discharge	Deep	Excellent (mirrors Well 119)	Retain	1a. b and 2a	Long period of record, water sustainability concerns
14	118	111	II C (11)	Surficial	Armstrong		1971	1026	4 (liner)	1261	Thalimedes Datalogger	MOE	Private	1972 - Present	36	May reflect longer-term (e.g. 5-10 year) climatic cycles	Discharge	Deep	Excellent	Retain	1a. b and 2a	Long period of record, climate response monitoring
15	119	111	II C (11)	Surficial	Armstrong		1971	280	4 (liner)	1281	Thalimedes Datalogger	MOE		1972 - Present	36	Shows pumping effects	Discharge	Deep	Good to Excellent (mirrors Well 117)	Consider for closure as hydrograph is mirrored by Well 117	1a. b and 2a	long period of record, water sustainability concern, proximity to Well 117 and similar hydrograph response
16	122	111	II C (11)	Surficial	Enderby		1971	730	4.5 (liner)	1213	Thalimedes Datalogger	MOE	Private	1972 - Present	36	May reflect longer-term (e.g. 5-10 year) climatic cycles, flowing artesian conditions	Discharge	Deep	Good to Excellent	Retain	1a and c	long-term climate response monitoring
17	154	297	IIIB (11)	Surficial	Summerland		1969	78	2	1142	Manual	MOE		1969 - Present	39	Responds to freshet, Trout Creek and Okanagan Lake	Discharge	Deep	Good to Excellent	Retain	2a, b and c	Aquifer is relatively small, one observation well may be representative, overall water levels decline since 1970s
18	162	not mapped	not mapped	Bedrock	Kalawoods		1972	13.25	6	1723	Thalimedes Datalogger	MOE	Private	1969 - Present	39	Appears to respond to long-term climatic and local pumping effects	Discharge	Shallow	Excellent	Retain	1a, c and 2a	Declining trend since 2000.

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19	172	345	IIA(14)	Surficial	Kalawoods		1972	61	6	1343	Thalimedes Datalogger	MOE		1972 - Present	36	Appears to respond to runoff period and local pumping	Discharge affected by streamflow conditions	Shallow	Excellent	Retain	1a, c and 2a	Appears to be in Aquifer 345. Monitors surface water interaction.
20	173	345	IIA(14)	Surficial	Kalawoods		1972	62	6	1332	Manual	MOE	Private	1972 - Present	36	Appears to respond to runoff period and local pumping	Discharge affected by streamflow conditions	Shallow	Good to Excellent	Consider closing well or retaining in lieu of Well 174	1a, c and 2a	Mirrors Well 174 but shows larger range in fluctuation.
21	174	345	IIA(14)	Surficial	Kalawoods		1972	133	6	1404	Thalimedes Telemetry	MOE		1972 - Present	36	Appears to respond to runoff period and local pumping	Discharge affected by streamflow conditions	Deep	Good to Excellent	Retain	1a, c and 2a	Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website
22	176	not mapped	not mapped	Surficial	Kalawoods		1972	161	6	1426	Manual	MOE		1972 - Present	36	Affected by local pumping and possibly irrigation	Discharge	Deep	Good to Excellent	Retain	1a, c and 2a	Represents surficial conditions
23	180	353	IA (14)	Surficial	Eagle Rock Waterworks, Armstrong		1972	123	6	1377	Thalimedes Telemetry	Eagle Rock Waterworks District	Eagle Rock Waterworks District	1975 - Present	33	Local pumping interference	Discharge	Deep	Excellent	Retain	1a, b and 2a	High water use area, long period of record, water sustainability concerns. Partnership with Eagle Rock Waterworks District. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
24	A1(P-1) and (P-2)	193	II A (16)	Surficial	Osoyoos		1989	35.2 21.9	2 2	935	Manual	MOE		1993- Present	15	Shows climatic effects, recharge from irrigation and lake levels	Discharge	Shallow	Excellent	Consider for closure unless required for quality monitoring	1a and c	Response mirrored in other wells.
25	B-1A,	193	II A (16)	Surficial	Osoyoos		1989	43.9	2	944	Manual	MOE		1993- Present	15	Shows climatic effects and recharge from irrigation	Discharge	Shallow	Excellent	Consider for closure unless required for quality monitoring	1a and c	Response mirrored in other wells.
26	B-1B(P-2) and B-1B(P-3)	193	II A (16)	Surficial	Osoyoos		1989	34.7 28.3	2 2	944	Manual	MOE		1993- Present	15	Shows climatic effects and recharge from irrigation	Discharge	Shallow	Excellent	Consider for closure unless required for quality monitoring	1a and c	Response mirrored in other wells.
27	B-5	193	II A (16)	Surficial	Osoyoos		1989	22.6	2	1104	Manual	MOE		1993- Present	15	Shows climatic effects and recharge from irrigation	Recharge	Shallow	not available	Consider for closure unless required for quality monitoring	1a and c	Response mirrored in other wells.
28	B-7 (P-1) and (P-2)	193	II A (16)	Surficial	Osoyoos		1989	35.1 28.5	2 2	1000	Manual	MOE	Private	1993- Present	15	Shows climatic effects and recharge from irrigation	Recharge	Shallow	Excellent	Consider for closure unless required for quality monitoring	1a and c	Response mirrored in other wells.

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
29	B-8 (P-1) and (P-2)	193	II A (16)	Surficial	Osoyoos		1989	23.7 20.0	2 2	1001	Manual	MOE	Private	1993 - Present	15	Shows climatic effects and recharge from irrigation	Recharge	Shallow	Excellent	Consider for closure unless required for quality monitoring	1a and c	Response mirrored in other wells.
30	203	259	IIA (14)	Surficial	Cawston	No written agreement	1975	199	8		Thalimedes Datalogger	Fairview Heights Irrigation District	Private	1975 - Present	33	Shows pumping effects	Discharge	Deep	Excellent	Retain	1a, b and 2a	Long-term record, partnership with F.H.I.D., overall declining levels since 1996
31	217	158	IA (17)	Surficial	Grand Forks	not found, letters on file	1977	29	6.0	1688	Thalimedes Telemetry	MoE	City of Grand Forks	1977 - Present	31	Recharge during freshet and pumping effects,	Recharge	Shallow	Good with minor gaps	Retain	1a, b and 2a	Long term record. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
32	236	463	IC(14)	Surficial	Rutland	No written agreement	1979	140	6		Thalimedes Logger	MOE	City of Kelowna	1979 - Present	29	Local pumping Interference, irrigation effects	Discharge	Deep	Excellent	Retain	1a, b and 2a	High water use area, long period of record, water sustainability concerns, partnership
33	262	464	IC(14)	Surficial	Kelowna (S.E.K.I.D.)(McCulloch)	No written agreement	1980	277	6		Thalimedes Datalogger	SE Kelowna Irrigation District		1980 - Present	28	Local pumping Interference, overall decline since 1980	Discharge	Deep	Excellent	Retain	1a, b and 2a	High water use area, long period of record, water sustainability concerns, partnership with water district (S.E.K.I.D) and declining trend
34	279	803	IIIA (8)	Surficial	Revelstoke	not found	1982	35	4	1454	Thalimedes Datalogger	BC Hydro	Revelstoke?	1982 - 85 and 87 to Present	24	Recharge during freshet	Recharge	Shallow	Poor, several gaps	Retain, consider installation of diver to improve continuity of record	1a and b	Long term record, relationship to river
35	282	257	IIA (14)	Surficial	Willow Brook/Meyers Flats	Permit No. K24 368-82 File no 24-21-1m Ministry of Transportation and Highways	1983	55	6		Thalimedes Telemetry	MOE		1983 - Present	25	responds to long-term climatic, runoff conditions	Recharge	Shallow	Good to Excellent	Retain	1a, b and 2a	Aquifer experiences wide fluctuations in water levels related to long-term climate variations and runoff conditions, partnership with Willowbrook Utility. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
36	291	523	IB (11)	Bedrock	Cranbrook	road right of way	1985	250	6.0		Thalimedes Telemetry	MoE	MoTH	1985 - Present	23	Seasonal and pumping	Discharge	Deep	Excellent	Retain	1a, b and 2a	Long period of record. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
37	294	315	IIA(10)	Surficial	Lumby	Permit No. K23 54-86 File no 23-21-2 Ministry of Transportation	1986	54	6	1710	Thalimedes Datalogger	MOE	Crown	1986 - Present	22	Shows recharge with creek flows and precipitation	Recharge	Shallow	Excellent	Retain	1a, b and 2a	Long period of record, high water use area



Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
38	302	307	IA (13)	Surficial	Malakwa	road right of way	1988	75	12.0		Diver pressure transducer	MoE	MoTH	1988 - Present	20	Seasonal and pumping	Recharge	Shallow	Good with minor gaps	Retain	1a, b and 2a	Long period of record
39	305	463	IC(14)	Surficial	Okanagan Mission		1988	134	8		Manual	MOE	City of Kelowna	1988 - 1998 (currently not active)	10	Significant local pumping Interference	Discharge	Deep	Poor to Good	Retain, consider installation of pressure transducer to improve continuity of record. Check status of well in field.	1a, b and 2a	High water use area, long period of record, water sustainability concerns, partnership with water district (S.O.M.I.D)
40	306	482	IIIA (11)	Surficial	Beaverdell	road right of way	1989	69.2	6.0		Thalamedes datalogger	MoE	MoTH	1989 - Present	19	Shows recharge with freshet and precipitation	Recharge	Shallow	Good with minor gaps	Retain	1a, b and 2a	Long period of record
41	308	456	IIB (12)	Surficial	Golden	agreement on file not signed	1989	80	12.0		Manual	MoE	Golden	1989 - Present	19	Recharge during freshet and pumping	Recharge	Shallow	Good with minor gaps	Retain	1a, b and 2a	Long period of record
42	309	450	IIB (8)	Surficial	Golden area	road right of way	1989	148	6.0		Thalamedes Telemetry	MoE	MoTH	1989 - Present	19	Recharge during freshet	Recharge	Deep	Excellent	Retain	1a, b and 2a	Long period of record. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
43	311	351	IIC(9)	Bedrock	Vernon-BX Creek		Oct. 1991	307	4 (liner)		Thalimedes	Private	Private	1991 - 2001, 2006 - present	15	Shows recharge during spring-summer, overall decline since late 1990s	Discharge	Deep	Excellent	Retain	1a, b and 2a	Reactivated October 2006, Thalimedes installed, water sustainability concerns
44	322	349	IIC(9)	Surficial	Vernon (Falcon Rd. Silver Star)	Permit No. 02-013-10766 MoTH	1993	100.4	6		Stevens F 68 Recorder	MOE	Crown	1993 - Present	15	Shows recharge during spring-summer	Discharge	Deep	Excellent	Retain	1a, b and 2a	artesian flow, extension welded on, water sustainability concerns, rising trend since 1994
45	332	254	1A (16)	Surficial	Oliver		1997	91.4	6		Thalimedes Datalogger	Private	Private	1997- Present	11	Seasonal response to climate, river flows and possibly long term pumping withdrawals	Discharge	Deep	Excellent	Retain	1a, b and 2a	High water use area, shows long-term declining trend
46	356	344	1B (13)	Surficial	Winfield	Road right of way jurisdiction of the City of Kelowna	2004	40	6		Thalimedes Datalogger	MOE	City of Kelowna	2004- Present	4	seasonal and possibly surface flow effects	Discharge	Shallow	Excellent	Retain	1a, b and 2a	High water use area
47	362	521	IA (12)	Surficial	Jaffray	road right of way	2005	37	6.0	2717	Thalamedes datalogger	MoE	MoTH	2005 - Present	3	seasonal and possibly surface flow effects	Recharge	Shallow	Fair with large gaps	Retain, consider installing diver to improve continuity of record	1a, b and 2a	Newly established well.
48	363	540	IA (12)	Surficial	Wasa Lake	road right of way	2005	45	6.0	2566	Thalamedes datalogger	MoE	MoTH	2005 - Present	3	seasonal, possibly surface flow effects and pumping	Recharge	Shallow	Excellent	Retain	1a, b and 2a	Newly established well.

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
49	366	299	IIC(10)	Surficial	Summerland, Rodeo Grounds/KV R Station		2005	322	8		Thalamedes Datalogger	District of Summerland		2005 - Present	3	pumping effects	Discharge	Deep	Poor	Retain, consider installing diver to improve continuity of record	1a, b and 2a	Newly established well.
50	367	299	IIC (10)	Surficial	Summerland		2006	162	6.0		Thalamedes datalogger	Private		2006 - Present	2	pumping effects	Discharge	Deep	Excellent	Retain	1a, b and 2a	Newly established well.
51	379	299	IIC (10)	Surficial	Faulder		2007	118.5	6.0		Thalamedes datalogger	Private		2007 - Present	1	insufficient record available	Discharge	Deep	Excellent	Retain	1a, b and 2a	Newly established well.
52	384	102	IIC (11)	Surficial	Spallumcheen	right of way Spallumcheen	2008	295	6.0	1641	Diver pressure transducer	MoE	Spallumcheen	2008 - Present	<1	insufficient record available	Discharge	Deep	not available	Retain	1a, b and 2a	Newly established well.

\* Well depth reported as the completed depth of the well and not the total drilled depth.

Note: 6 piezometer sites at Osoyoos used for water quality monitoring have been included in this listing.

Appendix K. Table 5. Summary review of active observation wells in the Skeena/Omineca/Peace Region.

Item No.	MOE Obs. Well No.	Aquifer Number	Aquifer Classification and Ranking	Aquifer Type	Location	Site Agreement	Date Established	Well Depth (feet)	Well Diameter (inches)	Collar Elevation (feet)	Recorder Type	Owner of Well	Owner of Property	Period of Record	Duration (Years)	Water Level Response	Recharge or Discharge Regime	Shallow or Deep Flow Regime	Quality of Hydrograph Record	Recommendations	Relevant Network Objectives Achieved	Rationale and Comments
1	82	not mapped	not mapped	Bedrock	Barkerville (Lower)	Yes, Park Reserve	1967	95	6.0	5000	Diver Pressure Transducer	MoE	Crown	1967 to present	41	Seasonal effect of snowmelt	Recharge	Shallow	Excellent, info. gap between 80-82	Retain	1a, b, c	High elevation recharge area, long period of record, climate response monitoring site. Key well reporting on ground water conditions for forecasting water supply outlook at River Forecast Centre (RFC) website.
2	89	584	IIC (10)	Surficial	Smithers	none found	1969	250	1.25	1636 (ground elev.)	Manual	MoE	right of way	1969 to 2006	37	Pumping effects, overall decline	Discharge	Deep	Good. Some info. gaps.	Retain and consider replacing with new larger diameter well.	1a, b and 2a	Long period of record. Shows long-term groundwater decline.
3	124	451	IIIC (12)	Bedrock	Ft. St. John (Charlie Lake)	Yes, Park use agreement	1971	272	5.5	2330	Thalamedes datalogger	MoE	Crown	1971 to present	37	monitors local pumping interference	Discharge	Deep	Good. Some info. gaps.	Retain	1a, b and 2a	Long period of record.
4	199	242	IIIC (11)	Surficial	Vanderhoof	none found	1972	335	3.0	2171	Thalamedes datalogger	private	private	1972 to present	36	Pumping effects, overall decline	Discharge	Deep	Poor, incomplete with large gaps in record	Retain and consider cleaning out or replacing with new well in aquifer.	1a, b and 2a	Long period of record. Shows long-term groundwater decline.
5	200	828	IIIB (10)	Surficial	Dease Lake	none found	1973	113	6.0	2644	Manual	MoE	Crown	1973 to present	35	Seasonal and pumping.	Recharge?	Shallow	Poor to good, several gaps.	Retain. Consider for transducer and telemetry.	1a, b and 2a	Long period of record.
6	286	635	IIA (15)	Surficial	Tumbler Ridge	none found	1983	127	8.0		Thalamedes telemetry	Town of Tumbler Ridge	right of way	1983 to present	25	Seasonal, pumping and stream flow effects, overall declining trend.	Recharge	Shallow	Good with significant gap between 1985 and 1988	Retain	1a, b and 2a	Long period of record. Declining trend.
7	293	332	IIIC (10)	Surficial	Prince George (Ferguson Lake)	Yes, road right of way	1986	129	6.0		Thalamedes datalogger	MoE	MoTH	1986 to present	22	Seasonal and pumping.	Recharge	Shallow	Good to excellent, minor gaps.	Retain	1a, b and 2a	Long period of record. Slight declining trend.
8	377	585	IIC (10)	Surficial	Smithers		2008	189	8.0	1608 (ground)	Diver Pressure Transducer	Town of Smithers	right of way, Town of Smithers	2008 to present	1	Seasonal and pumping.	Discharge	Deep		Retain	1a, b and 2a	
9	378	92	IA (15)	Surficial	Prince George	City of PG Agreement?	2007	155	6.0	1980.8 (ground elev.)	Diver Pressure Transducer	MoE	City of PG?	2007 to present	1	Seasonal and pumping.	Recharge ?	Shallow		Retain	1a, b and 2a	Significant groundwater usage in Prince George. 1A Aquifer. Replaces observation well 342

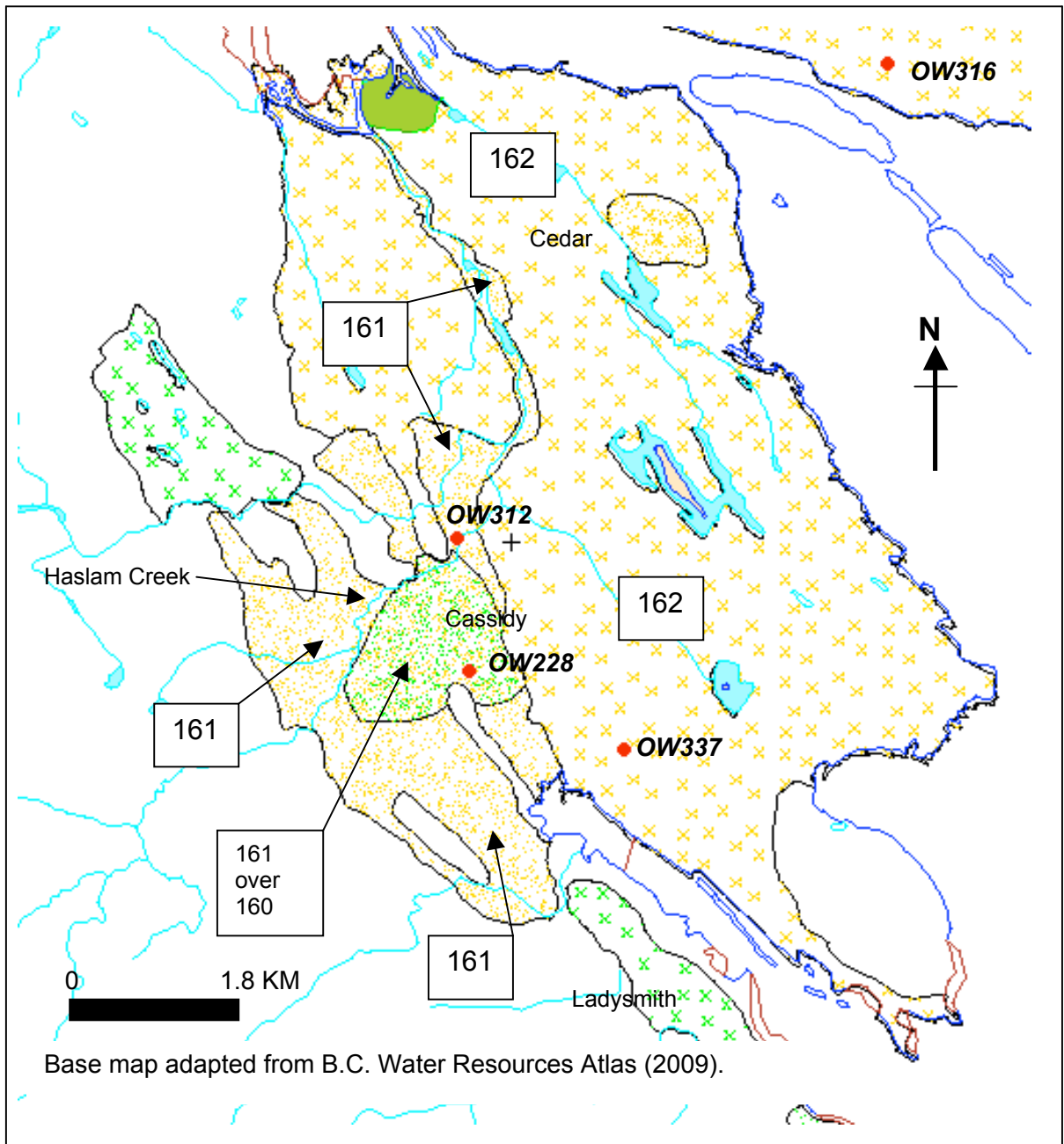


Figure 1. Priority aquifers and existing observation wells in the Cassidy-Nanaimo area.

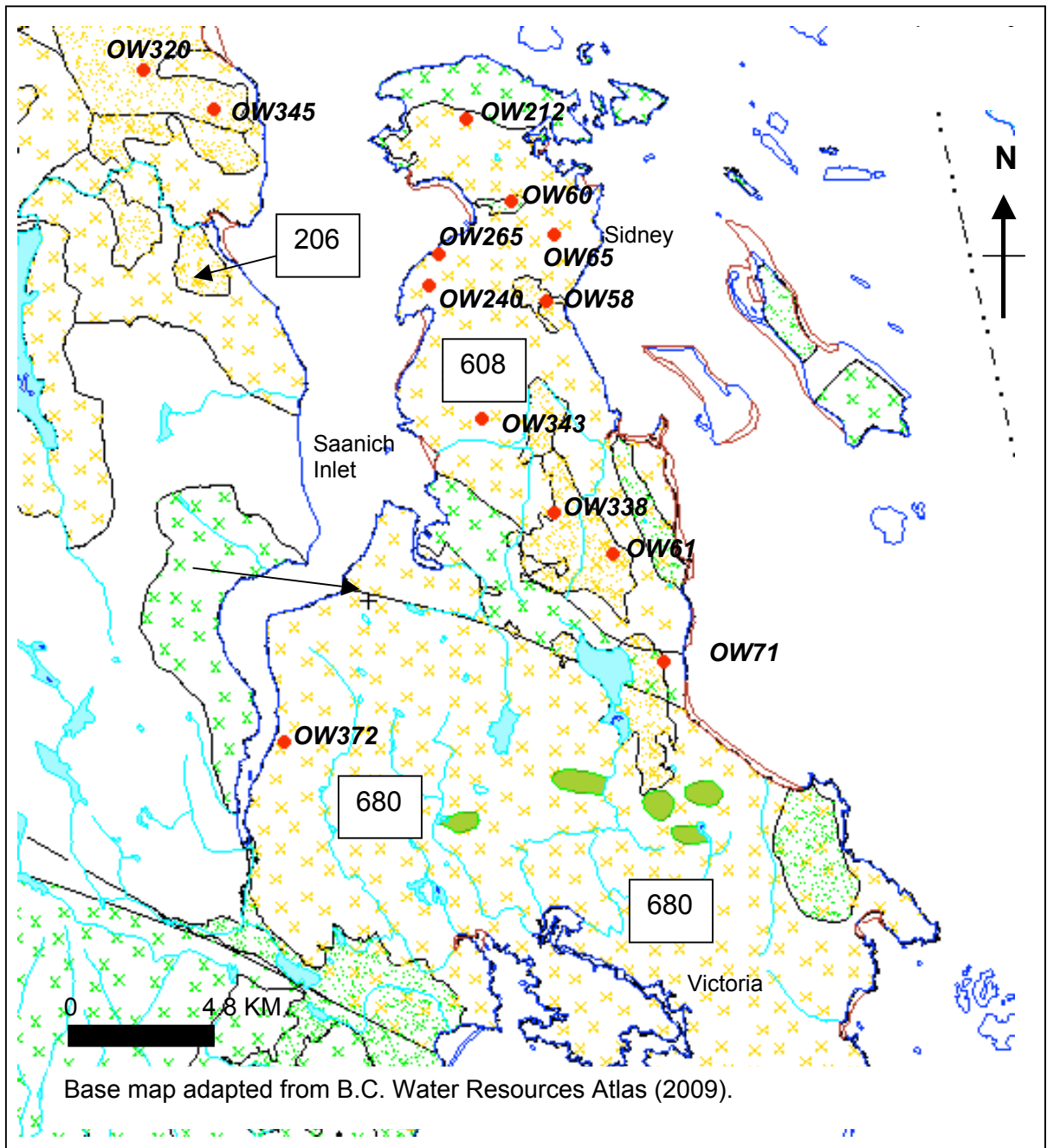


Figure 2. Priority aquifers and existing observation wells in the Saanich-Mill Bay area.

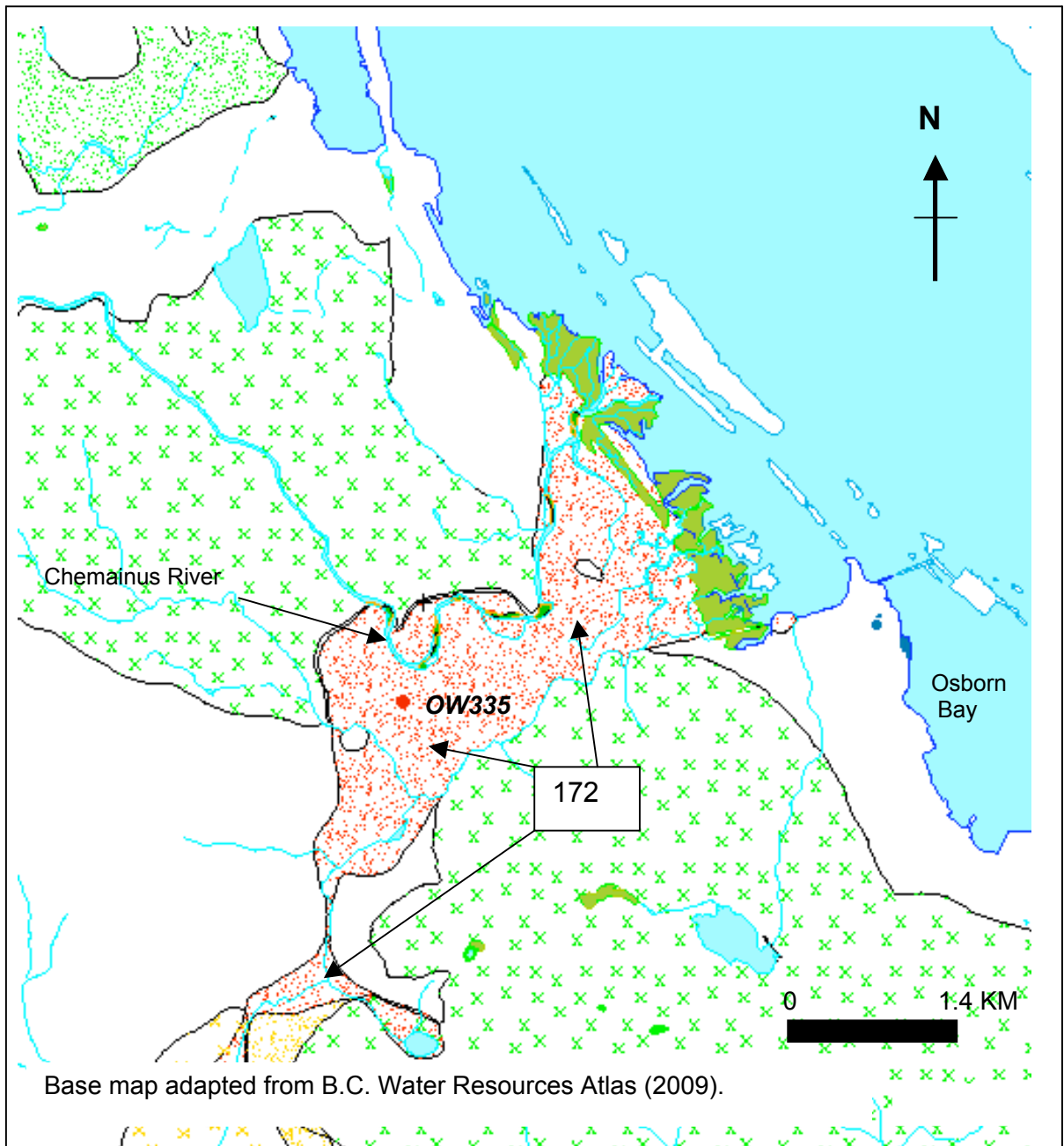


Figure 3. Priority aquifers and existing observation wells in the Chemainus-Crofton area.

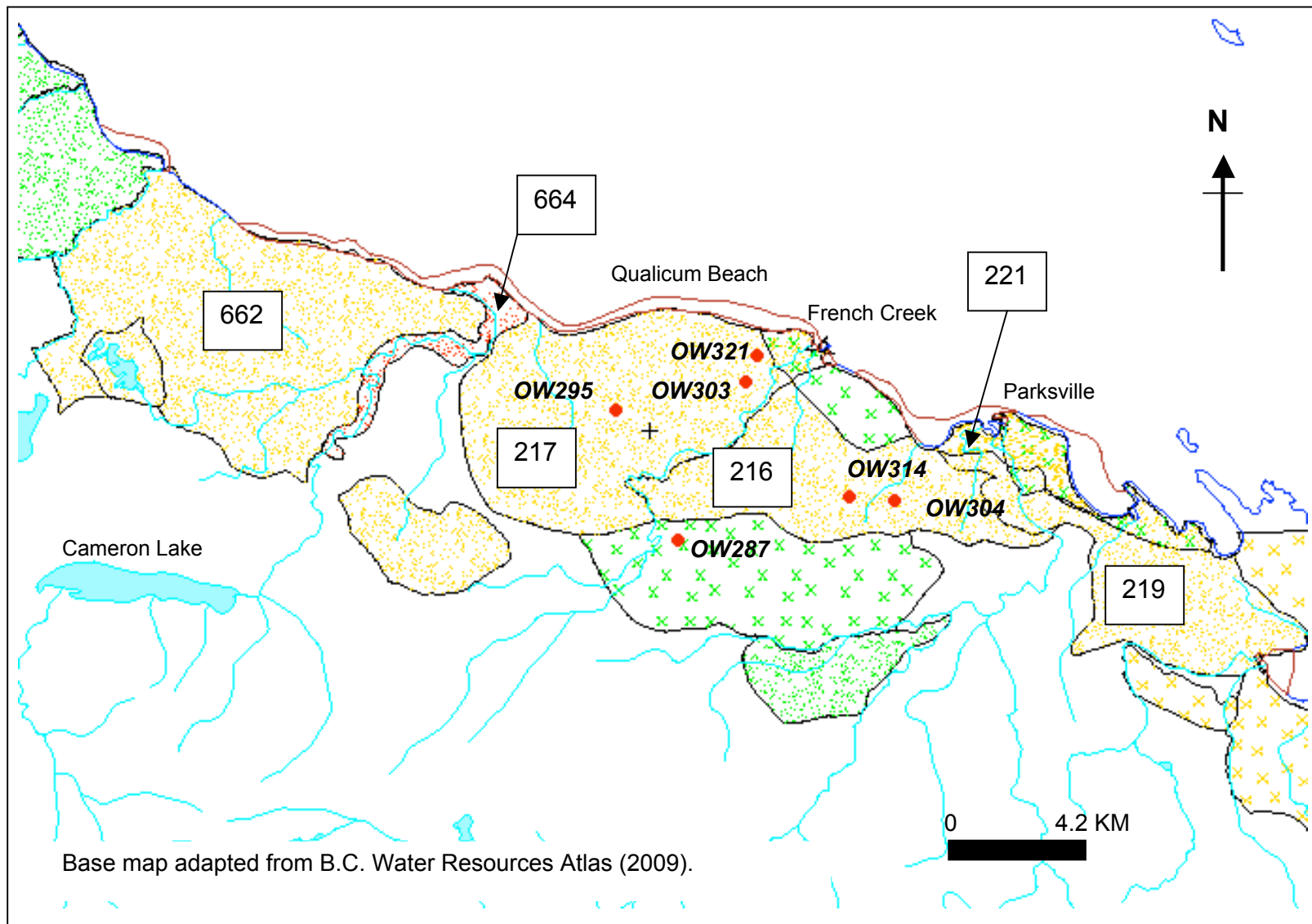


Figure 4. Priority aquifers and existing observation wells in the Parksville-Qualicum area.

