Ministry of **Forests, Lands, Natural Resource Operations and Rural Development**

Groundwater Protection: From Wells to Aquifers

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Presentation to:

Capital Regional District, Juan de Fuca Electoral Area

January 26, 2022

OUTLINE

- Introduction
- Understanding your well
- Groundwater licensing
- Aquifers and groundwater protection
- Resources

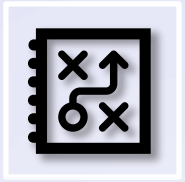
FLNR Water Protection

Dike & Dam Safety

Audits and compliance

Public safety

Outreach, education

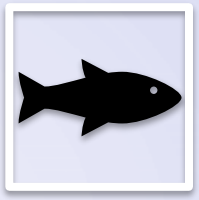


Groundwater Science for Water Sustainability Act implementation

Aquifer studies

Technical support for water authorizations

Treaty and non-treaty water agreements (reserves)



Surface-groundwater monitoring/reporting

Observation well network (80+ wells)

Hydrometric network

Low flow monitoring

FLNR Water Authorizations

Water licensing

Surface & groundwater licensing

Compliance & enforcement (unauthorized use)

Short-term use approvals (surface, groundwater)

Water Sustainability Act implementation

Treaty and non-treaty water agreements (reserves)

Environmental Flow Needs

Outreach, education

Drought & flood monitoring & response

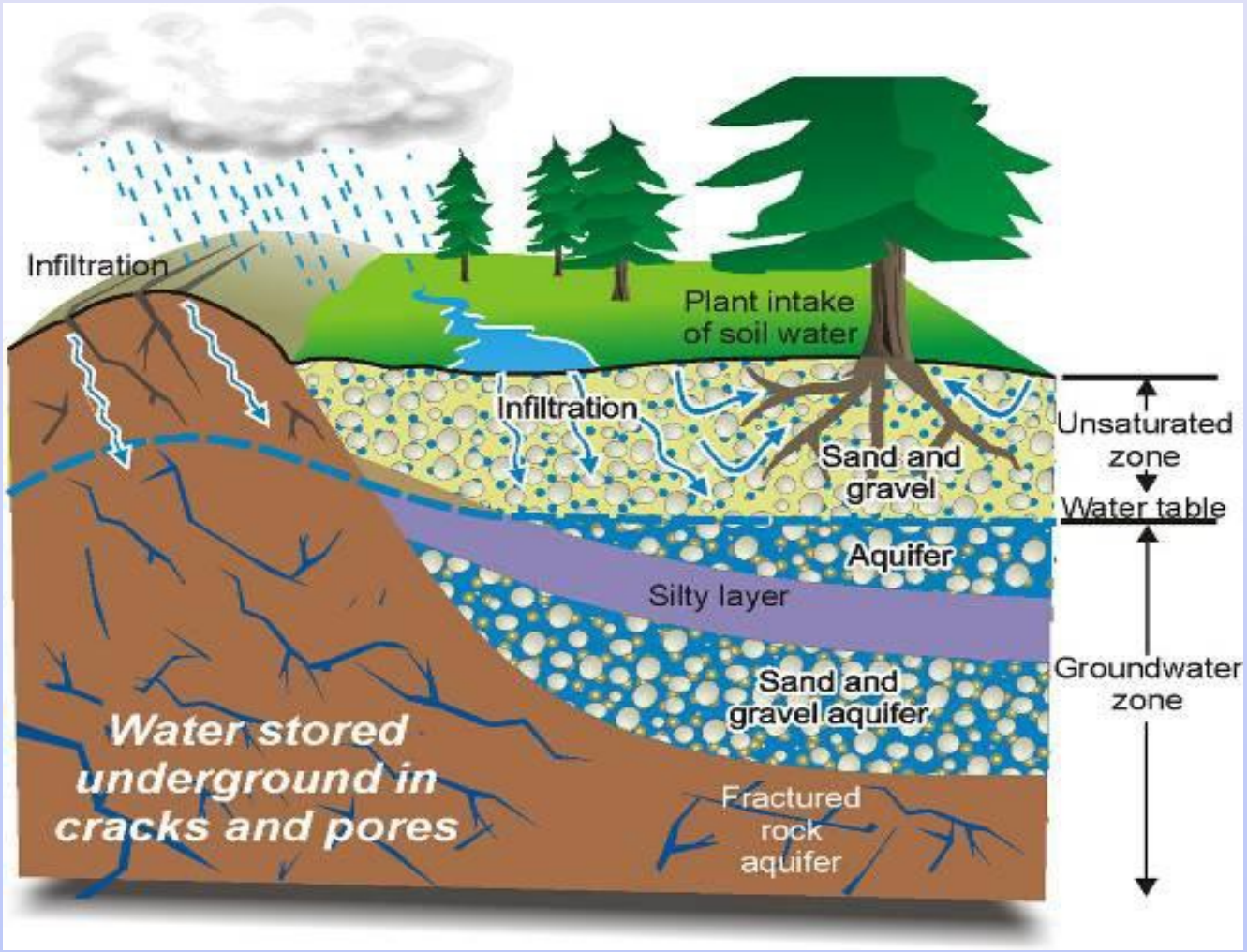
Low flow monitoring

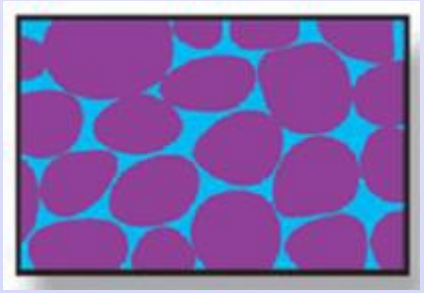
Priority streams

Drought levels

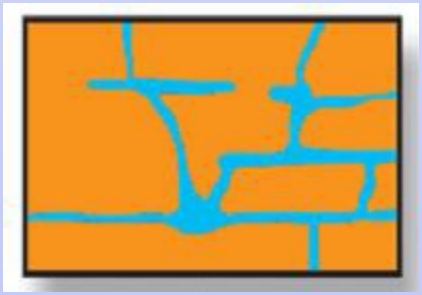
Temporary Protection Orders

Understanding Groundwater





UNCONSOLIDATED
Water between grains of sand & gravel



BEDROCK
Water in rock fractures

Image: Natural Resources Canada

WELL PROTECTION

- Why be Well Smart
- Types of wells
- How does a well work
- Construction & maintenance standards
- Factors influencing groundwater quality
- Water quality sampling, disinfection, treatment

Why be Well Smart?

- Private well owners are their own water manager
- Proper well operation & maintenance ca
  - ✓ Protects water quality
    - For you & your family
    - For the community
    - For the ecosystem
- Sustains your well yield
  - ✓ Saves money on costly repairs

What kind of well do I have?

There are 3 common well installations in the West Coast Region

Dug Wells

Drilled Wells

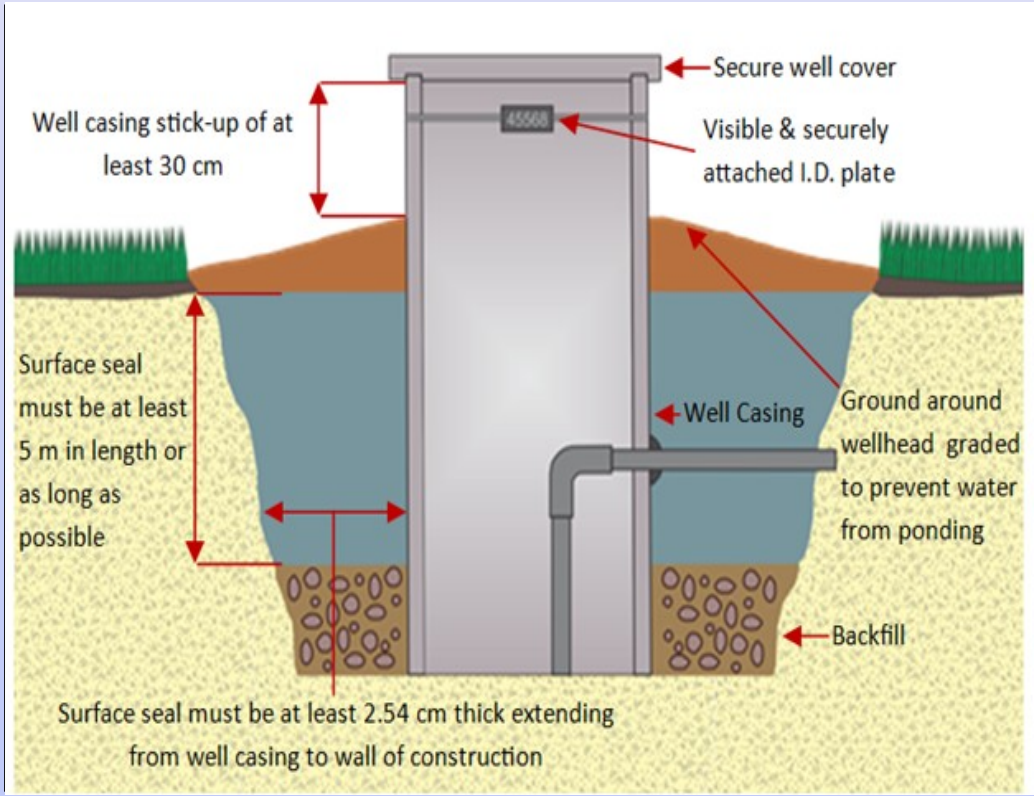
Drilled Wells in Pits

Photo credits: BC FLNRO, Island Health

Well Types: Dug

Large diameter / shallow

Photo credit: BC FLNRO, Ontario Ministry of Agriculture, Food and Rural Affairs/ Agriculture (OMAFRA)



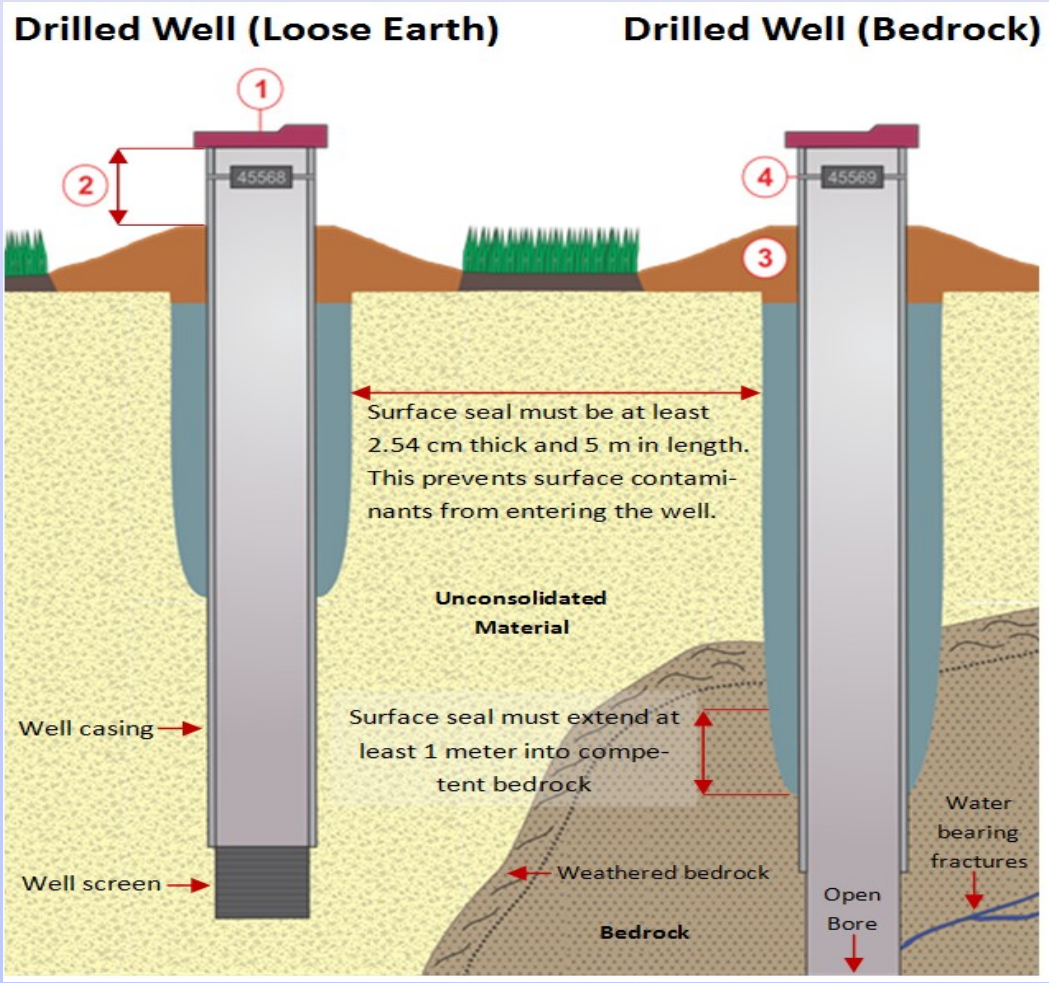
Well Types: Drilled

Small diameter / deep

Photo credit: Island Health, OMAFRA

Drilled wells must have:

1. Securely attached well cap
2. Well casing stickup at least 30 cm
3. Graded surface around well head
4. Securely attached ID plate



Well Types: Drilled Wells in Pits

- Older installations – below frost line to protect water line connections from freezing

