



Groundwater Matters

British Columbia Groundwater Association Quarterly Newsletter

December 2017



IN THIS ISSUE

President's Report.....	2
General Manager's Report.....	3
2018 BCGWA Tradeshow & Convention.....	4
General Announcements	7
The Importance of Base Marks	9
Mike Wei – A Retirement Salute.....	11
Report From the Prov. Government.....	13
2017 Fall Regional Meetings Synopsis.....	21
Holiday Crossword	27

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GENERAL MANAGER'S REPORT - December 2017

Here we are, Christmas has snuck up upon us once again. For myself and my family, it has been a challenging fall. We are scrambling to complete a roof on our house for Santa to land on. It all began with one small, but fateful decision: who to hire as general contractor for our home renovation project. Checked out his references? Yes? Worked with him before? Yes. But when demolition started this summer, the project blew wayyy off course. Let's just say we won't be home for Christmas... hopefully Easter.

Why am I telling this humbug tale during this season of merriment and joy? Because the trials that we faced with the construction industry hatched valuable lessons that can be translated to any industry. So, bear with me as I offer some New Year's resolutions to ponder:

Landowners: Know who you are hiring to do the job, because you will ultimately own and live with the work that they do. Ask for credentials, references, examples of past projects. Check if they are a member of any reputable Associations ;) Have a written contract or work agreement in place that clearly sets out expectations, and stick to it. If you see things that don't look right, don't delay in asking questions or seeking advice.

Contractors: Take the time to relay to owners the information they need to make a good decisions and take risks that they are comfortable with. Take pride in the work you do and don't sacrifice the quality of jobs for quantity of jobs. Educate your clients about what their legal responsibilities are, have a discussion up front about what could go wrong, and what your contingency plan is. Communicate regularly and honestly.

Engineers: get out of your offices and onto the job site! Wherever possible, take the time to visit the site and familiarize yourself with site conditions

before the job starts. Get to know the contractors you are working with, listen to their ideas and suggestions, and integrate them into a plan that is achievable and realistic. Think twice before choosing the ultraconservative approach – this can add more delay, complexity, and expense to the job and frustrate everyone involved.

Regulators: take the time to understand the intricacies of the situation at hand, and the economical and personal repercussions of any law enforcement decisions. Sometimes strict adherence to one set of rules can create problems in other areas. Get to know a variety of experienced industry practitioners, and don't hesitate to call them up for an opinion. They'll be more than happy to share what they know.

And everyone, let's not forget to say thank you. After all, we are all doing our best. Thank you to our members for their ongoing support. Thank you to our Board of Directors and ITA Subject Matter Experts for the hours of volunteer time that you put in this year. Thank you government staff for your approachability and for working to creating tools and resources that make our work easier. Thank you Mike Wei, for your 30+ years of service, and best wishes as you move on to retirement next year.

Speaking of which, our next big event is our 2018 Trade Show, Convention, and AGM. Mark your calendars for April 4 and 5, in Langley. We have moved it a month later so that our northerly members can take a break with us while road bans are on (wink, wink, nudge nudge!). We have some great educational opportunities lined up, a virtual 'Wellspring of Information,' and an amazing band for the President's Gala. Anyone wishing to give a presentation or volunteer at our convention will enjoy significant rewards, and is encouraged to get in touch with me at general-manager@bcgwa.org. On-line registration is will open Jan 1 at bcgwa.org.

Thanks everyone for a spectacular year and all the best to you and your families over the holiday season!

Kathy Tixier



PRESIDENT'S REPORT -

December 2017

Three weeks left until Christmas and it's a time of big decisions. What to get the wife for Christmas.

Where to have the company Christmas party. And which clients am I going to tell aren't going to get their projects done before the Holidays.

If you haven't had an opportunity yet, I encourage everyone to check out the new BCGWA website. Kathy has done a great job of working with the web developer to create this new site. It's modern, easy to navigate, and as the online face of our organization, conveys professionalism and competency for the Association and its members.

There are lots of links to useful information on there, as well as a link to the recently completed Groundwater Protection Handbook. This can be downloaded as a PDF, or purchased in hard copy. It is probably something that every contractor would want to have in their truck, and an especially good resource for new employees to bring them up to speed on the standards and regulations that affect our industry.

The handbook includes a table of well setback distances from the various regulations - I have been meaning to make a table like this myself for years. The table below summarizes some of the most common setbacks, and I'll make a couple of comments about a few.

Horizontal Setback	metres	Feet
Private Dwelling	6	20
Existing Water Supply Well	15	50
Known or probable source of contamination (including septic systems)	30	100
Cemetery or dumping ground	120	400
Large volume septic fields	Varies. 30 m to 300 m depending on the size of the septic system and the type of aquifer.	

- The 15 m setback from an existing supply well is a new setback introduced with the Water Sustainability Act. The setback does not apply to

wells on the same property with the same well owner.

- The 30 m setback from known or probable sources of contamination, including septic systems, is probably the most common one we encounter. Interior Health has clarified that the 30 m setback applies to all parts of a septic system, including septic tanks.

All over the province there are existing, very small lots from old subdivisions created at a time when very small lots were permitted, even when onsite water and septic was needed. People getting around to building on these lots now are constrained by this 30 m setback, and may need what's called septic setback letters, which in some cases can justify a reduced setback. The order in which the septic system and well is constructed is important. A septic system can be constructed within 30 m of a well with a septic setback letter that gets attached to the septic system filing with the Health Authority. The reverse is not true. There is no mechanism I am aware of that permits a well to be drilled within 30 m of a septic system after the fact. This is a discrepancy that should be addressed.