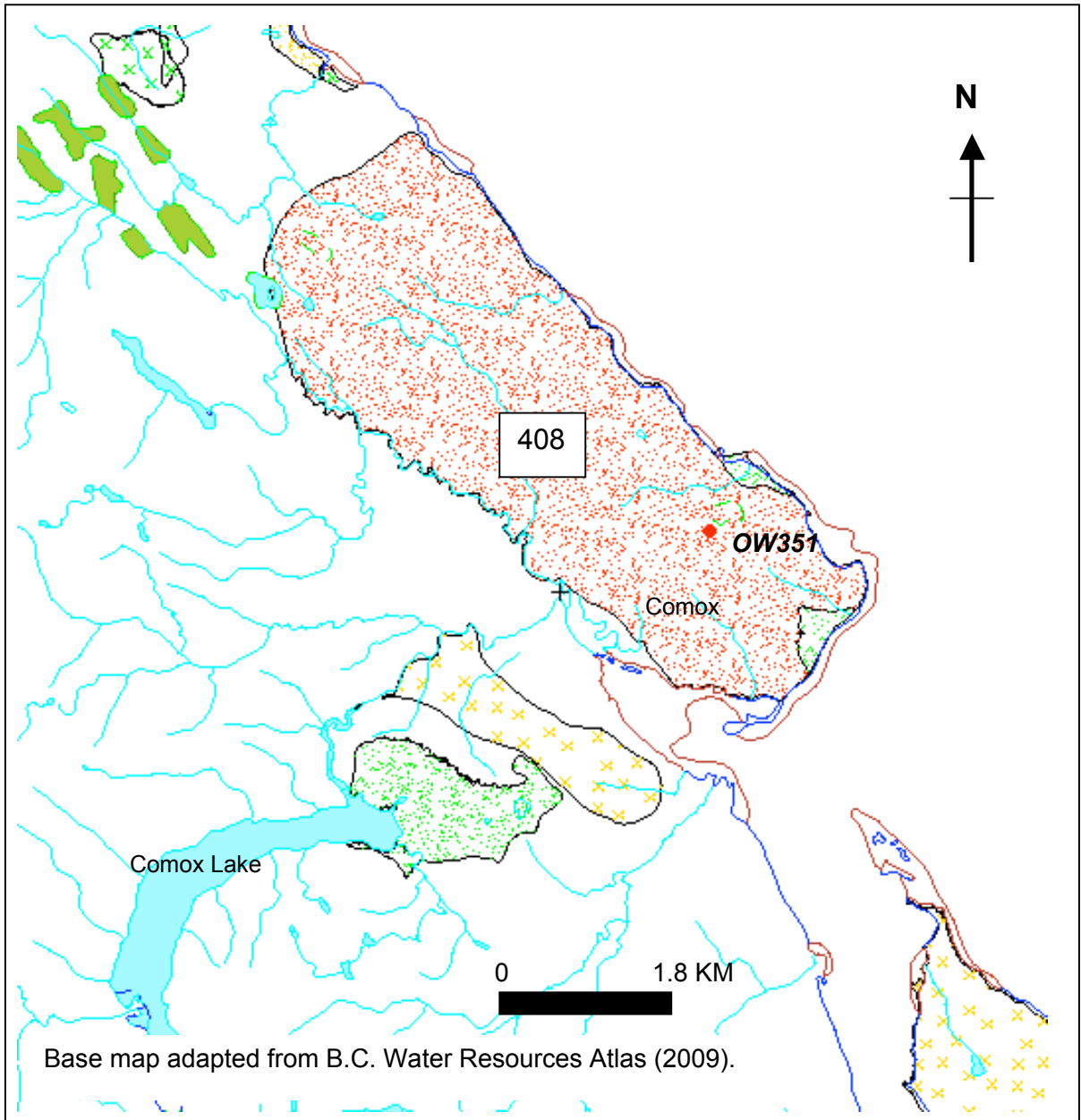


Figure 5. Priority aquifers and existing observation wells in the Comox area.



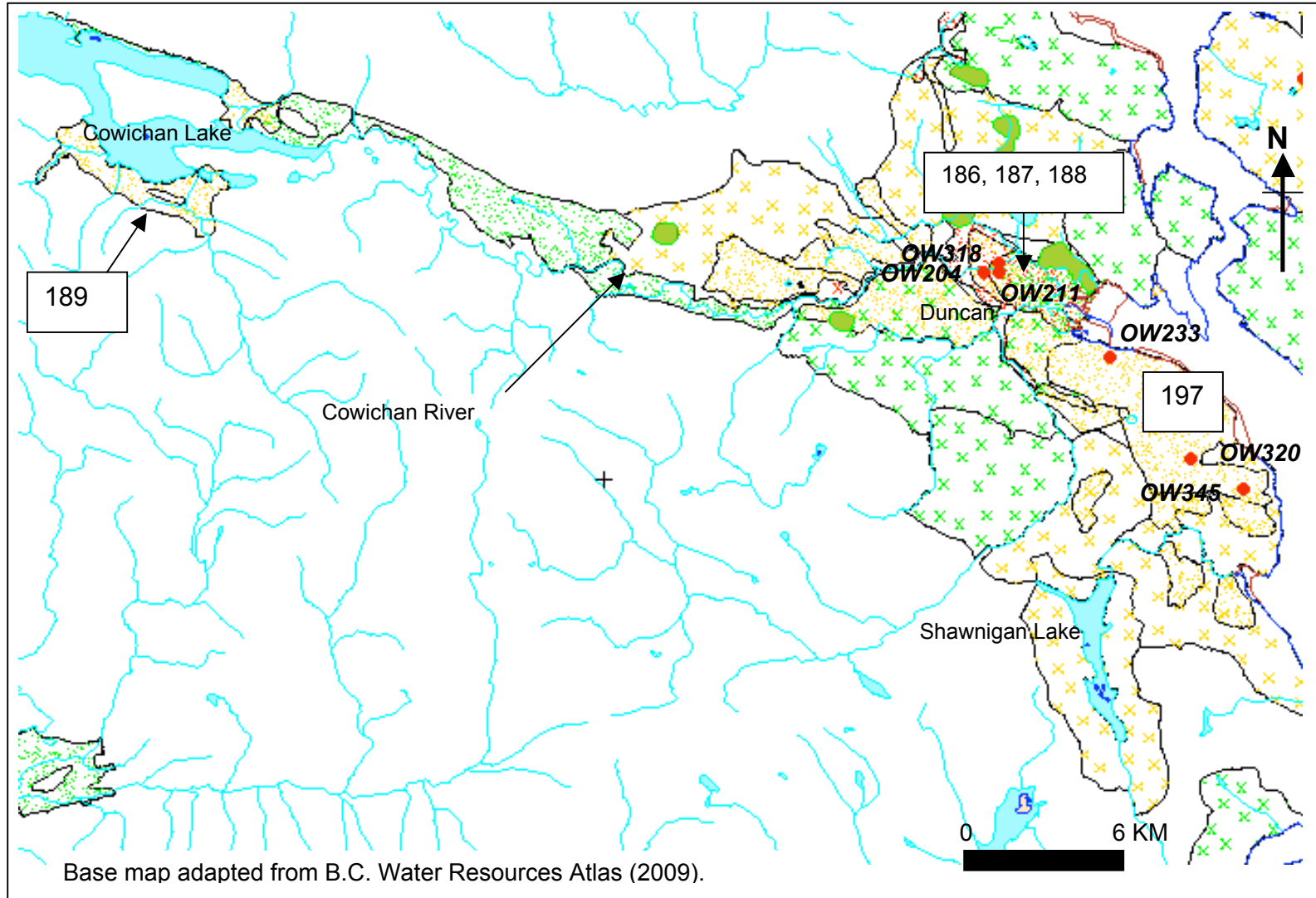


Figure 6. Priority aquifers and existing observation wells in the Cowichan area.

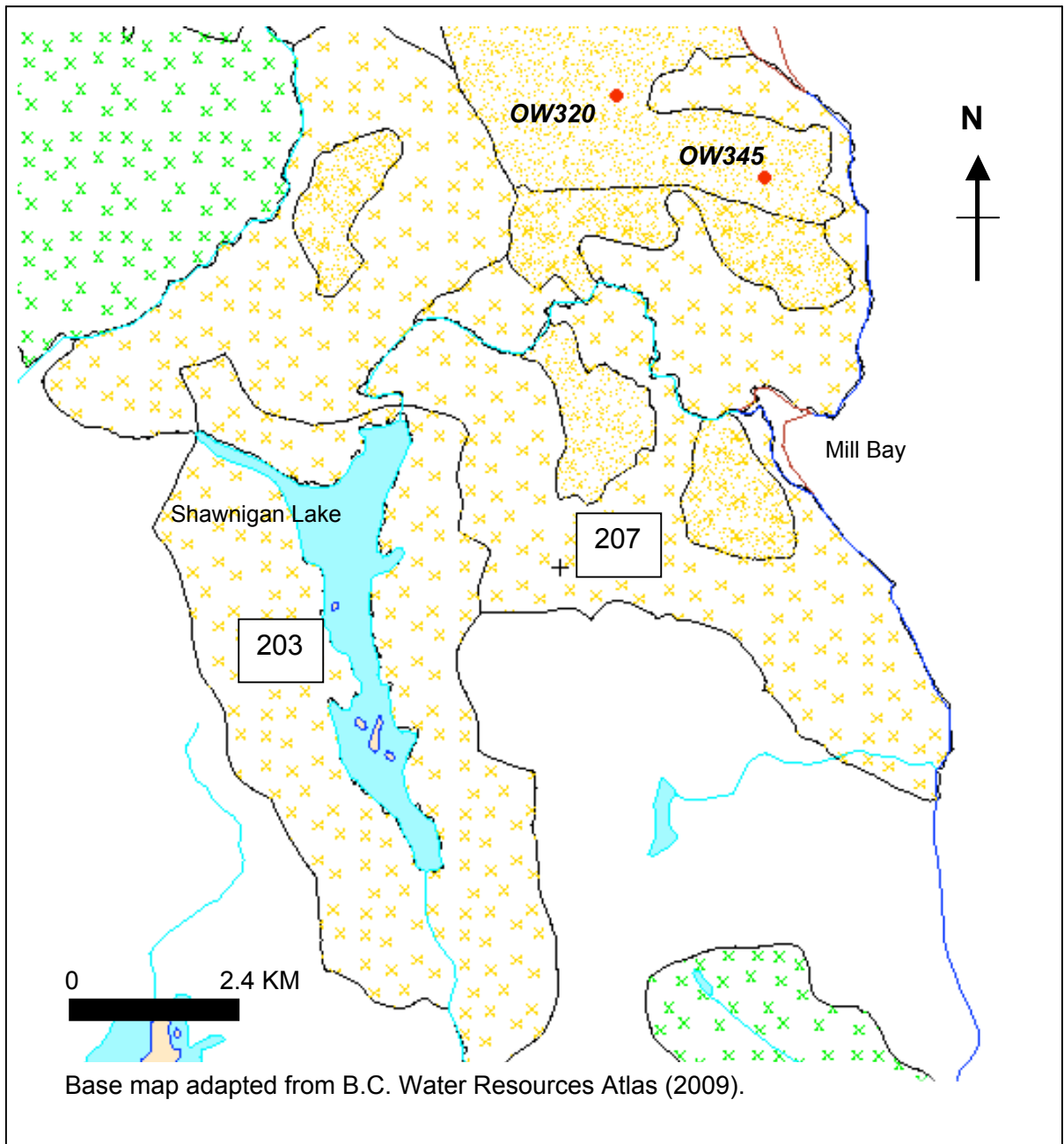


Figure 7. Priority aquifers 203 and 207 and existing observation wells in the Shawnigan-Cobble Hill area.

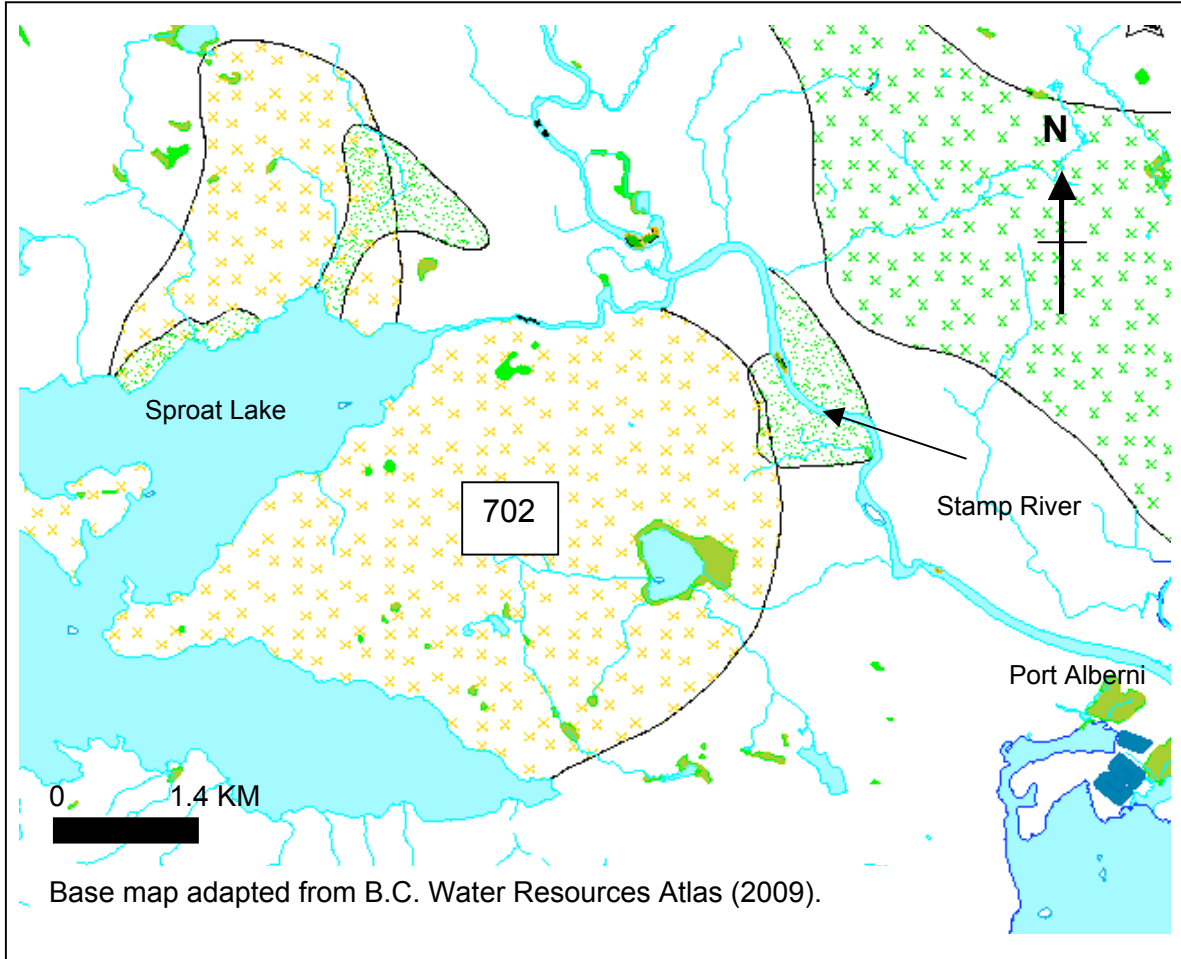


Figure 8. Priority aquifer 702 in the Alberni Valley,

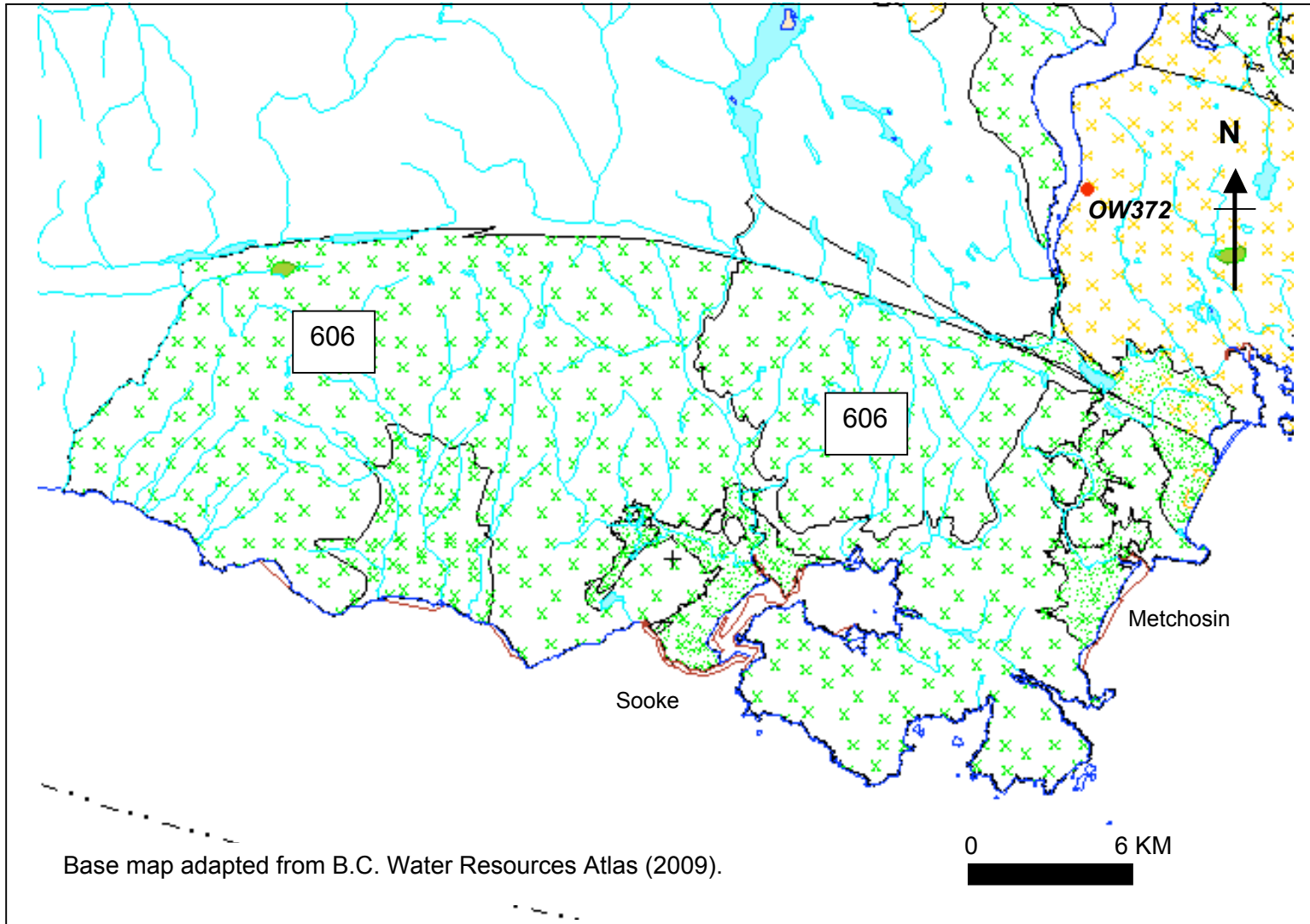


Figure 9. Priority aquifer in the Metchosin-Sooke area.

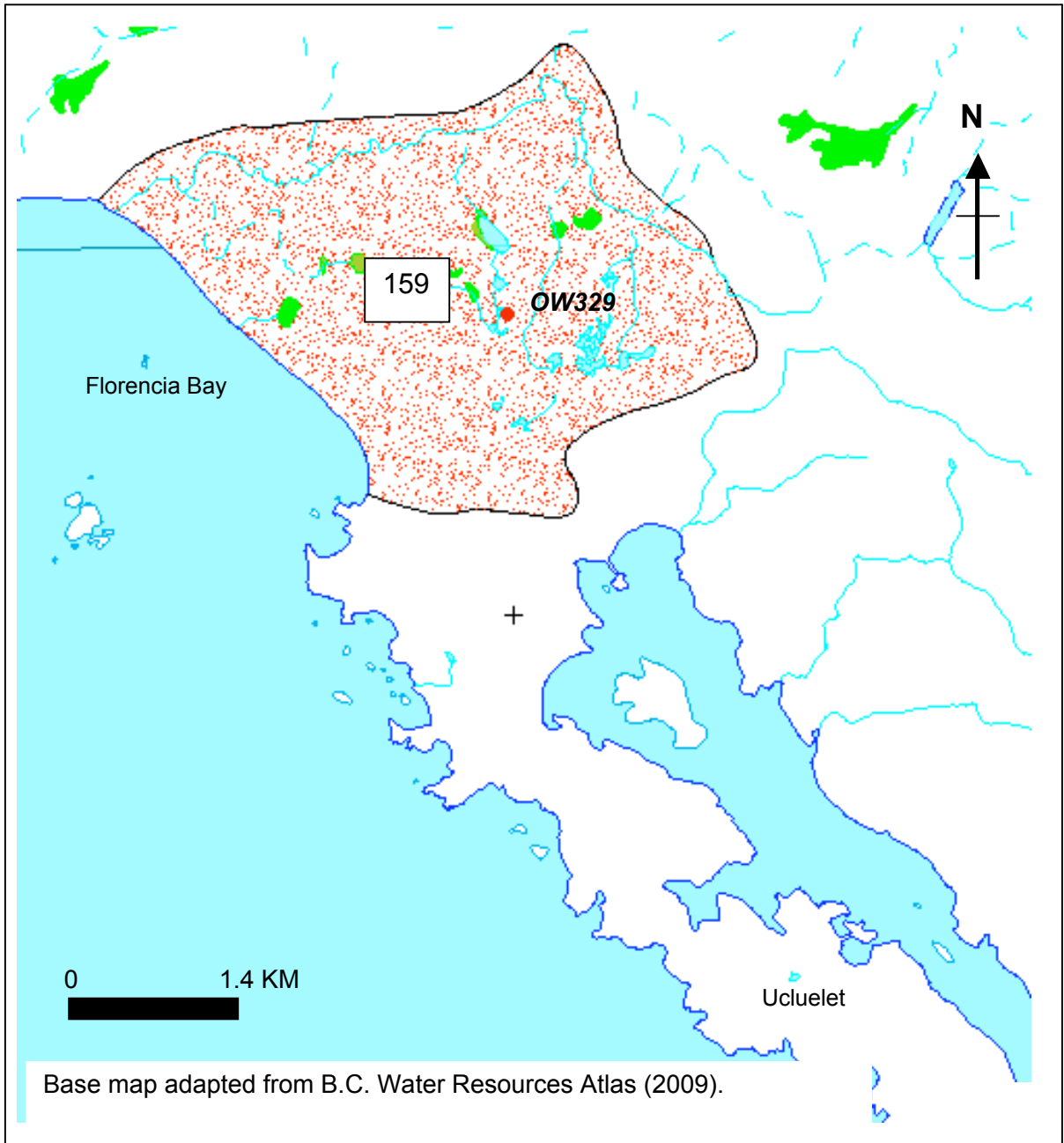


Figure 10. Priority aquifer 159 and existing observation well in the Ucluelet area.

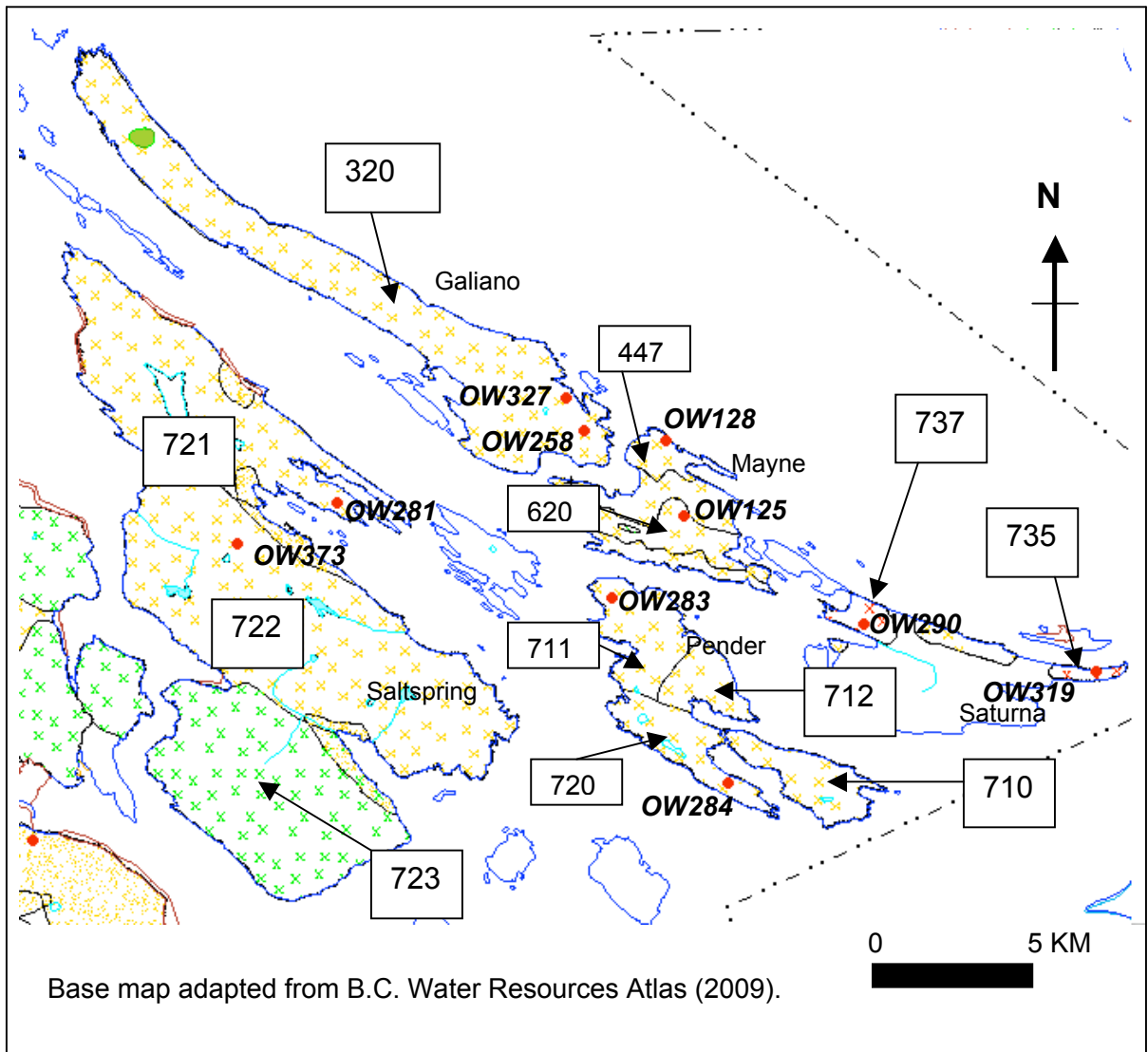


Figure 11. Priority aquifers and existing observation wells in the Saltspring-Galiano, Pender-Mayne and Saturna areas.