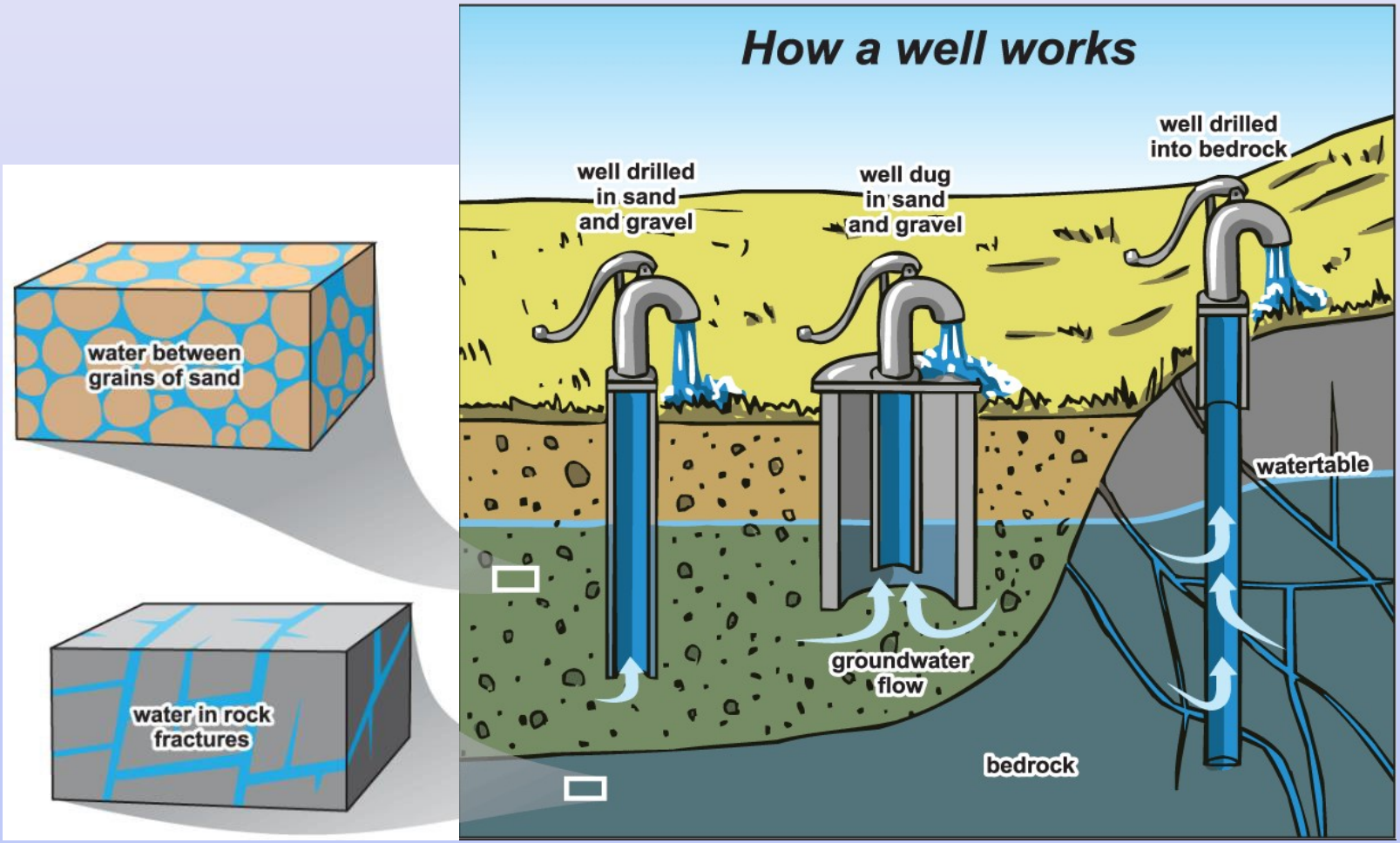
Photo credit: Ministry of Environment (ENV)

Well Types: Drilled Wells in Pits

- Risk flooding and water collection in pit
  - Floodwater can contain debris, bacteria, pesticides, fertilizers, etc.
- Risk of asphyxiation if entering pit without proper safety gear (low oxygen, high levels of carbon dioxide)

See ENV brochure "Upgrading Wells in Pits"

How a Well Works



Well Protection

Factors influencing water quality & quantity:

1. Aquifer properties
2. Location
3. Construction & set-up
4. Maintenance
5. Proper closure

1. Aquifer Properties

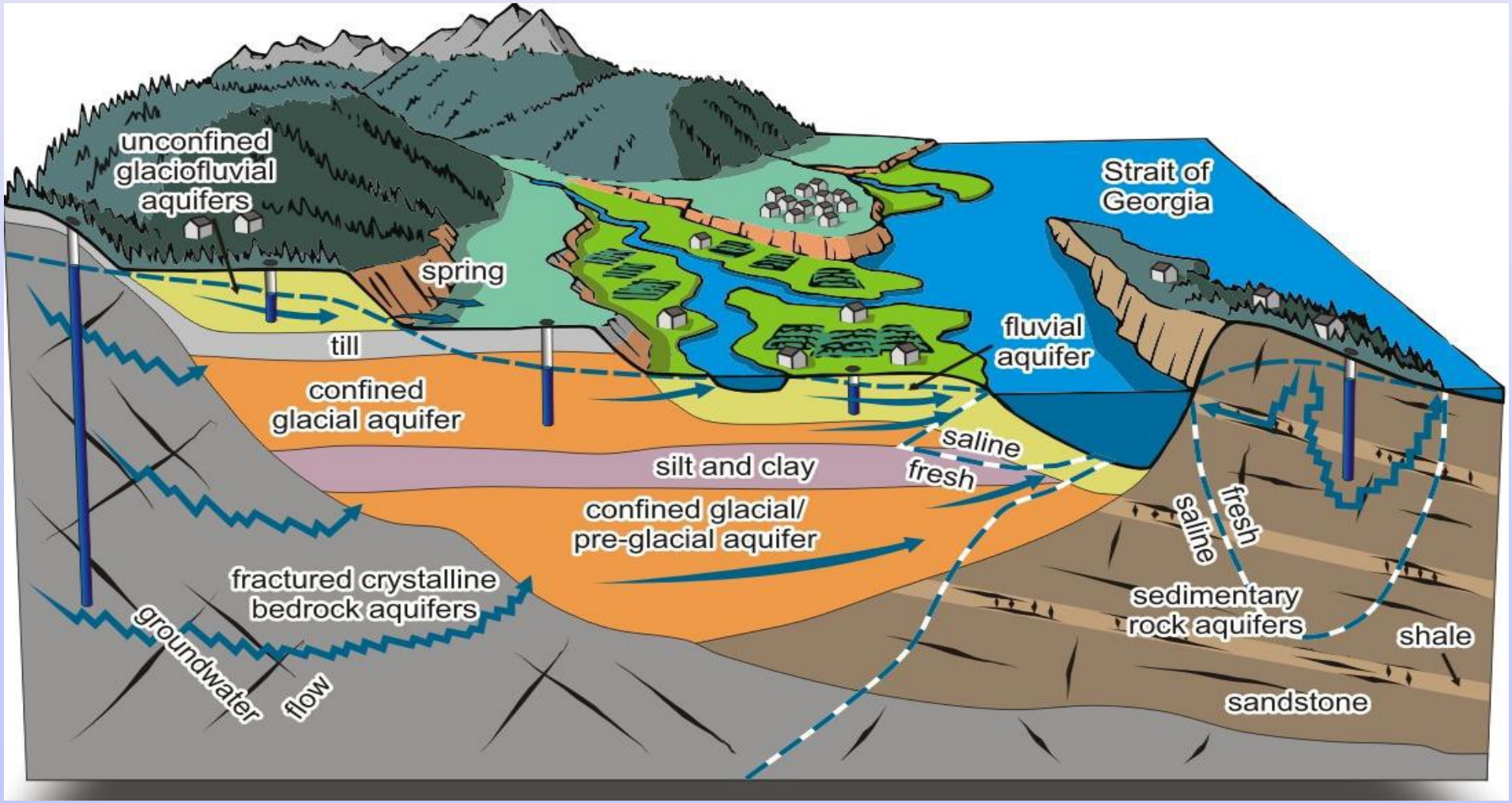


Photo credit: Natural Resources Canada

2. Well Location

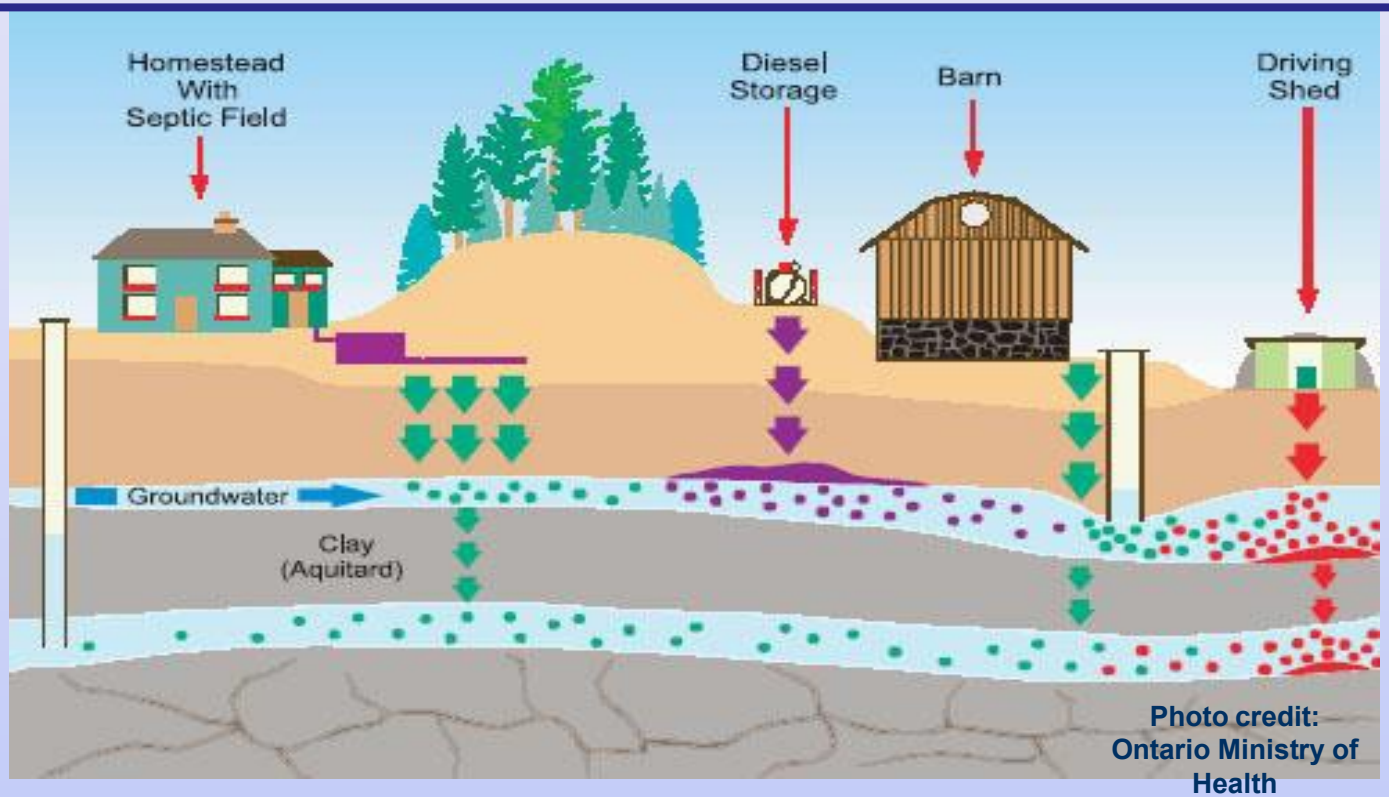


Photo credit:
Ontario Ministry of
Health

- Upslope area
- Secure, dry area
- Avoid wells in pits
- 30m / 100’ away from potential contaminant sources
- Not in basement or surrounded by concrete

2. Well Location

30 metres or 100 feet from potential contaminant sources including:

- Pesticides
- Vehicle Parking
- Fertilizers
- Fuel
- Septic Fields
- Animals
- Storage Tanks
- Contaminated Runoff
- Waste

See Public Health Act, Health Hazard Regulation

3. Construction & Set-up

- Standards for well construction protect the health of your family and the aquifer.
- Hire registered qualified contractors
- All drilled wells, and dug wells more than 15m deep, must be constructed by a provincially registered well driller
- All pumps must be installed by a provincially registered pump installer