If you are involved in a project like this as a driller, to reduce your liability, make sure this reduced setback is somehow addressed with a septic filing. If that's not possible, I probably wouldn't take the job.

- Large septic systems (>5,000 lpgm) are regulated differently than small domestic systems, and can have larger setbacks. If you are drilling in heavily developed area, where they may be a large strata, campground or mobile home park, you should be digging a little deeper into what kind of septic systems are around.

As a closing note, preparations are beginning for next year's convention which will be held in Langley on April 4 and 5. Put that date in your calendars and stay tuned for more details.

I hope everyone is planning a long holiday break with their families. I wish everyone a safe and Happy Holiday season!
Ryan Rhodes

2018 BCGWA Trade Show Convention and AGM



A 'WELL SPRING' OF INFORMATION

THE
BRITISH COLUMBIA
GROUND
WATER
ASSOCIATION



April 4 & 5, 2018 Coast Langley Resort & Casino, Langley, BC

Full 2-Day Delegate Package:

- BCGWA members **\$450 +tx**
- Non-members **\$500+tx**
- Spouse, addl employee, or addl booth participant **\$350 +tx**

Trade Show Booth:

\$750 + tx
(includes
1 full 2-day
delegates package)

1-Day Well Pump Installers Course:

Early Bird \$450 +tx
(before Jan 31)

Regular rate \$500 +tx
(after Jan 31)

We are setting the stage for another successful event in 2018, featuring a two-day interactive trade show, a full day well pump installer course, an opportunity to challenge the well pump installer ITA exam, and a Hard Day's Night with the Fab Fourever at our President's Gala.

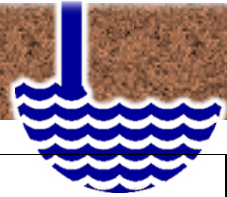
A variety of informative talks are planned on flowing artesian wells and other topics pertinent to groundwater science and the water well and geotechnical and environmental drilling industry.



More info and registration on-line January 1 at www.bcgwa.org



PRELIMINARY EVENTS CALENDAR



DATE	DAY	TIME	LOCATION	DESCRIPTION
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April 3	Tues	5:00 pm - 9:00 pm	Ballroom 1	Trade Show Set-Up
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April 4	Wed	7:00 am - 3:00 pm	Reg Desk	Registration Desk Open
		7:00 am - 8:30 am	Foyer	Breakfast
		8:30 am - 11:30 am	Room A	Well Pump Installer Course
		8:30 am - 11:30 am	Room B	Annual General Meeting
		8:30 am - 11:30 am	Ballroom 1	Trade Show Set-Up
		10:00 am - 10:30 am	Ballroom 1	Coffee Break
		11:30 am - 1:00 pm	Ballroom 1	Lunch with General Manager Welcoming Address
		1:00 - 4:30 pm	Room A	Well Pump Installer Course (Continued)
		1:00 pm - 4:30 pm	Room B	Trade / Technical Talks
		1:00 - 4:30 pm	Ballroom 1	Trade Show
		2:30 pm - 3:30 pm	Ballroom 1	Coffee Break
		4:30 pm - 6:00 pm	Ballroom 1	Trade Show Games and Silent Auction
		6:00 pm - 11:00 pm	Ballroom 2	President's Gala with Beatles Tribute Band - "The Fab Fourever"

April 5	Thurs	7:30 am - 11:30 am	Reg Desk	Registration Desk Open
		8:00 am - 9:00 am	Ballroom 1	Buffet Breakfast
		9:00 am - 12:00 pm	Room B	Trade/Technical Talks
		9:00 am - 12:00 pm	Room A	ITA Certification Exam for Well Pump Installers (tentative)
		9:00 am - 12:00 pm	Ballroom 1	Trade Show
		10:00 am - 10:30 am	Ballroom 1	Coffee Break
		12:00 pm - 1:30 pm	Ballroom 1	Lunch with Keynote Speaker Address
		1:30 pm - 3:00 pm	Room B	Trade and Technical Talks (tentative)
		1:30 pm - 3:00 pm	Trade Show	Trade Show Take-Down



WELL PUMP INSTALLER COURSE

APRIL 4

Title: Groundwater and Well Pump Fundamentals
Instructor: Dave Mellis, Pump Systems Incorporated
Date: April 4, 8:30am-4:30pm, with 1.5 hour lunch break
Location: BCGWA Trade Show & Convention, Coast Langley Resort & Casino



Course description: This course reviews those aspects of hydrogeology, well pumping systems, workplace safety, regulations, and industry best practices that pertain to the installation, troubleshooting, and repair of well pump systems. The course is designed to help individuals prepare to challenge the ITA Well Pump Installer certification exam, but is also open to other groundwater practitioners, including consulting engineers, government agents, and well drillers.

Cost: Early bird (before Feb 16): \$450 Regular rate (up to Mar 16) : \$500
Includes breakfast, lunch, and coffee breaks.

On-line registration opens January 1st at bcgwa.org.
A recommended list of study materials will be distributed upon registration.



WELL PUMP INSTALLER EXAM

APRIL 5
(TENTATIVE)



Taking the Well Pump Installer Course does not automatically qualify you to challenge the ITA certification exam.