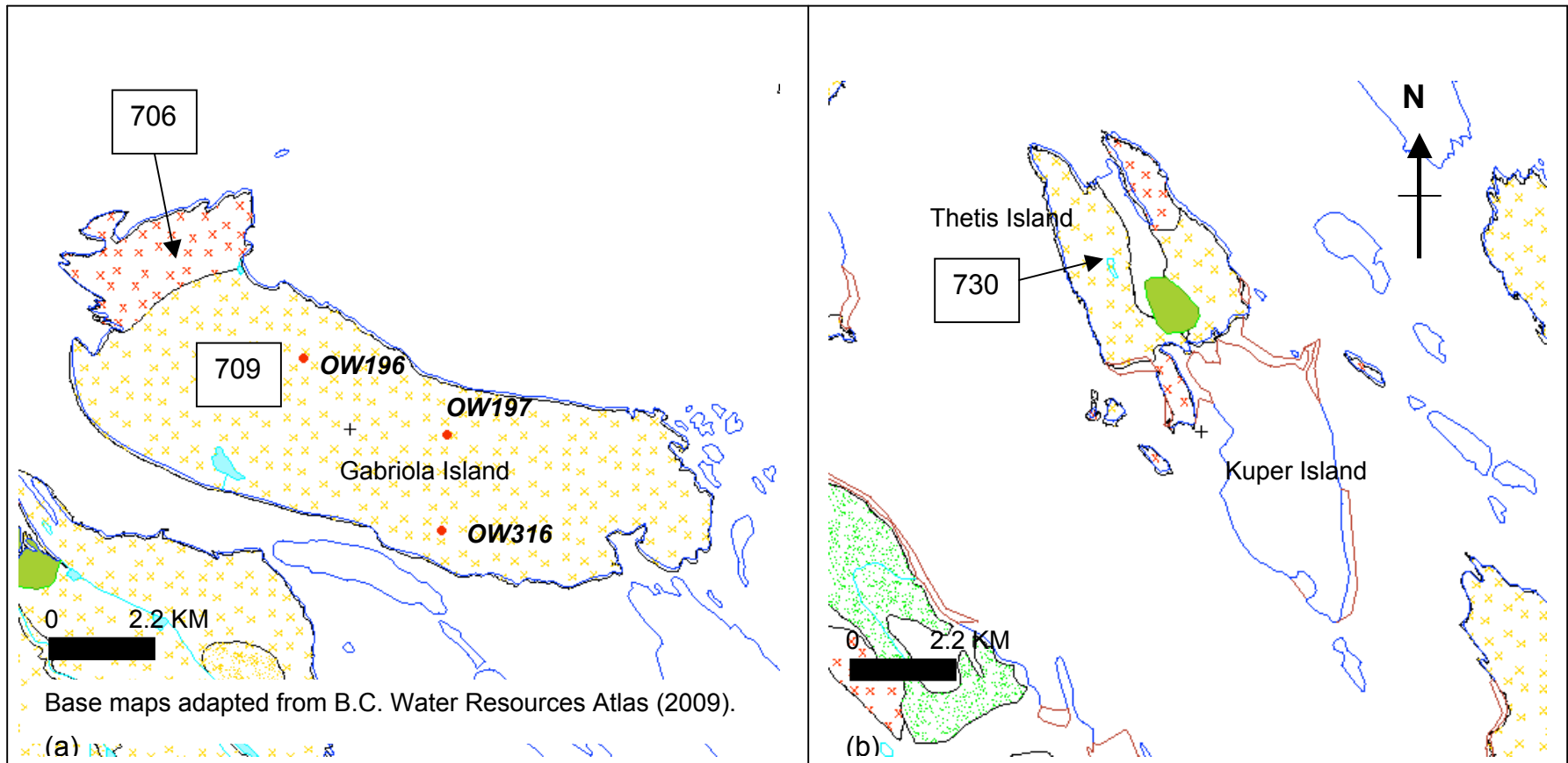


Figure 12. Priority aquifers and existing observation wells on Gabriola and Thetis islands.

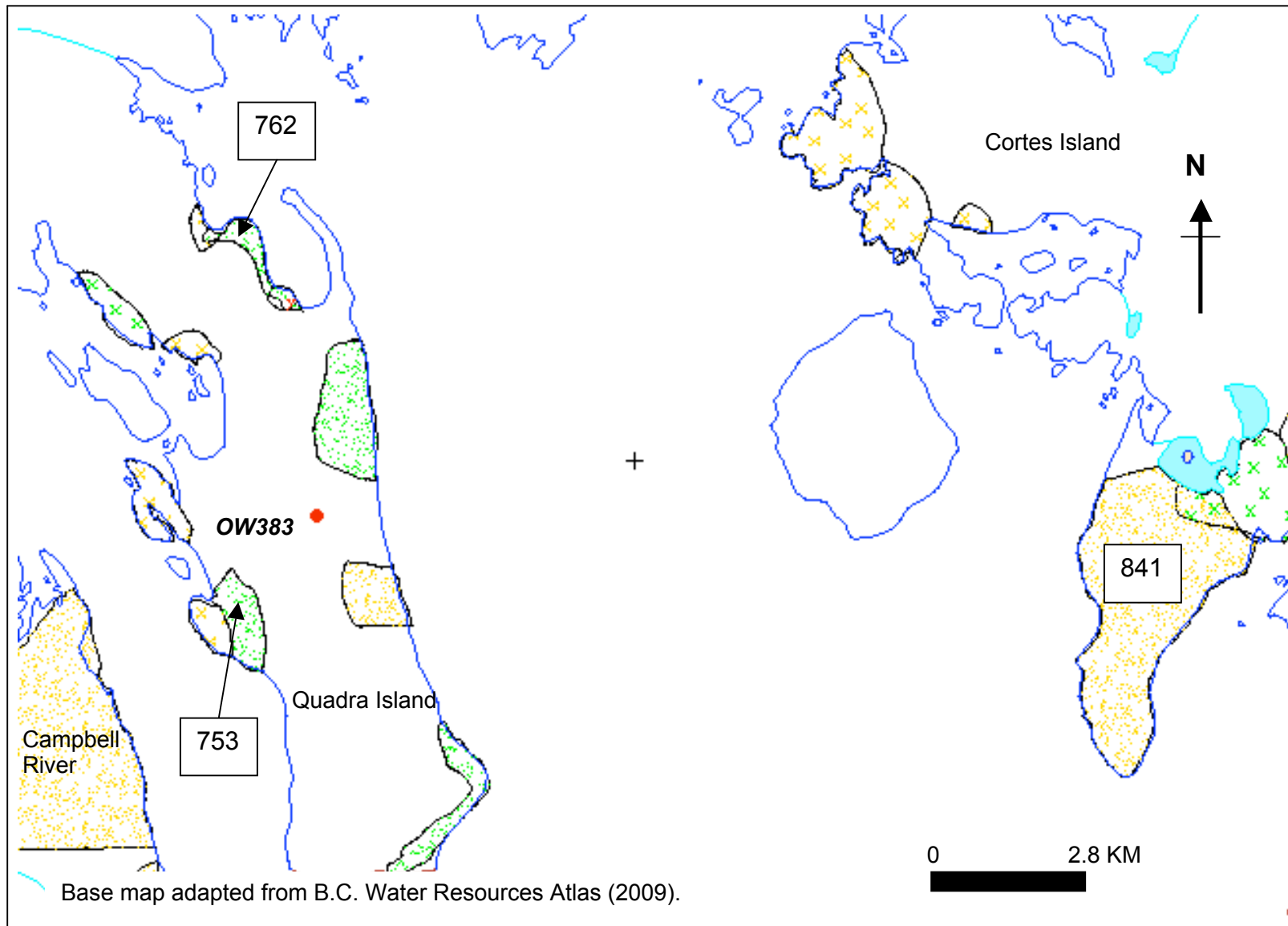


Figure 13. Priority aquifers and existing observation well in the Quadra-Cortes area.



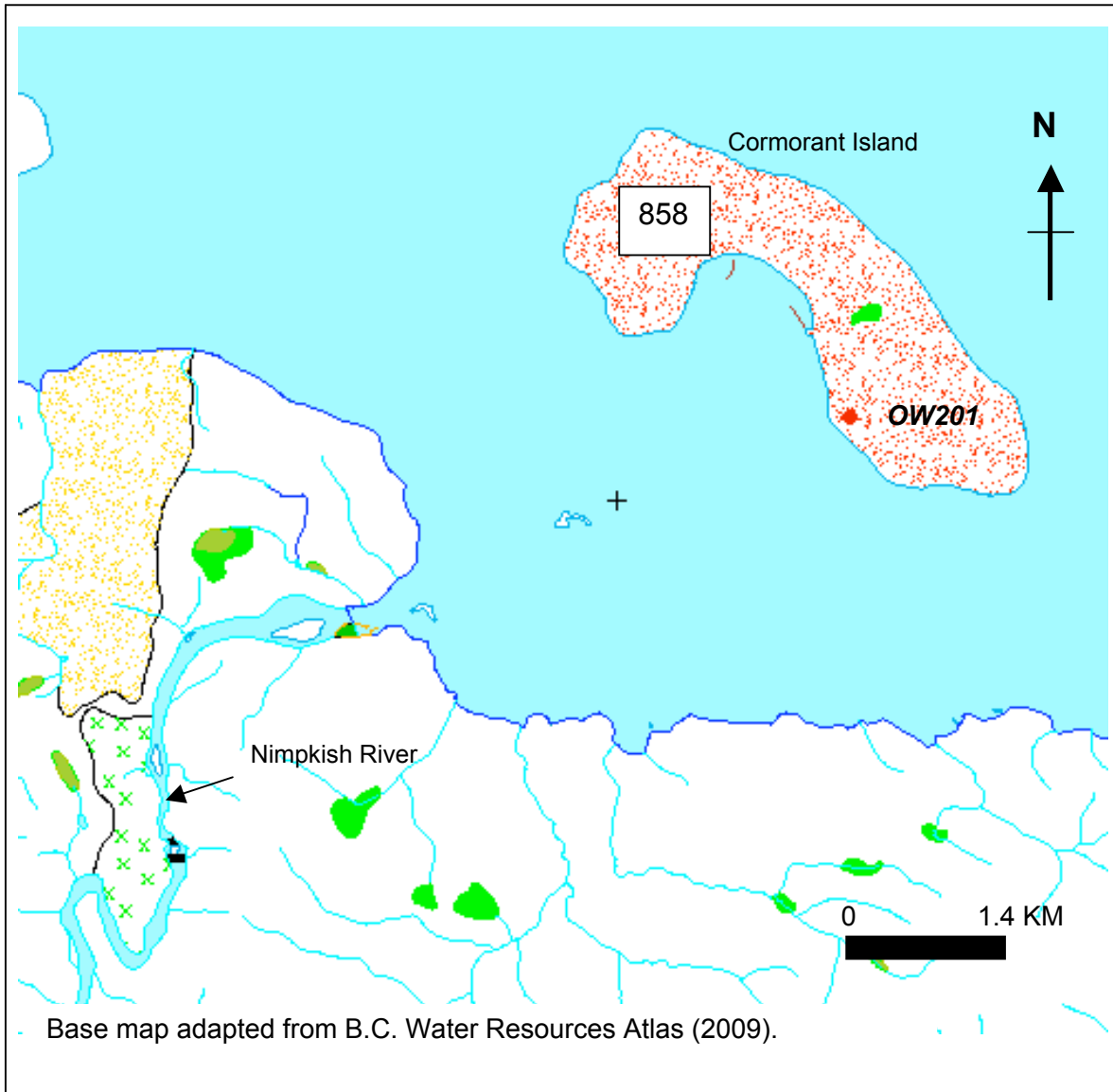


Figure 14. Priority aquifer 858 and existing observation well at Alert Bay.

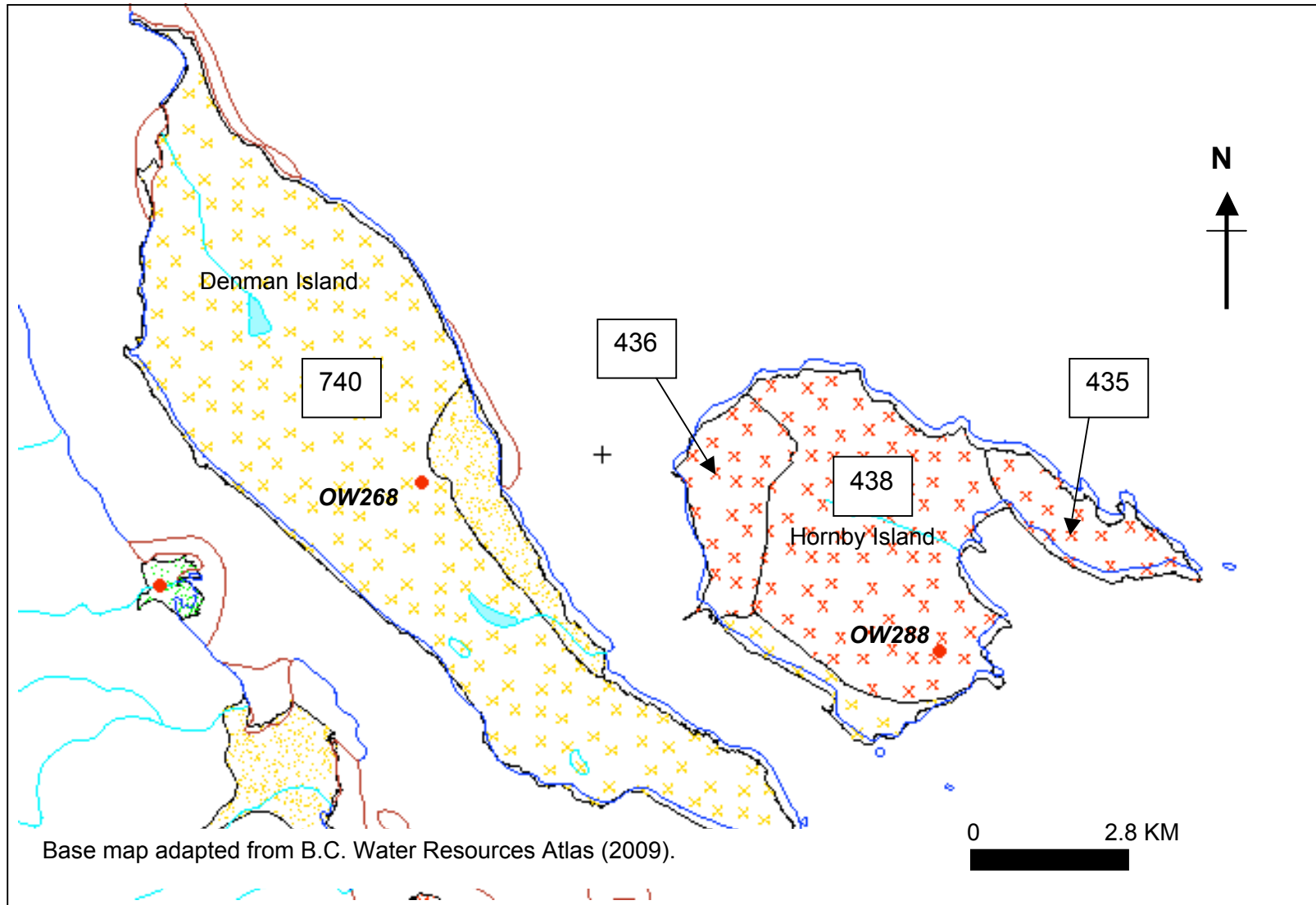


Figure 15. Priority aquifers and existing observation wells in the Hornby-Denman area.

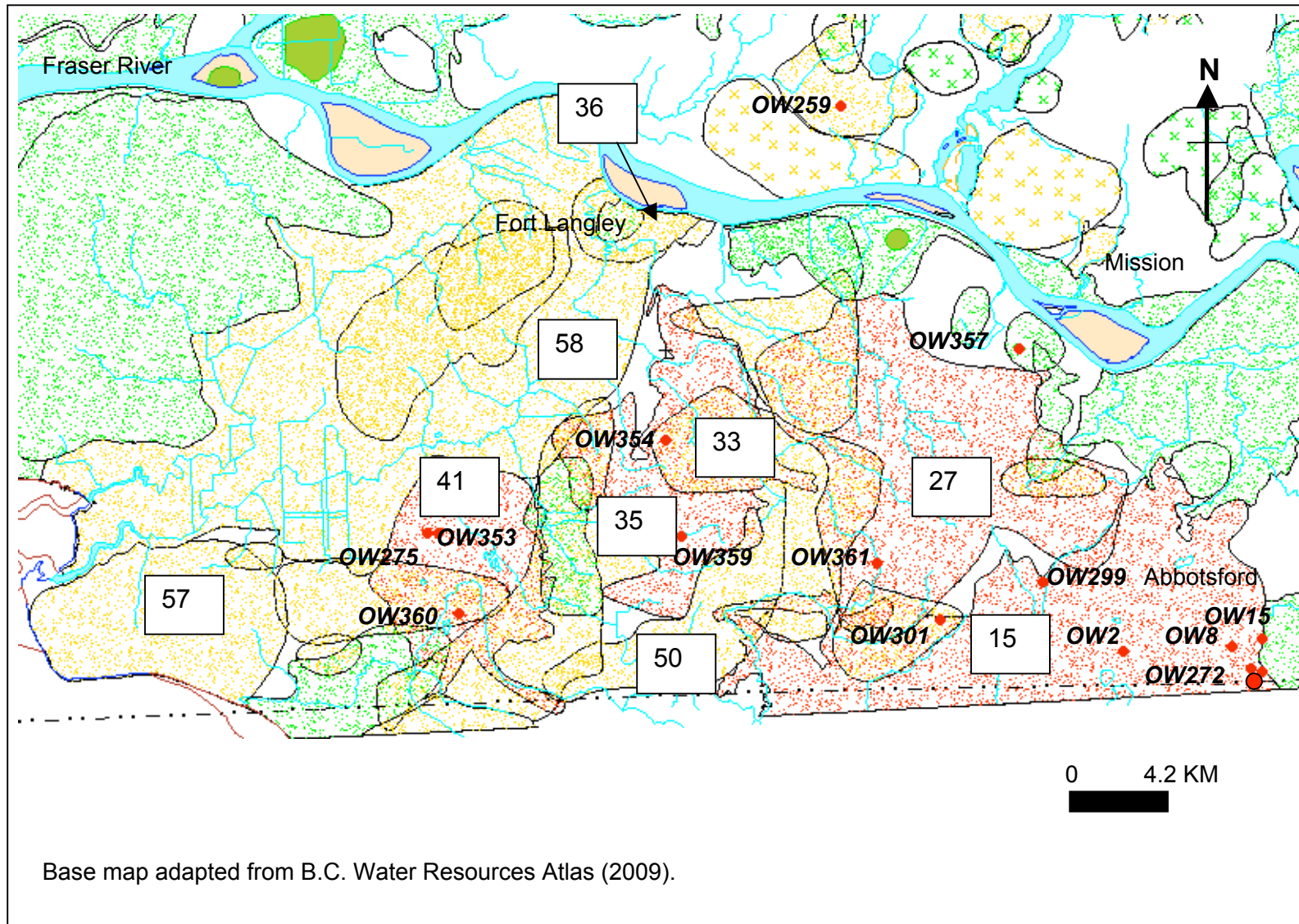


Figure 1. Priority aquifers and existing observation wells in the Fraser Valley south area.

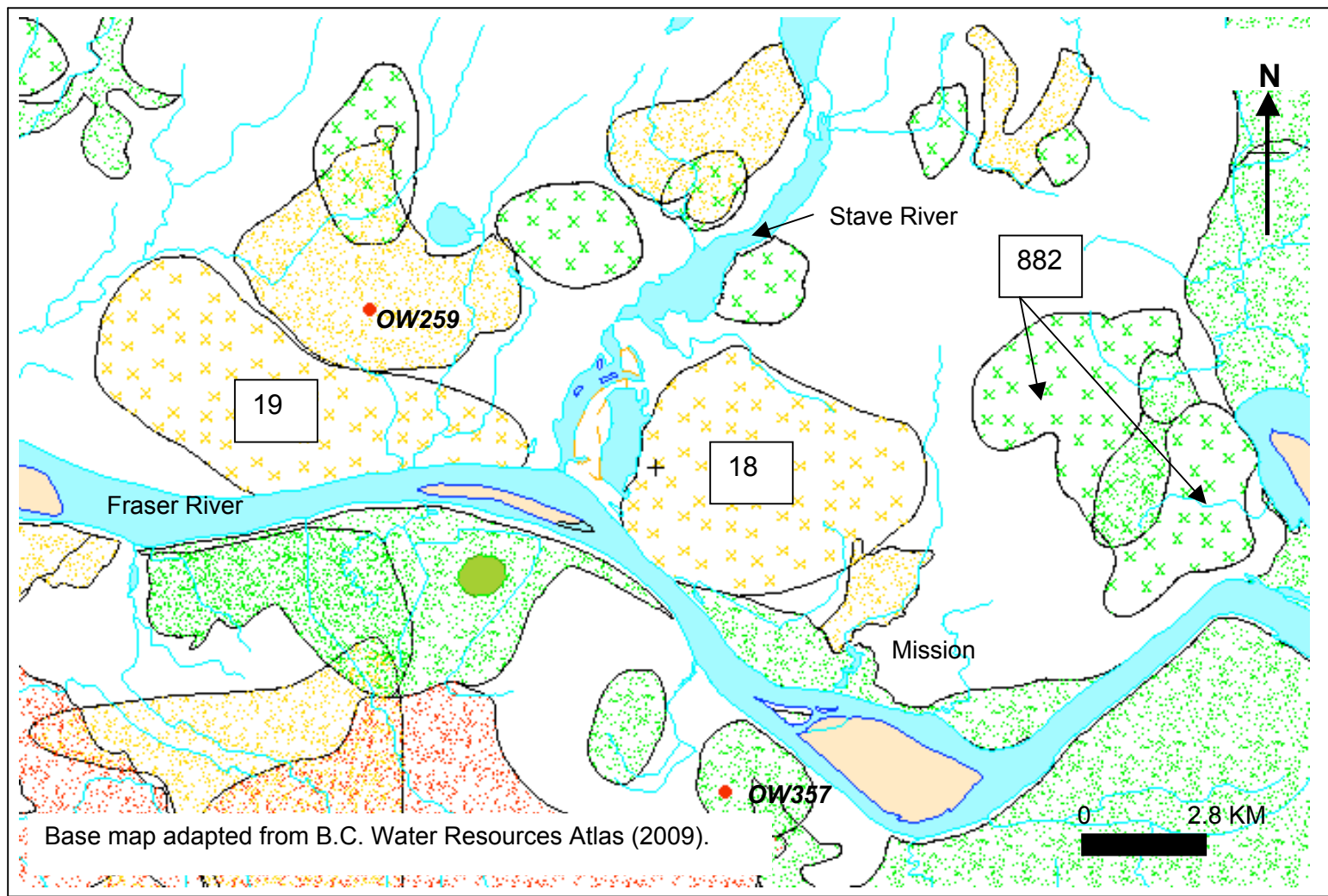


Figure 2. Priority aquifers and existing observation wells in the Fraser Valley north area

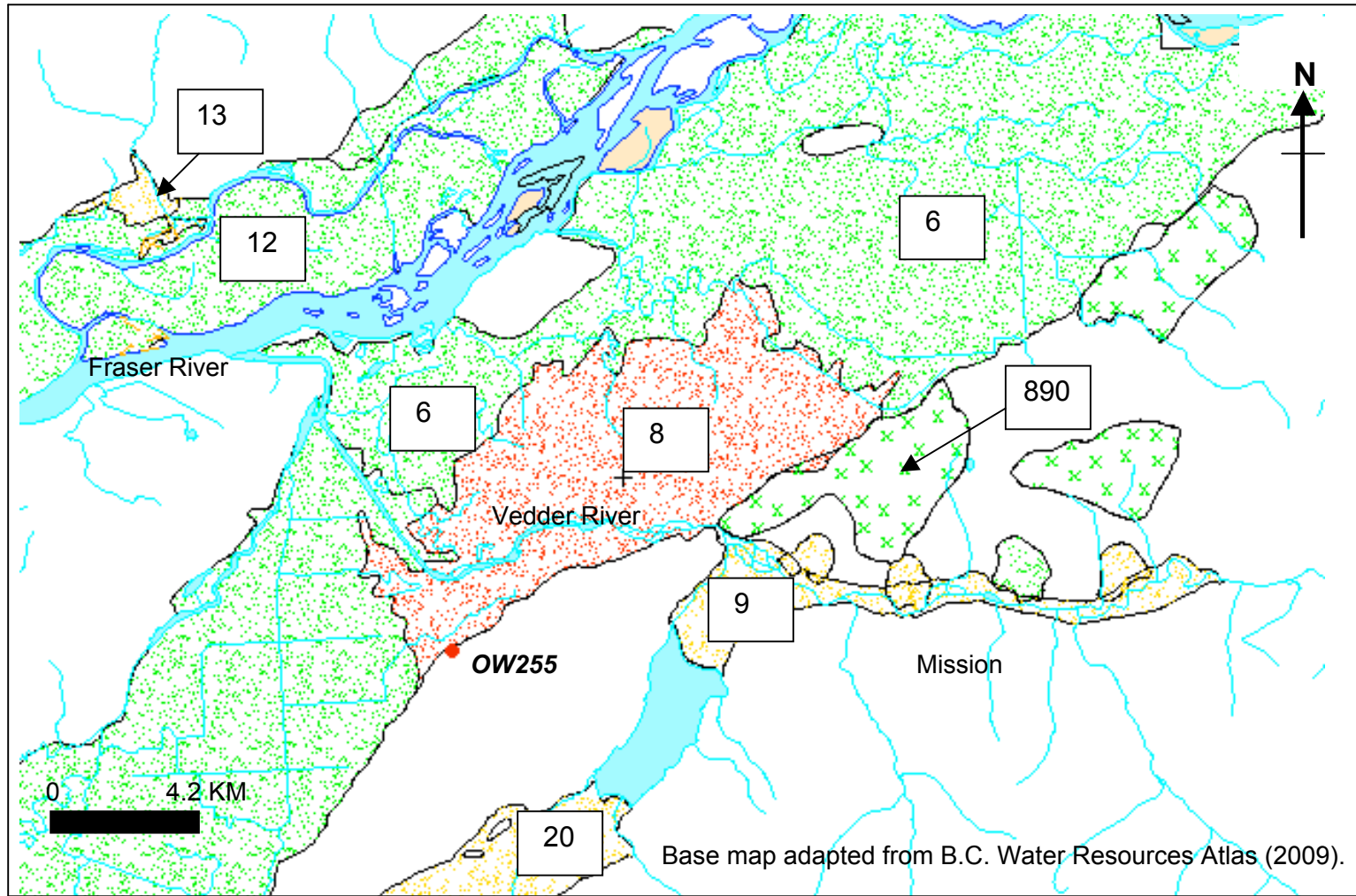


Figure 3. Priority aquifers and existing observation wells in the Chilliwack-Vedder area.

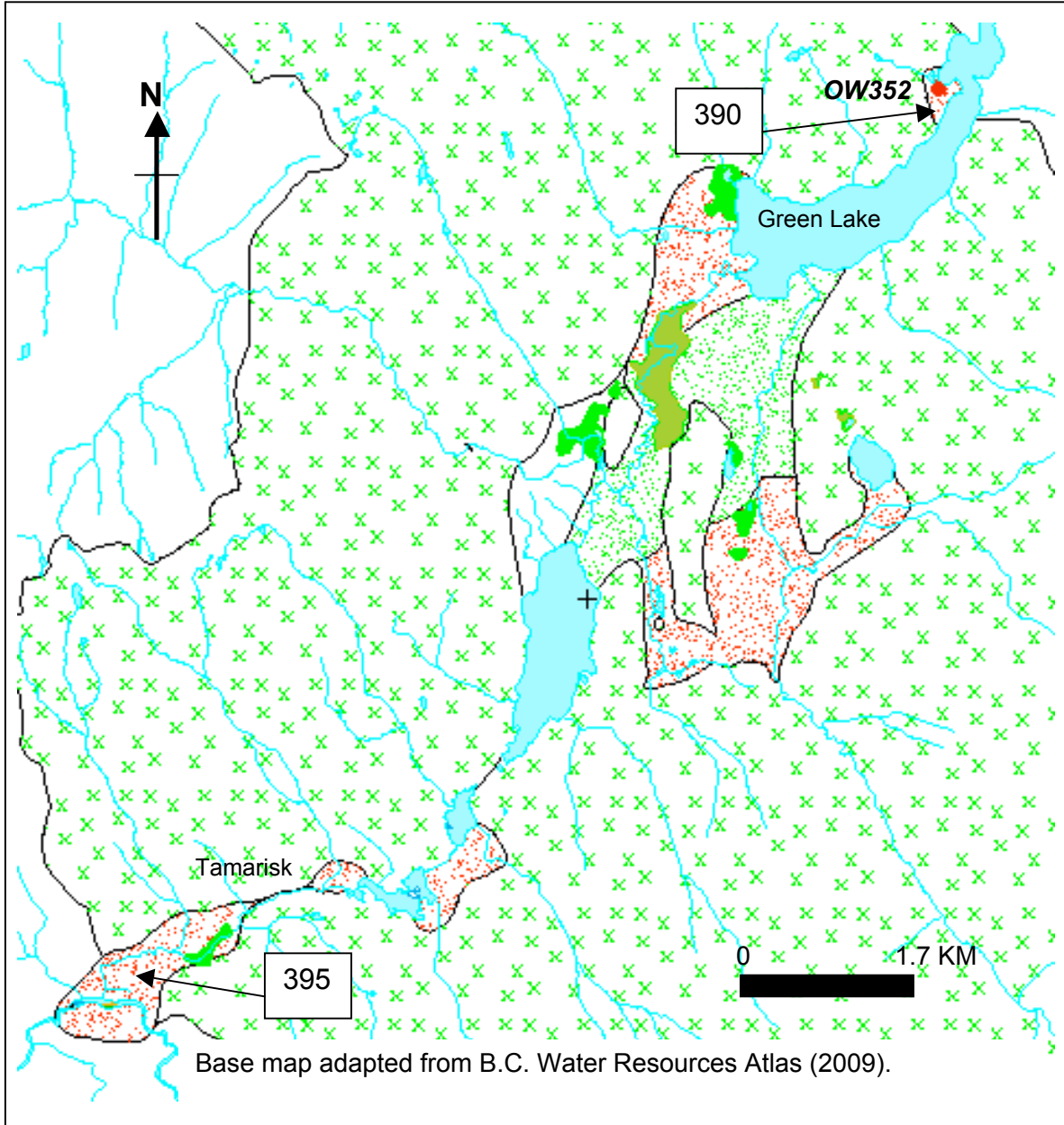


Figure 4. Priority aquifers and observation wells in the Whistler area.