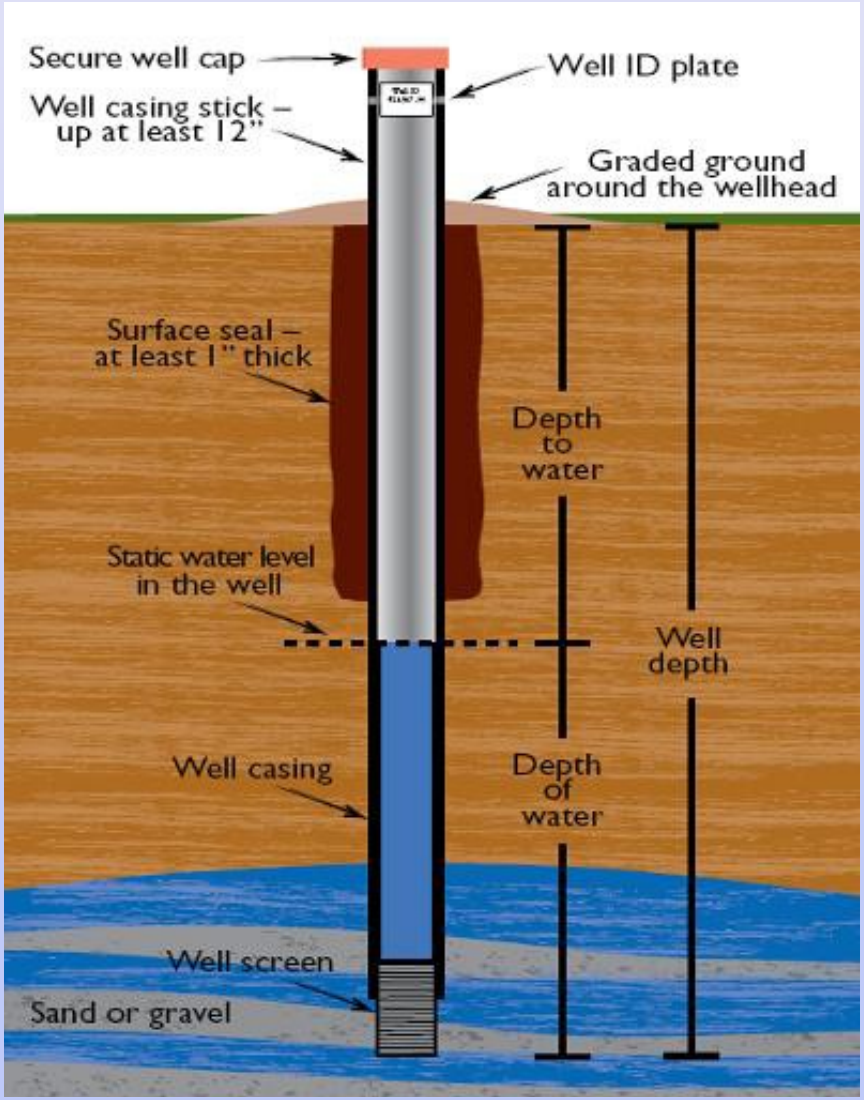


Photo credit: BC FLNRO

3. Construction & Set-up – Well Caps

All wells must have a water-tight, vermin-proof cap

Sanitary seal

Cast aluminum (pitless)

UV stable Plastic

3. Construction & Set-up – Surface Seal

- ✓ A surface seal prevents contaminants from entering a well along the outside of the casing
- ✓ Installed during drilling or may be possible to add to an existing well (consult driller)
- ✘ An improper surface seal allows contaminants into the well

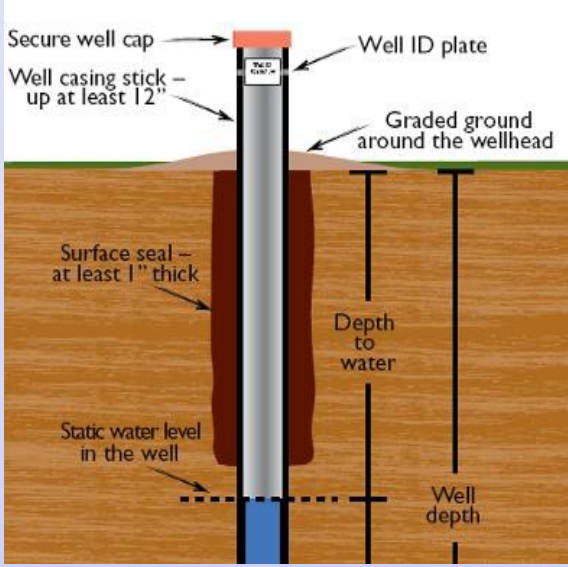


Photo credit: ENV

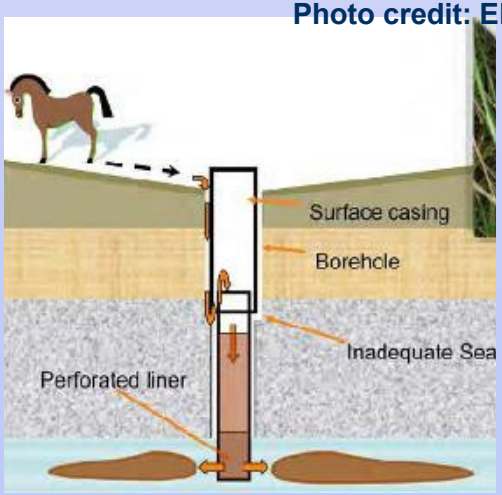


Photo credit: Alberta Working Well Program

3. Construction & Set-up: Artesian Flow Control

Artesian flow must be stopped or brought under control

Responsible parties:

- Driller at time of construction
- Well owner or land owner for existing well

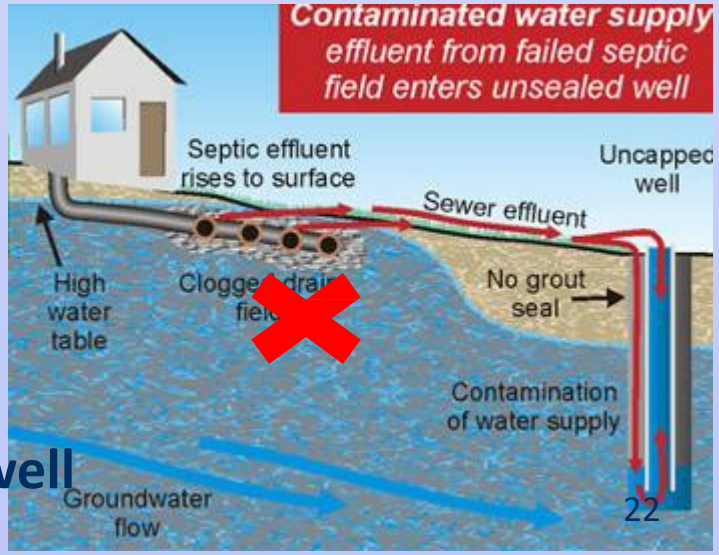
"Under control" means:

- Clear of sediment
- Entirely conveyed through casing (if applicable)
- Can be turned off indefinitely
- Does not pose a threat to property, public safety or the environment

4. Well Protection: Good Maintenance

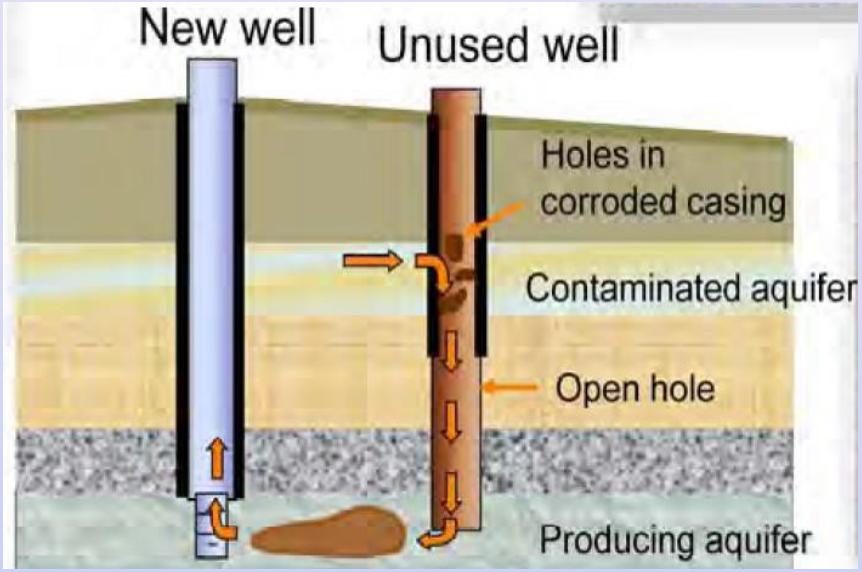
- ✓ Inspect the wellhead regularly
- ✓ Properly maintain septic system
- ✓ Have water quality tested on a regular basis
- ✓ Keep well head area and pump house in good repair and free of contaminants

- Disinfect the well and water system *only* if:
  - -Work is done on the well
  - -Water testing indicates bacterial contamination
  - -After a flood if surface water entered well



5. Well Protection: Properly Decomission

- Abandoned or improperly closed wells create a direct pathway for groundwater contamination

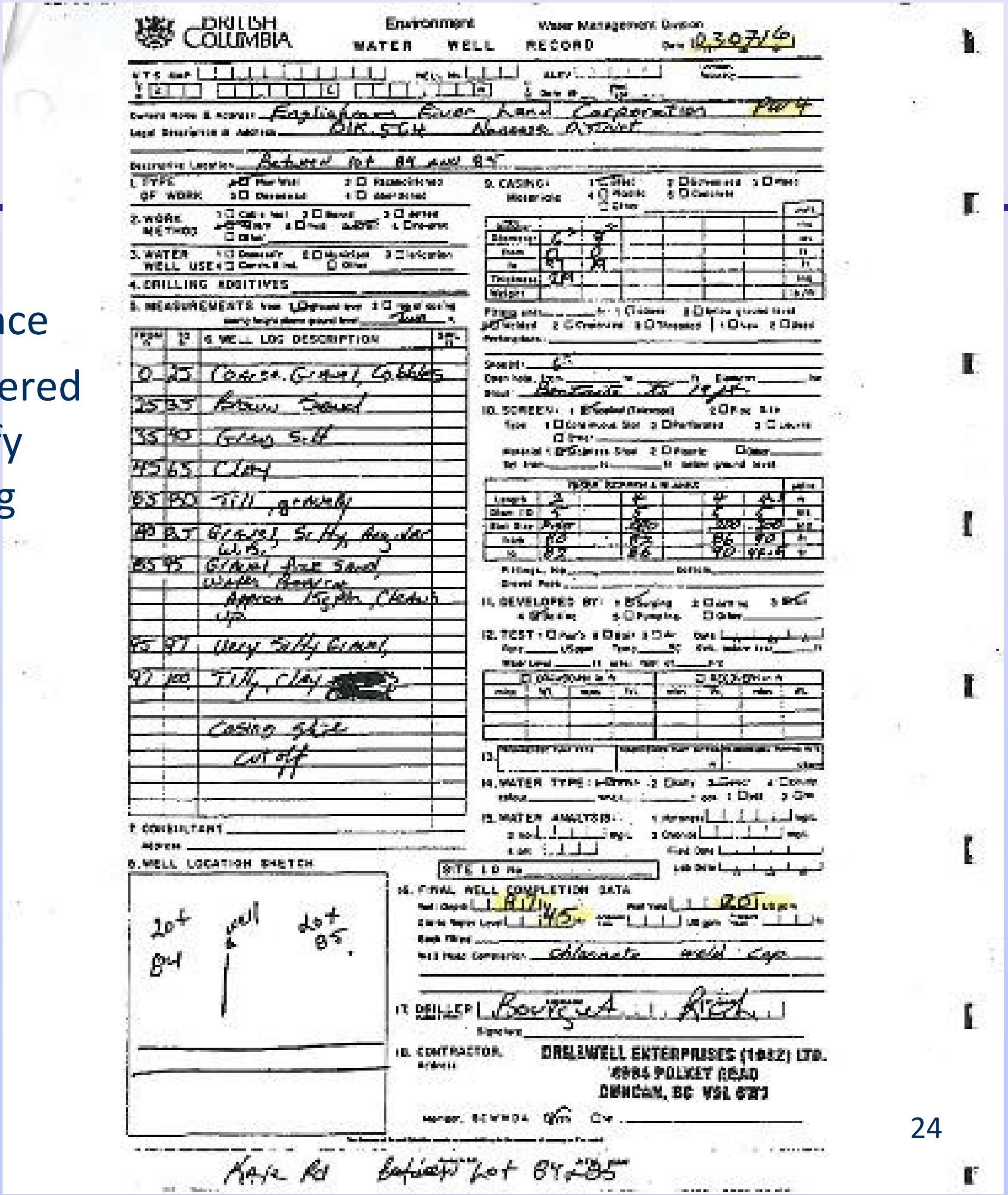


To decommission/close a well:

- Drilled wells: Must use a provincially registered and qualified well driller to complete the work
- Dug wells <15 m deep can be closed by contractor or owner
- All Wells: Must meet decommission requirements in *Water Sustainability Act*, Groundwater Protection Regulation standards and the

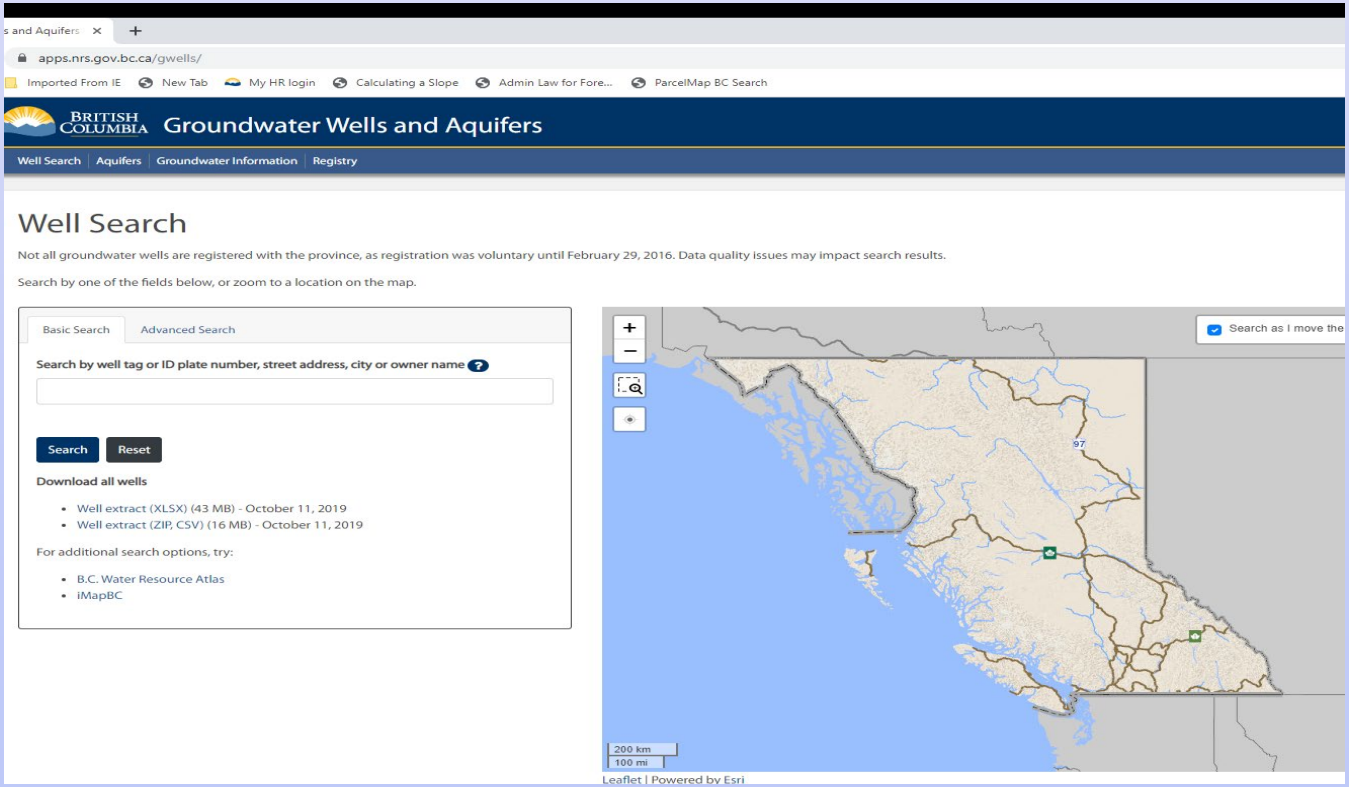
Well Records

- Keep all records of well construction and maintenance
- If no record – check if registered in GWELLS database or verify well construction details (e.g depth) if well maintained
- Key info included on record
  - Address and Owner
  - Geology
  - Construction date
  - Depth
  - Water Level
  - Estimated Yield
  - Location
  - Driller/company