For eligibility requirements to challenge the exam:

- Visit the [ITA website](http://www.itabc.ca/program/well-pump-installer) for the Well Pump Installer Trade at www.itabc.ca/program/well-pump-installer.

If you intend to write the exam at the BCGWA Convention on April 5:

- Download the [Application form](#) AND EITHER the [Employer Declaration of Work Experience](#) OR (if self-employed) the [Statutory Declaration of Work Experience](#)
- Complete and submit the forms plus the application fee to the ITA before January 31
- Notify the BCGWA at general-manager@bcgwa.com that you have submitted your application and that you wish to write the exam at the convention
- Wait to be notified by the ITA if you have been approved to write the exam. If approved, the BCGWA will contact you with additional information about the exam.

DO YOU HEAR WHAT I
HEAR?

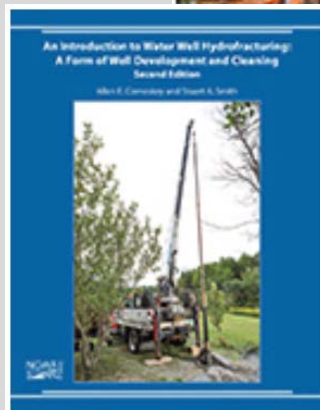
To sign-in to our Member Home area of our website:

- Click the member login button at top right of our home page
- Click "Forgot Password"
- Enter your email address
- Click "Request Password Reset"
- Check your email for a password reset link, click on link
- Enter your new password twice, and confirm
- You are now logged in!



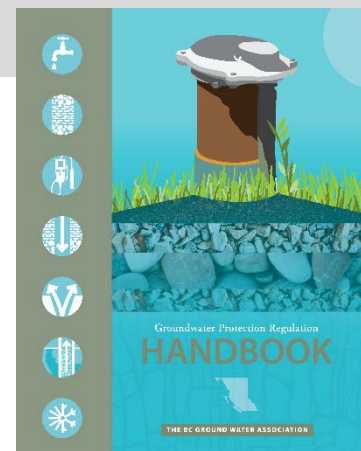
Two interesting reads now available at the NGWA bookstore:

Groundwater for the 21st Century, by John A. Conners McDonald & Woodward Publishing Co, write reviews the science of groundwater, its use by humans, and the need for people to understand groundwater science when making water use decisions



An Introduction to Water Well Hydrofracturing, by Allen E. Comeskey and Stuart A. Smith, shows how hydrofracturing is used to develop wells and enhance their productivity

Obtain your copy of the new Ground Water Protection Regulation Handbook, designed to walk you through the new regulation and other regulations and best practices related to well construction in BC. \$75 including shipping and handling via bcgwa.org





Service Beyond Expectation

2018

Equipment mobilizing to interior jobsite

JANUARY

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
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APRIL

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MAY

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JULY

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AUGUST

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OCTOBER

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NOVEMBER

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DECEMBER

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30	31					



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Background Photo:
Suction Erosion developing
in injection wells

THE IMPORTANCE OF BASE MARKS

By Jim Clark

BCGWA Fraser Valley Regional Director

Like any piece of infrastructure, a water well is affected by its surrounding environment. Changing conditions in an aquifer will impact well conditions and well performance. Most well performance problems are related to biofouling or aquifer depletion, signaled by a dropping pumping water level and accompanying drop in well yield. If left unchecked, biofouling can be very costly to remediate and can severely shorten a well's operational life.

Tracking the static water level, pumping water level, and quality of the well discharge helps well specialists to pinpoint the source of the problem and identify if and when a well needs to be serviced. Having a historical record of these parameters over months or years makes this task much easier.

To determine what changes have occurred in the aquifer or in the condition of your well, you need some reference point, or 'Base Mark' to compare to. If you are working with water wells, you are regularly measuring Base Marks. Base Marks are the original values of well, aquifer, or pumping system parameters. The following lists most of the Base Marks that need to be recorded in a new well.

1. Hole depth
2. Top of Screen
3. Static water level
4. Pumping level
5. Screen condition (video/photograph)
6. Pump discharge rate
7. Pump set level
8. Pump amperage draw
9. Pump house voltage
10. Water pressure at the well head
11. Water quality parameters
12. Well Specific Capacity

In most cases, Base Marks are recorded by people who operate and/or service the well, and appear on forms that are filled in as part of their work, such as:

1. Well record
2. Flow test record
3. Pump set record
4. Lab report

The first thing a Well Specialist does when assessing a troubled well is to round up all the Base Marks he/she can find, and compare these to a current set of measurements. As few as one or two Base Marks can point him/her in the right direction, while several Base Marks can more definitively identify the problem. In reality, we are lucky to have one or two Base Marks to work with, meaning as an industry need to do more.

One thing that we can do better is to make sure that well heads are readily and safely accessible for the measurement of Base Marks. Caps should be easy to remove, and a sounding tube should be installed when possible to provide unobscured access for water level or water quality monitoring instrumentation.

Contractors that take care to measure and record Base Marks, and advise well owners and operators to file these for future reference will stand out in the industry as providing superior service to their clients.



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MIKE WEI - A RETIREMENT SALUTE

By Bruce Ingimundson & Kathy Tixier
Former BCGWA Managing Director and Current
BCGWA General Manager

The closing of 2017 also marks the closing of Mike Wei's 35-year long career with Ministry of Environment in Victoria.