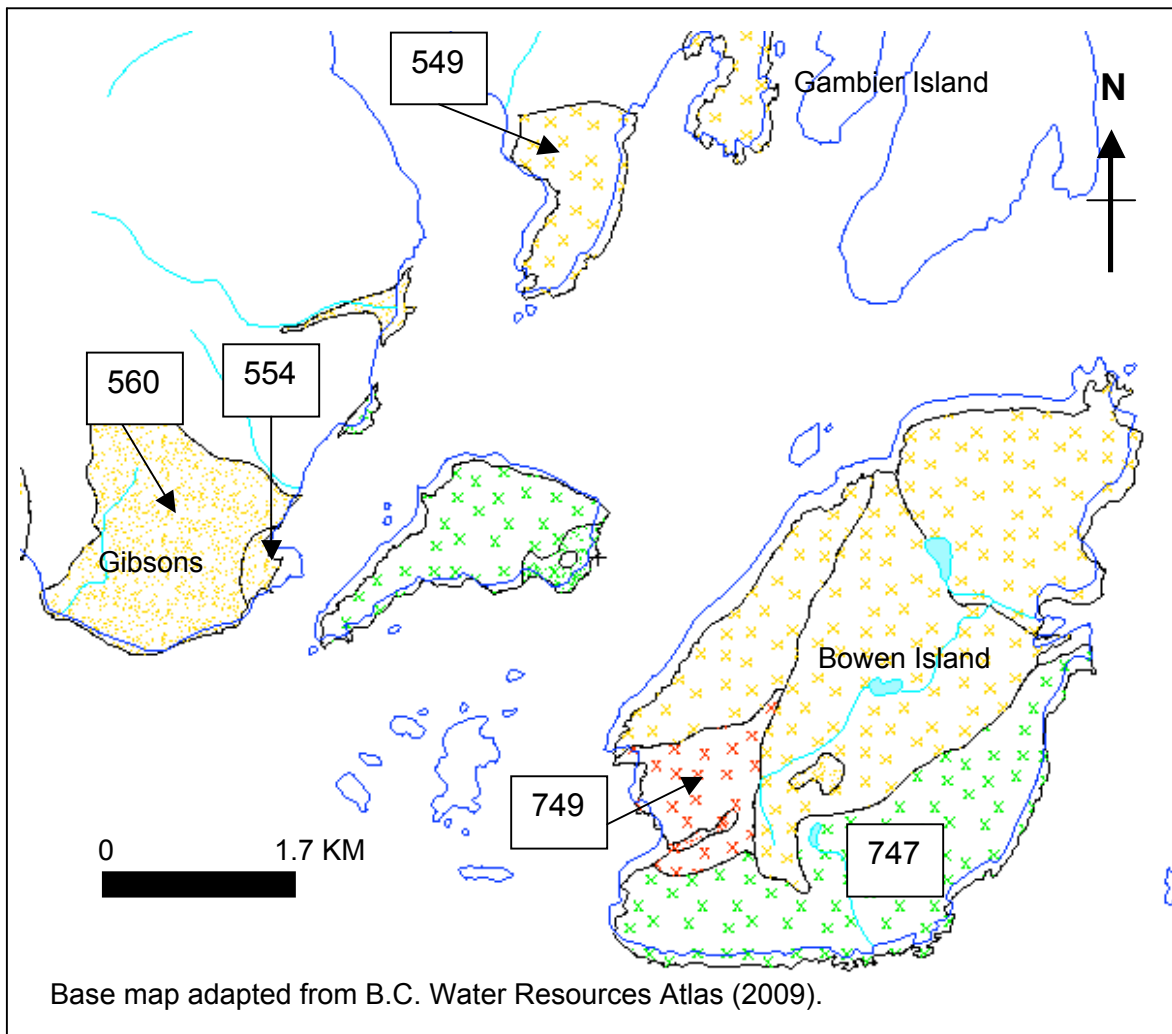


Figure 5. Priority aquifers and observation wells at Bowen Island, Gambier Island and southern Sechelt sub-areas.

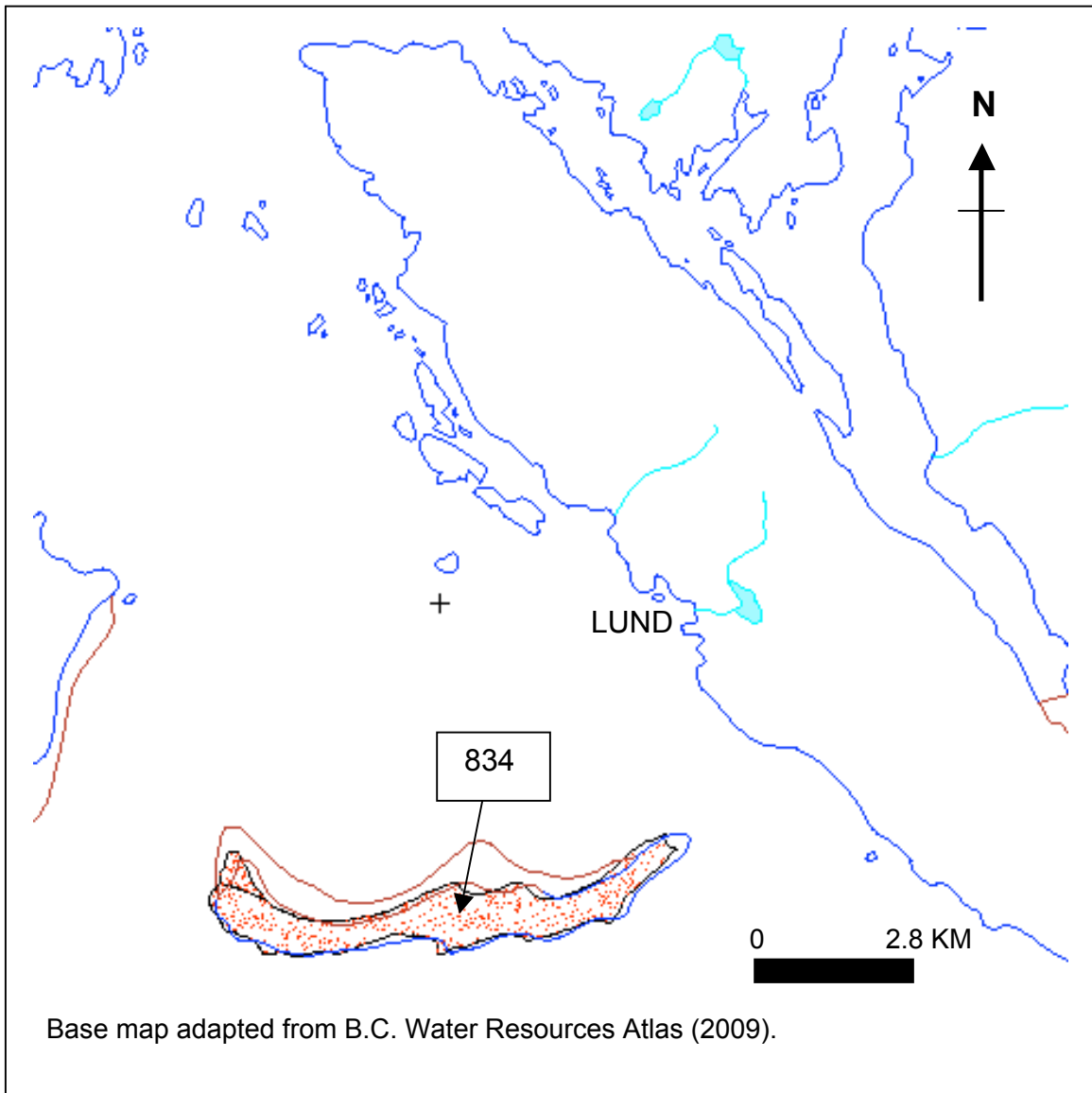


Figure 6. Priority aquifer 834 at Savary Island.



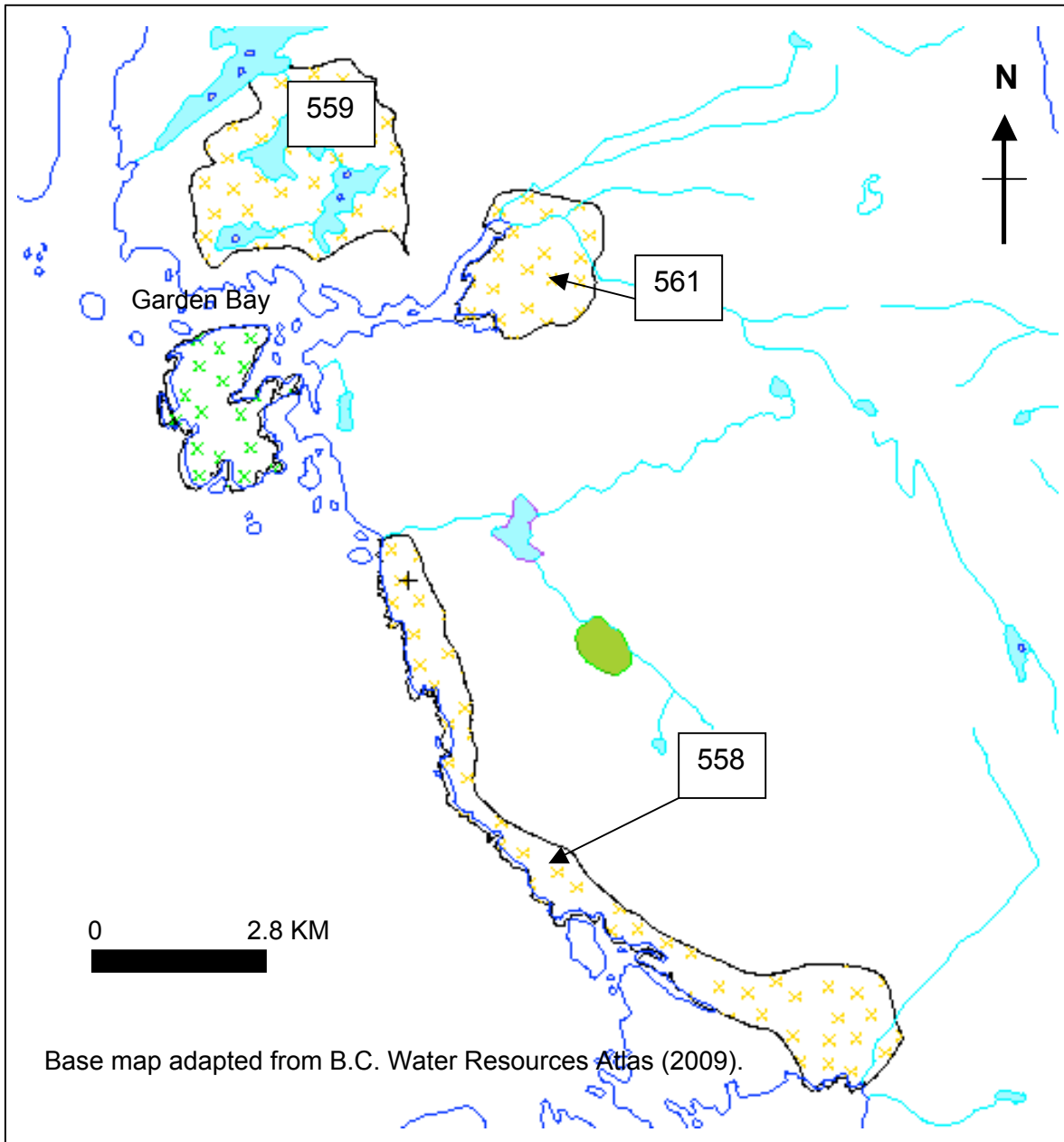


Figure 7. Priority aquifers in the northern Sechelt sub-area.

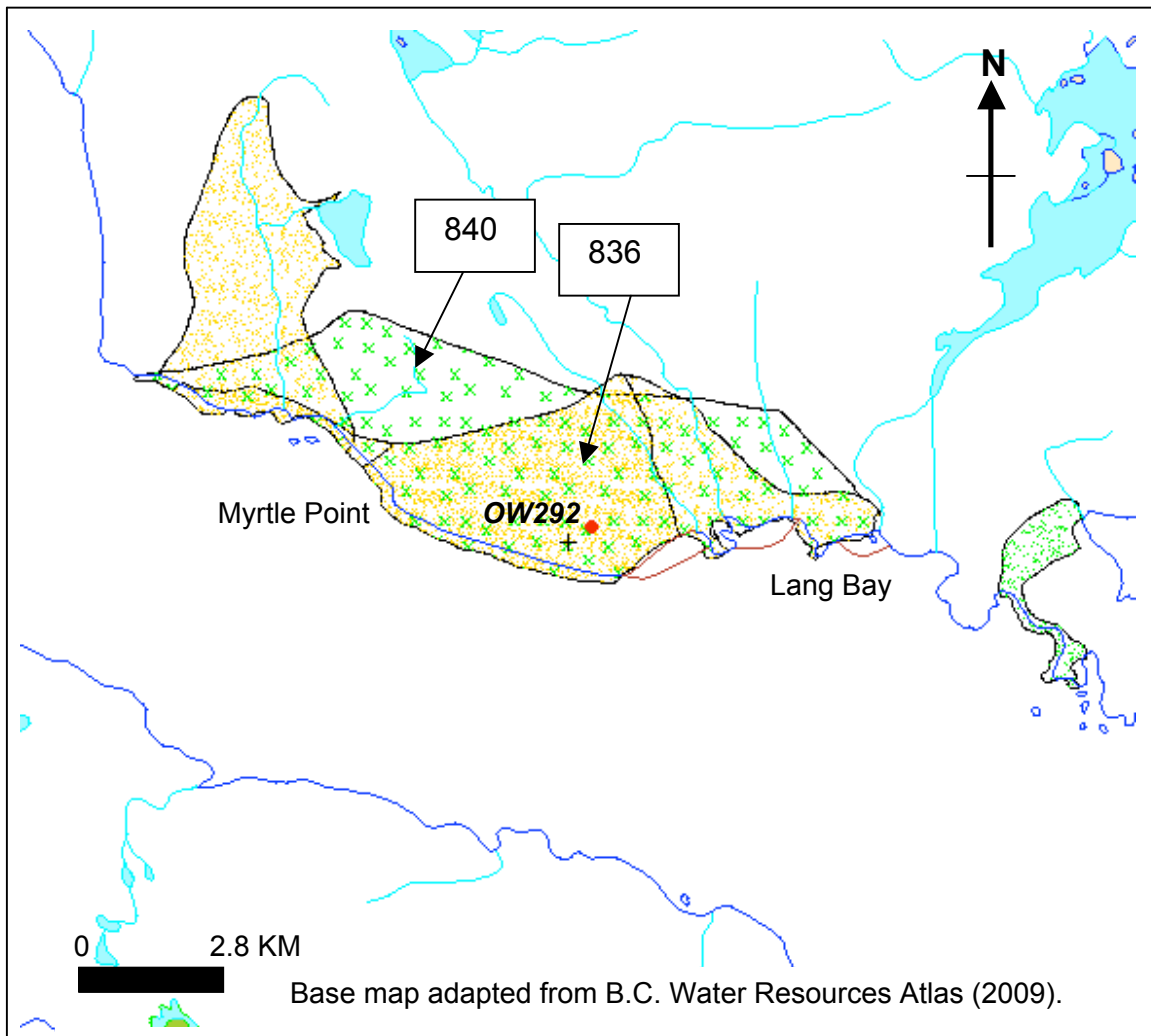


Figure 8. Priority aquifers and existing observation wells in the Powell River area.

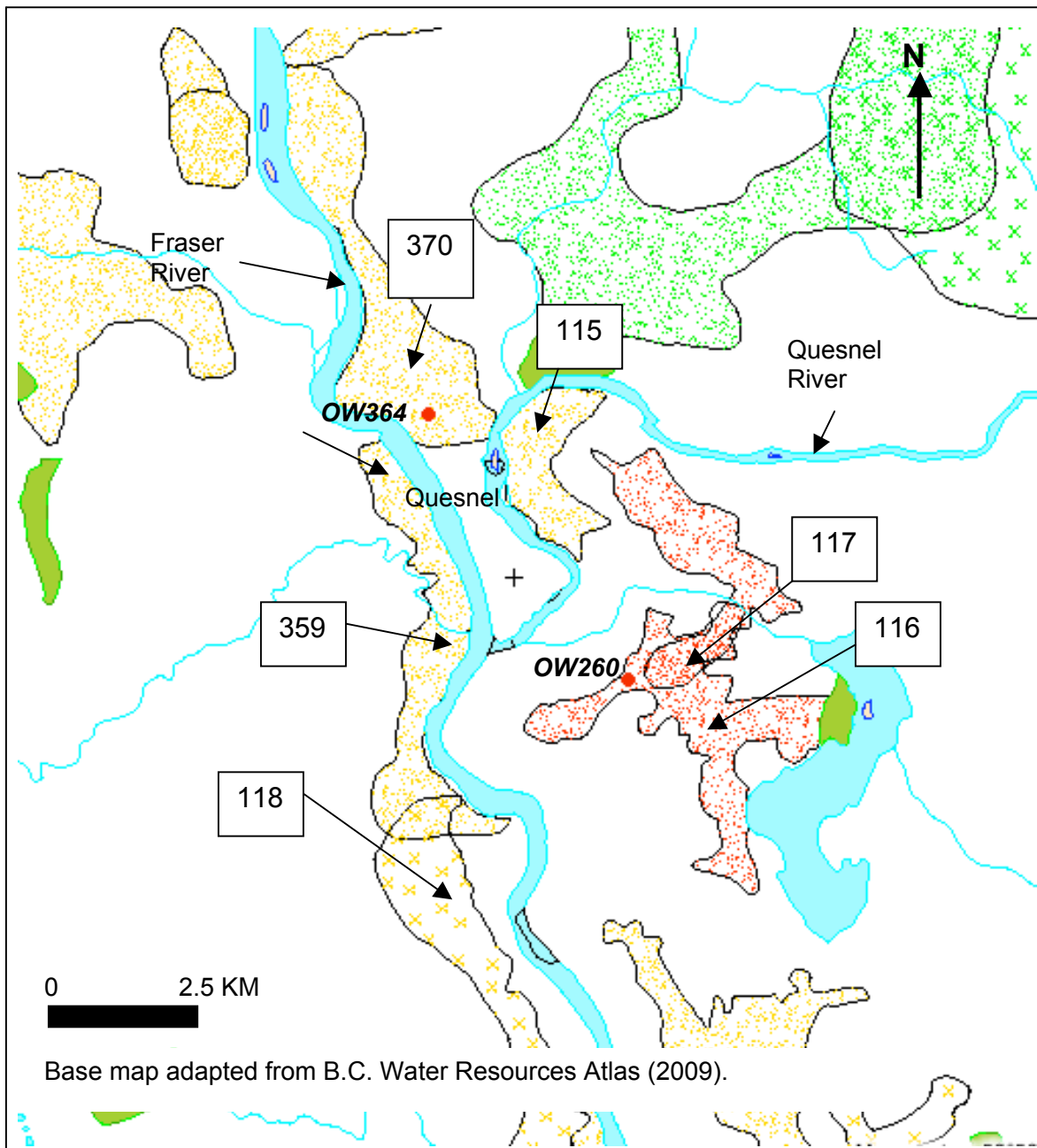


Figure 1. Priority aquifers and existing observation wells in the Quesnel area.

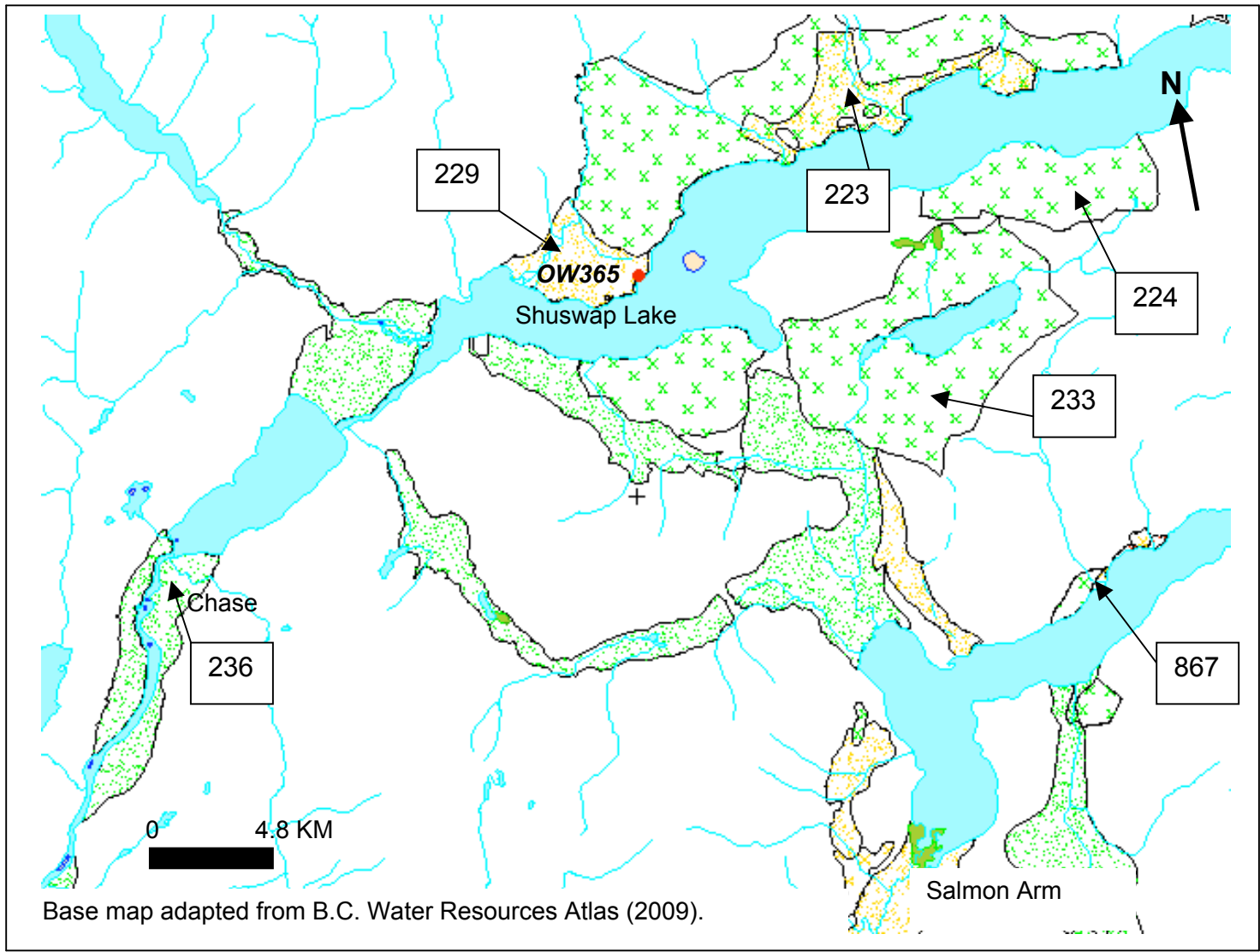


Figure 2. Priority aquifers and existing observation well in the north part of Salmon Arm area.

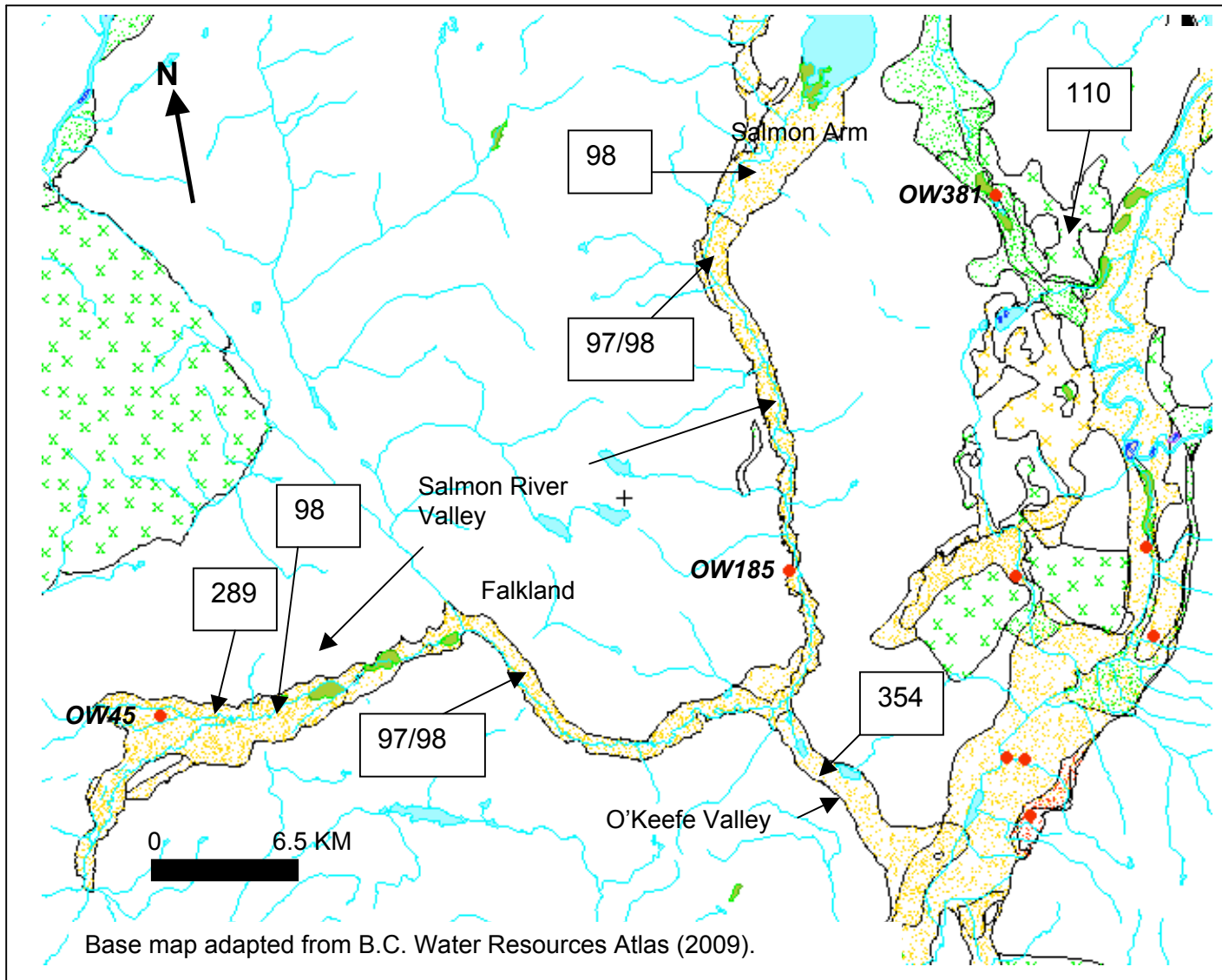


Figure 3. Priority aquifers and existing observation wells in the south part of Salmon Arm area.



Figure 4. Priority aquifers in the Kamloops area.

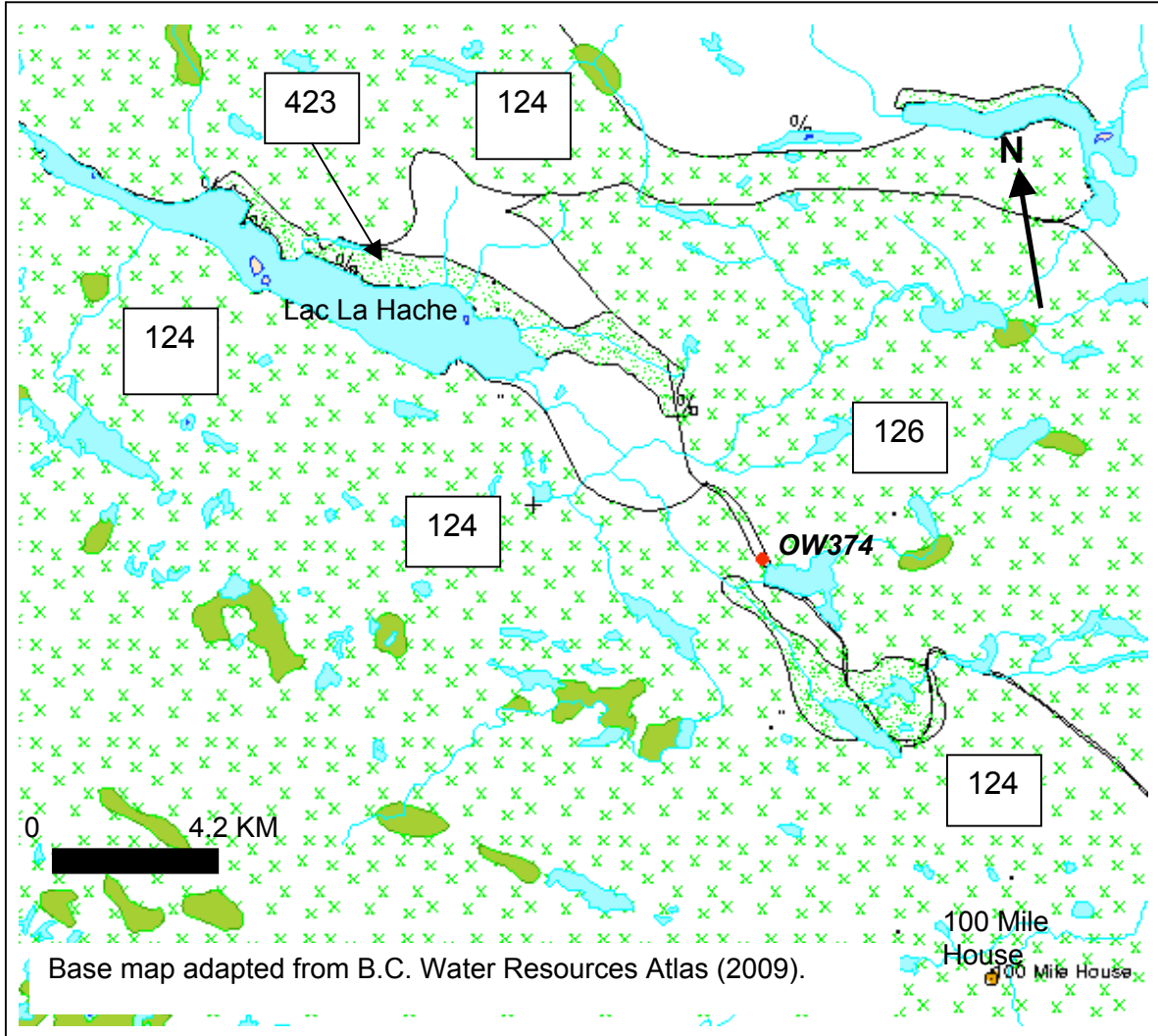


Figure 5. Priority aquifers in the 100 Mile House area.