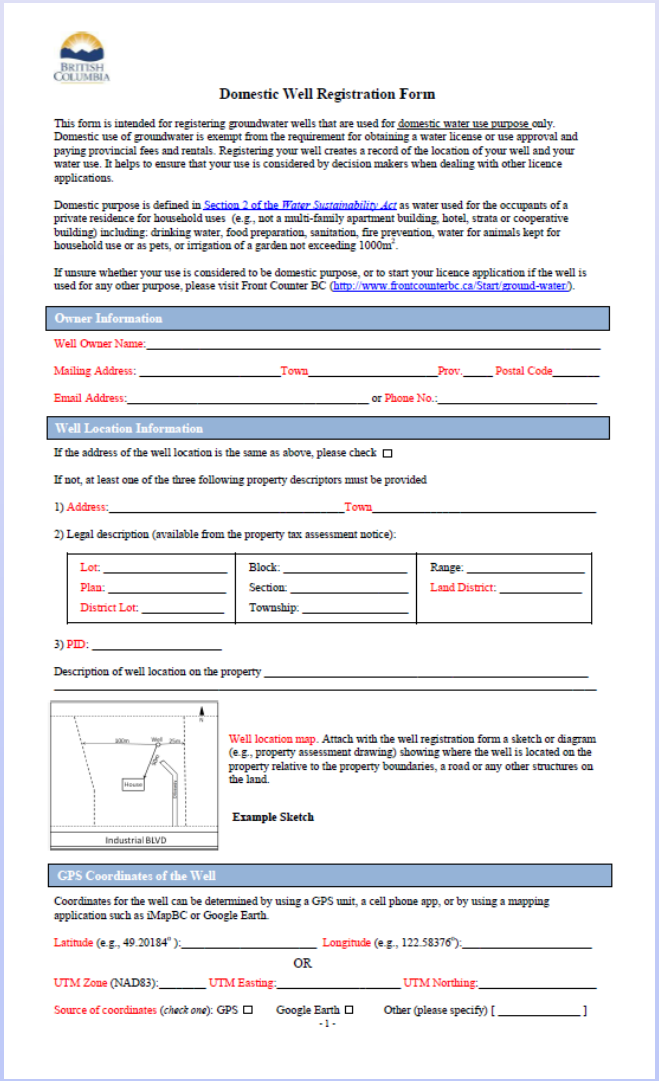


Well records

- Where can I find my well record?
- If your well is registered, at: https://apps.nrs.gov.bc.ca/gwells/



Registering your domestic well not mandatory but recommended



BRITISH COLUMBIA

Domestic Well Registration Form

This form is intended for registering groundwater wells that are used for domestic water use purpose only. Domestic use of groundwater is exempt from the requirement for obtaining a water license or use approval and paying provincial fees and rentals. Registering your well creates a record of the location of your well and your water use. It helps to ensure that your use is considered by decision makers when dealing with other licence applications.

Domestic purpose is defined in Section 2 of the *Water Sustainability Act* as water used for the occupants of a private residence for household uses (e.g., not a multi-family apartment building, hotel, strata or cooperative building) including: drinking water, food preparation, sanitation, fire prevention, water for animals kept for household use or as pets, or irrigation of a garden not exceeding 1000m².

If unsure whether your use is considered to be domestic purpose, or to start your licence application if the well is used for any other purpose, please visit Front Counter BC (http://www.frontcounterbc.ca/Start/ground-water/).

Owner Information

Well Owner Name:_____

Mailing Address: _____Town_____Prov:____ Postal Code_____

Email Address:_____ or Phone No.:_____

Well Location Information

If the address of the well location is the same as above, please check ☐

If not, at least one of the three following property descriptors must be provided

1) Address:_____Town_____

2) Legal description (available from the property tax assessment notice):

Lot: _____	Block: _____	Range: _____
Plan: _____	Section: _____	Land District: _____
District Lot: _____	Township: _____	

3) PID: _____

Description of well location on the property _____

_____

Well location map. Attach with the well registration form a sketch or diagram (e.g., property assessment drawing) showing where the well is located on the property relative to the property boundaries, a road or any other structures on the land.

Example Sketch

GPS Coordinates of the Well

Coordinates for the well can be determined by using a GPS unit, a cell phone app, or by using a mapping application such as iMapBC or Google Earth.

Latitude (e.g., 49.20184°):_____ Longitude (e.g., 122.58376°):_____

OR

UTM Zone (NAD83):_____ UTM Easting:_____ UTM Northing:_____

Source of coordinates (*check one*): GPS ☐ Google Earth ☐ Other (please specify) [_____]

- 1 -

Well Information

If the well construction report is available, please attach to this form. Attached ☐ Not Available ☐

If no well construction report is available, complete the following information:

Well Identification Plate Number (steel plate attached to some wells):_____

Date well drilled (YYYY/MM/DD):_____

If the date the well was drilled is unknown, provide the date you took possession of the property (YYY/MM/DD):_____

Drilling Company:_____

Method of Drilling: ☐Drilled ☐Excavated or Dug

Well depth (ft):_____ Well Diameter (in):_____

Disclaimer

Red lettering indicates information that must be provided for the well and the domestic use to be registered.

The information provided on this form, including personal information, will be added to the Provincial WELLS Database, which is accessible to the public at http://a100.gov.bc.ca/pub/wells/public/.

Information relating to the well and well owner submitted to the Deputy Comptroller in this form shall be considered part of the Provincial Government records and subject to the *Freedom of Information and Protection of Privacy Act*.

For more information related to the *Water Sustainability Act* or Groundwater Protection Regulation, please visit http://gov.bc.ca/water.

Signature of Declaration

I have read and understand the above and declare that the information provided on this form is true to the best of my knowledge. I understand and consent that the information on this form will be published and made publically available. Digital signatures are acceptable.

Signed:_____Date (YYYY/MM/DD):_____

Send Completed Forms To

Before Submitting:
- ☐ Ensure your well is used for domestic purposes only.
- ☐ Complete all required information.
- ☐ Attach a sketch or map depicting where the well is located on the property.
- ☐ Provide any supporting documentation (e.g., well construction report) if available.
- ☐ Sign the well registration form.

Mailing Address:

Deputy Comptroller
Ministry of Environment
PO Box 9362 Stn Prov Govt
Victoria BC V8W 9M2

Email:
GroundWater@gov.bc.ca

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***copies of these forms can be found online**

See: Domestic Well Registration - Province of British Columbia (gov.bc.ca)

Ground water quality - contaminants

Fecal matter

- **Bacteria**
  - *e.g. E. coli, fecal coliforms, total coliforms*
- **Viruses**
  - *e.g. Norovirus*
- **Parasites**
  - *e.g. Giardia lamblia*

Human activities

- **Chemicals**
  - *e.g. Nitrates, pesticides, hydrocarbons, pharmaceuticals*
- **Minerals**
  - *e.g. iron and/or manganese, lead, hardness (calcium & magnesium), boron, fluoride, sodium, sulphur, chloride, arsenic, or other metals*

Minerals

Water Quality Testing

Most well owners drink untreated groundwater

Groundwater can contain naturally occurring contaminants, or become contaminated with harmful *chemicals* or *pathogens*

Water may taste and look fine, but contain harmful substances

When to Test?

Bacteria

3 times per year

After any major plumbing work

~$60

Chemicals and other parameters

Generally, twice in first year and every 3-5 years after

~$170

How to Take a Water Sample?

Water Quality Tests

- **Test results will give you CLUES regarding the sources of contamination**
- ***FOR EXAMPLE …Total Coliform present***

  Can mean surface water is getting into the well or there is a problem with the well construction

If test results do not meet Drinking Water Guidelines…

Contact Island Health for advice

Shock Chlorination

- Simple disinfection method
- Used when bacterial contamination of the well has occurred (or may have occurred, such as after pump replacement or flooding of well)
- ***Not*** recommended as a regular maintenance activity (strong oxidizing agent)
- How to? See ENV brochure "Water Well Disinfection"

Disinfection

Disinfection for *pathogens*

- ✓ Chlorinators
- ✓ UV
- ✓ Distillers
- ✓ Ozonators

- ✗ Brita filters
- ✗ Charcoal
- ✗ Ion exchange

Treatment

Treatments for *chemical contamination* and *physical parameters*

- ✓ **Reverse osmosis**
- ✓ **Activated carbon filters**
- ✓ **Ion exchange**

- ✗ **Chlorine shock**
- ✗ **UV**
- ✗ **Distillers**

Estimated Cost of Well Upgrades

FIX	APPROX. COST
Well Cap	$55 - $175 (usually more for a dug well)
Well Casing Stick-Up Extension*	$300 -$600
Surface Seal *	$1000 - $2000
Well Closure *	$800 - $2000
New Well *	$7,000 - $20,000

*** Work MUST be completed by a registered qualified well driller**

Suspected Problems

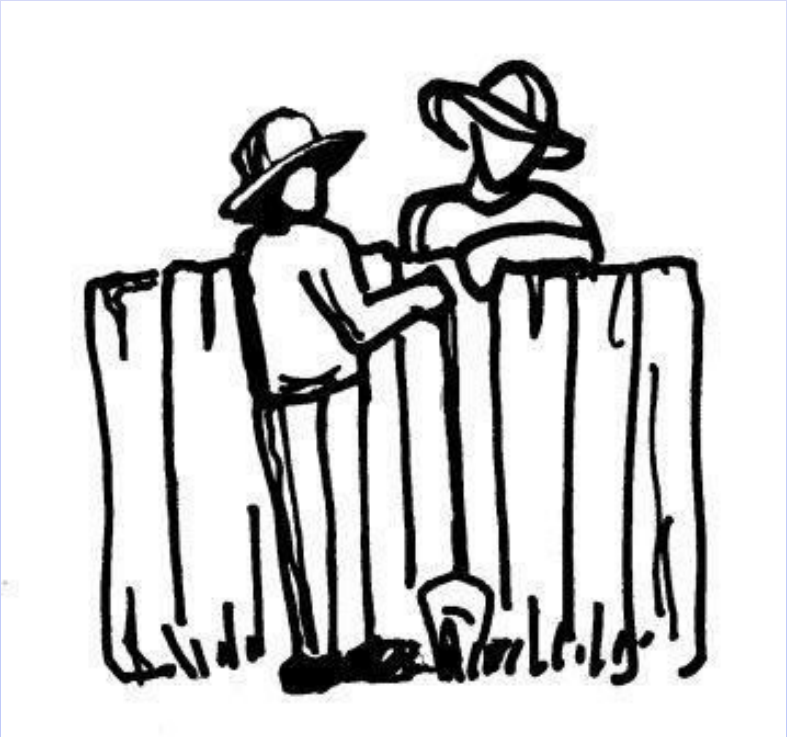
On your property:

Contact Island Health or FLNRO

On a neighbours' property:

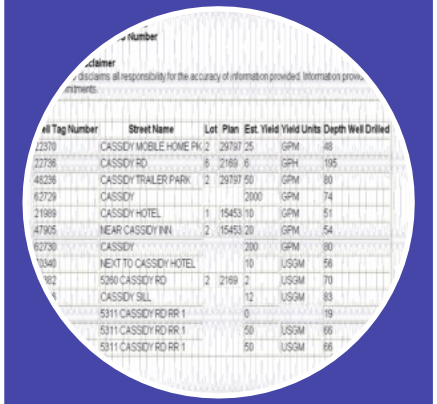
- ✓ Talk to & listen to your neighbour
- ✓ Provide information
- ✓ Identify solutions

If the issue can't be resolved, contact FLNRO Natural Resource Violations (RAPP) or Island Health