Mike Wei connected initially with the BCGWA in the mid-1980's shortly after he was hired by the provincial government. At that time, Al Kohut was the Association's primary contact with the Province on groundwater affairs. When Al retired, Mike replaced him as head of the "Groundwater Group" in Victoria. He also assumed the co-chair position (with Bruce Ingimundson) on the *Ground Water Advisory Board* (GWAB) from 2002 to 2008. The GWAB was set up to develop the foundation for the recently modified *Ground Water Protection Regulation* (GWPR), which sets the standard for well construction in BC. The GWPR is a result of many hours of consultation between government and the private sector.

Mike spent a lot of time working with the BCGWA on matters of common interest. Highlights of that enduring relationship include Mike's active support for the establishment of provincial *Industry Training Authority* (ITA) trade status for well drillers and well pump installers. This was a major accomplishment for the Association's trades members and the groundwater using public, and was in no small part due to Mike's involvement.

Mike also worked tirelessly on the development and passing of the new *Water Sustainability Act*. This act places groundwater on equal footing with surface water in the allocation and management of water resources.

Mike recognized the importance that Associations have to play in policy development. He created many opportunities for our members to engage with government, whether it be at our conventions, regional meetings, or other special events. He is an effective communicator and never turned down an invitation to speak, even on sensitive topics.

Mike's ability to connect government with the private sector on a mutual respect basis was exemplary. He was able to bridge that (often wide) gap between public-private sector interests. His efforts have significantly advanced the protection of groundwater resources while continuing to foster the development of the groundwater industry.

Recently Mike was awarded the prestigious **2017 Robert N. Farvolden Award for Hydrogeology** (International Association of Hydrogeologists, Canadian National Chapter) and the BC Ministry of Environment **2017 Premier's Award in the Legacy Category** for his exceptional and lasting contribution to the Province of British Columbia.

Mike is a true professional with a high level of integrity and ingenuity. Congratulations Mike on your many successful years in the provincial civil service, and all the best in your future endeavors!





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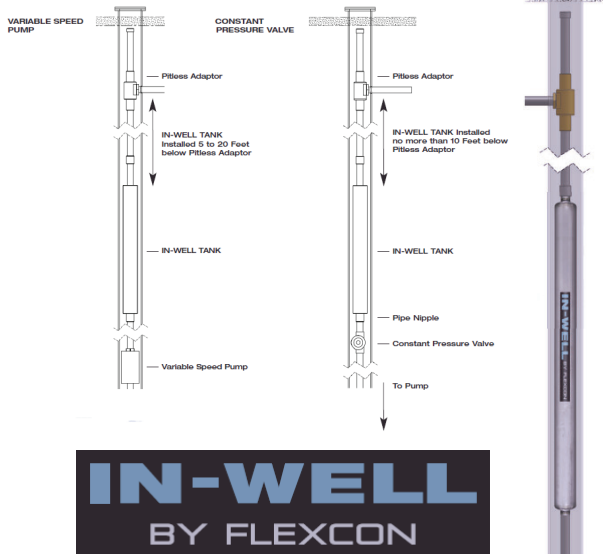
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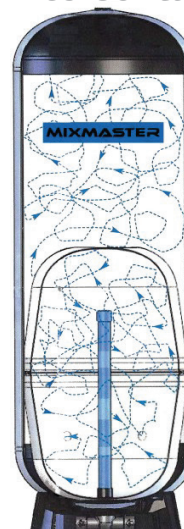
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Email: elemay@flexconind.com

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Report from the Provincial Government

In this December issue:

- Update on groundwater licencing requirements
- Driller & Pump Installer registration requirements
- Regional groundwater program update
- Artesian flow advisory
- Updates related to the development of GWELLS
- Well record submission
- Contact list of groundwater staff with regulatory authority

Driller & Pump Installer Registration Requirements

To ensure you are registered with the Province or to ensure your contact information is up-to-date, visit:
<http://www2.gov.bc.ca/gov/content/environment/air-land-water/water/groundwater-wells/information-for-well-drillers-well-pump-installers>.

If you would like to become registered or if you would like to update your contact information, email Groundwater@gov.bc.ca.

New Groundwater Licencing Requirements

If you divert and use groundwater for non-domestic purposes (e.g., irrigation, commercial, industrial, power purpose or waterworks), you must now obtain a water licence and pay water fees and rentals. Domestic well owners (i.e., homeowners with a well that provides water for household use) are exempt from licensing and paying provincial water fees and rentals. This change came into force with the *Water Sustainability Act* (WSA) on February 29, 2016. Licensing clarifies how much water you can legally use, and increases the security of your access to that water. Licensing establishes rights to groundwater based on the same priority scheme that currently exists for surface water, and will help to reduce conflicts between water users in times of scarcity.

Existing groundwater users (water use began on or before February 29, 2016) must apply by March 1, 2019 to have your historic use be recognized and to be in compliance with the law. You can continue to divert and use groundwater while your application is being reviewed. If you apply by December 31, 2017, you will be exempt from paying an application fee; however, annual water rentals are not waived and began to accrue when the WSA came into effect.

New groundwater users must apply for a licence before the water can be lawfully diverted, used or stored. This applies to any non-domestic groundwater use that began after February 29, 2016.

Visit <http://www.frontcounterbc.gov.bc.ca/Start/ground-water/> to start your online application for a groundwater licence.