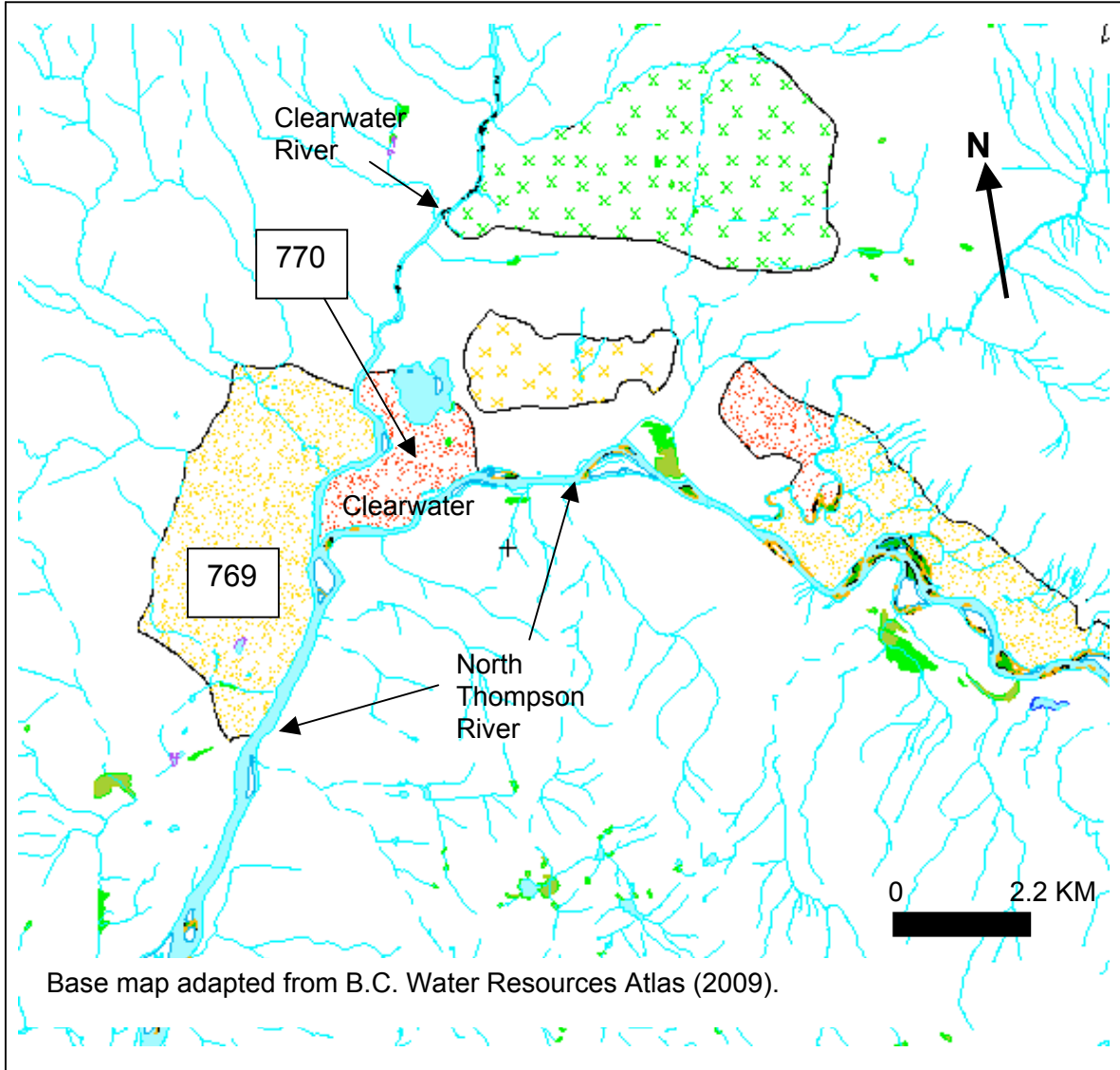


Figure 6. Priority aquifers in the North Thompson area.



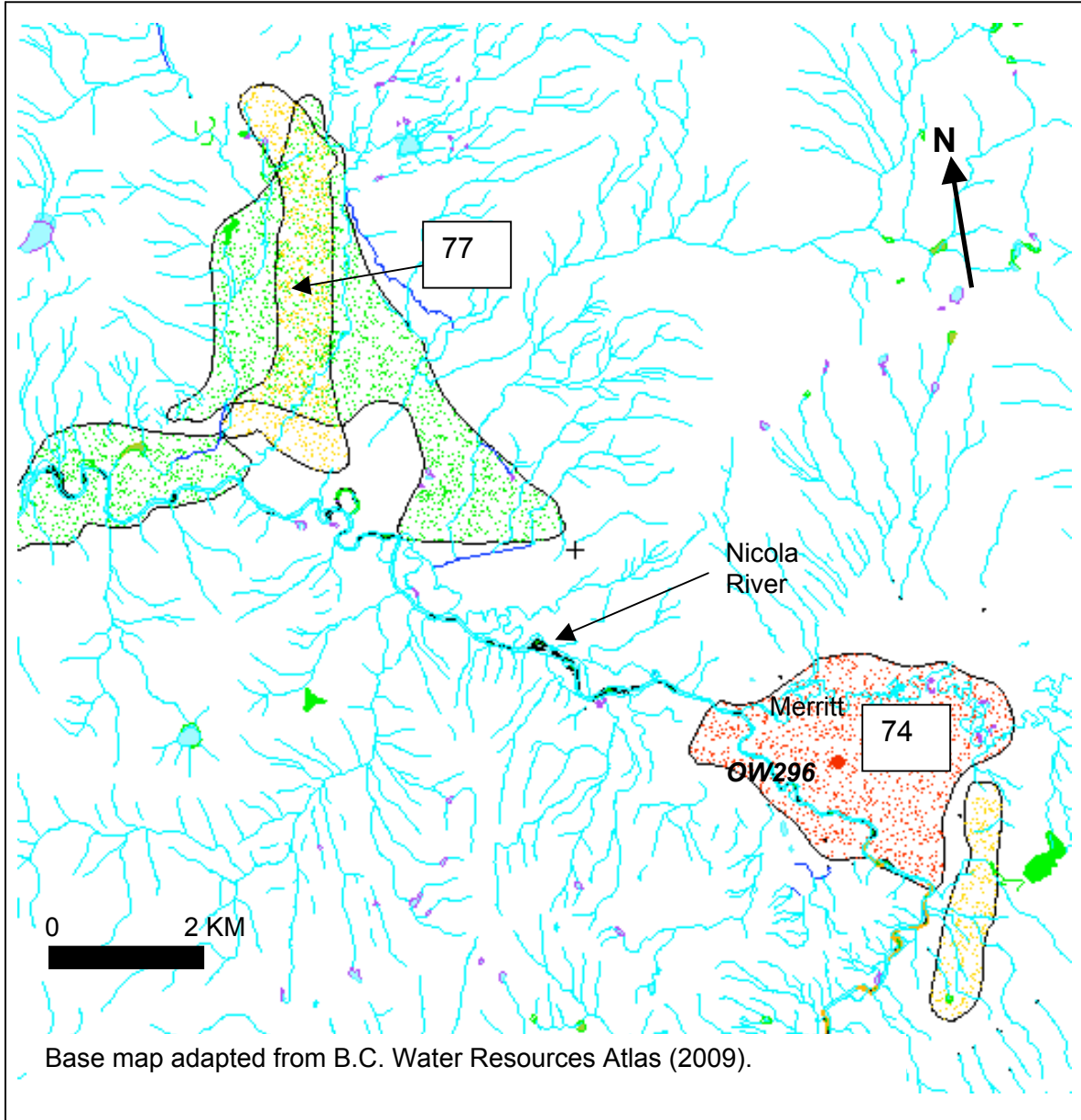


Figure 7. Priority aquifers and existing observation well in the Lower Nicola area.

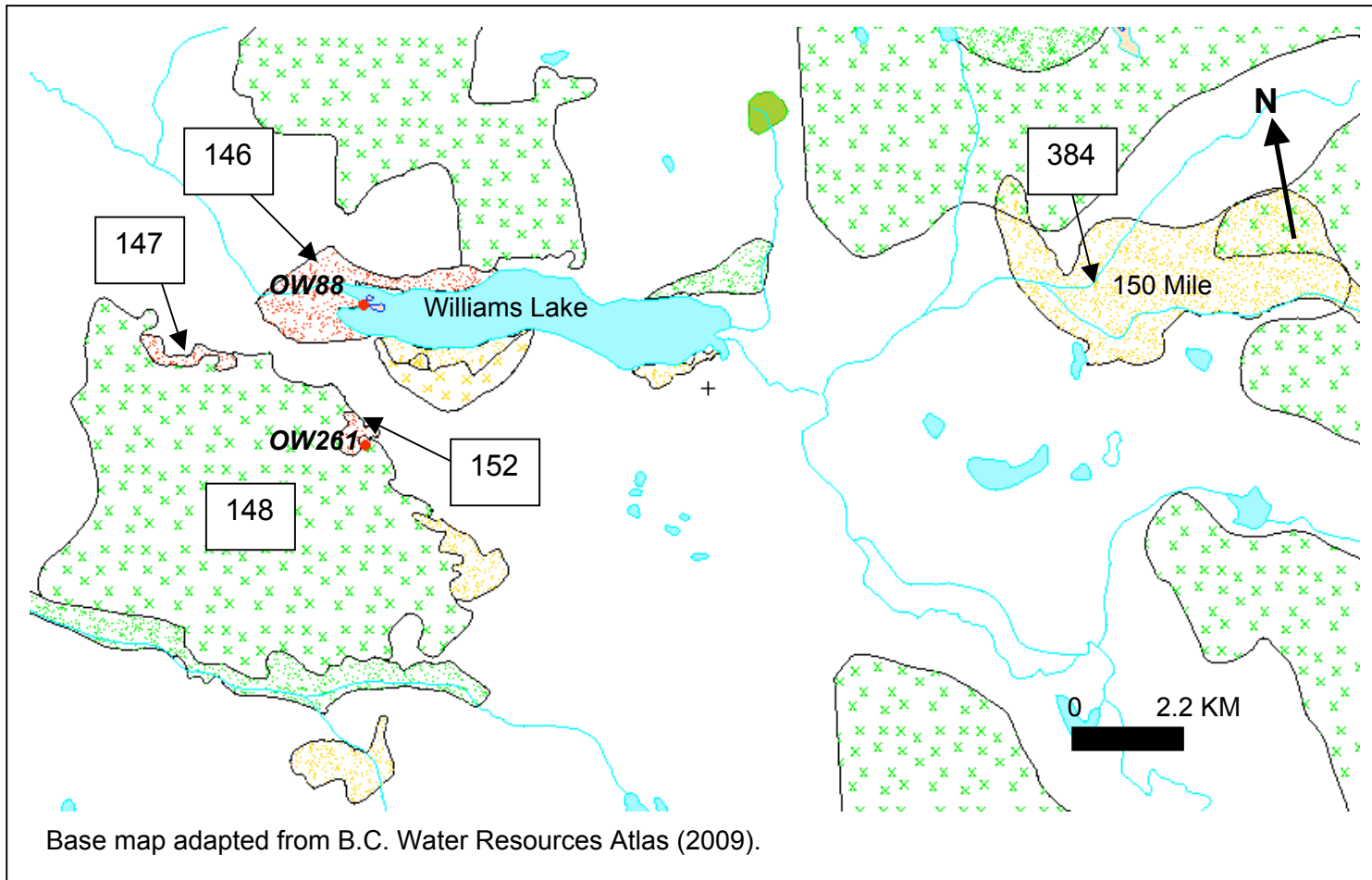


Figure 8. Priority aquifers and existing observation well in the Williams Lake area.

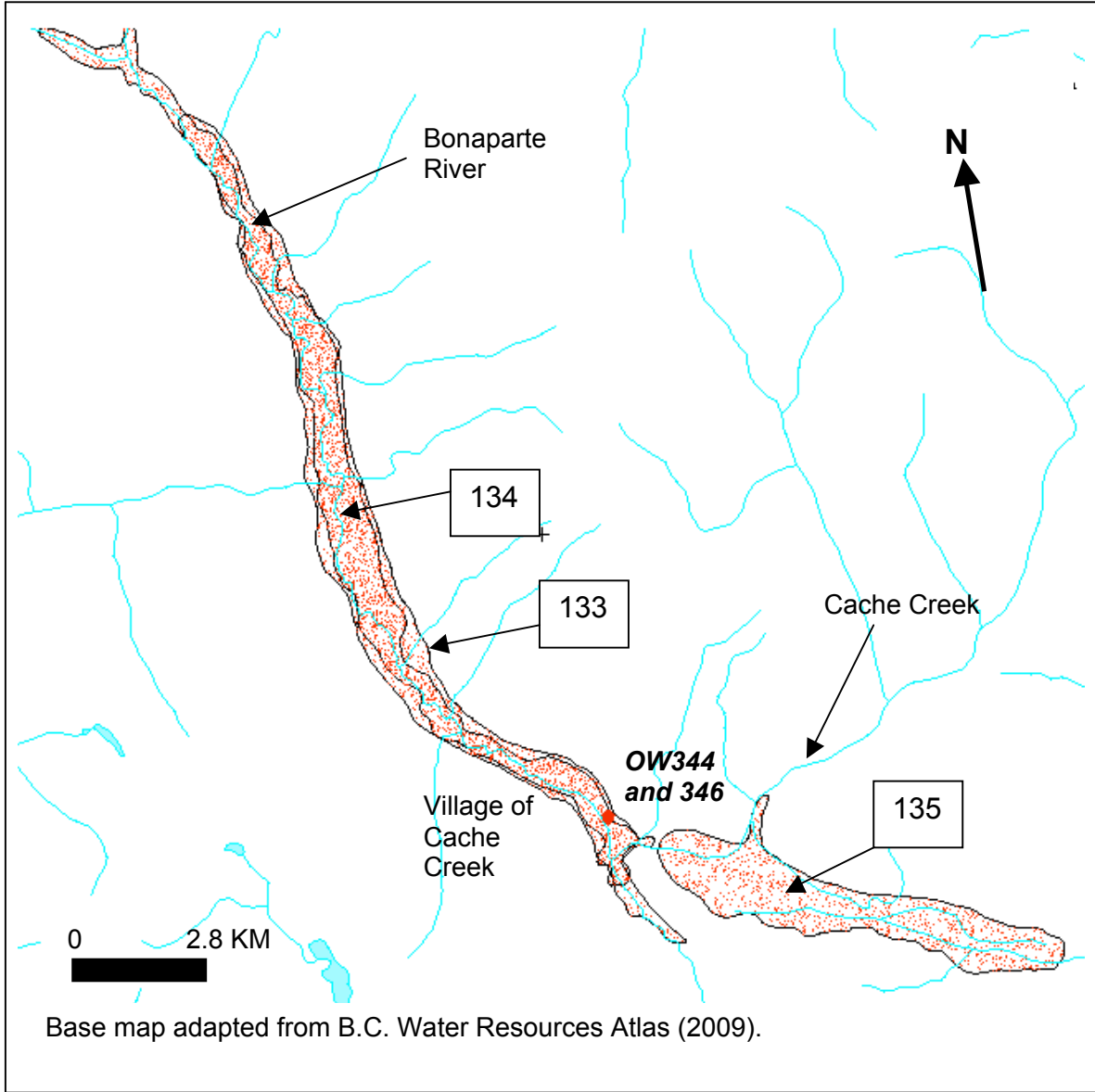


Figure 9. Priority aquifers and existing observation wells in the Cache Creek area.

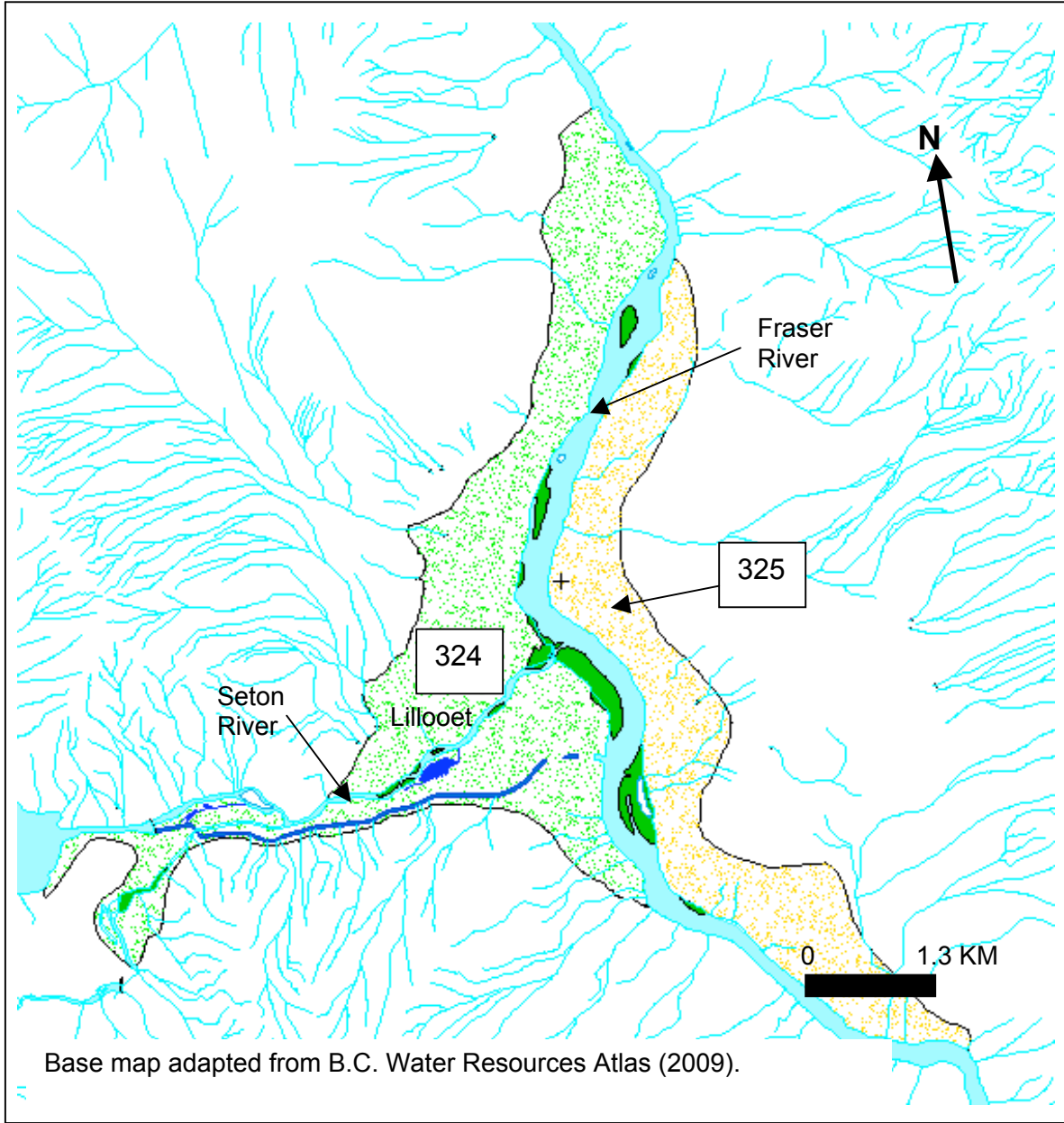


Figure 10. Priority aquifers in the Lillooet area.

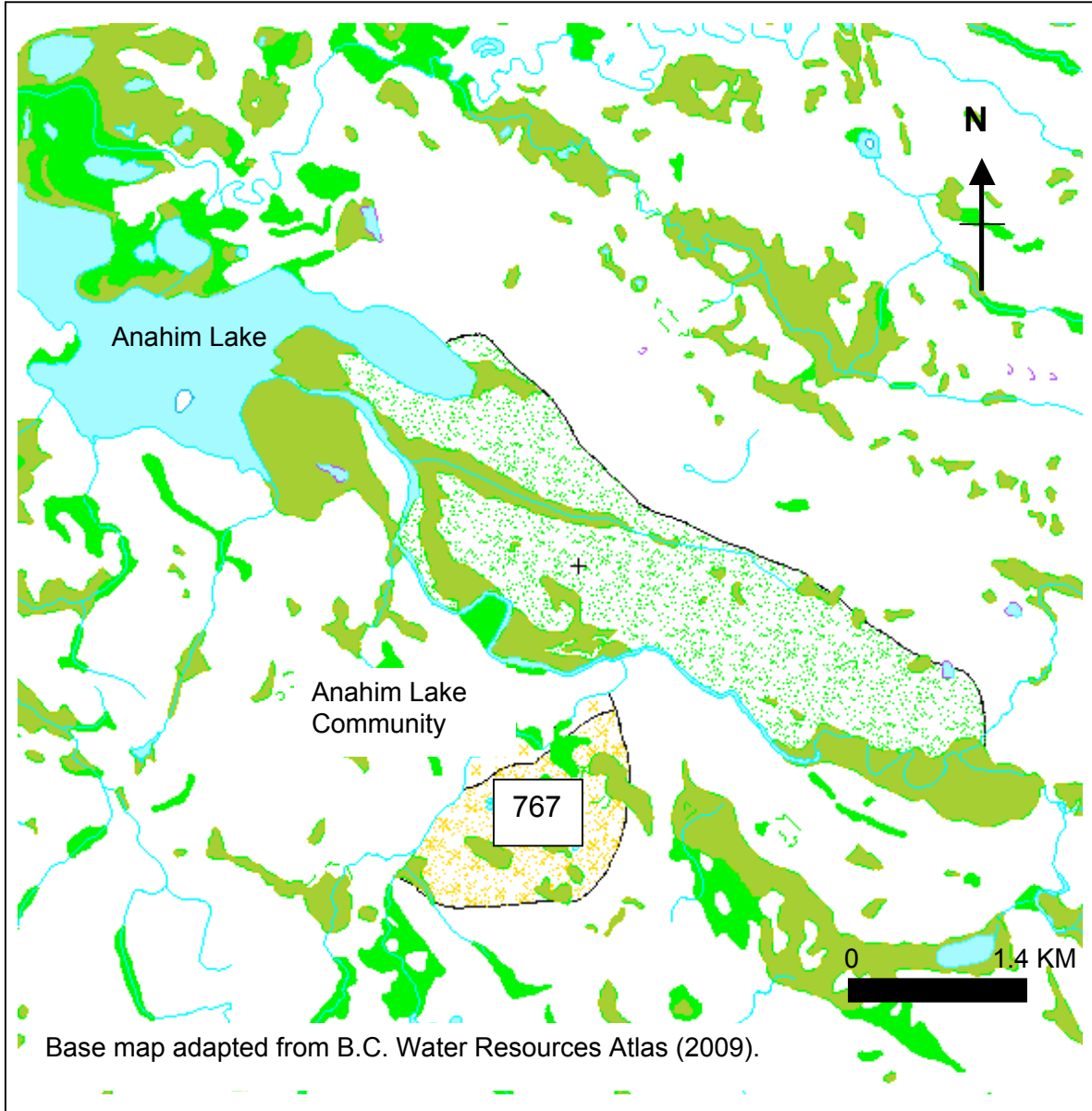


Figure 11. Priority bedrock aquifer 767 in the Anahim Lake area.

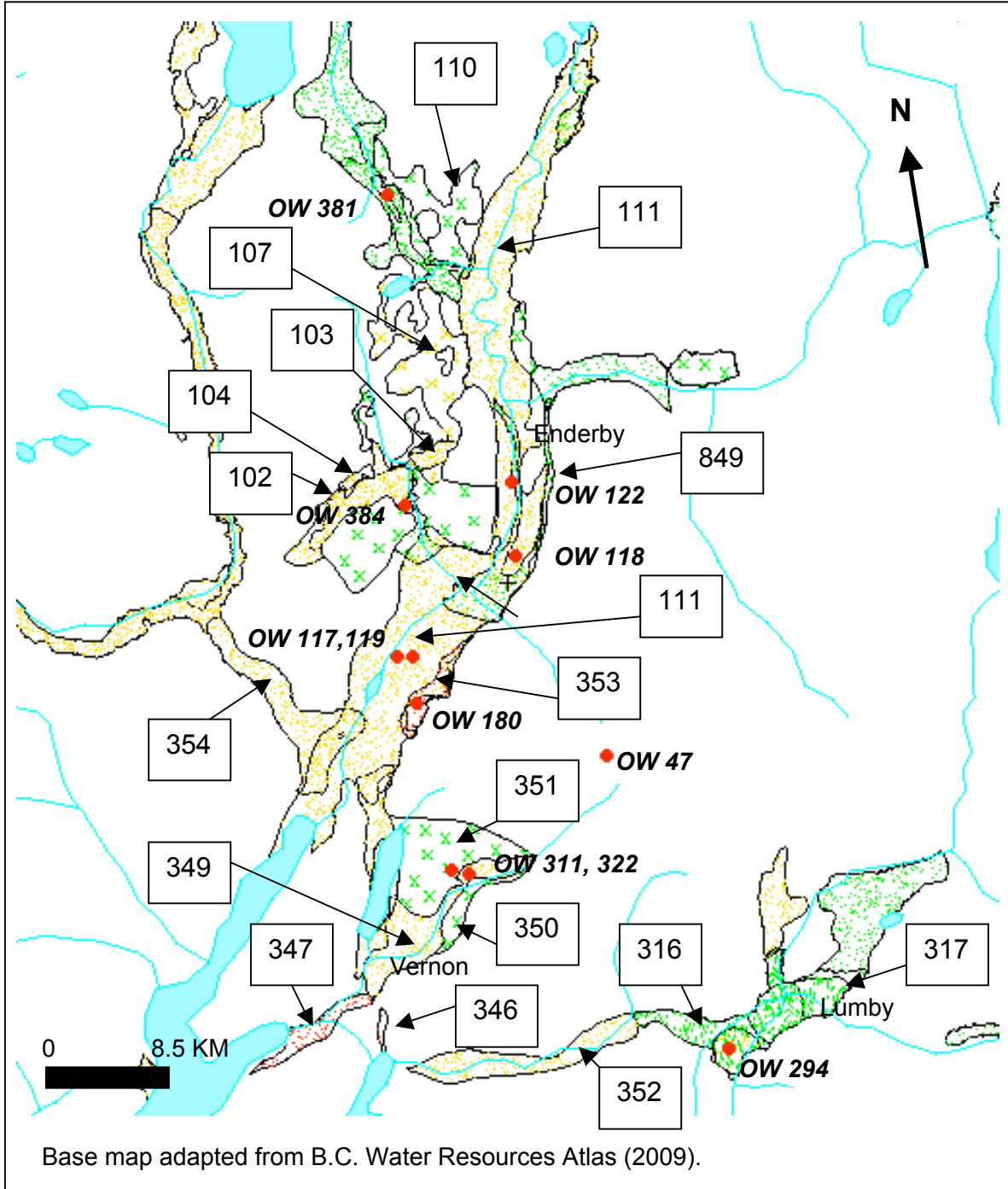


Figure 1. Priority aquifers and existing observation wells in the North Okanagan area.

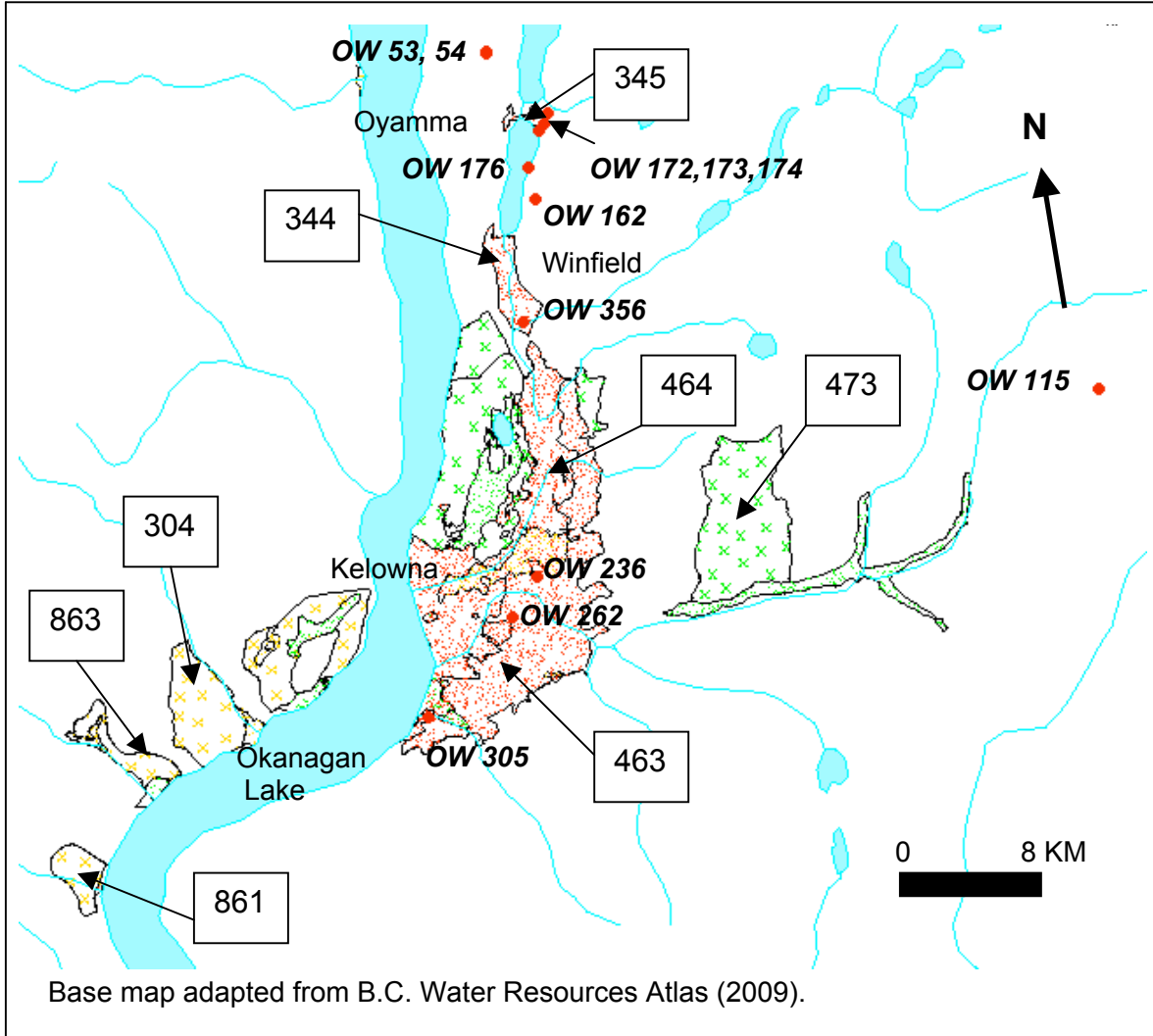


Figure 2. Priority aquifers and existing observation wells in the Kelowna area.