Key Messages

Groundwater is shared by your family, your neighbours, and the environment



ell Tag Number	Street Name	Lot	Plan	Est. Yield	Yield Units	Depth Well Drilled
22370	CASSIDY MOBILE HOME PK	2	29797	25	GPM	48
22736	CASSIDY RD	8	2169	6	GPH	195
46236	CASSIDY TRAILER PARK	2	29797	50	GPM	80
62729	CASSIDY			2000	GPM	74
21989	CASSIDY HOTEL	1	15453	10	GPM	51
47905	NEAR CASSIDY INN	2	15453	20	GPM	54
62730	CASSIDY			200	GPM	80
10340	NEXT TO CASSIDY HOTEL			10	USGM	56
162	5260 CASSIDY RD	2	2169	2	USGM	70
	CASSIDY SILL			12	USGM	83
	5311 CASSIDY RD RR 1			0		19
	5311 CASSIDY RD RR 1			50	USGM	66
	5311 CASSIDY RD RR 1			50	USGM	66

Keep good records of water levels, water testing, chlorination, and repairs

Regularly:

- Test your water
- Inspect your wellhead

ALWAYS properly close unused wells and upgrade components that have failed

GROUNDWATER LICENSING

- Context
- Key dates for Existing Groundwater Users
- When is groundwater license required?
- Your groundwater license
- Consequences of not applying
- How to Apply
- Questions

Context

WSA brought into force February 29, 2016

- **Allows surface water and groundwater to be managed and protected as one interconnected source**
  - **Fair and transparent system for managing use during scarcity**
- **Previously, groundwater was used under common law**
- **First 6 years have been a transition period**

Groundwater Licensing Key Dates

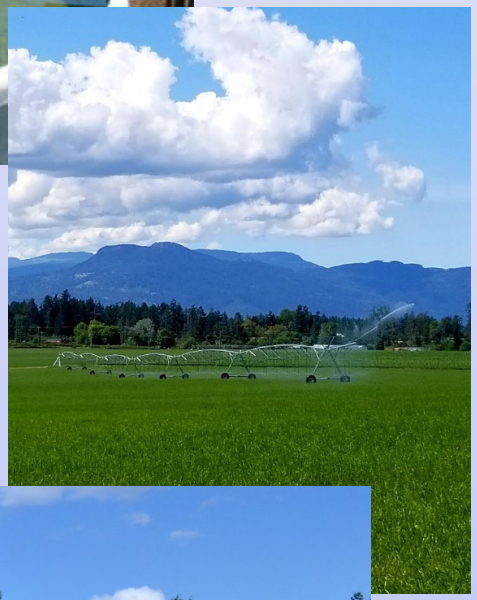
- **As of Feb 29 2016, non-domestic groundwater users must apply prior to diverting and using the water**

EXISTING non-domestic groundwater users
(using the groundwater before Feb. 29, 2016)
have until March 1, 2022 to apply

- **Application fee is waived**

Non-Domestic Use

Licence required



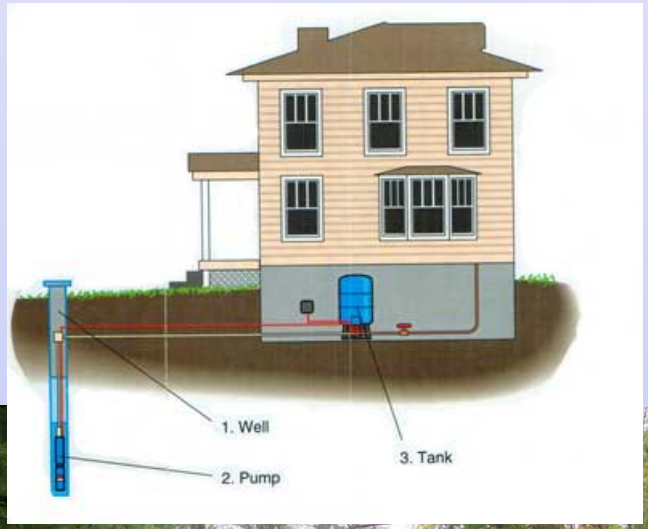
Examples:

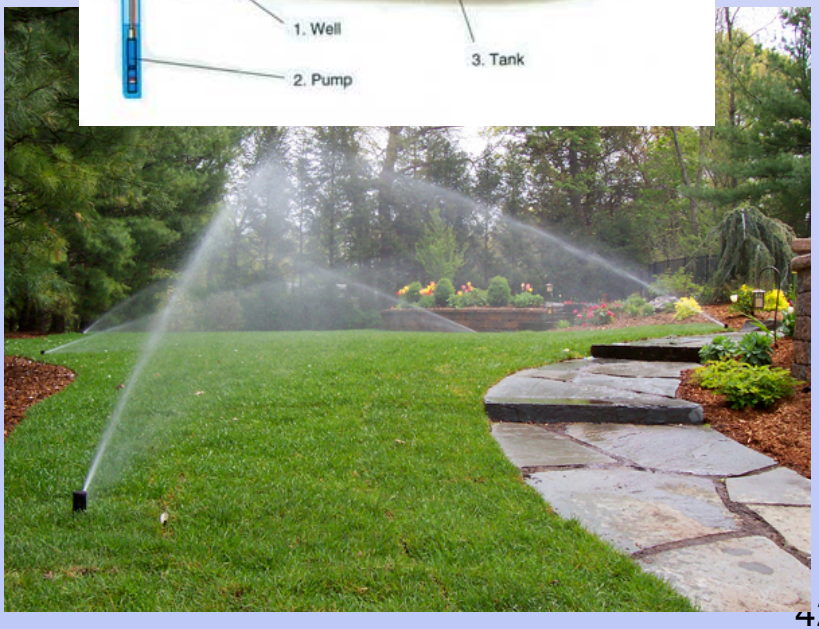
- Water supply systems (small water systems, stratas, municipalities)
- Agricultural irrigation, livestock
- Commercial (stores, restaurants, campgrounds, bed and breakfasts)
- Institutional (community centres, churches)
- Industrial (hatcheries, greenhouses, golf courses)

Domestic (Single Household) Use

No licence required

- Drinking water
- Food preparation
- Sanitation
- Fire prevention
- Water for pets and household animals or poultry
- Irrigating a garden adjoining the dwelling (under 1000 m^2, 0.25 acre)





Your Groundwater Licence

Your license:

- **Is attached to the land, not people**
- **Is for a specific purpose and volume to support your business**
- **Includes your date of first use, which will ensure your right to water is based on First-In-Time, First-In-Right (priority date)**
  - **Protects your use from newer users and future development**
- **Enhances property value**
- **Not the same thing as "registering a well"** Well Registration Form (gov.bc.ca)

Consequences of Not Applying

Non-domestic groundwater users that have not applied by March 1, 2022:

1. **Will be committing an offence under the WSA**
2. **May be subject to fines and penalties**
3. **May be ordered to cease using water**
4. **Will need to apply as a New User**
   - **Lose historical rights**
   - **Application could be refused**

How to Apply!

1. **Register for a BCeID**

   www.bceid.ca

   Allows you to begin your application and return to it later, if needed
2. **For application form, required information, fees, links and tips, please visit: groundwater.gov.bc.ca**
3. **Allow for about 2 hours to complete your application online; apply early to avoid technical issues**

Call FrontCounterBC for assistance

1-877-855-3222

AQUIFER PROTECTION

- Water-related laws
- Groundwater on Vancouver Island and in Juan de Fuca Area
- Aquifer mapping & data sources
- Monitoring
- Well testing
- Surface-groundwater linkages
- Water budgets & technical studies
- Current themes in water management

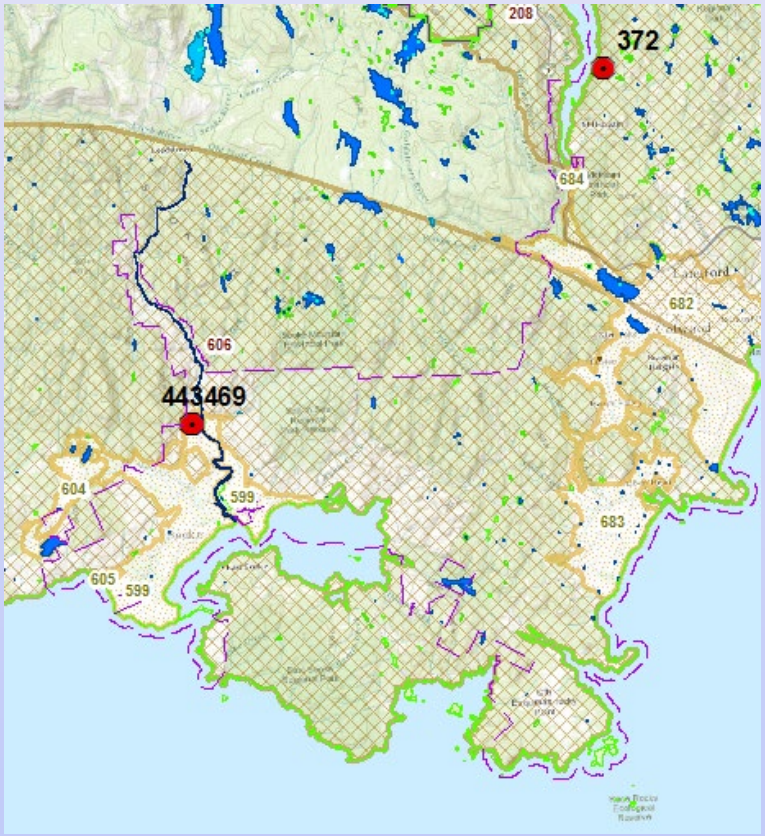
Water Related Laws in BC

Water Sustainability Act, Groundwater Protection Regulation	▪ Requires all wells to be properly constructed, maintained, and closed at end of service (FLNRO)
Environmental Management Act	▪ Prohibits pollution releases without permit (ENV)
Drinking Water Protection Act	▪ Standards for public water suppliers ▪ Prohibits contamination of a water source (Island Health, Ministry of Health)
Public Health Act	▪ Protects water supplies by requiring well setbacks of 30m from potential source of contaminants (Island Health)

Ground Water Use in Juan de Fuca, Sooke

Water supply

- Ground water major source for private homes, water systems, agriculture and commercial use in rural areas
- Most wells get ground water from “fractured rock aquifers”
- Many “low yield” wells e.g., at high elevation
- Precipitation only source of recharge
- Risk of seawater intrusion in coastal areas



Ecosystems - wetlands and fish-bearing streams

- GW base flow in periods of low rainfall
- Cool stream temperatures in summer

Ground water quantity concerns

- **Low well yields**

  Low producing bedrock aquifers, deep & tight fractures

- **Interference between adjacent well users**

  Mainly localized due to low aquifer permeability

- **Seasonal water shortages**

  Dug wells

  Water demands may exceed water supply in dry months

- **Aquifer overuse or depletion**

  Sea water intrusion

Photo credit: Natural Resources Canada

Water Quantity

The amount of water a well can produce is influenced by:

- Geology
- Aquifer type
- Precipitation / recharge
- Well depth
- Pumping rate

Groundwater & surface water are connected: Over pumping of the groundwater can impact stream base flow