For more information visit:
<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/water-licences-approvals/new-requirements-for-groundwater-users>.

Report Non-Compliance



See a well that does not meet the construction standards of the Groundwater Protection Regulation? Or know of someone who is drilling a well or installing a well pump without being registered? Report it anonymously through the Provincial R.A.P.P. line.

Phone: 1-877-952-7277

Email: <https://forms.gov.bc.ca/environment/rapp/>

Congratulations - Mike Wei

Congratulations to Mike Wei for receiving the 2017 Premier's Legacy Award.

Mike was honoured for his work as a leading authority on hydrogeology and the management and protection of groundwater in B.C.

Watch Mike's award video at:
<https://www.youtube.com/watch?v=ZRfU5H6DkUE>

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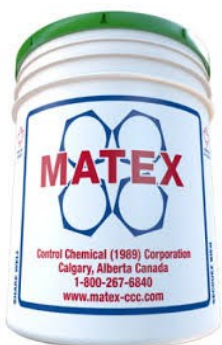


- DTH Hammers and Bits
- Drill Rods
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- Ring Bits
- Crossover Subs and Adapters
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Report from the Provincial Government

Regional Groundwater Program Update – North Natural Resource Area

The following is a brief update on some of the activities being carried out by the Ministry of Forests, Lands and Natural Resource Operations & Rural Development's (FLNRD) North Area groundwater staff working within the Skeena, Northeast and Omineca Region.

The North Area continues to receive both new and existing groundwater licence applications and many of these applications include excellent hydrogeological data (stratigraphy, pumping test, modeling, etc.). This provides us with the opportunity to update the WELLS database, understand the major groundwater users in the region, and better understand groundwater conditions in the area.

Staff have completed a second round of groundwater and surface water sampling in Terrace this summer to help capture and identify potential seasonal and inter-annual variability in relation to groundwater and surface water that will help us better understand the regional groundwater flow system in this area. In Vanderhoof, the Stony Creek groundwater surface water interaction project is in its third and final year. A numerical model has been developed and the model is currently being calibrated based on the observed stream and groundwater levels recorded since early 2016. Both projects will be used to support regional groundwater management.

In Northeast B.C., the Northeast Water Strategy won the 2017 Premier's Award for excellent partnership, which recognized the significant partnerships developed between the Province, First Nations, local governments and other organizations. The Premier's Awards recognize the exceptional work of B.C.'s public service employees and teams who make a positive difference in the province. For more information on the Northeast Water Strategy 2017 Premier's award, visit https://www.youtube.com/watch?v=jZ6Qo53dMqo&index=3&list=PLSNb4N2Am_HbwYyIJQdiMX_XfILdAxCD5v

North Area hydrogeologists are working with FLNRD Natural Resources Officers to inspect wells for compliance with the Groundwater Protection Regulation (GWPR) as part of a provincial initiative.



Map showing Natural Resource Regional Boundaries

A flowing artesian well advisory has been developed for the Chetwynd area. This is one of three current existing flowing artesian well advisories in the province. Please read the article "Artesian Flowing Advisories" on the following page for more information.

Database and Application Updates - Notifications

Do you want to be notified when the EWELLS, WELLS or GWELLS applications aren't working or if there are updates to the applications that may affect how you search and access groundwater well and aquifer data? Contact Lindsay.Macfarlane@gov.bc.ca to be added to a mailing a list.

Flowing Artesian Wells – Industry Working Group

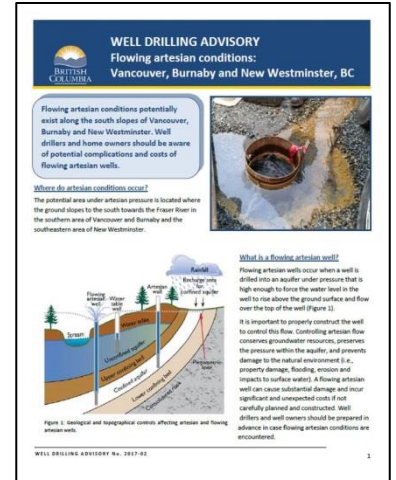
Government will soon be meeting with the BC Groundwater Association flowing well working group to discuss industry's concerns related to flowing artesian wells and the responsibility of the driller to control the flow.

Flowing Artesian Advisories

Flowing artesian wells occur when a well is drilled into an aquifer under pressure that is high enough to force the water level in the well to rise above the ground surface and flow over the top of the well casing. Controlling artesian flow conserves groundwater resources and prevents damage to the natural environment. The Province has issued two new Well Drilling Advisories to promote awareness among well drillers and home owners of the potential for flowing artesian conditions in low elevation valleys in the Chetwynd area and in the southern slopes of Vancouver, Burnaby and New Westminster.

Well drillers are encouraged to share these advisories with their clients when drilling in these areas. The advisories highlight the importance of having a pre-drilling agreement in place between the home owner and well driller in the event that flowing artesian conditions are encountered; and the importance of preparation for the costs, planning time, materials and expertise necessary for drilling in these areas. The drilling advisories are now available on the Province's website at the following address:

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/groundwater-wells/information-for-well-drillers-well-pump-installers/well-drilling-advisories>



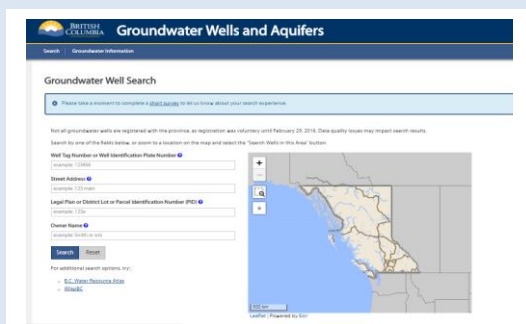
GWELLS

We are delighted to announce the launch of the new GWELLS search, which dramatically improves the way water well data is searched for in B.C.

