



Groundwater Matters

British Columbia Groundwater Association Quarterly Newsletter

September 2017

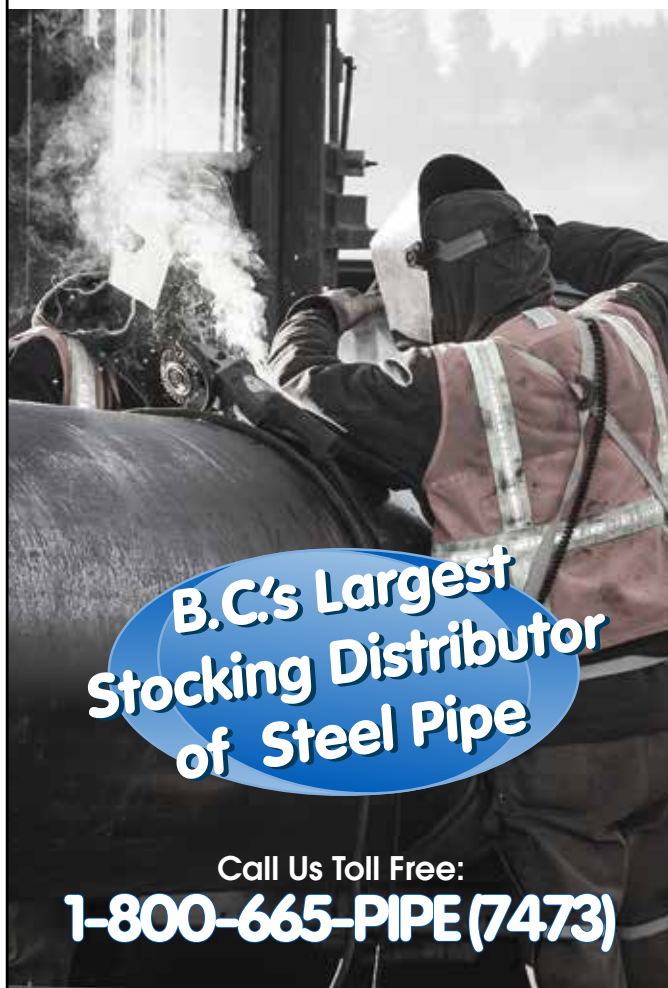


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PRESIDENT'S REPORT

- September 2017

Well, another summer has flown by for me and my family. While I didn't get as much fishing in as I would have liked, business in the interior has been very good and I know a lot of the contractors in the area very busy. It seems like most sectors of the economy - industrial, agricultural, municipal and land development – are making investments in groundwater supplies, and this is good news for all members of the Association. Lately it seems like every second email or phone call is for a new proposal or project, and I had to take a step back the other day and remind myself to make sure I am delivering for my good, long-term clients, the ones who will still be there when things return to a more normal pace.

My work this year has opened my eyes to a few facts. The first is related to artesian wells. In my last 12 years working as a hydrogeologist, I hadn't come across too many artesian wells. In the last year, however, I have come across a half a dozen, and a couple of those were completely unexpected. Just as some of the older and wiser members of the Association have been telling me, sometimes you just can't predict when you will run into artesian conditions. After a summer break, I know the Flowing Artesian Well Working Group will be returning to the business of engaging the Province on this matter and I look forward to their progress on the issue.



The second thing relates to groundwater licensing. I have raised this topic in my last two addresses, and I continue to believe it has the most potential to affect our industry, in both positive and negative ways. One of my concerns is the time it takes to receive a licence to use a new groundwater source; to date I have not received one for any of the applications I have submitted. I think it is important that we engage with the Ministry on this. I understand the intent of the licensing procedure, but the timeline and uncertainty around it will make it hard for our clients to make the decision to invest in groundwater development and put that water to use.

With fall here, the regional meetings are just around the corner, and I know Kathy, Debbie and the Regional Directors are hard at work organizing these. I hope everyone makes it out to their local meeting as I know there will be some useful information presented. I will be attending the Vernon and Prince George meetings, and I hope to see some of you there.

As always, if there is anything the Association can do for you or if anyone would like to get in touch with me directly please feel to do so at ryan@westernwater.ca. I look forward to hearing from you.