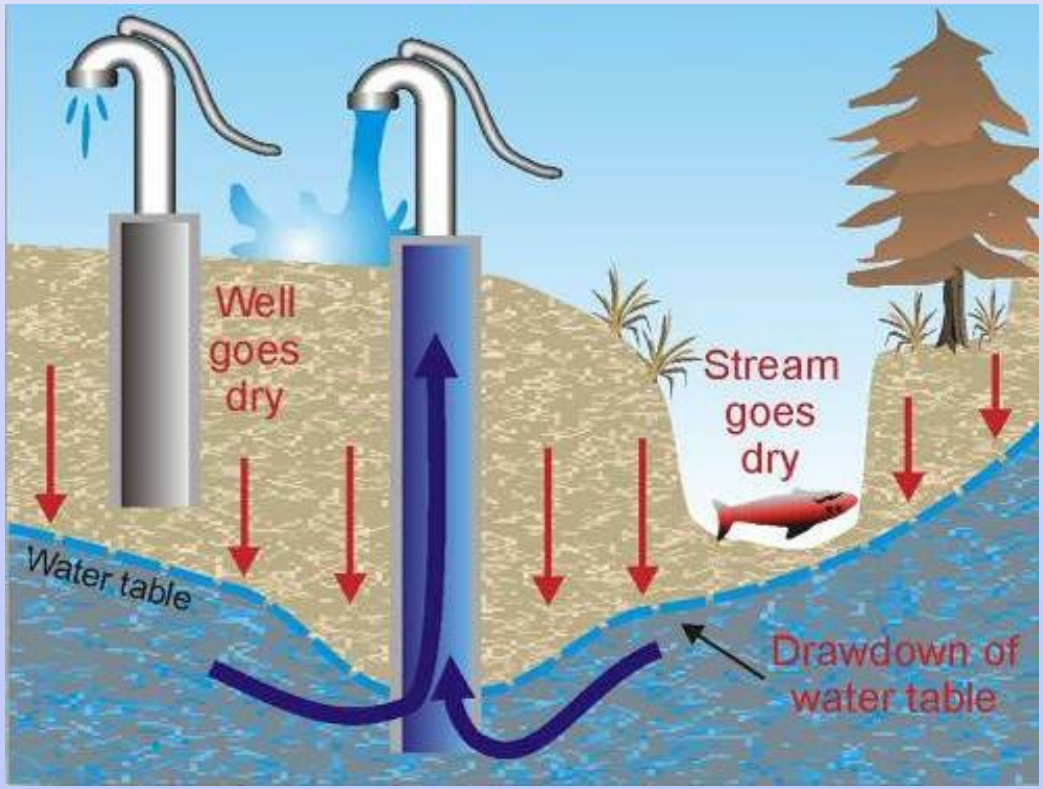


Photo credit: Natural Resources Canada

Seasonal Low Supplies

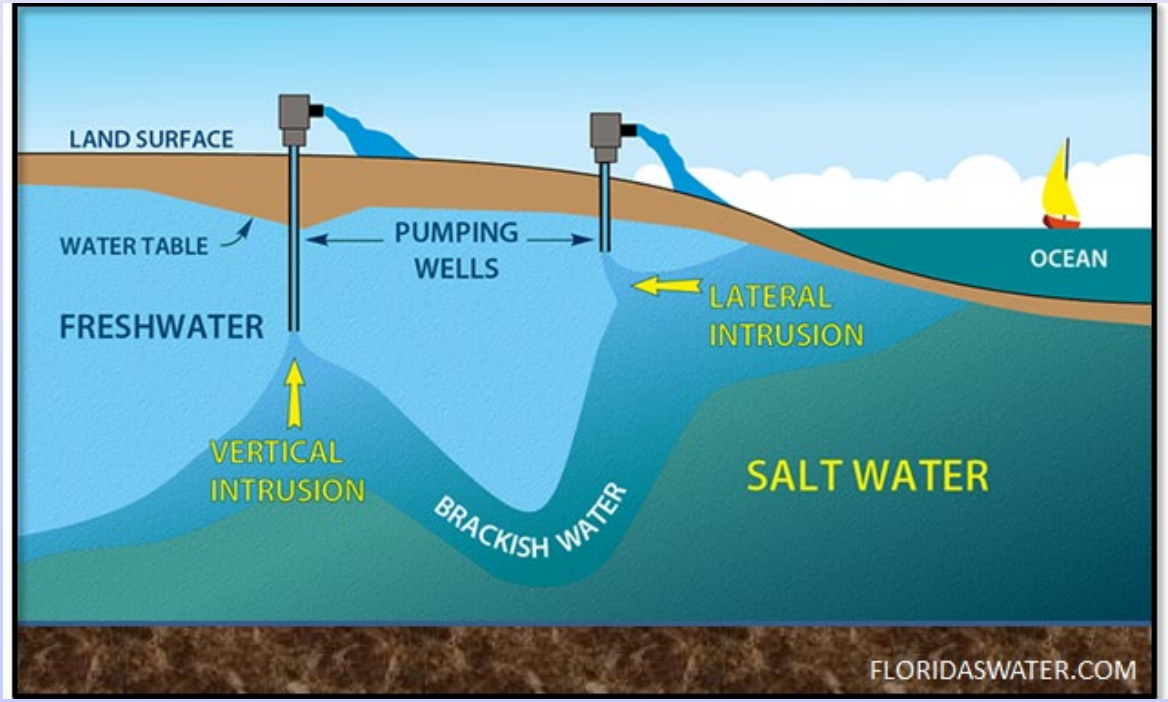
- If you are at risk of running out of water put contingency plans in place before water shortages occur

  -Identify alternate water sources

- Never use your well to store hauled water - buy or rent cisterns / storage tanks
  - Stored water may need disinfection
  - Clean and maintain tanks regularly

Follow water conservation practices consistent with local restrictions

Sea Water Intrusion



- Impact of SWI on freshwater may be long-term or permanent
- Well operation causing sea water intrusion into a fresh aquifer is a violation of WSA, S. 58

Refer to Best Practices for Prevention of Sea Water Intrusion

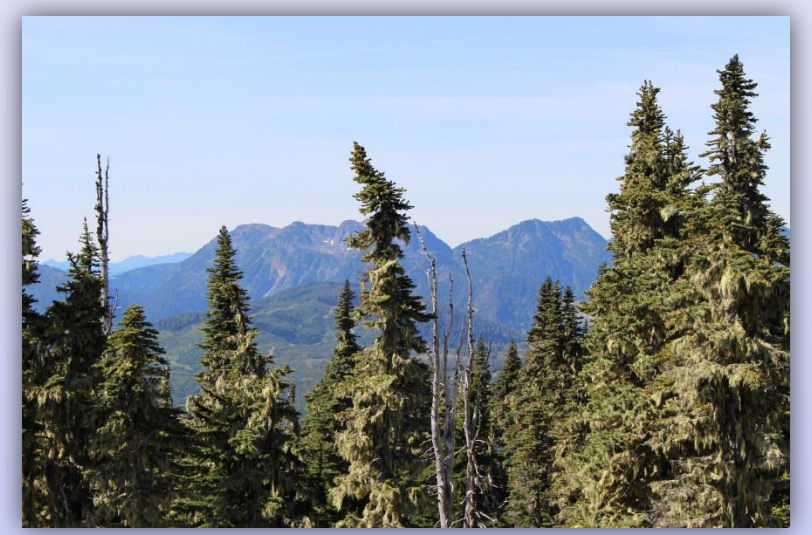
Sea water intrusion is process of saline or brackish water from ocean contaminating fresh ground water

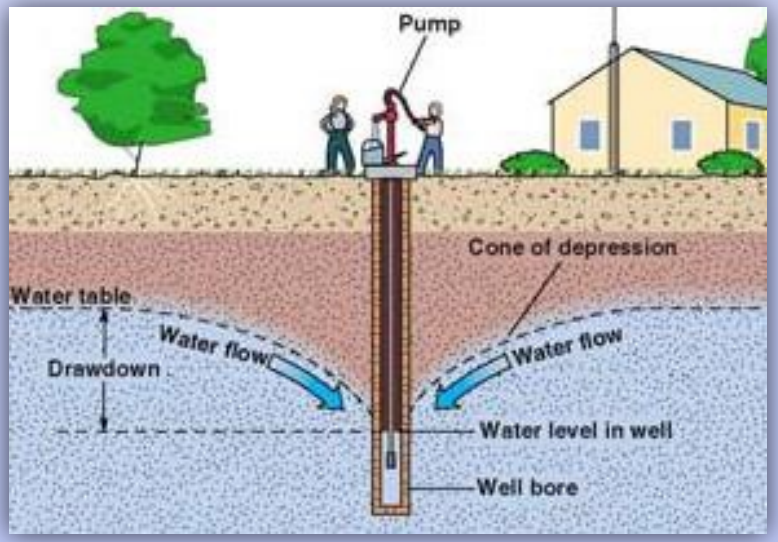
Caused by:
-Drilling into saline groundwater zone
-Over pumping from one well or many wells in an area
-Natural vulnerability due to coastal geography
-Climate change (storms, sea level rise)
-Indicators: Chloride >150 mg/L

Climate Change

What can we expect?

- Changing precipitation
- Longer ‘dry’ seasons with drought conditions
- More intense storms
- Multi-year droughts?
- More groundwater use

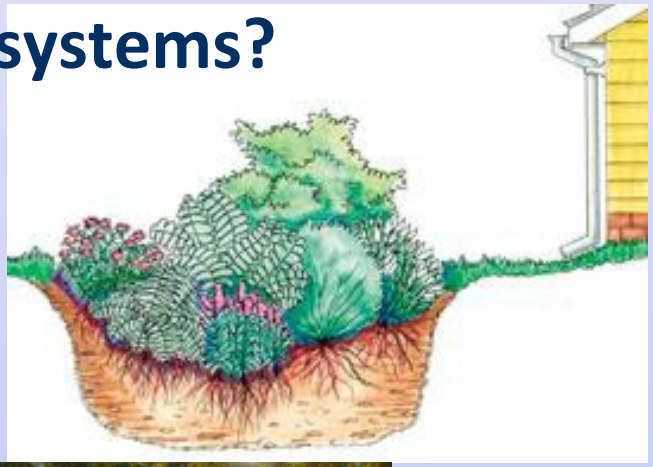




Below photo credit: wellmanager.com

Climate Change & Drought Management

What can a private well owner do to better prepare and manage their water systems?



- Reduce water use
  - ie. convert to low-flow fixtures
- Increase storage capacity on property
- Diversify water source
  - ie. add rainwater collection
- Change landscaping
  - ie. xeriscaping, rain gardens

Aquifer mapping data sources

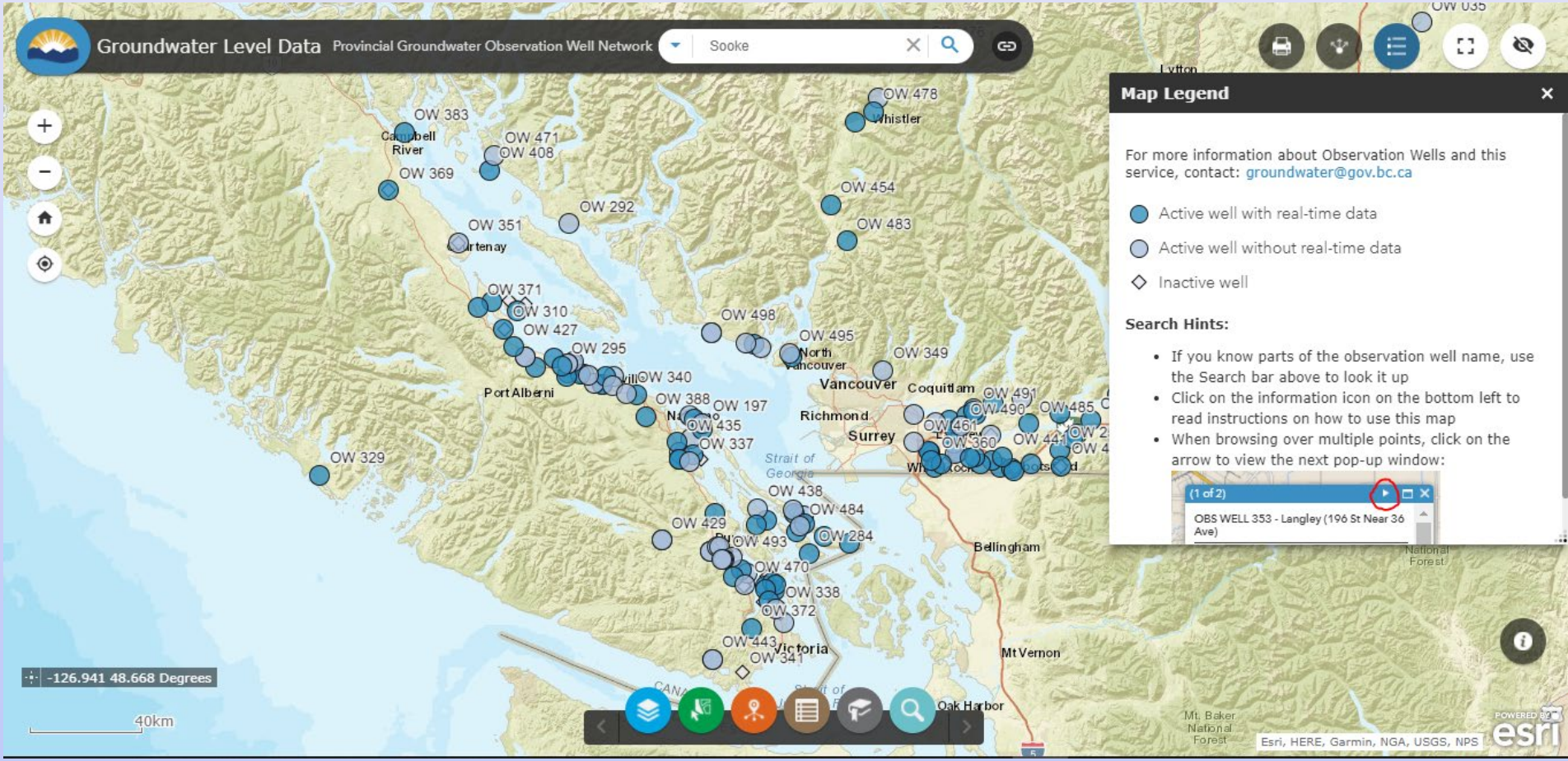
- Groundwater wells and aquifers database (GWELLS)
  - Aquifer search
  - Aquifer summaries
  - Aquifer worksheets
- Water Science Series publications
- Ecological reports catalogue