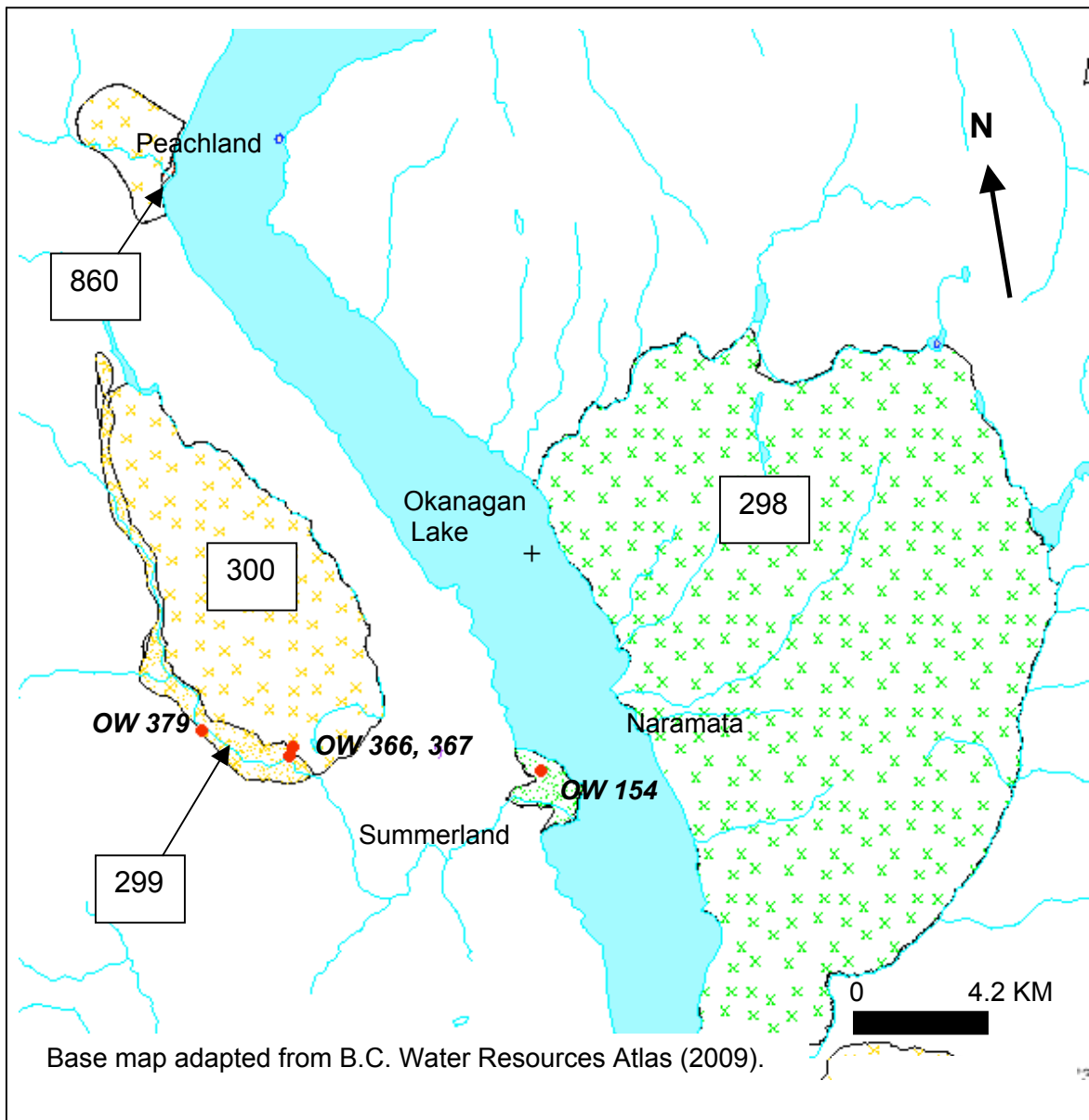


Figure 3. Priority aquifers and existing observation wells in the Summerland area.



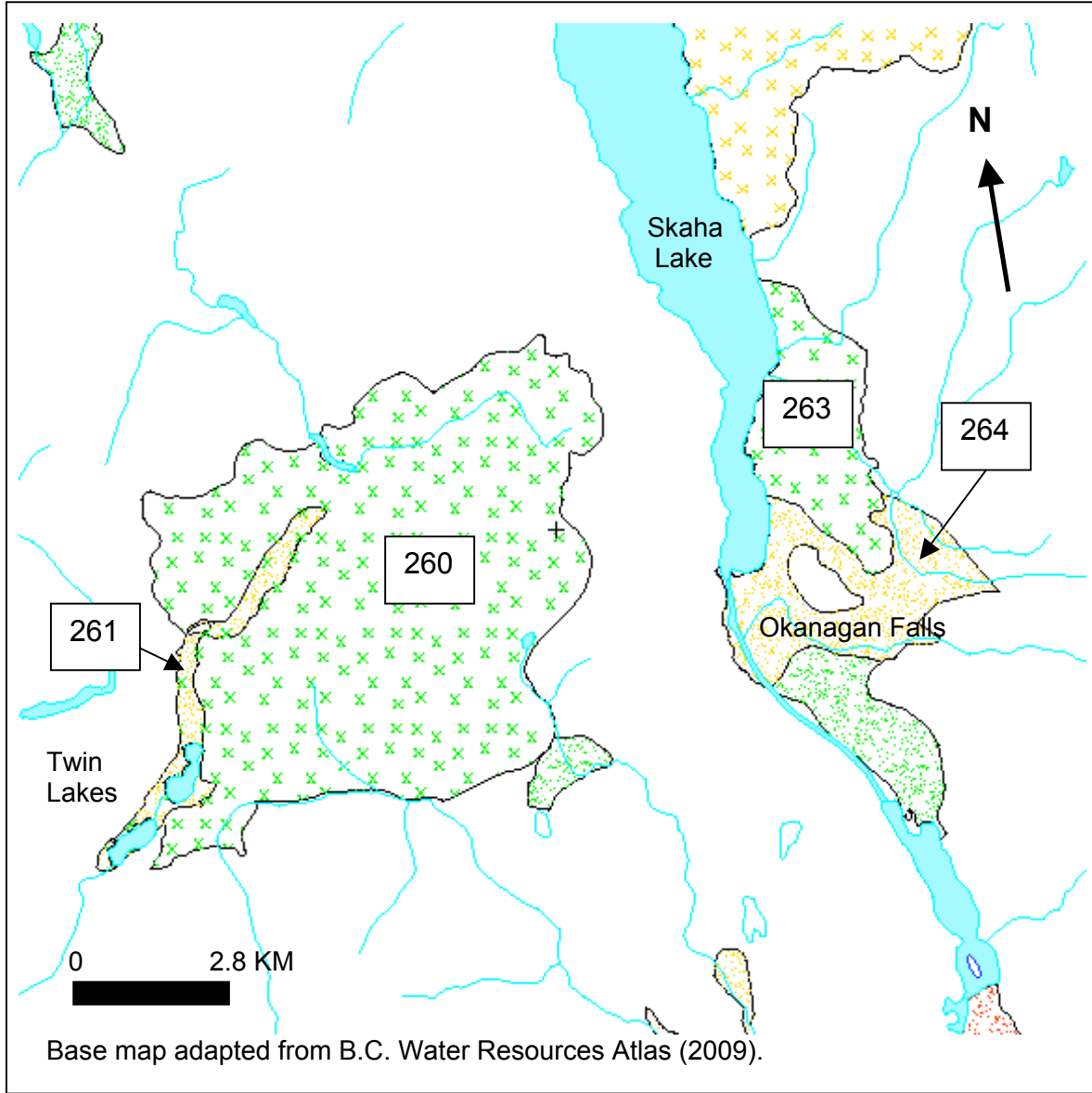


Figure 4. Priority aquifers in the Skaha Lake area.

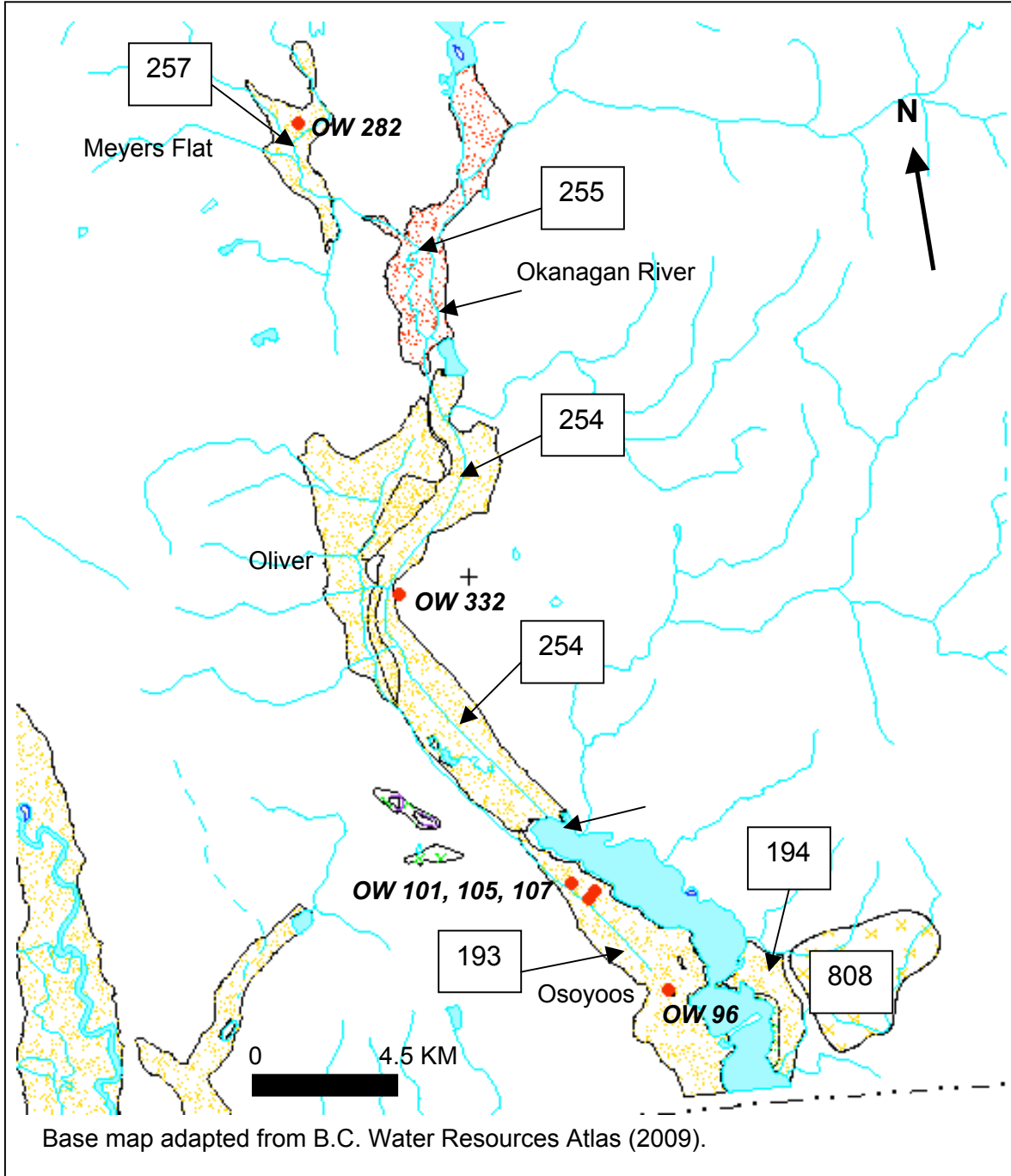


Figure 5. Priority aquifers and existing observation wells in the Osoyoos area.

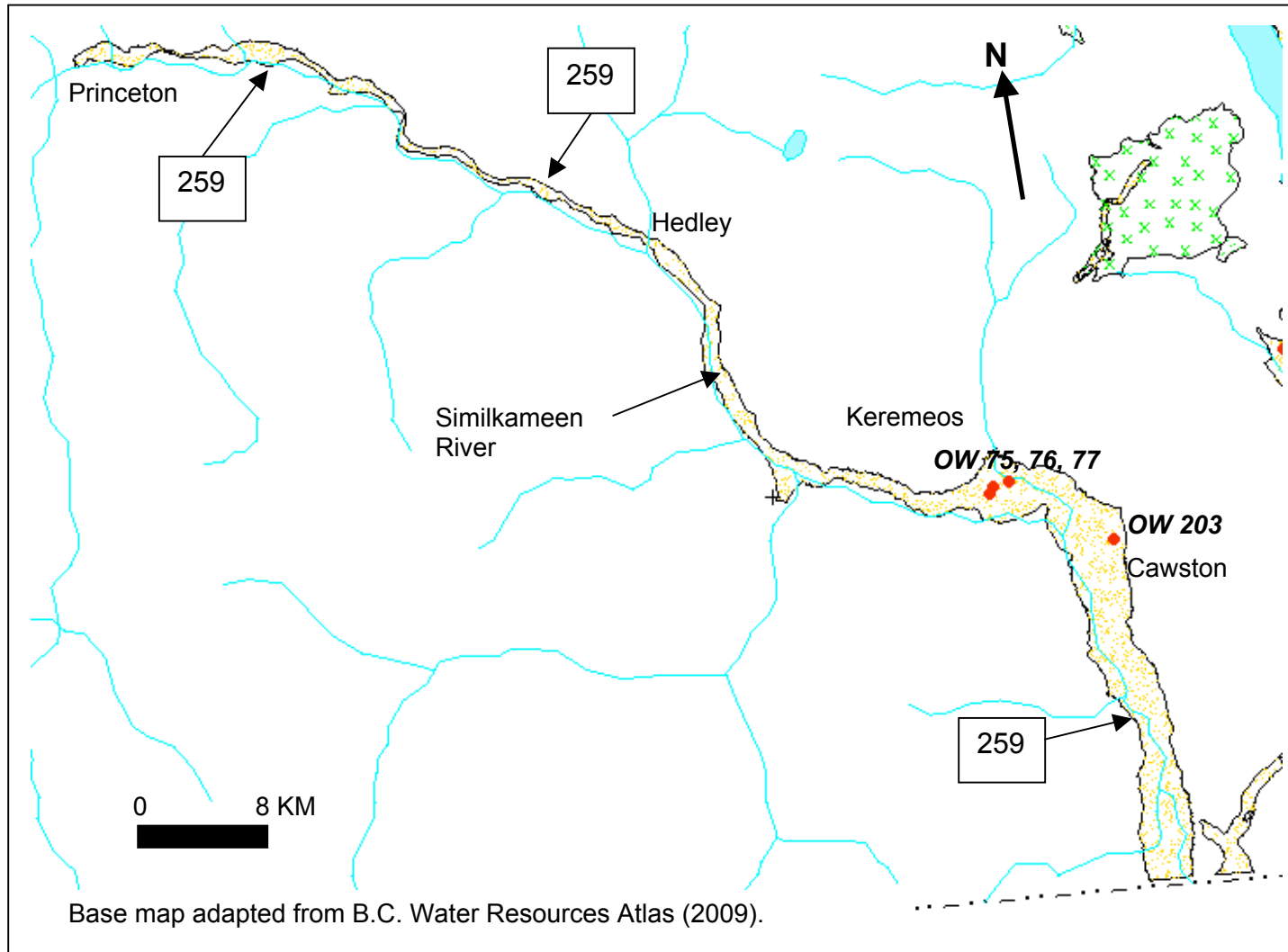


Figure 6. Priority aquifers and existing observation wells in the Similkameen area.

Kootenay/Okanagan Region

Appendix O

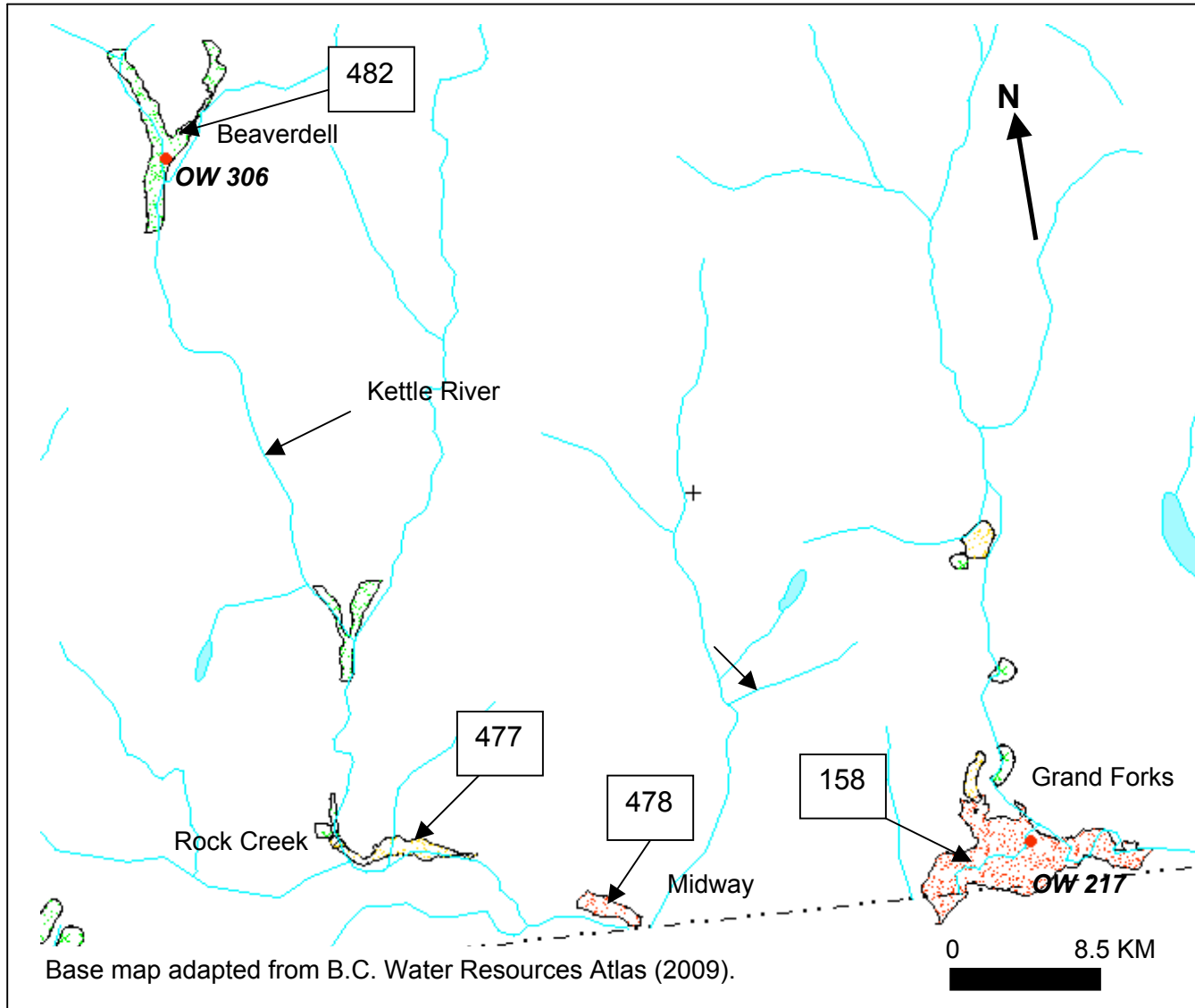


Figure 7. Priority aquifers and existing observation wells in the Kettle Valley area.

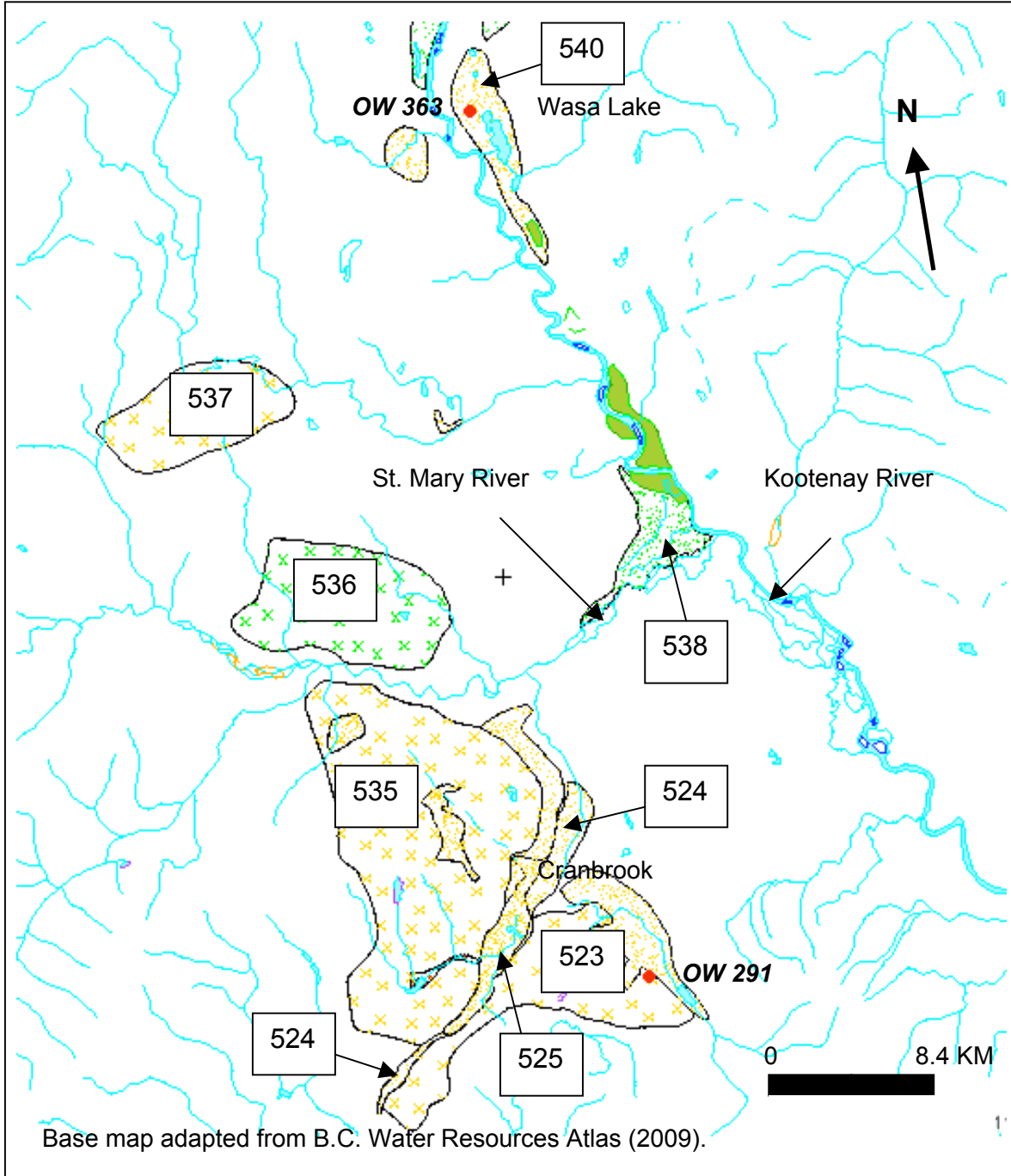


Figure 8. Priority aquifers and existing observation wells in the Cranbrook – Kimberley area.

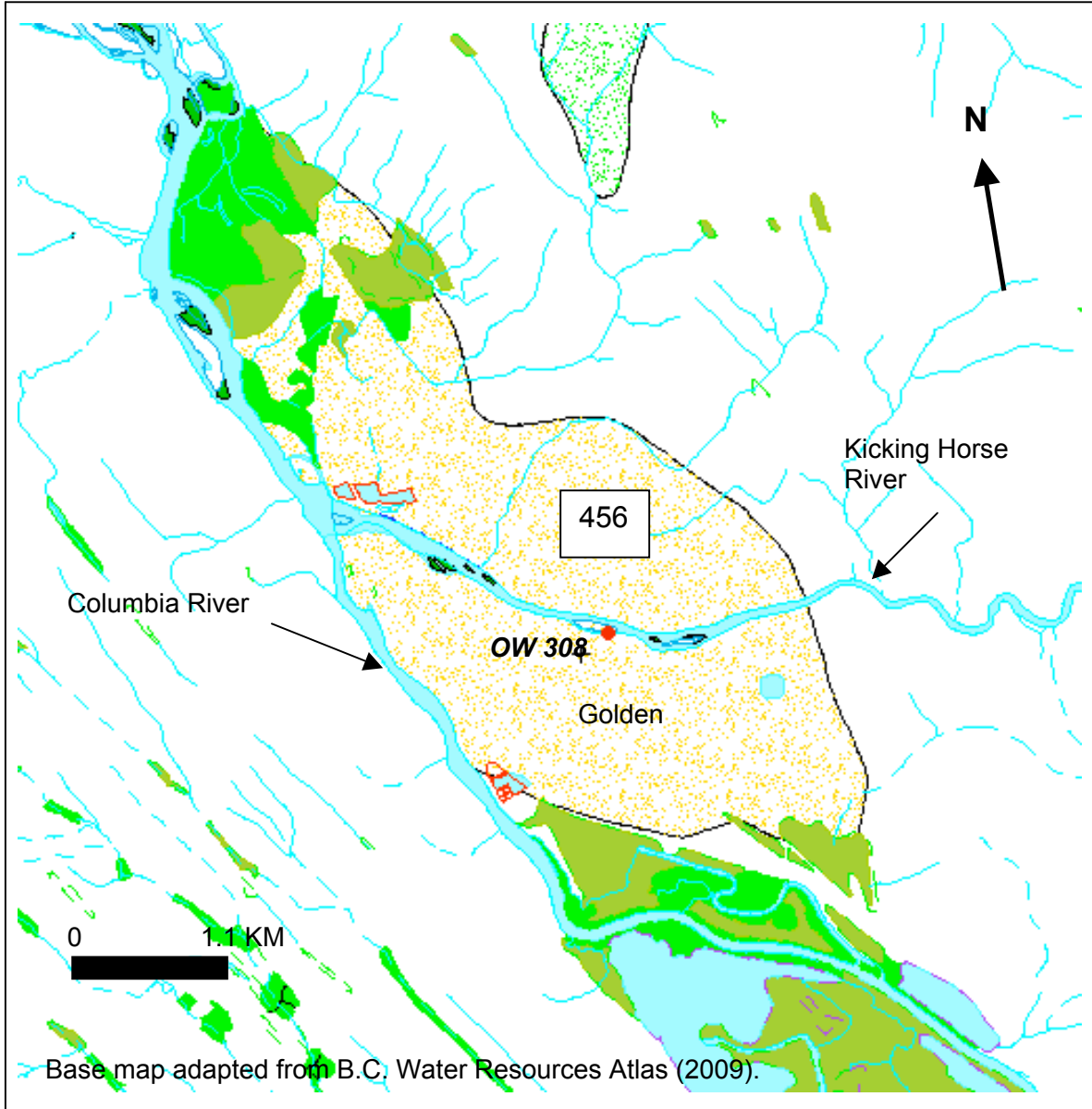


Figure 9. Priority aquifer and existing observation well in the Golden area.

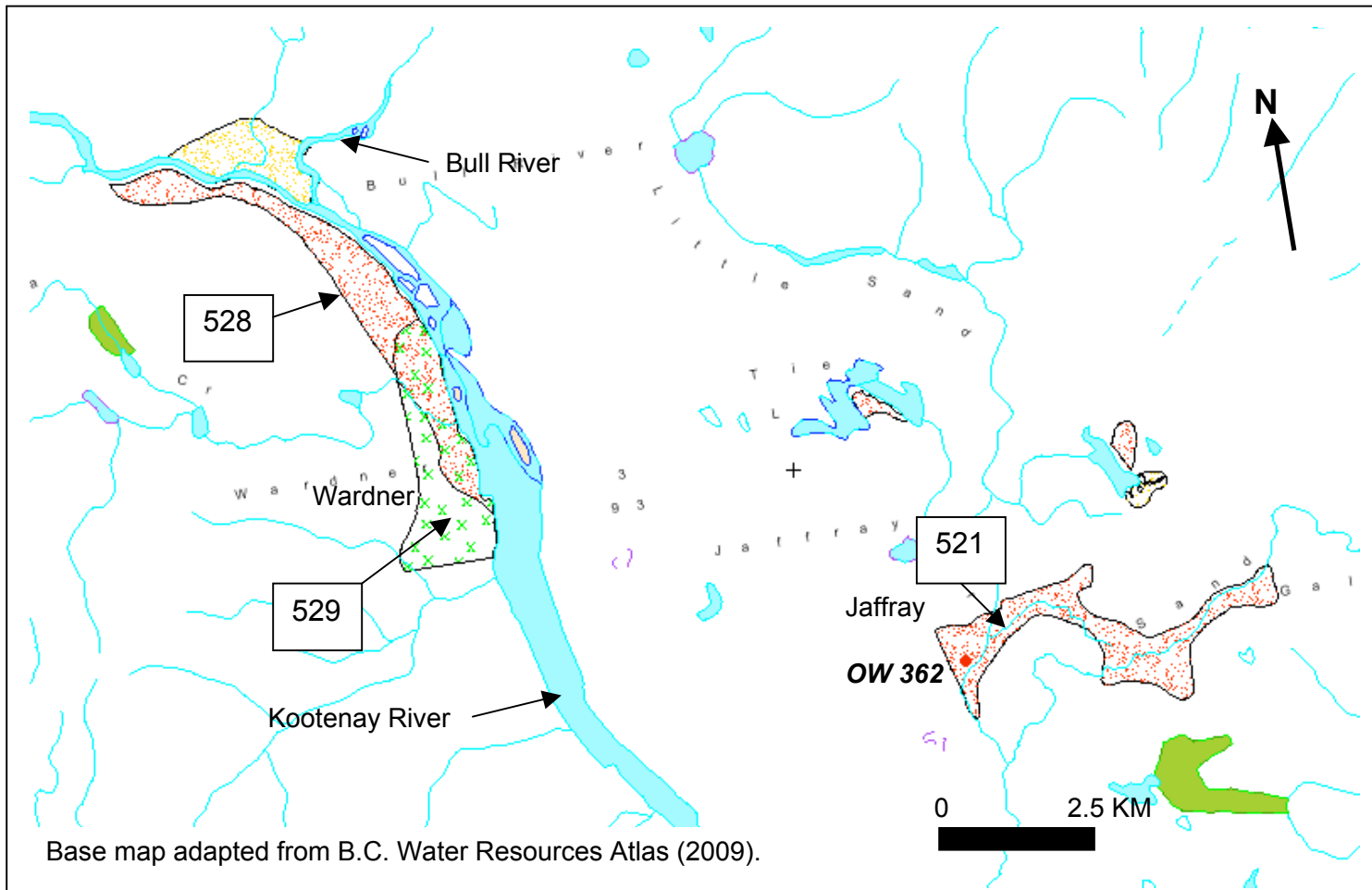


Figure 10. Priority aquifers and existing observation well in the Wardner-Jaffray area.