Ryan Rhodes, President, BCGWA



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- Supply, installations, maintenance, and repairs
- Pump and level control upgrades
- Safety hatches
- Plumbing and valve replacement

Kiosks

- Kiosk supply, installations, and upgrades

Plants

- Water and wastewater treatment plant repairs, maintenance, and upgrades
- Reservoir cleaning, coating, and disinfecting
- Installation of static mixers and sampling lines

Other

- Maintenance service agreements
- Emergency service
- On-site installations and crane service
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GENERAL MANAGER'S

REPORT - September 2017

For a mother of two school aged kids (one now entering high school!), September is about a return to the normal routine. In my family, we tuck away the inner tubes, camping gear, and first aid kit, and bring out the family-sized agenda, lunch boxes, and rubber boots. In other parts of BC, where summer has brought fire, smoke, and anxiety, I hope that fall brings some much needed relief, and a sense of gratitude for what our tireless firefighting crews have managed to spare. For many of us, fall will be a time to recollect and start anew.

And here at the Association, we are starting with a new newsletter name: Groundwater Matters. This name took 50% of the popular vote, with other candidates taking less than 20%. I think it is a most suitable name for an Association represents those who care about the groundwater industry. Groundwater matters, because it is naturally filtered by the subsurface and better protected from disease-causing organisms. At the same time, it can be contaminated in ways that are difficult and costly to reverse. Groundwater matters, because a third of our province's population rely on it to sustain their home and business activities.

And so do matter the people that help us tap into this amazing resource. We are not as numerous as other trades and professions (e.g. electricians and mechanical engineers), but we have a big impact. For this reason, we need to consider carefully what we charge for our services. This edition's article "The impact of lowering prices", kindly on loan from the Ontario Ground Water Association, makes some good points about the pitfalls of discounting your services. For years now, groundwater supply has not been a big money-making industry. Much of the rural development that spurred water well construction has slowed in favour of densification and community water supply. Many of our members rely to the construction, energy, and mining sectors to make up the difference and keep their businesses profitable. Collectively, we need to

price our services right to reflect the benefits we bring our clients and customers.

Groundwater matters, and for this reason the Province introduced the *Water Sustainability Act* and new Groundwater Protection Regulation. With their help, the BCGWA have prepared a new Groundwater Protection Regulation Handbook. It has been organized in step with a well's life cycle – from hiring a registered contractor to submitting a report on a decommissioned well. It also includes industry suggested practices and some helpful information on compliance and enforcement, licensing, and other groundwater-related legislation. As rules and practices change, it is my hope that the Handbook will also continue to evolve to serve as a 'go to' reference for our industry. Stay tuned for its upcoming release on our website!

Speaking of which, we are renovating our website to make it better serve our members and the general public. New features will include a fresh landing page, a members only portal, and the ability to shrink or expand onto whatever sized device you are viewing it with. We are also working on reviving our Facebook page, so please check us out and add us to your list of 'Follows'. By selecting 'See first' under the 'Follows' menu, we'll regularly make it to the top of your news feed! We may also try to get a Facebook Group started for on-line discussion of... you guessed it... groundwater matters!

Lastly, our regional meetings are fast approaching on October 14, 20, 28, and November 4. Our tentative agendas are included with this newsletter. Space is limited, so please register on-line at: www.bcgwa.org. I look forward to seeing you there!!

Kathy Tixier

General Manager,
BCGWA





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THE EFFECT OF LOWERING PRICES

By Dwayne Graff

Well Initiatives Ltd. / OGWA Director



We have all been in the industry long enough to see the effect price may or may not have on securing work. Often price is only part of the equation, though it is often misinterpreted as the item that lost the work. Many contractors do not understand the input costs of a completed project and many are using arbitrarily established “market prices” or my other fabled favorite “the going rate” as a benchmark for their pricing. I’m not really sure where these mythical “market prices” come from or what rationale was used to confirm these prices were correct, but I have a feeling it’s just the lowest possible number one feels they can get the job completed. More often I see many that use a rate slightly less than the next nearest competitor as a method for ensuring work. Others tend to use the initial “going rate” and then get into negotiating with the owner / purchaser and offer a quick discount (say 10 %) to close the sale quickly.