  Examples
  - AQ599
  - AQ449
  - AQ606

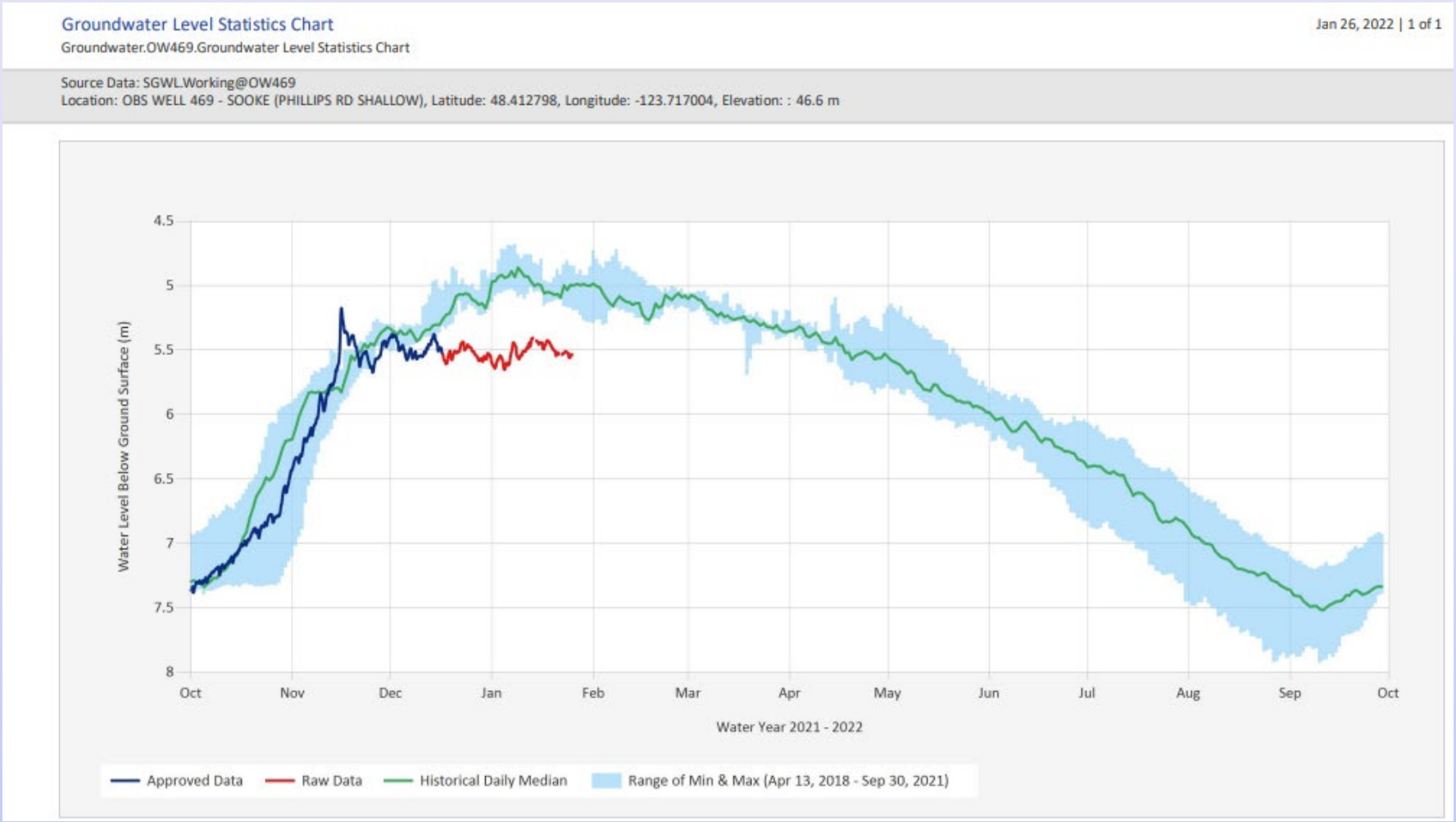
Evaluating Ground Water Sustainability

1. Environmental monitoring
   - ✓ Observation wells measuring groundwater levels over time (seasonal variation, pumping interference, long-term trends)
   - ✓ Streamflow (esp. low flow)
   - ✓ Climate (weather)
2. Pumping tests and well assessments
   - ✓ Pump well and measure aquifer response
   - ✓ Groundwater levels and water use (demand/supply)
3. Technical studies – water budgets, aquifer characterization, modelling

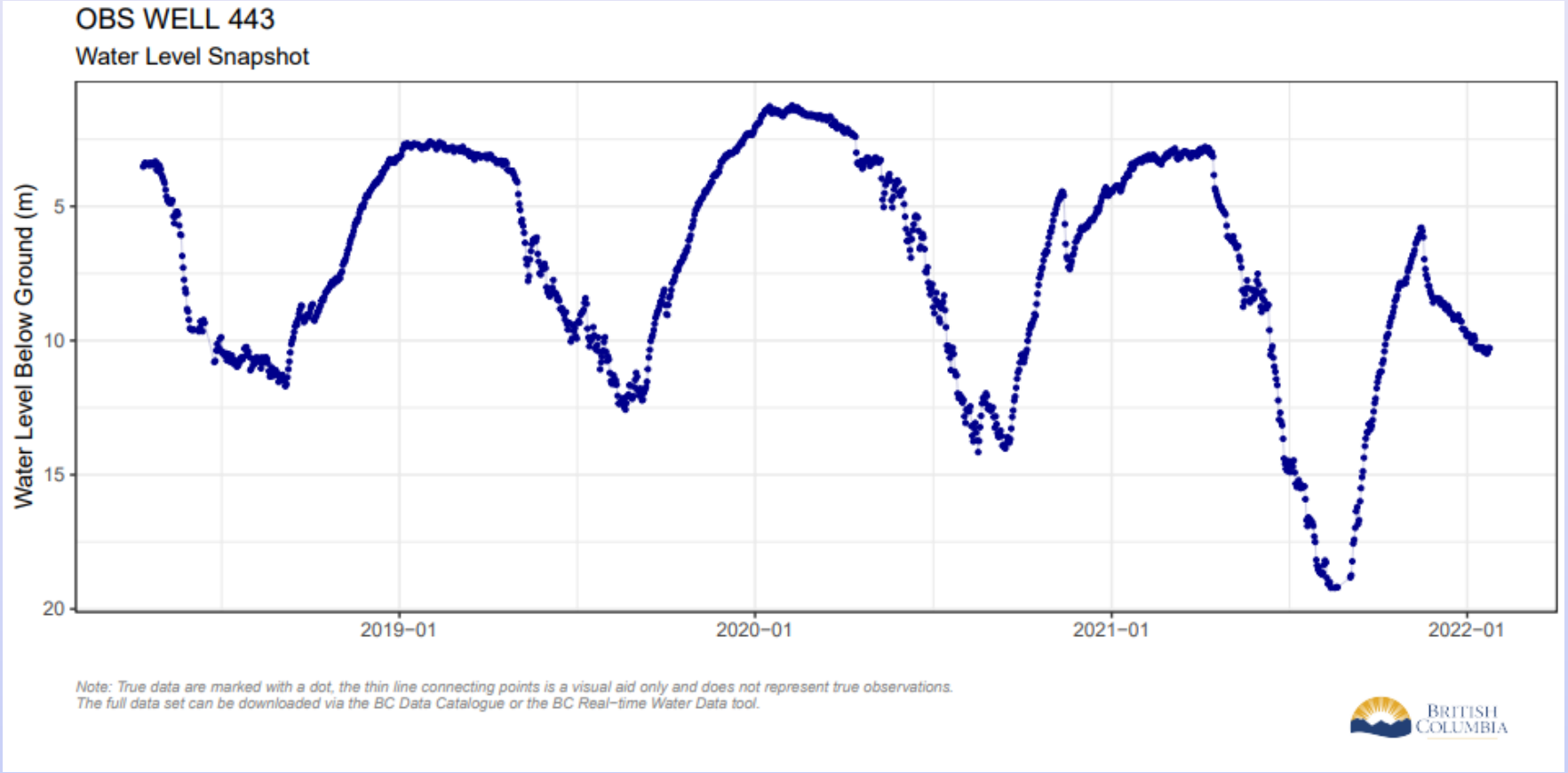
Provincial Groundwater Observation Well Network



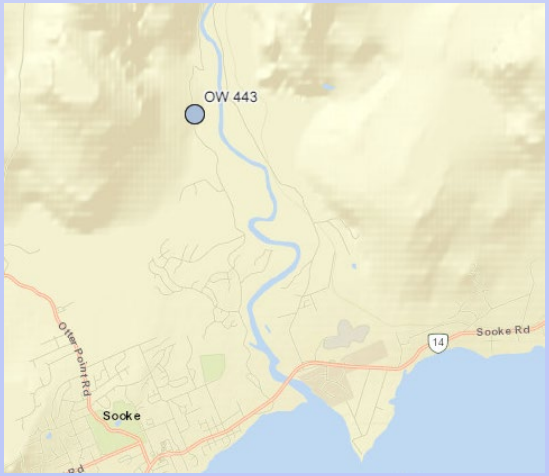
[Groundwater Level Data Interactive Map - Province of British Columbia (gov.bc.ca)]



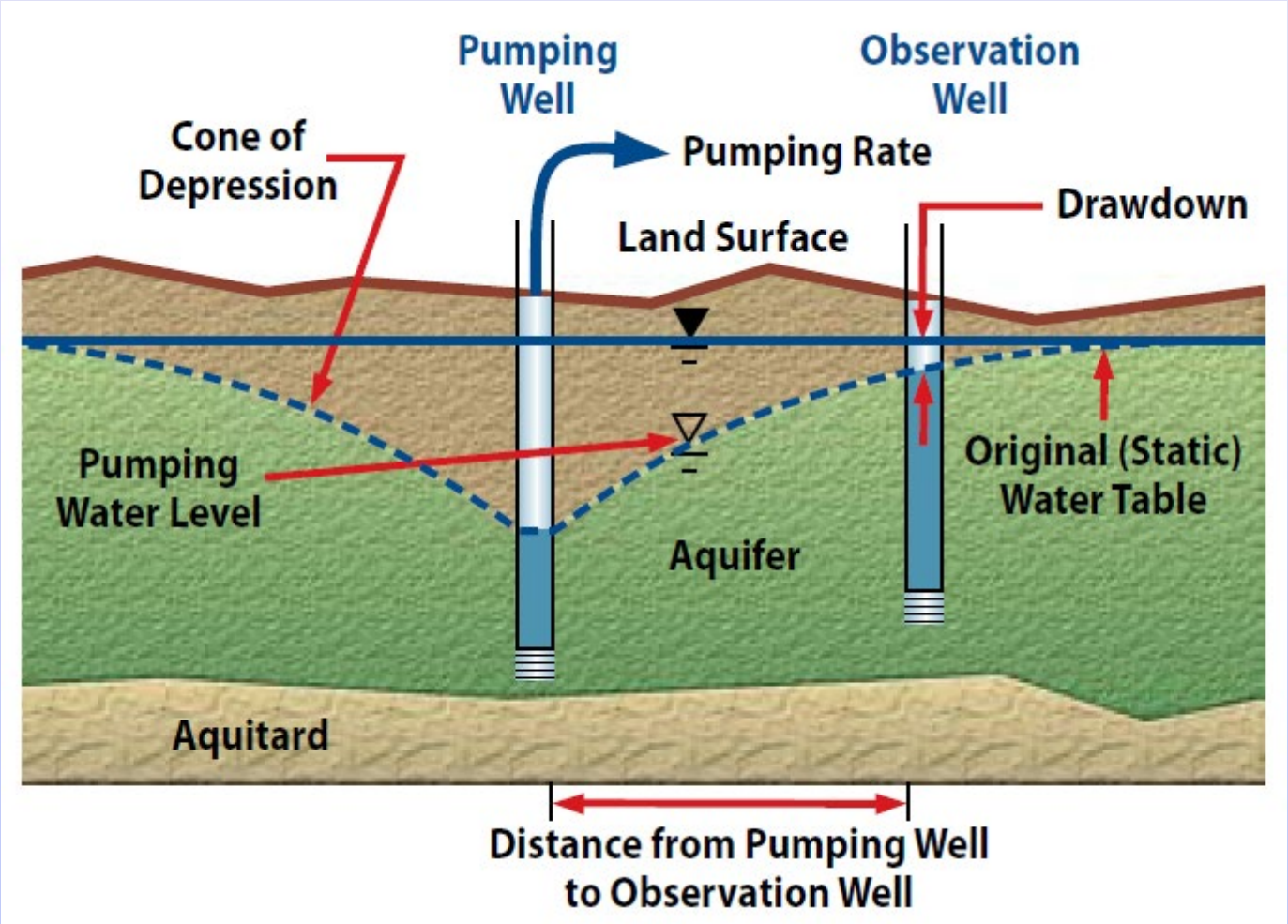
- OW469 Sooke (Phillips Road, Shallow)
- Aquifer: **599**
- Aquifer type: **Unconsolidated, confined (subtype 4b)**
- Well depth: **28 m** (93 ft)
- Period of record: **April 2018- present**



- OW443 Sooke (Phillips Road, Deep)
- Aquifer: **606**
- Aquifer type: **Unconsolidated, confined (subtype 6b)**
- Well depth: **214 m** (702 ft)
- Period of record: **April 2018- present**



Well testing



- Measures the effect of well pumping on aquifer and adjacent wells
- Required for GW licence applications above a certain volume

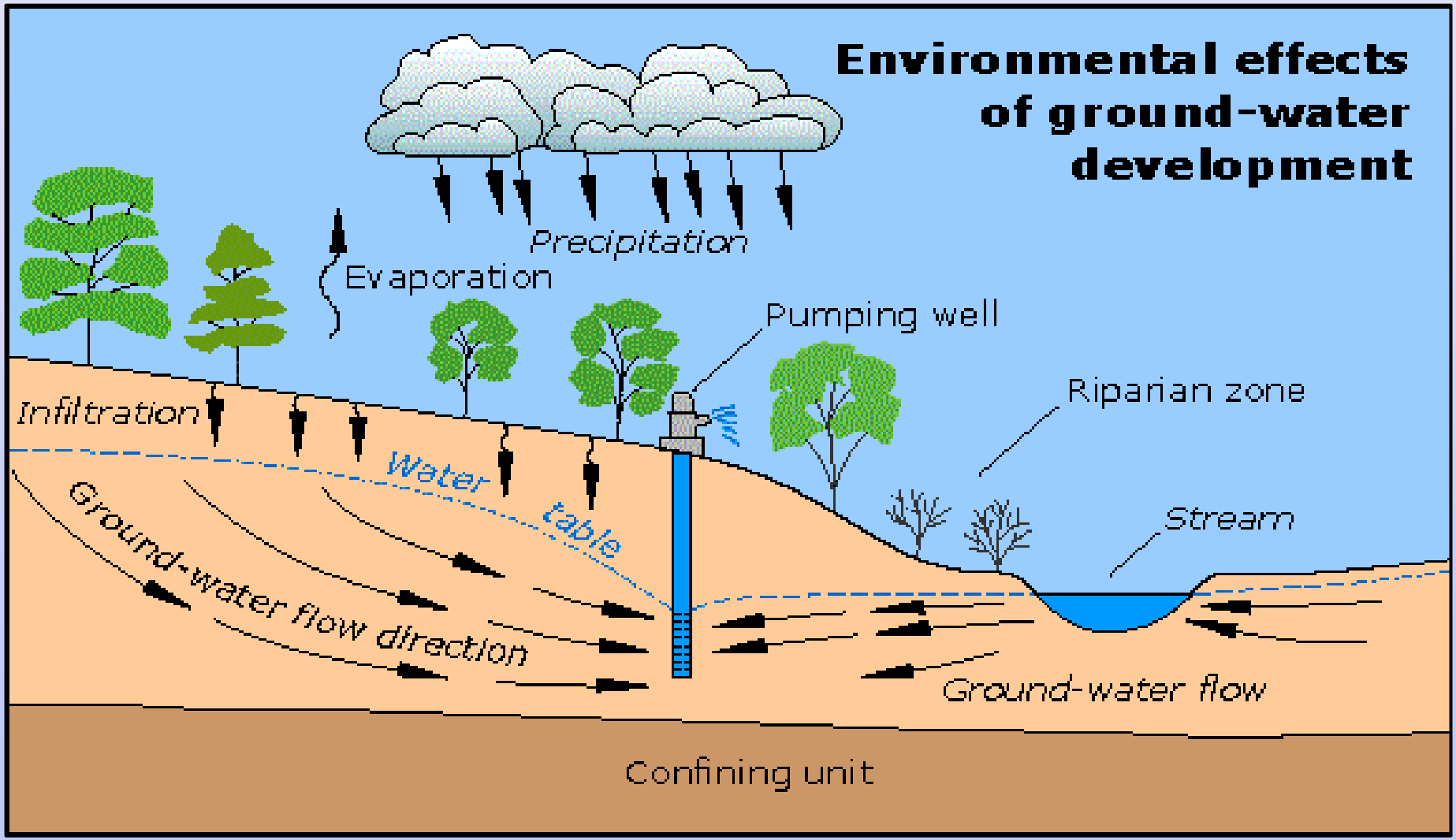
Refer to: Guidance for Technical Assessments in Support of an Application for Groundwater Use in British Columbia (Version 2)