There is a project to replace the existing WELLS database and other applications including EWELLS. The replacement application is called 'GWELLS' and it will incorporate existing functionality found in WELLS and add new functionality to support the *Water Sustainability Act* (WSA) and Groundwater Protection Regulation (GWPR), improve business processes and decision making, and improve access to groundwater data and information.

The goals of the new GWELLS application are to:

- Simplify how users enter and submit well data to the provincial government
- Simplify how users access groundwater data and information through GWELLS and other government applications and systems
- Improve how aquifer data and information is captured, stored, and accessed
- Incorporate the register of well drillers and the register of well pump installers



Thank you to everyone, both staff and external stakeholders, who have provided feedback. Your feedback has been invaluable and allowed us to develop a search that meets the needs of our users.

If you have any questions regarding the project or would like to be involved in future user research or testing, please contact Lindsay Macfarlane at Lindsay.Macfarlane@gov.bc.ca.

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Report from the Provincial Government

Well Record Submission

Well records can be submitted electronically (EWELLS) or by mail to the Ministry of Environment & Climate Change Strategy. It is intended that electronic submission of well records will replace paper submission to allow for more efficient processing and information accessibility. Paper records will now only be accepted on a Ministry form.

- EWELLS:
<https://a100.gov.bc.ca/ext/ewells/>
- Mail: **Ministry of Environment & Climate Change Strategy, PO Box 9362 STN PROV GOVT, Victoria BC V8W 9M2.**

Did You Know?

A well record needs to be submitted to the Province for:

- ✓ All water supply wells
- ✓ Recharge or injection wells made drilling or boring
- ✓ Permanent dewatering wells
- ✓ Closed-loop geoechange wells (one per system)
- ✓ Any well that encounters flowing artesian conditions



**Have a Safe
and
Happy Holiday**

Contact Information for Groundwater Staff with Statutory Designation

Office	Name	Statutory Designation	Phone	Email	Ministry
West Coast (Nanaimo)	Pat Lapcevic, P. Geo	Assistant Water Manager	250-751-3149	Pat.Lapcevic@gov.bc.ca	FLNRORD
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	Ben Robinson	Officer	250-751-3266	Ben.Robinson@gov.bc.ca	
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	Michele Lepitre, P. Geo	Assistant Water Manager	604-586-4413	Michele.Lepitre@gov.bc.ca	
	Emily Elsliger	Officer	604-586-2802	Emily.Elsiger@gov.bc.ca	
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	Nicole Pyett, P. Geo.	Assistant Water Manager	250-490-2285	Nicole.Pyett@gov.bc.ca	
	Twyla Legault, P. Eng.	Officer	250-490-8287	Twyla.Legault@gov.bc.ca	
	John Pogson, P. Geo.	Officer	250-490-8220	John.Pogson@gov.bc.ca	
South Area (Vernon)	David Thomson, P. Geo	Assistant Water Manager	250-260-4641	David.Thomson@gov.bc.ca	
South Area (Kamloops)	Melissa Wade, P. Geo.	Assistant Water Manager	250-371-6206	Melissa.Wade@gov.bc.ca	
	Laurie Lyons	Officer	250-371-6280	Laurie.Lyons@gov.bc.ca	
North Area (Prince George)	Jun Yin, P. Geo.	Assistant Water Manager	778-693-3015	Jun.Yin@gov.bc.ca	
North Area (Smithers)	Barry Watson	Officer	250-847-7329	Barry.Watson@gov.bc.ca	
Victoria	Mike Wei, P. Eng.	Deputy Comptroller	250-356-5062	Mike.Wei@gov.bc.ca	ENV
	Lindsay Macfarlane	Officer (Sr. GW Data Specialist)	250-953-3408	Lindsay.Macfarlane@gov.bc.ca	

For general enquiries, contact Groundwater@gov.bc.ca.



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- Deep well screen jetting and cleaning
- Production well flow testing and disinfection
- Down hole well video inspection, recording, and reporting

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- Pump and level control upgrades
- Safety hatches
- Plumbing and valve replacement

Kiosks

- Kiosk supply, installations, and upgrades

Plants

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- Reservoir cleaning, coating, and disinfecting
- Installation of static mixers and sampling lines

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2017 FALL REGIONAL MEETING HIGHLIGHTS

by Kathy Tixier, BCGWA General Manager

The year is slowly drawing to a close, with our regional meeting series as one of the final acts. Thank you to all who took the time to come out to listen to the talks and mingle with industry peers. And special thanks to our speakers for delivering talks on a wide variety of subjects. Copies of the presentations are available in the Member Home area of our *new* website. Here are some highlights:

CARIBOO Region, Prince George, October 14

It was a snowy runway that greeted me when I touched down in Prince George that morning. Fortunately, John's pretty used to driving in snow and brought me safely to his place for a cup of coffee with Joyce and Chris and tour of the shop. Some race to work, but John works to race ;) About seventeen came out to the Sandman for the buffet lunch and the meeting that followed. Of these, four drilling companies were represented: Cariboo Water Wells, Aqua Drilling Services, Waterfall Drilling, and Canadian Quality Control, all of which are long-established, family-run operations.