I’m sure we are all familiar with price reduction strategies but I doubt few have looked at the actual effect price cutting has on the business.

This article will focus on the simpler side of the equation – offering the 10% discount and the effect on sales and bottom line. To illustrate this, we will examine a business case of a fictional company – DrilCo. DrilCo just had a good year in 2015 and completed \$750,000 in sales. The owner collects a salary of \$150,000 which represents 20% of total sales. A common project for this company would be a \$7,500 job. Of that \$7,500 project, there are \$6,000 in hard costs and \$1,500 (20%) gross profit. To recover the owners overhead (salary) of \$150,000, DrilCo has to complete 100, \$7,500 jobs with a gross profit of \$1,500 when using the following equation (owners overhead / gross profit per job) or $\$150,000 / \$1,500 = 100$ jobs.

Let’s say the existing sales person were replaced and the new sales person was a bit lazy but had the bright idea that DrilCo is doing profitable work and can offer a 10% discount on all projects in an effort to secure more workload. His rationale is more workload has to be more profitable. With the approval of the owner of DrilCo, the new plan is in full swing for 2016. Let’s review the numbers: the \$7,500 job from last year is sold as a \$6,750 project this year. Hard costs remain the same (assuming this is even possible from year to year) at \$6,000, leaving a gross profit of \$750. Using the previous equation (owners overhead / gross profit per job) or $\$150,000 / \$750 = 200$ jobs. Is this better or worse than 2015?

Review of the new sales person’s strategy at DrilCo has unwittingly created a significant problem for the company. This seemingly harmless 10% reduction in cost will require the company to complete 100% more projects in 2016 to realize the same profits as 2015. One might ask how easy this growth can be obtained, though most reasonable people

would most certainly doubt that DrilCo could easily grow the sales volume by 100% over a 1 year period, only to find that DrilCo made the same amount of profit the year before working much less. Subsequently, if the sales person at DrilCo fails to make the 100% improvement in sales and sales volume remain the same as 2015, the owner will be left with a salary of \$75,000 for 2016.

The obvious flip side of this case with DrilCo could also look very different supposing the new sales person was really good at his job. Suppose the new sales guy had decided DrilCo is a great company with a great reputation in the community for doing above average quality of work. The new sales person says you know what I think we should increase rates by 10% and the owner agrees, knowing that the sales guy needs to produce and maintain workload. So for 2016 assuming workload remains the same here is a breakdown of the numbers. Typical project priced at \$8,250 (\$7,500 +10% increase) – hard costs of \$6,000 = \$2,250 gross profit per job. \$2,250 gross profit per job x 100 jobs = \$225,000 available as owner's salary.

So the lessons here are as follows:

1. Offering discounts will catastrophically destroy bottom line profits
2. Anticipated margins need to be beyond 20% gross profit
3. Where margins are already tight, a seemingly harmless 10% discount could easily be the end of the business.
4. It is much easier to increase the bottom line by increasing pricing than by lowering pricing and increasing sales volume.
5. Being busy and working hard does not mean the company and subsequently the owner is making money.

If you are not making money at your reduced prices, neither is your competition regardless of what they might say or believe. Would you not rather work less and make money than work more and not make any money at all?

The easy answer here is simply charge more for the work. The harder thing to do is implement the pricing change and sell the work. Selling isn't that complicated and there is a great opportunity for potential reward because the math equations don't lie. Becoming a good sales person / better business person may require you to step out of your comfort zone into some unfamiliar territory. Do your business (and yourself) a favor and take a day or two and sit in a properly designed and administrated sales / business management course. Then apply what you've learned to your business, and see the difference.



This article appeared in the Spring 2016 issue of The Source magazine published by the Ontario Ground Water Association, and is reprinted with their permission. The BCGWA would like to acknowledge the OGWA for this privilege.