Groundwater recharge

Recharge into an aquifer depends on factors including:

- Precipitation - Amount, intensity timing (rainfall, snowmelt)
- Topography, slope, depressions in land surface
- Surficial materials and soil properties
- Hydraulic connectivity with river systems (e.g. losing streams)
- Groundwater pumping
- Evapotranspiration and other losses

Impacts on environmental flows in streams



Water budgets

Estimates fluxes between components of water cycle

- ✓ In practice often difficult to measure
- ✓ Baseline monitoring and data collection needed
  - ➢ Well inventory
  - ➢ Water use
  - ➢ Climate
  - ➢ Streamflow

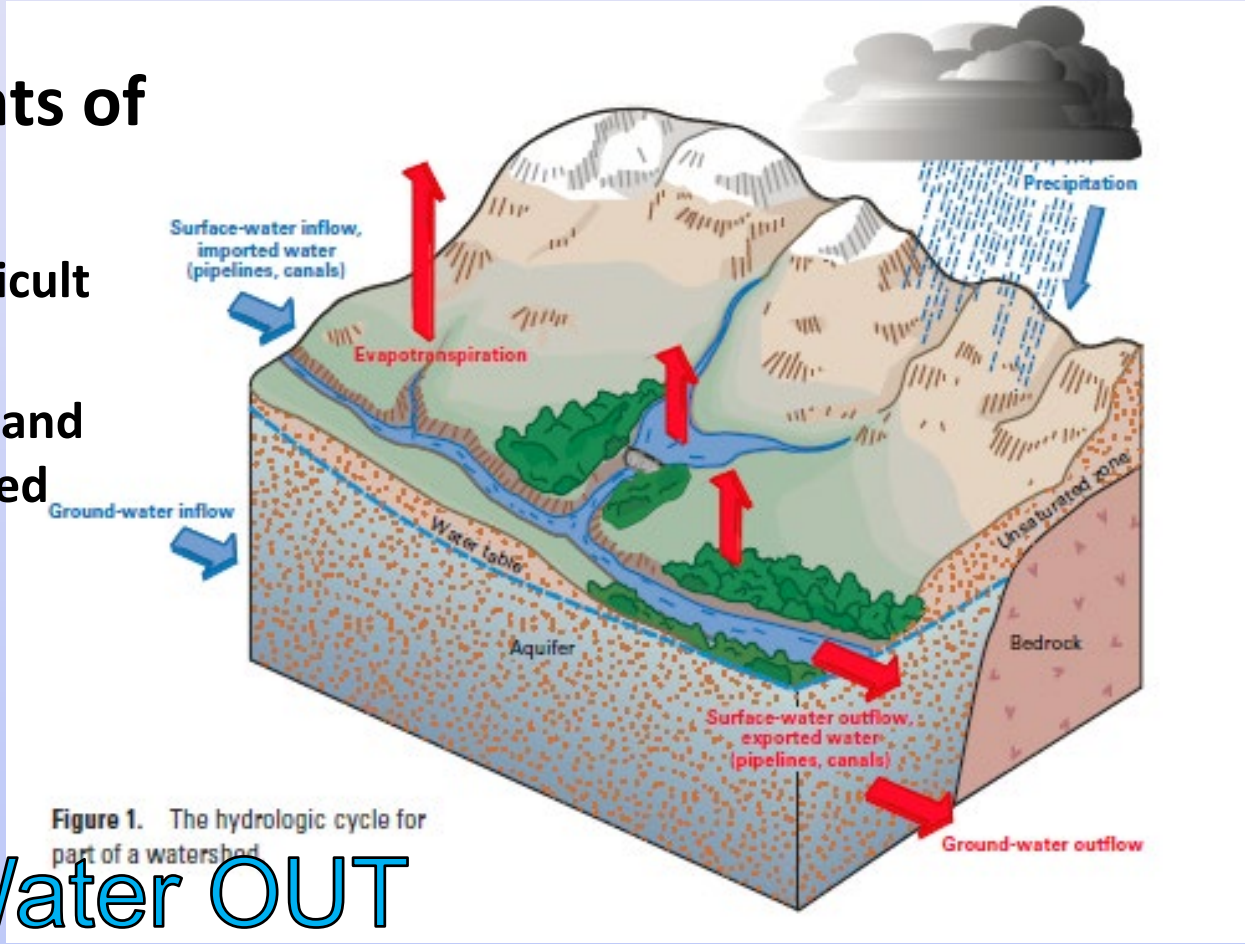


Figure 1. The hydrologic cycle for part of a watershed

Water IN = Water OUT

+/- Change in Storage

Source: Water Budgets, Circular 1308, USGS

Partnerships and Roles

Role of local government

- Land use planning
- Identifying & protecting water supply sources (e.g. as purveyors)
- Bylaw development
- Subdivision approvals & proof of potable water
- Riparian Areas protection
- Compliance and enforcement (referrals of WSA violations)
- Predicting future problems (quality/quantity)

Tools & assistance from FLNRO / ENV

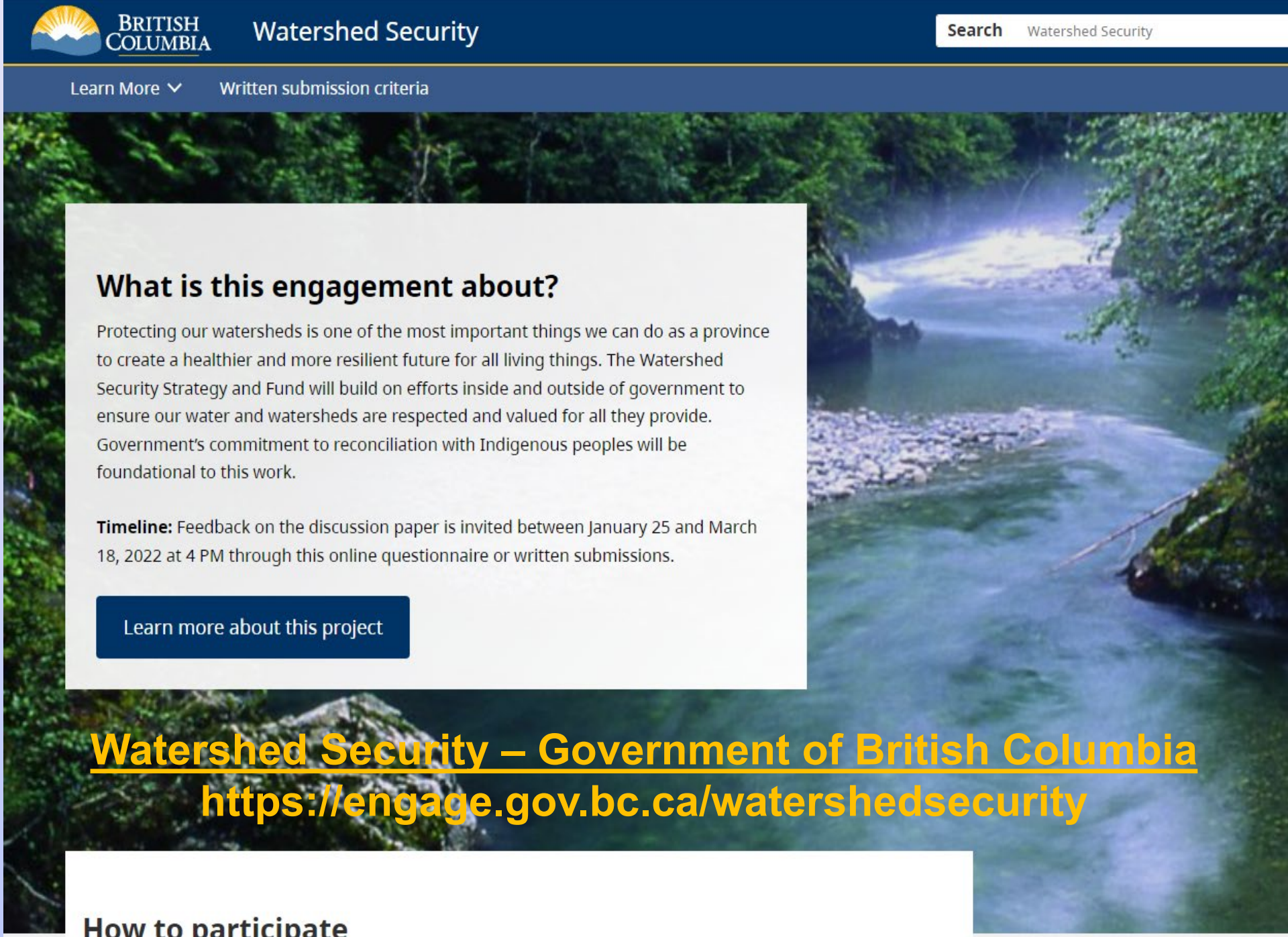
- Aquifer mapping
- IMAP/BC Water Resources Atlas
- Model bylaws e.g. for closure of unused wells
- Technical advice and guidance documents e.g. guide to applying for a CPCN for utilities; GWUDI/GARP* guidelines
- Compliance enforcement (WSA)
- Observation well network
- Ground water science (studies)

GWUDI Groundwater under direct influence of surface water or at risk of containing pathogens

CPCN: Certificate of Public Convenience and Necessity

Current Themes in Water Management

- Blue Ecology – Interweaving indigenous knowledge, values with western science (see: www.waterbucket.ca)
- Regional-based watershed protection programs (Nanaimo, Highlands, Islands Trust)
- Community monitoring networks
- Education – value of water literacy and awareness
- One water – identifying links between surface and groundwater sources
- Recognizing land use impacts on water resources
- First Nations Stewardship and Water Governance Opportunities


BRITISH COLUMBIA
Watershed Security
Search
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Learn More
Written submission criteria
What is this engagement about?
Protecting our watersheds is one of the most important things we can do as a province to create a healthier and more resilient future for all living things. The Watershed Security Strategy and Fund will build on efforts inside and outside of government to ensure our water and watersheds are respected and valued for all they provide. Government's commitment to reconciliation with Indigenous peoples will be foundational to this work.
Timeline: Feedback on the discussion paper is invited between January 25 and March 18, 2022 at 4 PM through this online questionnaire or written submissions.
Learn more about this project
Watershed Security – Government of British Columbia
https://engage.gov.bc.ca/watershedsecurity
How to participate

Contacts

Ministry of Forests, Lands, Natural Resource Operations & Rural Development (FLNRO)
Information on legislation, regulations, local groundwater resources and your well
Nanaimo Regional Office:
www.gov.bc.ca/for
250-751-7220

Island Health (Vancouver Island Health Authority) Environmental Protection
Information on water quality test results and your well
Victoria Gateway Office: 250-519-3401
www.islandhealth.ca/learn-about-health/drinking-water

Ministry of Environment & Climate Change Strategy (ENV)
Information on legislation, regulations, aquifers, and your well
http://www.gov.bc.ca/water

Reporting of Natural Resource Violations (Report All Poachers and Polluters)
www.for.gov.bc.ca/hen/nrv/report.htm
1 877 952-7277

Resources

Real Time Water Data - Hydrometric and Observation well networks

https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-science-data/water-data-tools/real-time-water-data-reporting

Drought Information Portal

https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/drought-flooding-dikes-dams/drought-information

Water information (laws, licensing& rights, well owners info)

www.gov.bc.ca/water

B.C. Agricultural Water Calculator

http://bcwatercalculator.ca/agriculture/welcome

Mapping tools (iMap)

https://www2.gov.bc.ca/gov/content/data/geographic-data-services/web-based-mapping/imapbc

Thanks & Discussion

West Coast Water Protection & Authorizations
250-751-7220

Acknowledgments:

Regional District of Nanaimo Drinking Water and Watershed Protection Program – Well Smart

Acoustic well sounder

www.enoscientific.com

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Well Watch 660 DL
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Well Watch 660
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Well Watch 660 with 310 Remote Display
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WS2100 Flow Meter Kit w/ Well Sounder 2010 PRO
$1,799.00 ★
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Solar Power Kit
$249.00 ★
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Protection Program

★ US funds