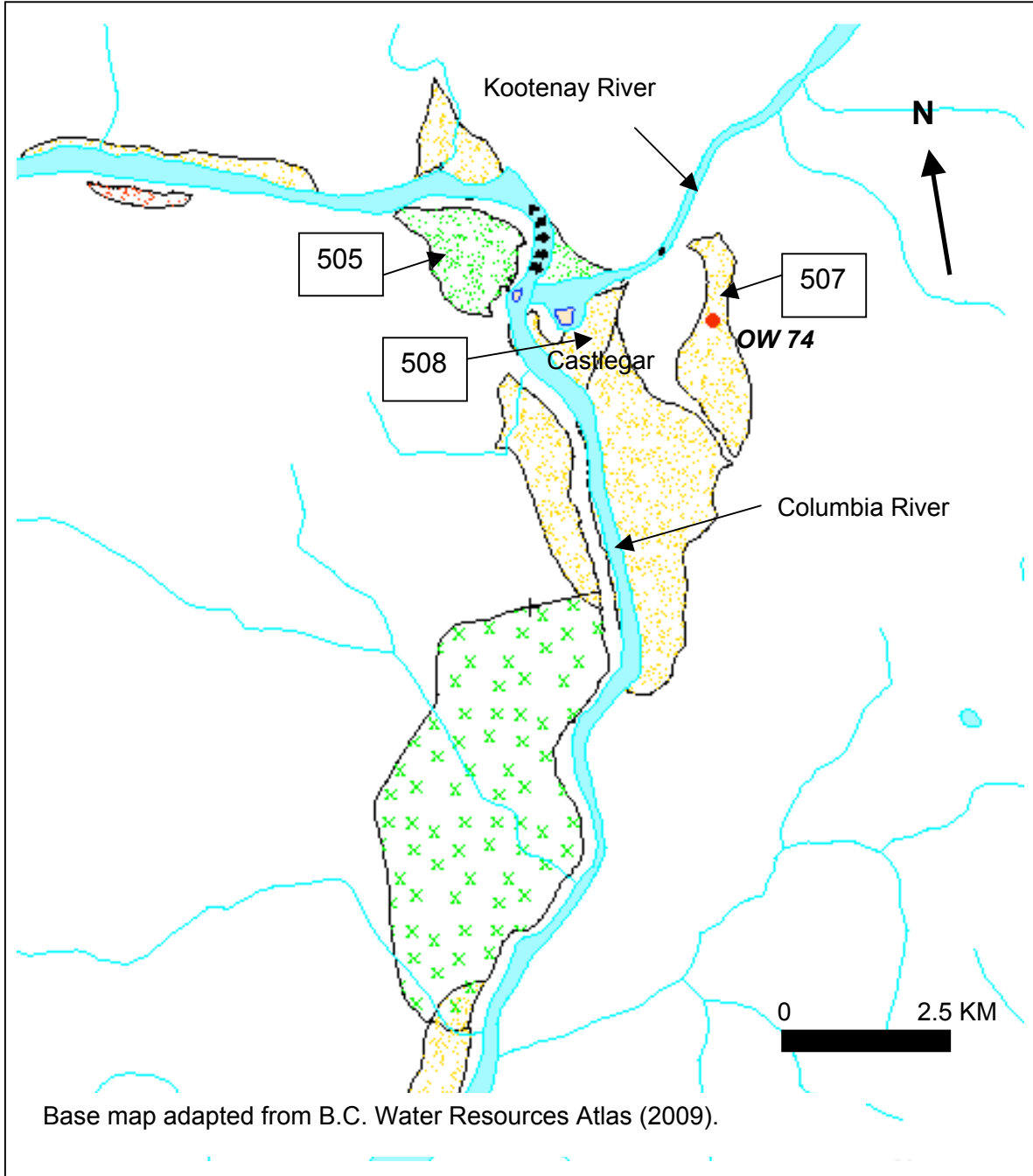


Figure 11. Priority aquifers and existing observation well in the Castlegar area.



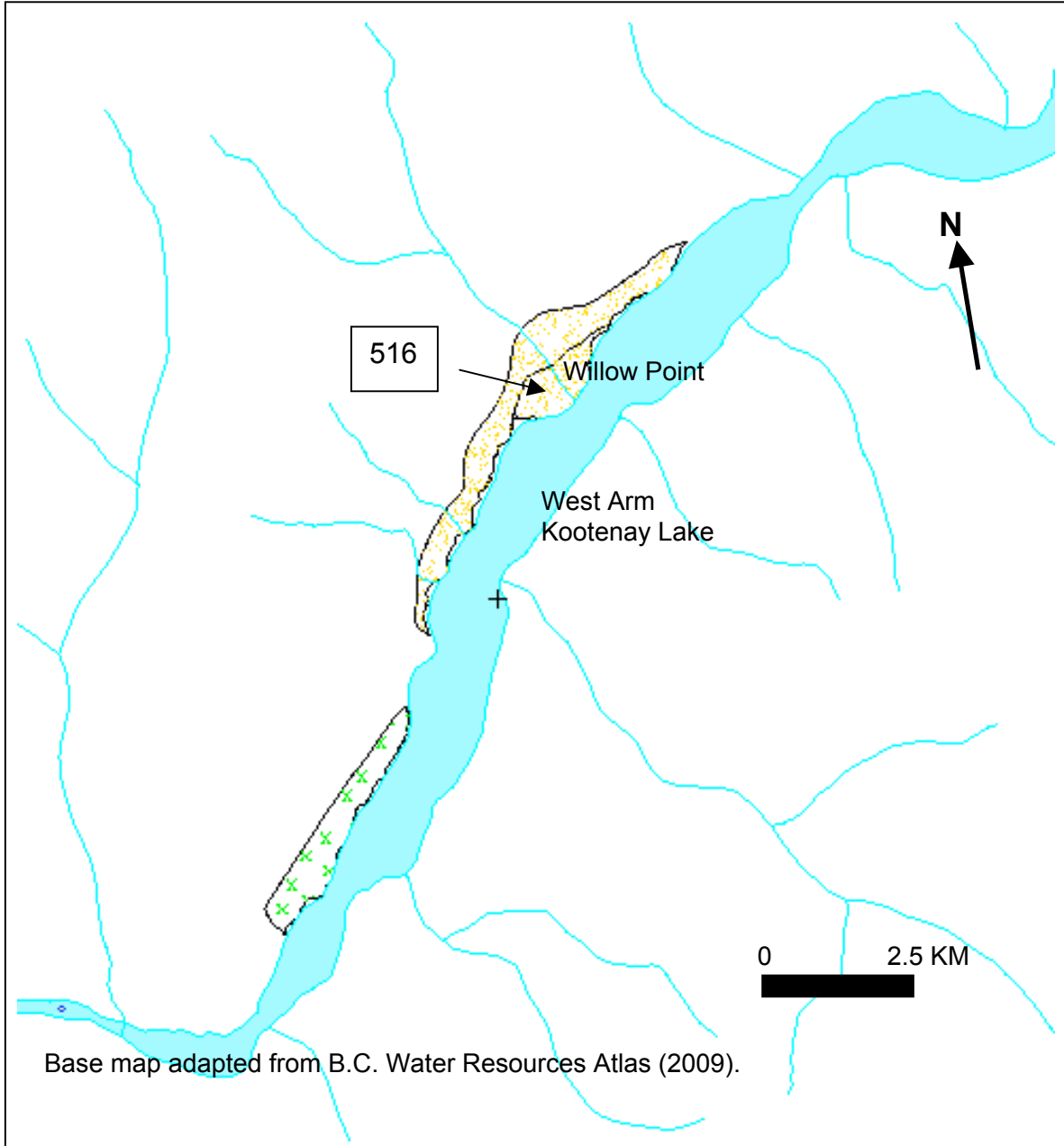


Figure 12. Priority aquifer 516 in the Kootenay Lake area.

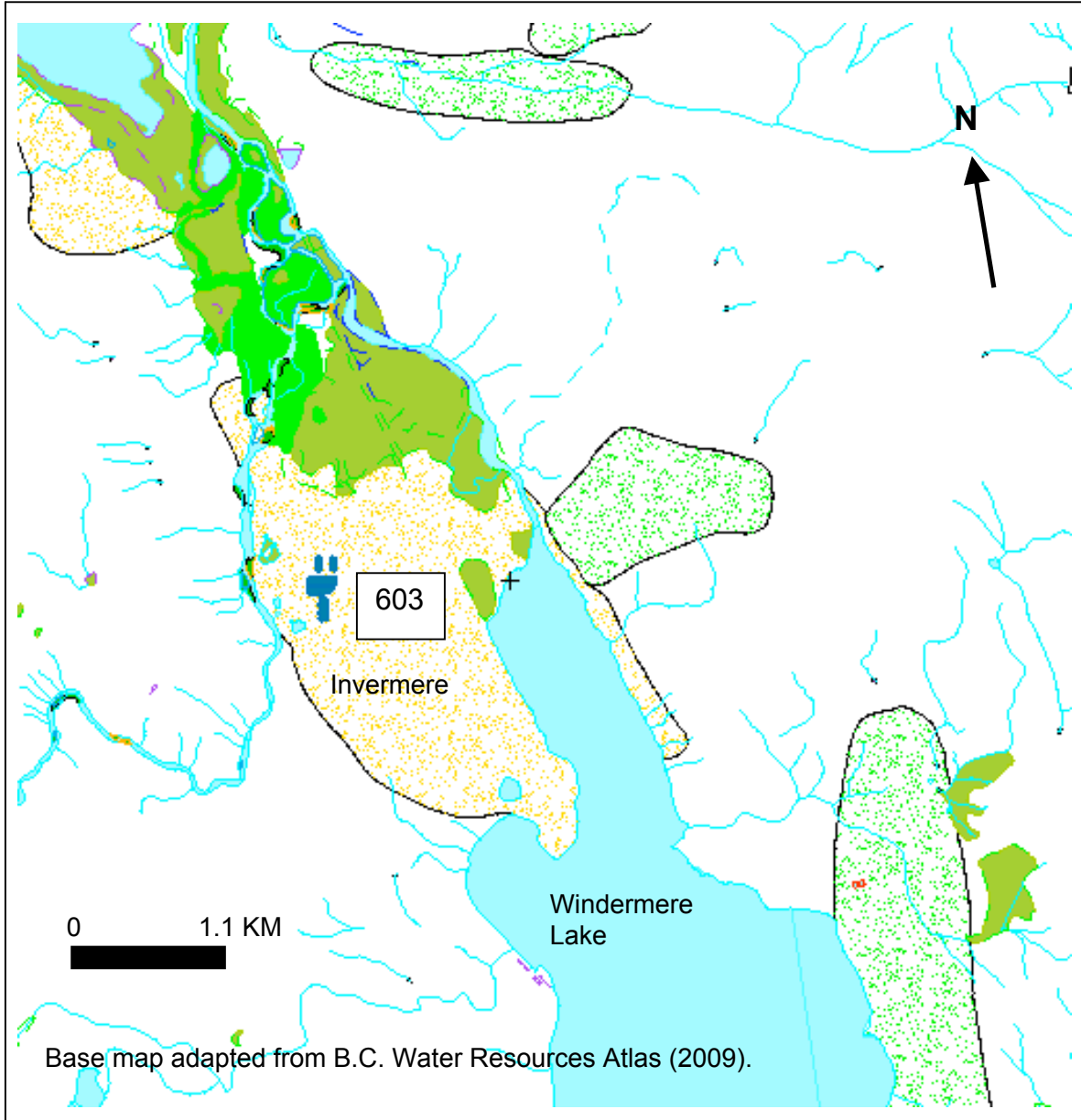


Figure 13. Priority aquifer 603 in the Invermere-Windermere area.

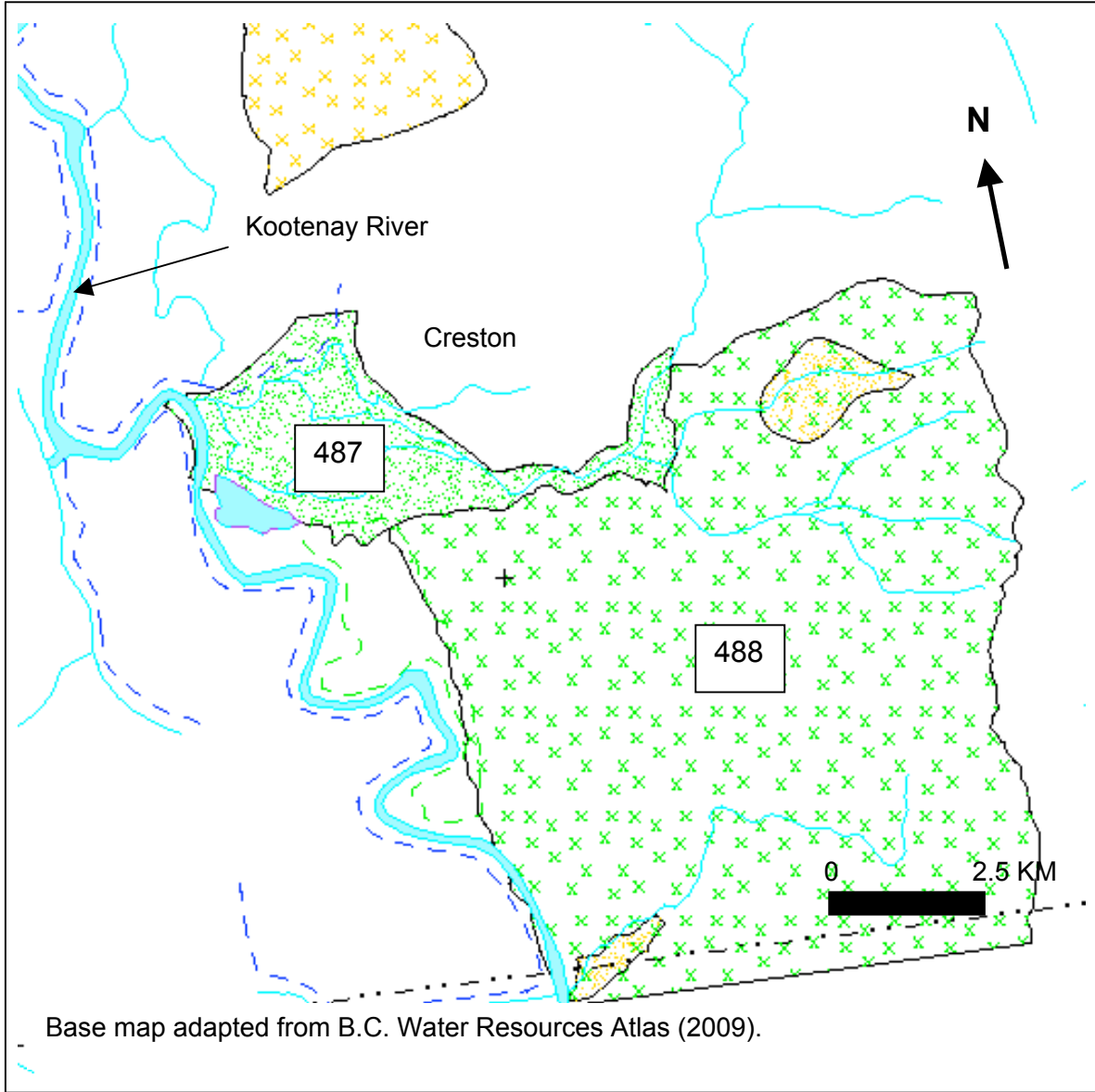


Figure 14. Priority aquifers in the Creston area.

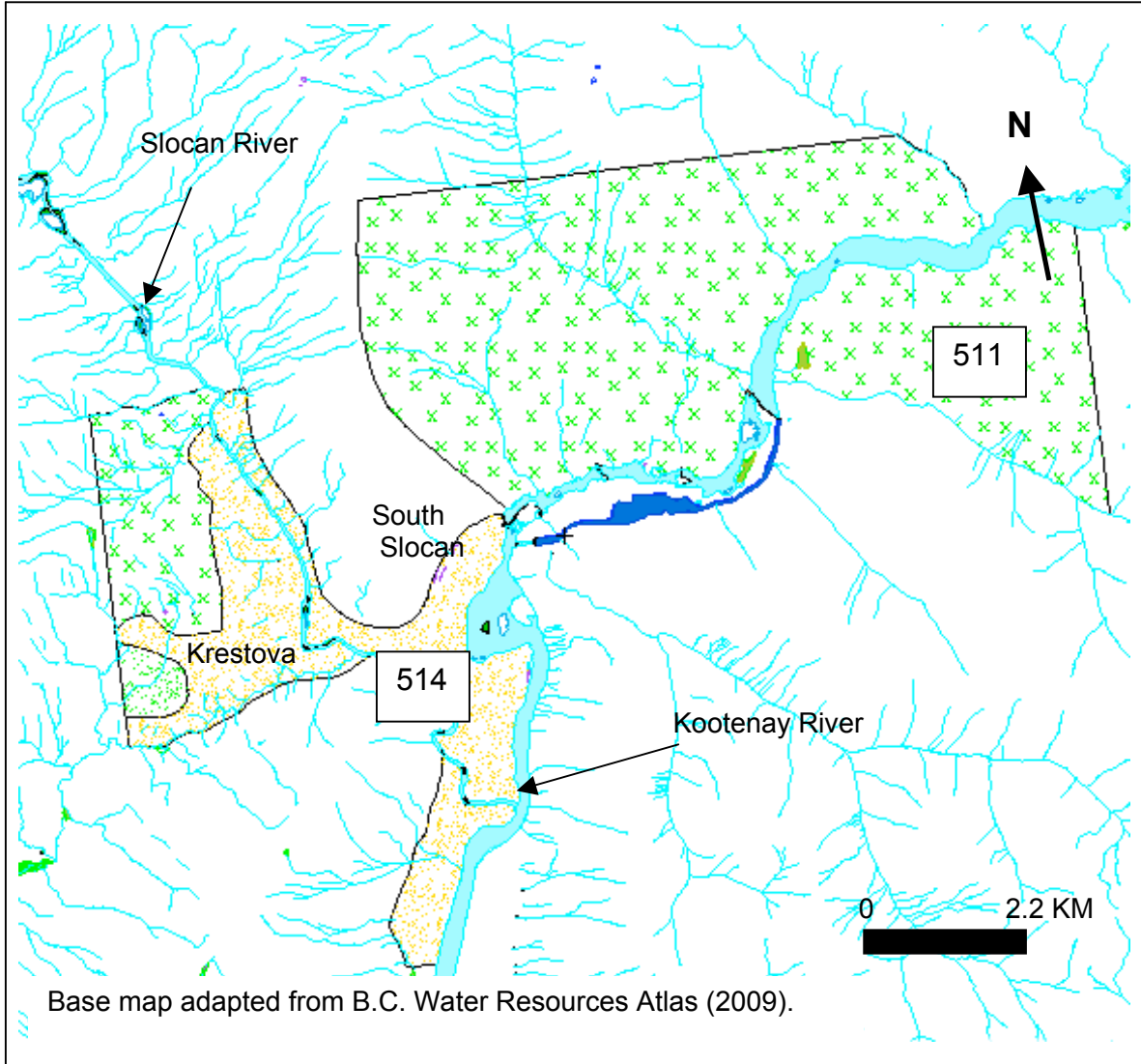


Figure 15. Priority aquifers in the Slokan area.

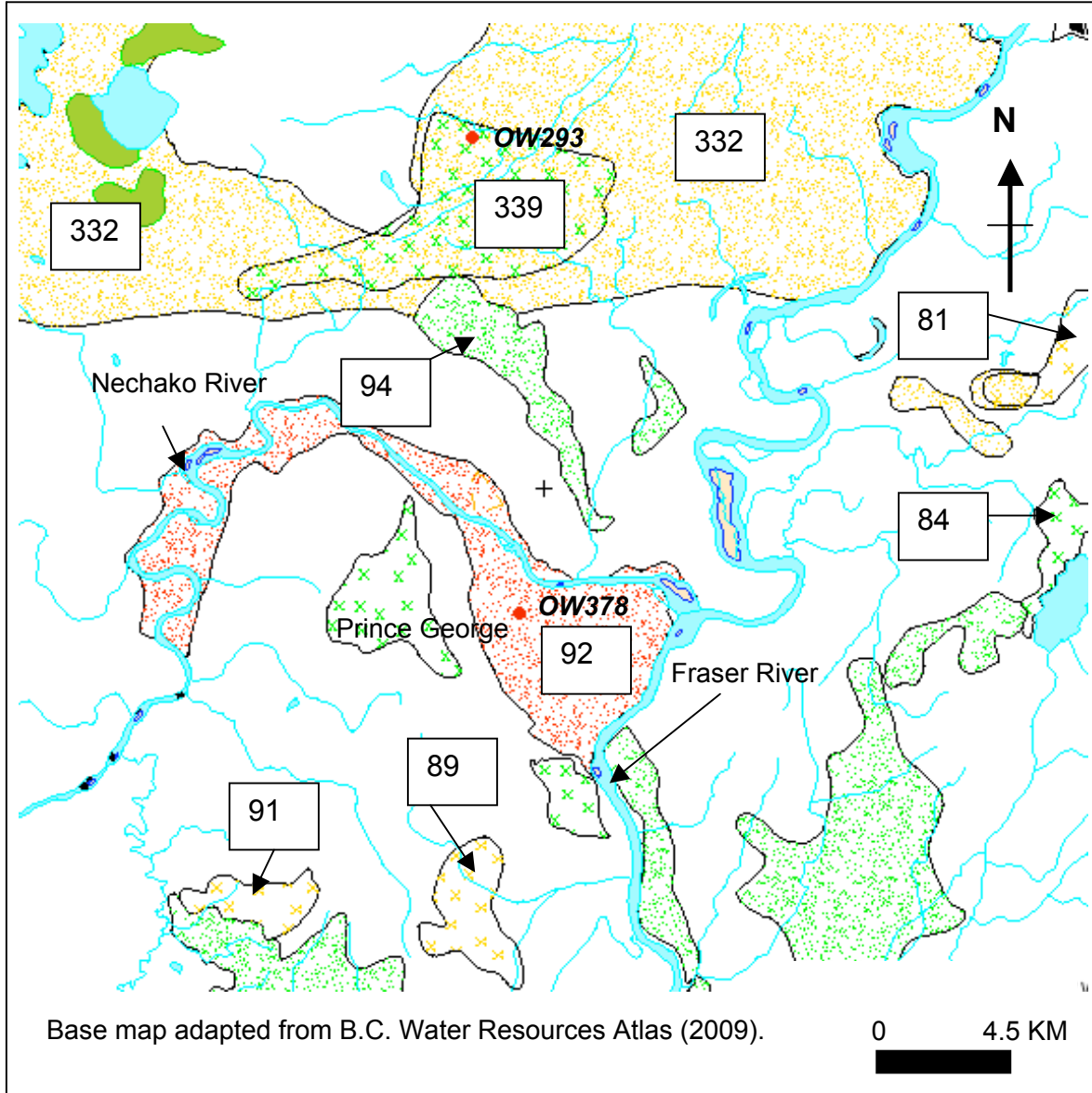


Figure 1a. Priority aquifers and existing observation wells in the Prince George area.

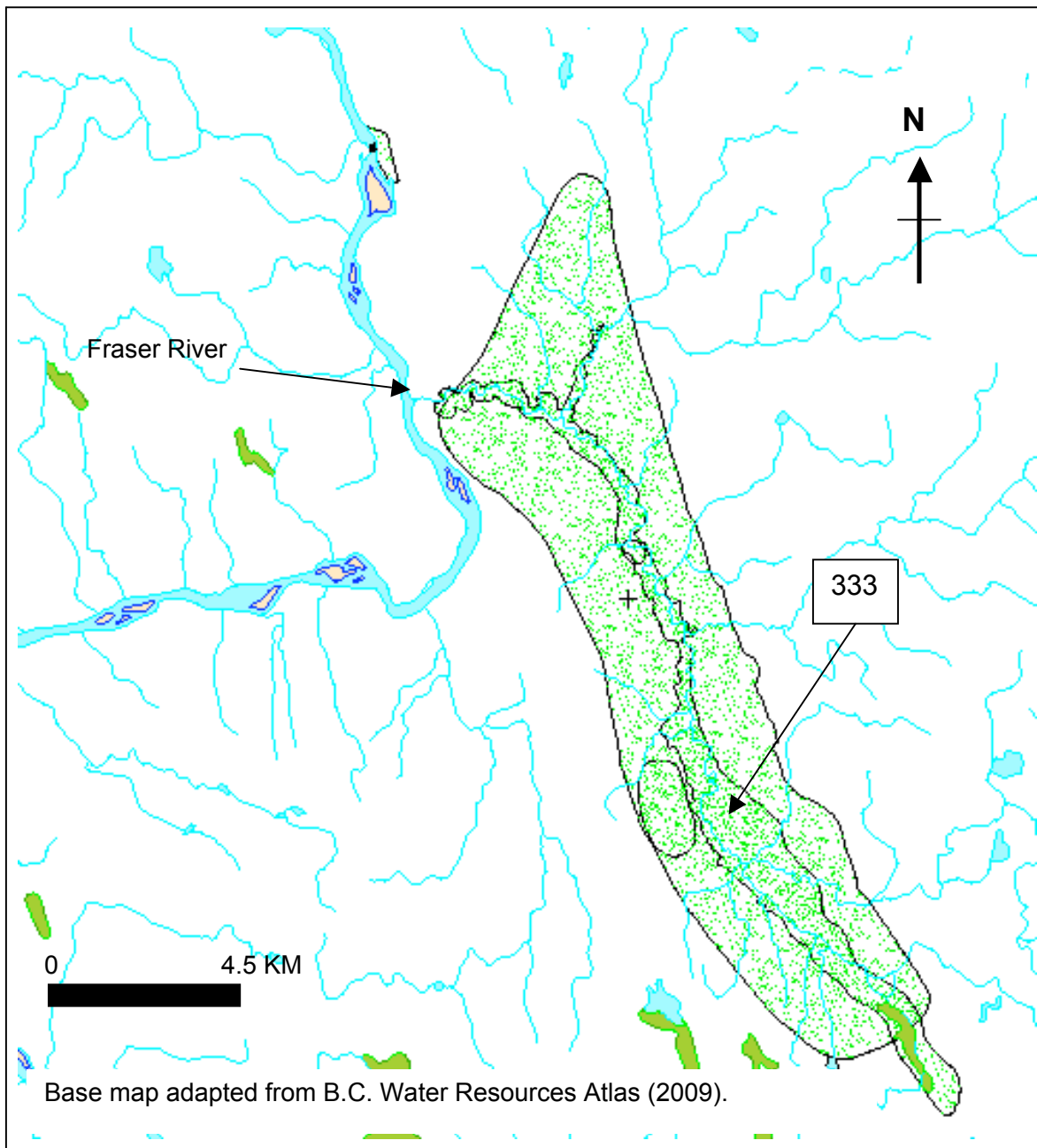


Figure 1b. Priority aquifers and observation wells in the Hixon area south of Prince George.

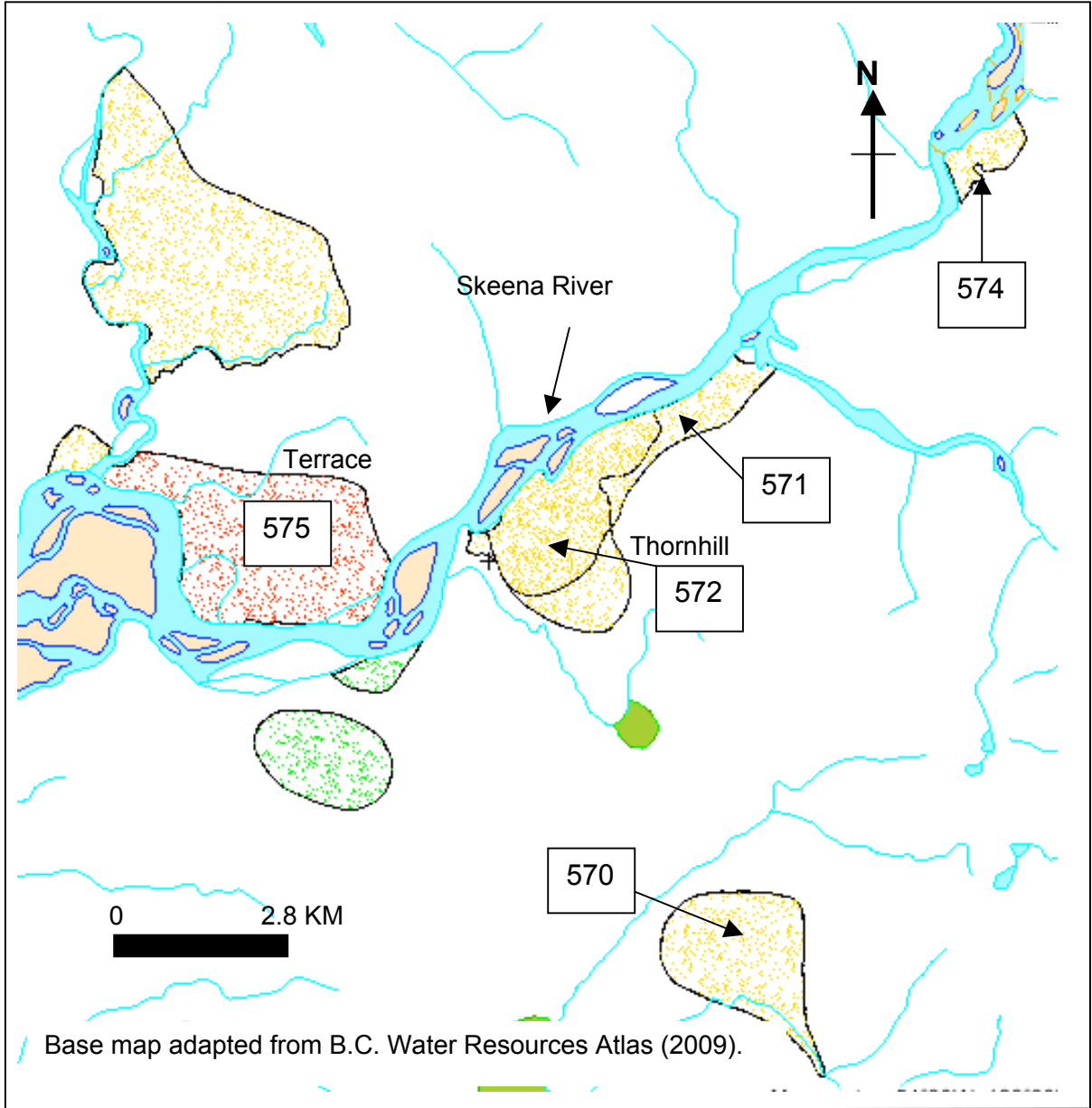


Figure 2. Priority aquifers near Terrace.