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UPCOMING EVENTS



BCGWA 2018 Regional Meetings



PRINCE GEORGE, Saturday Oct 14
VERNON, Friday Oct 20
PARKSVILLE, Saturday Oct 28
LANGLEY, Saturday Nov 4

*Meeting locations, agendas, and
registration included in this
newsletter*



Groundwater Week is 'instrumental to your success'
by David Evener, CAE, NGWA Director of Marketing
& Technology

This year, Groundwater Week comes to Nashville, Tennessee, and will again feature diverse educational programming taught by leading industry experts, hundreds of exhibitors under one roof, and the opportunity to meet thousands of professionals from around the globe.

The lineup of educational opportunities is designed to make you a better driller, pump installer, hydrogeologist, or whatever your specialty may be. Groundwater Week has something for everyone, whether you need to earn continuing education for licensing or certification, want to learn new skills, or are just looking for a refresher workshop. And, of course, there's the "can't-be-missed" exhibit hall, where you can visit with 300 exhibitors in two days.

While education and business are the main focuses of Groundwater Week, there will still be plenty of time for you to enjoy the Nashville scene and its world-renown hospitality. After you honor the best in the industry at the Keynote and Awards of Excellence Ceremony, you will be taken on a tour through music history as John Carter Cash delivers a presentation filled with music and stories about his family.

You may also choose to take a field trip to some of the area's best-known attractions, such as the subsurface landscapes of the Mammoth Cave Region, the former home of country music legend Barbara Mandrel, the Country Music Hall of Fame, or a Tennessee Titans vs. Houston Texans game.

Don't miss out on a minute of this event — register today at GroundwaterWeek.com

47TH Annual BCGWA Trade Show & Convention
April 4-5, 2018 Cascades Casino Resort, Langley, BC