The meeting kicked off with my usual introductory address, which covered upcoming changes to our bylaws to comply with the new *Societies Act*, the recent submission of our logo to the trademark office, and the new Ground Water Protection Regulation Handbook and BCGWA website.

Next, Dave Tamblyn, Public Health Engineer with Northern Health, gave an overview of the process for assessing whether groundwater is at risk of containing pathogens (i.e. GARP). Of the estimated 800 water system wells in the North, about 50 have been assessed for GARP. His presentation included some pretty cool diagrams explaining the science of pathogens in groundwater. He also emphasized the importance of an accurate well location reading (GPS coordinates in decimals please!) and a detailed lithological and well construction record in getting the facts straight so that defensible decisions can be made.

Jun Yin, Regional Hydrogeologist with FLNRORD, spoke about groundwater protection and licensing in the region. When drilling in an area that may be flowing artesian, it is advised that the well driller talk to the owner ahead of time about the hazards associated with uncontrolled artesian flow, how these will be mitigated, and who pays. A new flowing well drilling advisory has recently been posted for the Chetwynd area. About 240 license applications for existing groundwater users (using groundwater *before* Feb 29, 2016) and 15 applications for new water users have been received in the region. New and ongoing research initiatives include a Stoney Creek hydraulic connectivity study, a conceptual groundwater model for Terrace, and work in support of the Northeast water strategy or expanding Provincial observation well network.

Morly Bishop from Capri Insurance explained to us some of the finer points of insurance coverage. Most businesses have a Commercial General Liability policy, which indemnifies them in the event of a successful claim for bodily injury or property damage. However, pollution liability, professional liability, damage/theft/loss of their own equipment, and additional expenses (e.g. fighting forest fires or controlling a flowing artesian well) are usually excluded. If you would like to learn about their flowing artesian well breakout coverage, give Morly or Lana Hunnie at Capri a call.



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KOOTENAY'S AND OKANAGAN VALLEY Region, Vernon, October 20

Approximately 32 were in attendance at the meeting which took place at the Village Green hotel. There was a strong showing of Ministry staff, including some new faces. John Pogson, Regional Hydrogeologist, reiterated the importance of being prepared in potentially flowing artesian zones. When drilling in bedrock, the bottom of the casing should be sealed securely into the bedrock, and in sand and gravel, a permanent outer casing should be grouted into the lowest confining layer, before the production casing is advanced into the aquifer. If drilling near 'sensitive' or 'fully recorded streams' drillers and professionals are encouraged to reach out to authorizations staff *before* drilling. On the enforcement side, Natural Resource Officers have been trained and are actively responding to water supply well concerns across the province.



Ryan Whitehouse, Nicole Pyett, and Michael Epp explained the meanings of hydraulic connection between groundwater and streams and assessing environmental flow needs (EFNs) from a water allocation perspective. Simply put, a well is hydraulically connected to a stream if pumping of that well will eventually deplete the flow in that stream to the extent it may impact the EFN's of that stream or the rights of other water users. EFN's refer to the volume and timing of flow in the stream required for the health of the aquatic ecosystem. When evaluating EFN's, decision makers consider how much water would flow naturally without any

diversion, how much water has been licensed, how much water is being consumed, and how much water the ecosystem requires. For more information, consult the guidance documents available on the Province's Water Science Series.

Marta Green, OK/Kootenay Regional Director and senior hydrogeologist at Associated Environmental, cast a practical perspective on assessing EFNs in the context of three case studies: the curtailing of irrigation withdrawals during an extended drought, the creation of a framework for setting EFNs for Okanagan streams, and groundwater licensing for a new golf course in the Similkameen Valley.

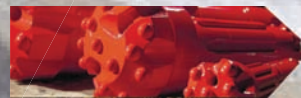
Thank you Marta for helping to organize and facilitate this meeting, and to Lana and Morly at Capri for their repeat presentation on Commercial and General Liability and Professional Liability Insurance.

VANCOUVER ISLAND Region, Parksville, October 28

This meeting occurred on a most gorgeous Vancouver Island fall morning – perfect for a road trip but less ideal for a meeting behind closed doors. So a special thank you goes out to all 17 who made it there. After my opening speech, Lynne Magee, Regional Drinking Water Coordinator with Vancouver Island Health, talked about how the new GARP and GWTO guidance documents are being implemented on the Island. Of the estimated 950 water systems in the region, the vast majority (>700) rely on water wells. Of those identified to be at some risk of GARP, it was often due to some deficiency with well construction (e.g. inappropriate cap, missing surface seal or well cap).

Lindsay Macfarlane, Senior Groundwater Data specialist with MECCS, unveiled the new GWELLS application, designed to improve access to and increase the quality of the groundwater data we can obtain on-line. She offered a quick show-and-tell of the new search module, which allows you to search for a well based on its well plate number, owner

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name, or property address. It is smart-phone friendly, and the handy 'Find my Area' button will display all the recorded wells around you based on your current location. More work is planned to integrate aquifer data, the register of well drillers and well pump installers, and the ability to edit well records into the new application. They are relying on user feedback to guide the process, so don't hesitate to get in touch with Lindsay if you have any suggestions.