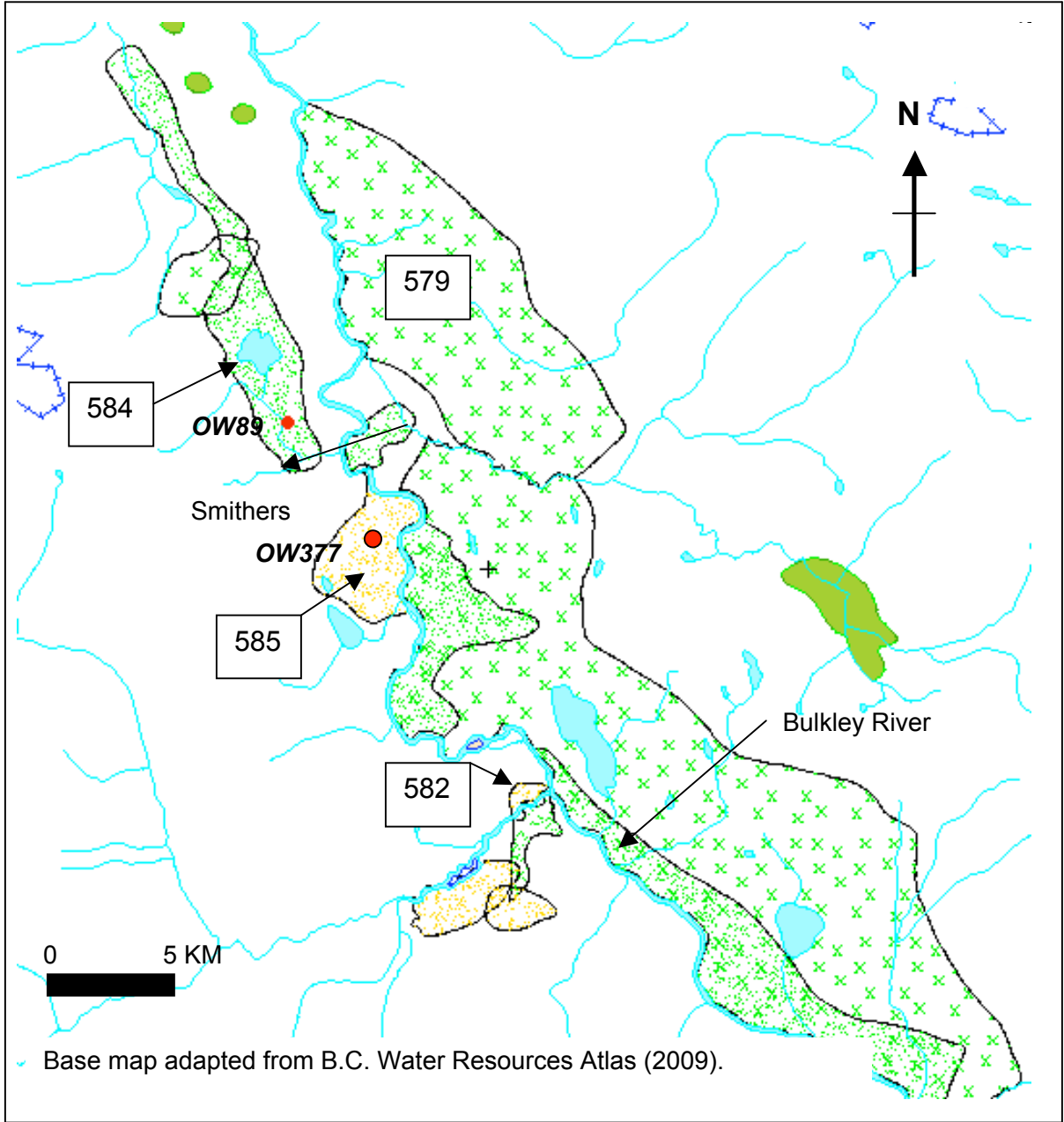


Figure 3. Priority aquifers and observation wells in the Smithers-Telkwa area.



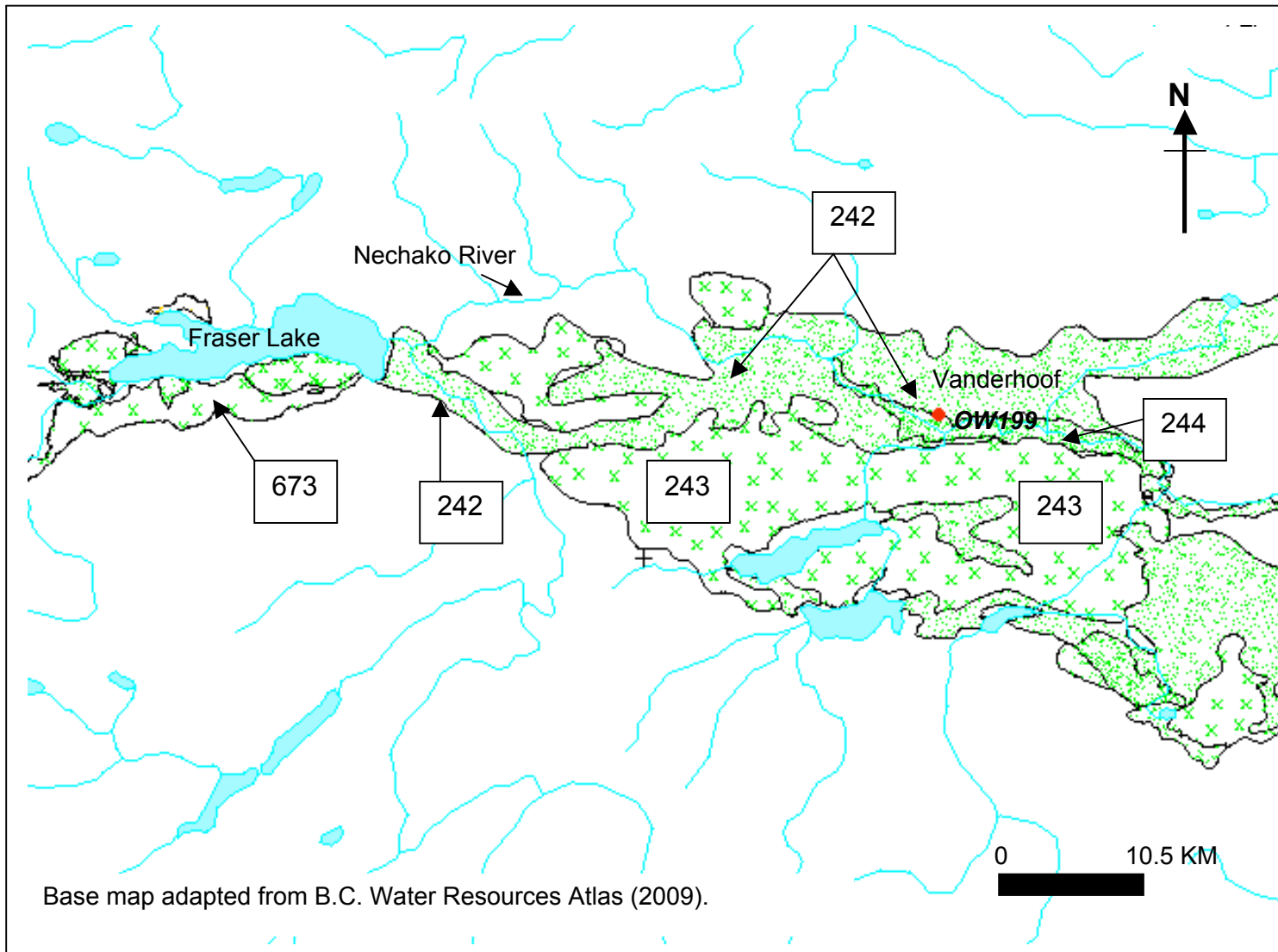


Figure 4. Priority aquifers and existing observation well in the Vanderhoof-Fraser Lake area.

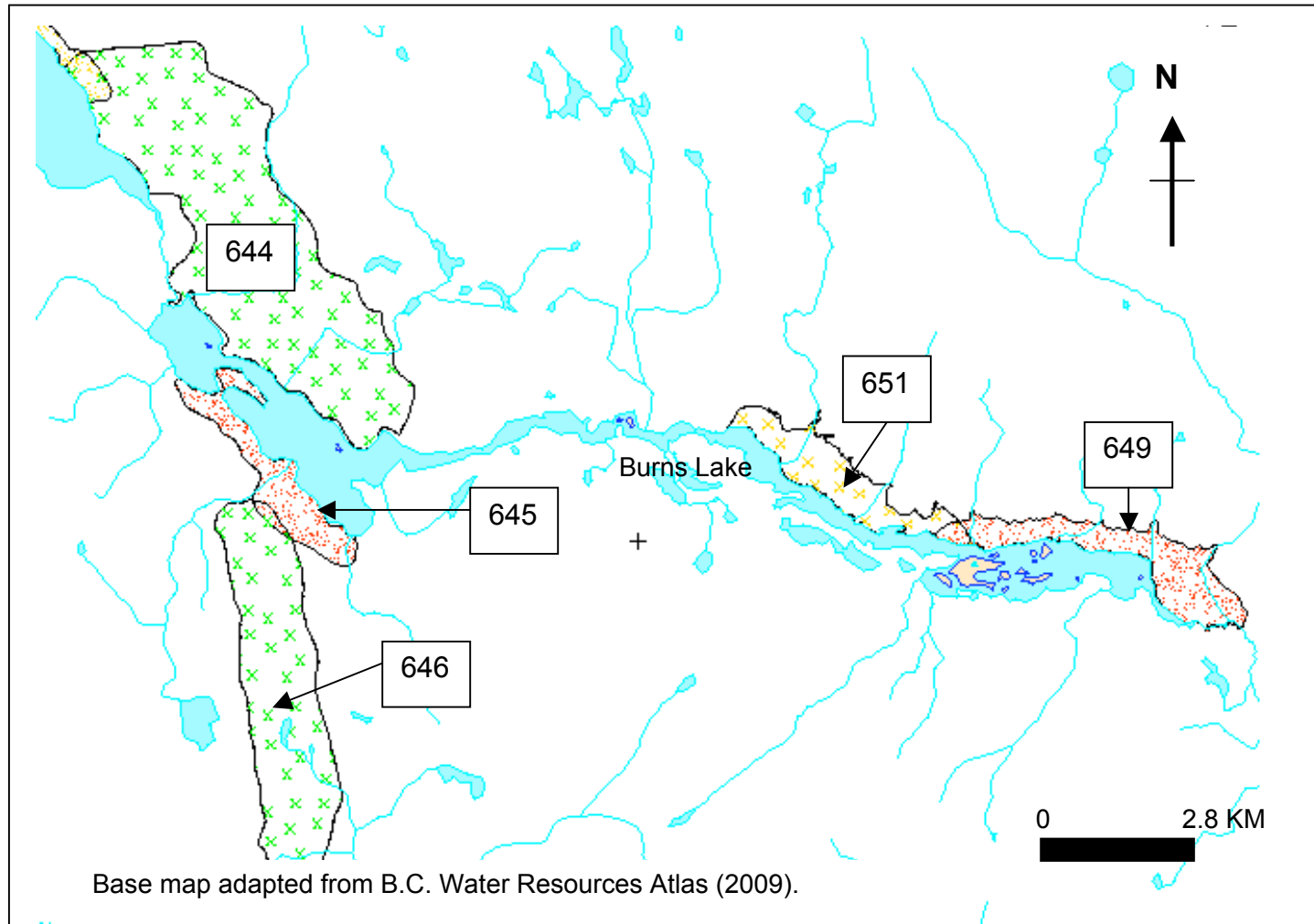


Figure 5. Priority aquifers in the Burns Lake area.

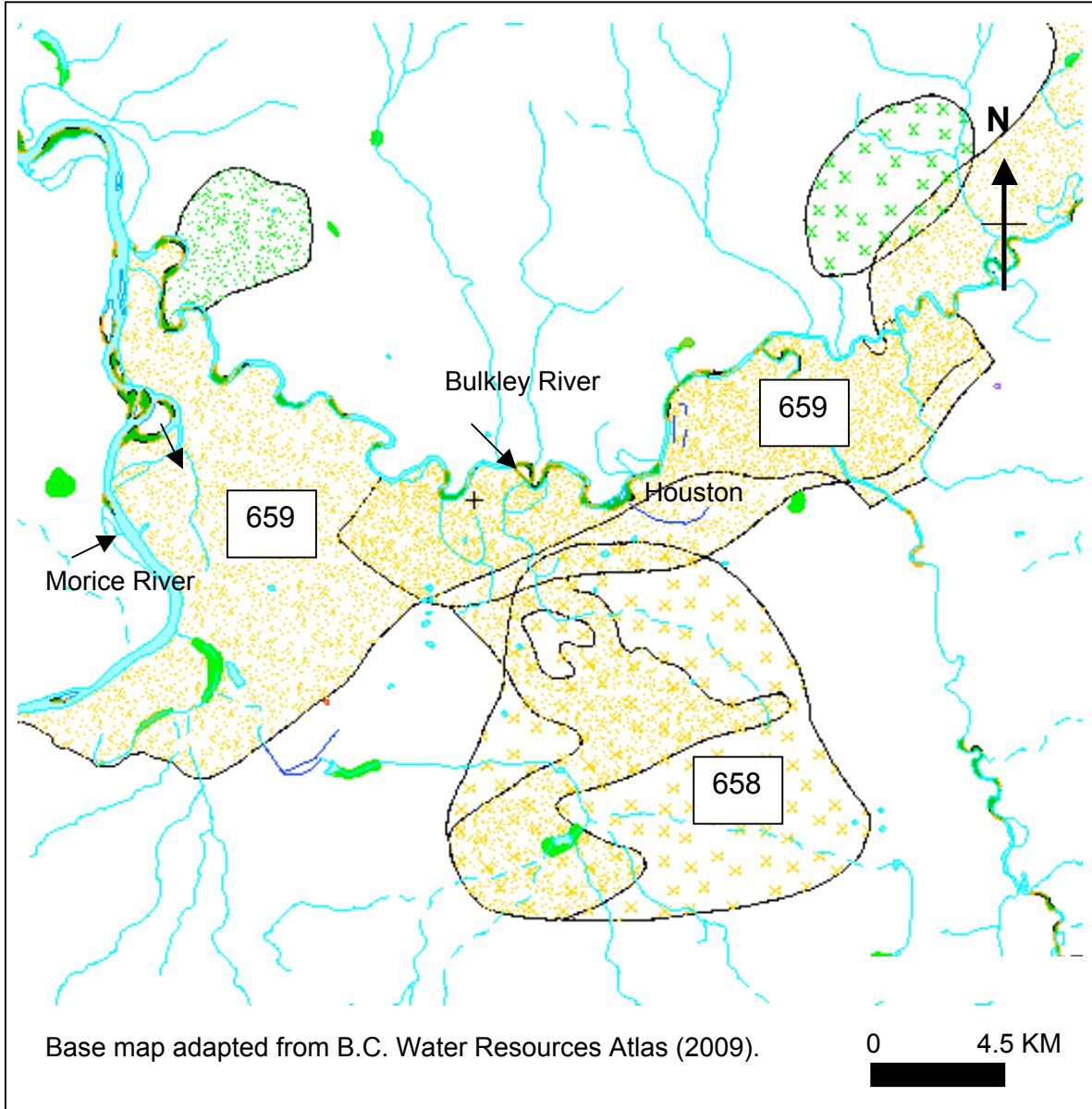


Figure 6. Priority aquifers in the Houston area.

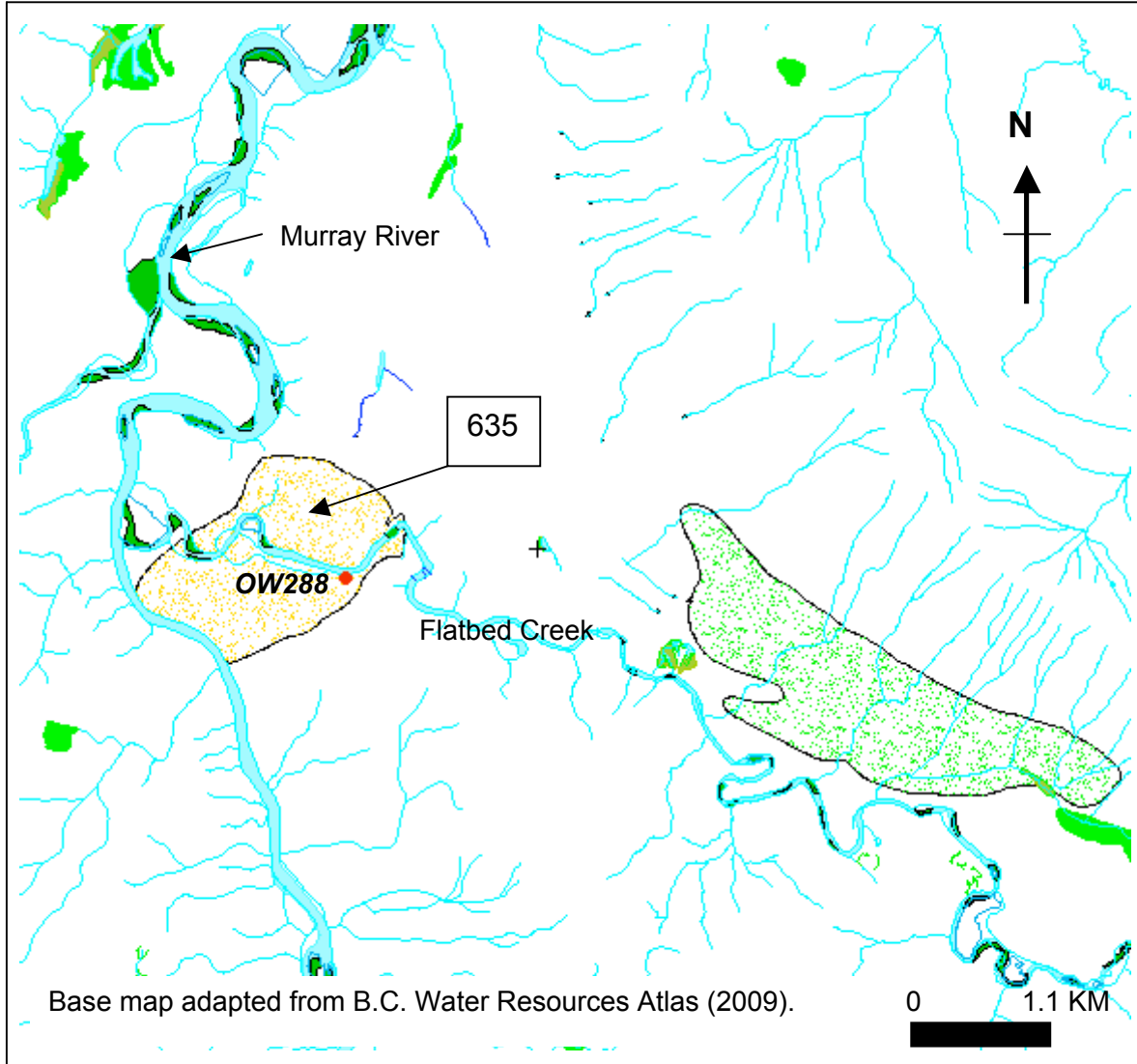


Figure 7. Priority aquifer 635 near Town of Tumble Ridge sub-area (Peace River area).

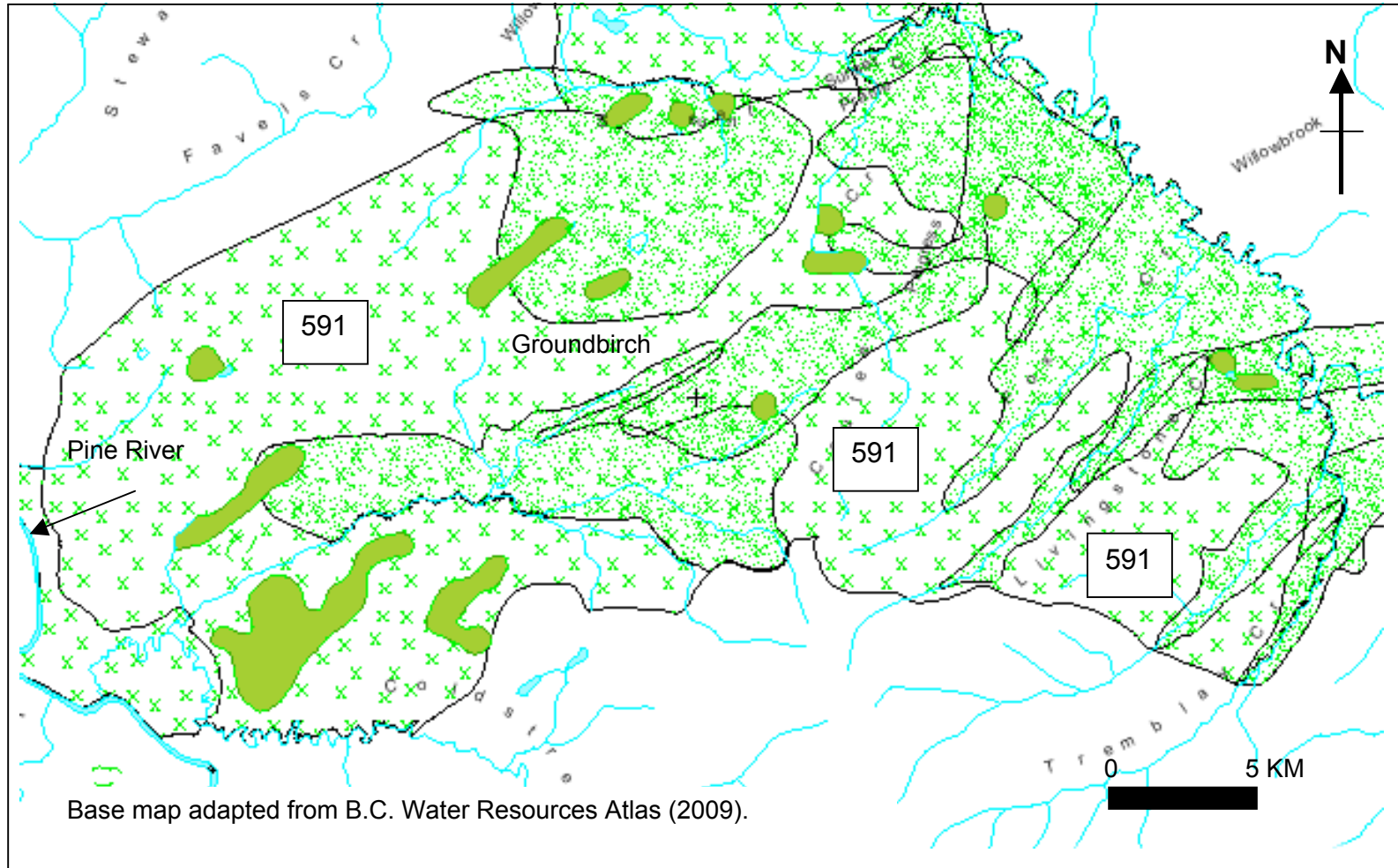


Figure 8. Priority aquifers and existing observation well in the Groundbirch sub-area (Peace River area).

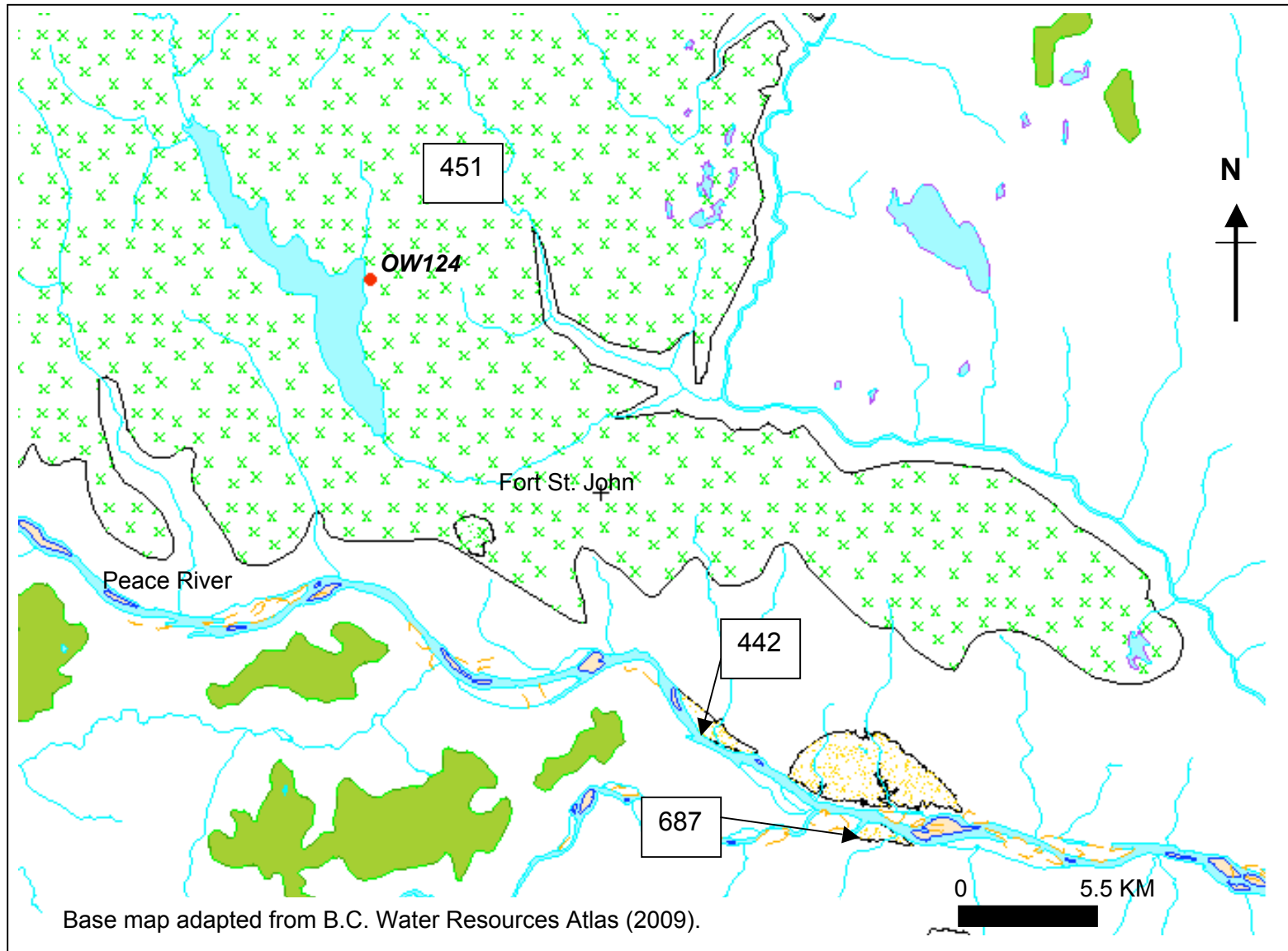


Figure 9. Priority aquifers and existing observation well in the Fort St. John sub-area (Peace River area).

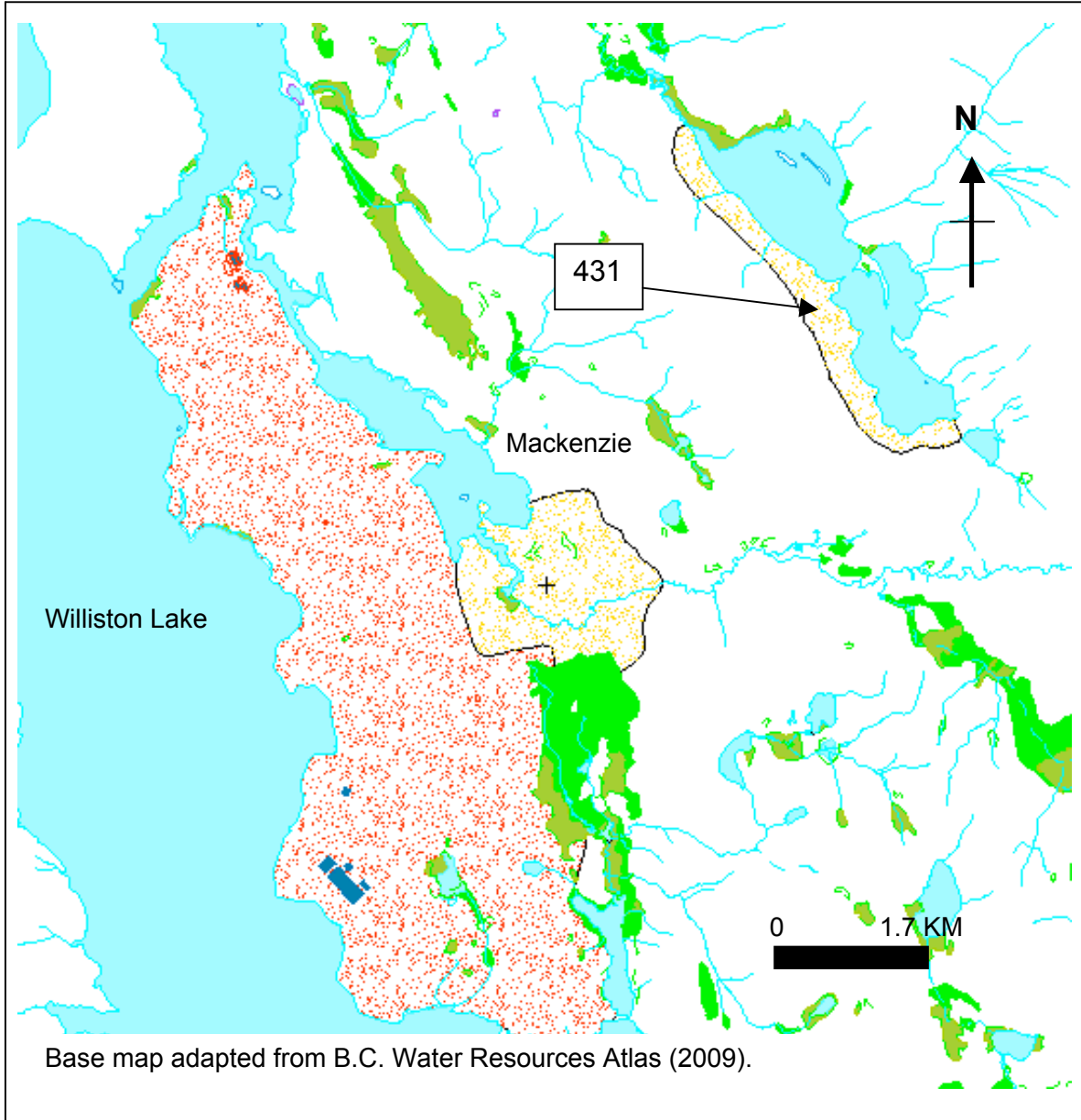


Figure 10. Priority aquifer 431 near Mackenzie sub-area (Peace River Area).