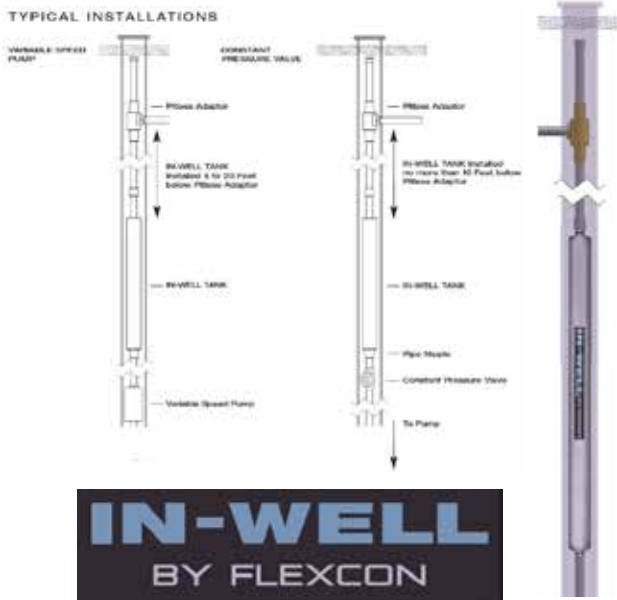
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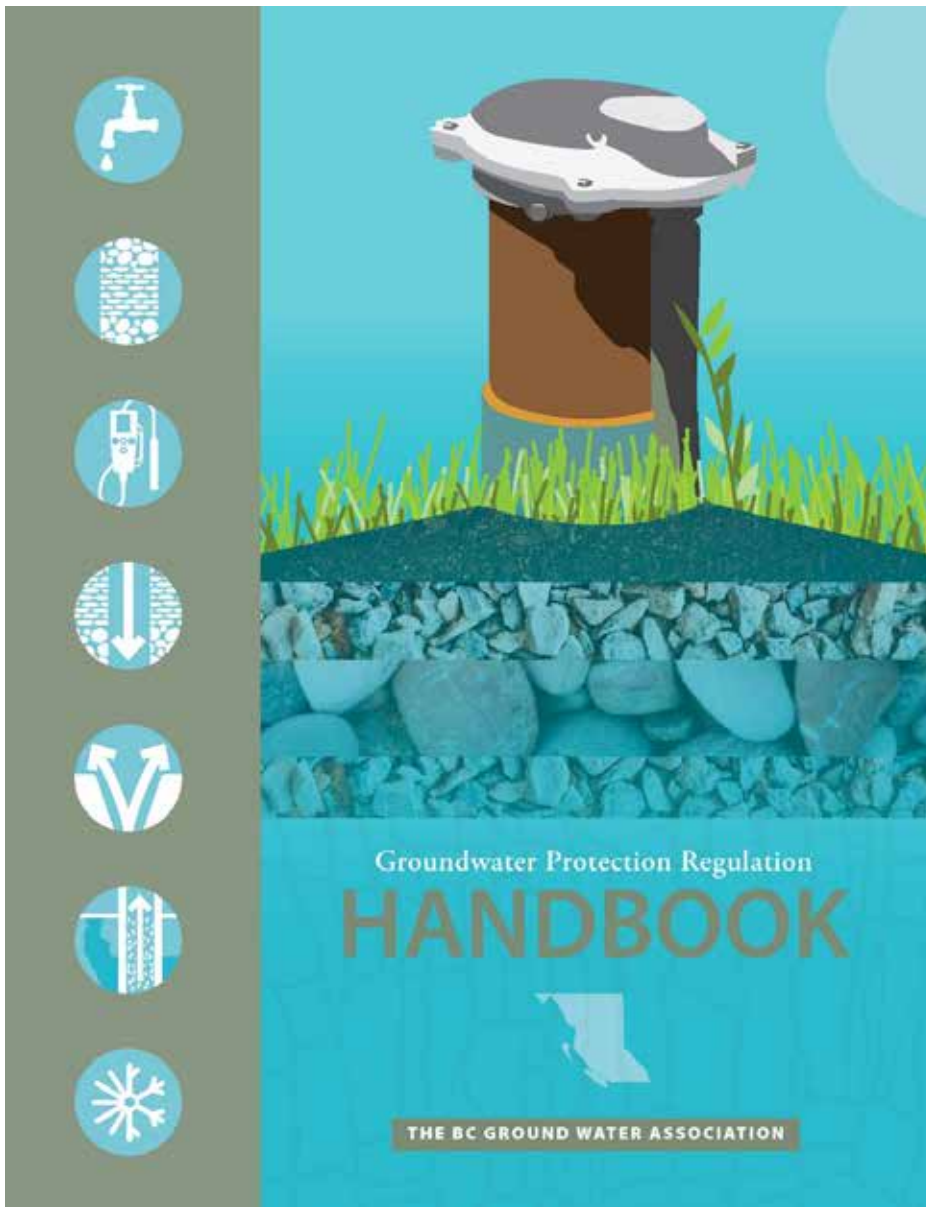
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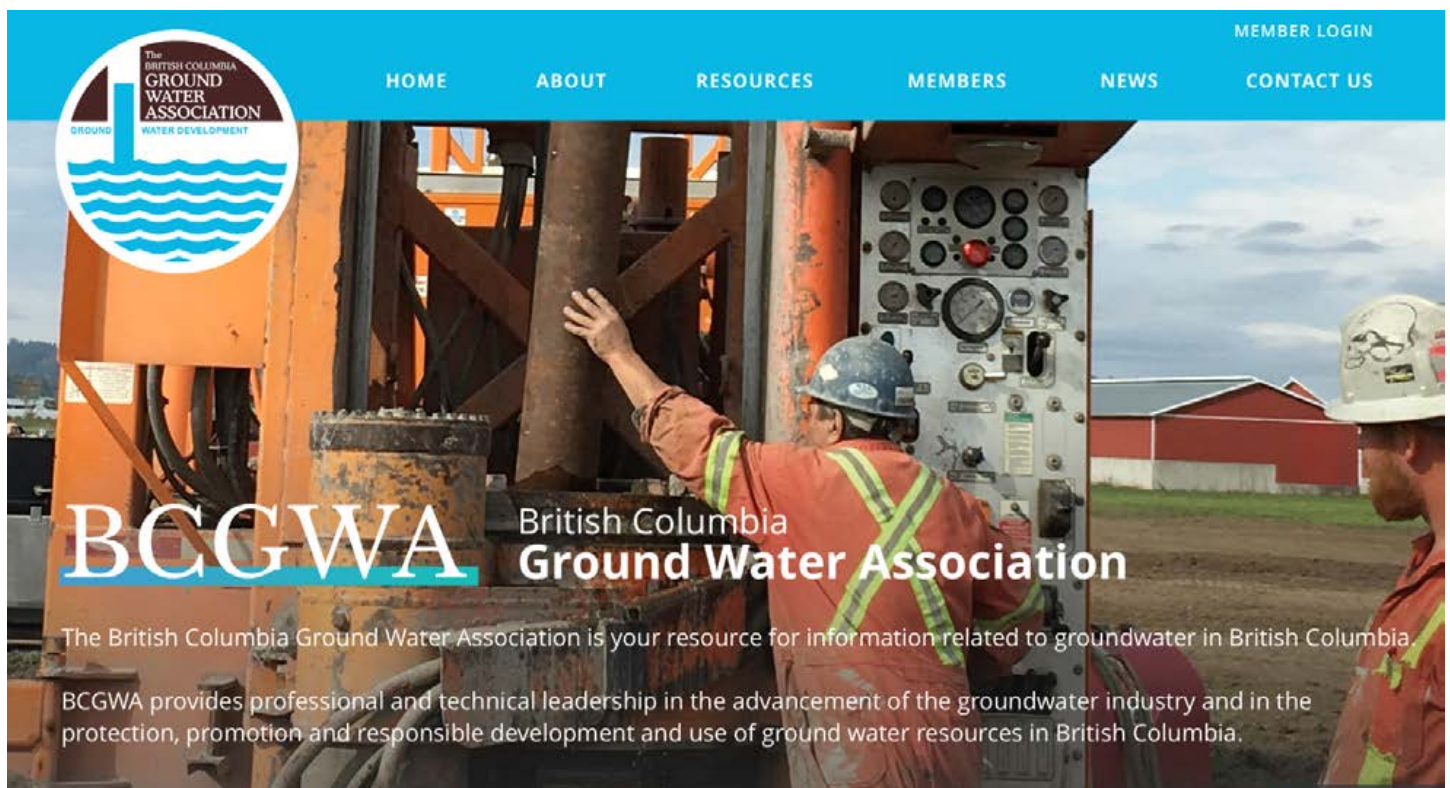