Ben Robinson presented the Ministry's update on groundwater protection activities in the region. He described how newly-trained Natural Resource Officers are working in partnership with FLNRORP staff to carry out well inspections and enforce the GWPR, and the many outreach events that took place on the Island and Gulf Islands this past summer. Dave Robinson, Water Authorizations manager for the region, explained that the process for applying for a licence has been made more user-friendly, and clarified some of the terminology used in the application. In many cases, existing groundwater users would not be asked to provide a technical assessment as part of their application, but a screening tool may also be used to make this call. The discussion that ensued with the members was really valuable and we thank all presenters for their candid responses to our questions.

FRASER VALLEY Region, Langley, November 4

This meeting got off to a great start with our annual director's breakfast at Denny's. After a quick rearrangement of KPMG's bright and beautiful boardroom, we kicked off this our final regional meeting. Over 25 people were in attendance, from

a variety of groundwater professions. Emily Elsliger, a new groundwater protection officer, and Michele Lepitre, regional hydrogeologist, gave an overview of groundwater protection and licensing in the South Coast region. Most noteworthy are the new flowing well drilling advisory for the Vancouver area, and the closure of the Beechwood Street flowing artesian well. As of October, the region has received 253 license applications for existing users, and 20 applications for new users. In recognition of the time sensitivity for bringing new wells on-line, the Ministry are prioritizing new user applications, aiming for a 140 day TAT.

Jill Sacré, senior hydrogeologist with Golder Associates, talked about the outcomes of a groundwater budget study for the Hopington aquifer and other aquifers in the Salmon River watershed. This area hosts over 5000 private water wells, and over half of the municipal water supply is sourced from groundwater. They tap into a complex puzzle of stacked aquifers, that are hydraulically connected to streams and other aquifers. The study concluded that the best candidate aquifers for future development are those that are not hydraulically connected to sensitive streams, have high throughput flows, and are close to sources of recharge. When looking at groundwater budgets, it is important to recognize that there is no such thing as 'free' water, and that groundwater pumped from wells is groundwater that would have otherwise discharged to streams or adjacent aquifers/aquitards.

Thank you everyone for helping make this year's regional meetings a successful and connective event!



A festive Christmas scene featuring two lit red candles, a large red bow, a striped gift box, and greenery. The background is softly lit with warm, golden light, suggesting a cozy holiday atmosphere. The candles are thick and cylindrical, with bright flames. The red bow is large and voluminous, tied around a gift box with red and white stripes. Greenery, including holly leaves and pine branches, is scattered around the base of the candles and gift box. A large, shiny red star is also visible in the foreground.

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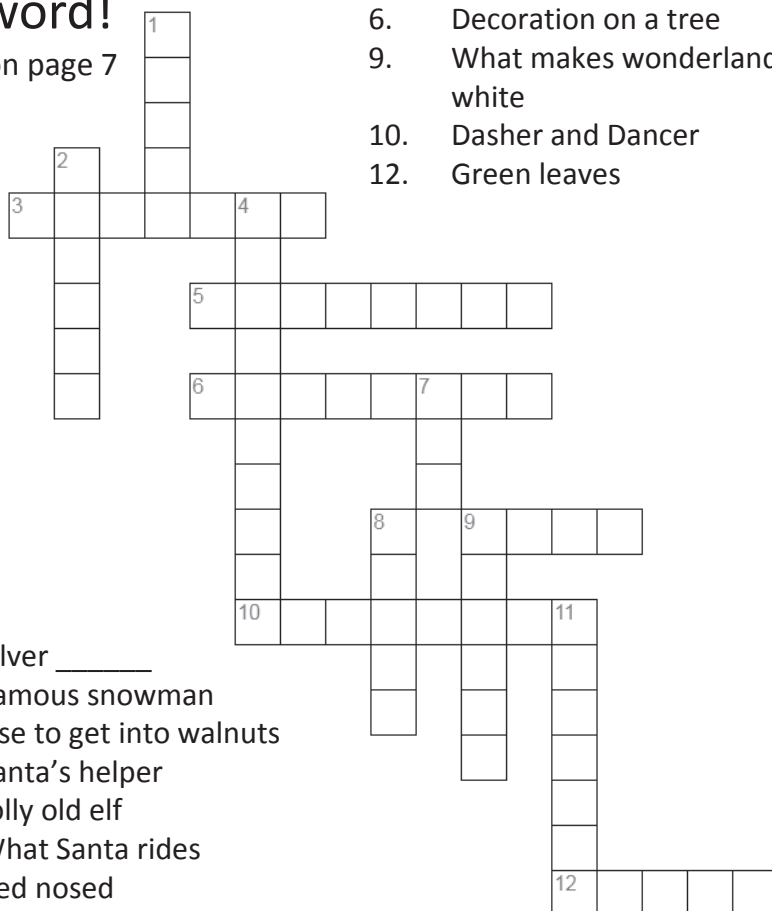
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Try our Christmas Crossword!

Answers on page 7



Across:

3. Wrapped package
5. Hanging from the mantle
6. Decoration on a tree
9. What makes wonderlands white
10. Dasher and Dancer
12. Green leaves

Down:

1. Silver _____
2. Famous snowman
4. Use to get into walnuts
7. Santa's helper
8. Jolly old elf
9. What Santa rides
11. Red nosed

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holiday season and a
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New Year!!

BCGWA Staff & Directors





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