We are excited to announce that we are on the cusp of releasing a new Groundwater Protection Regulation Handbook



.... and a new website!

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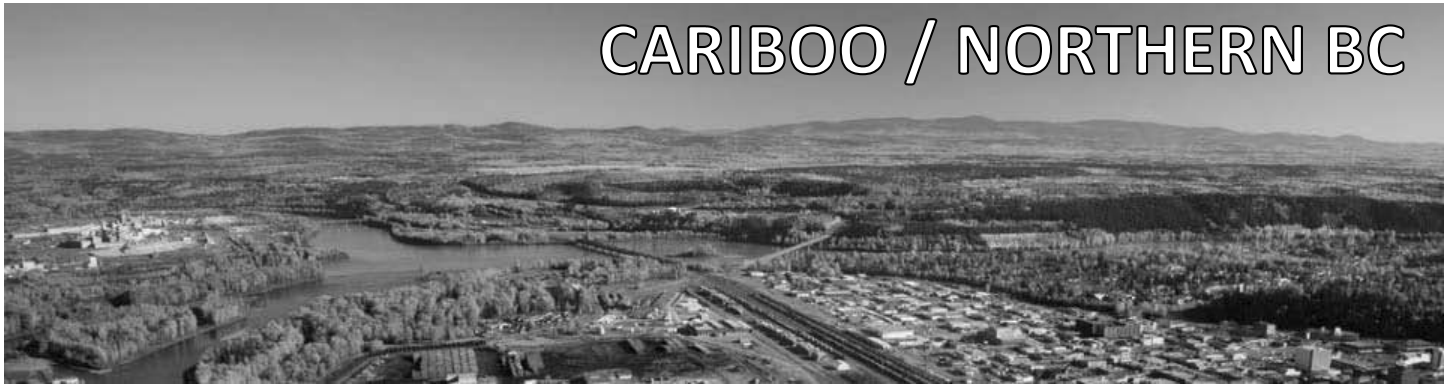
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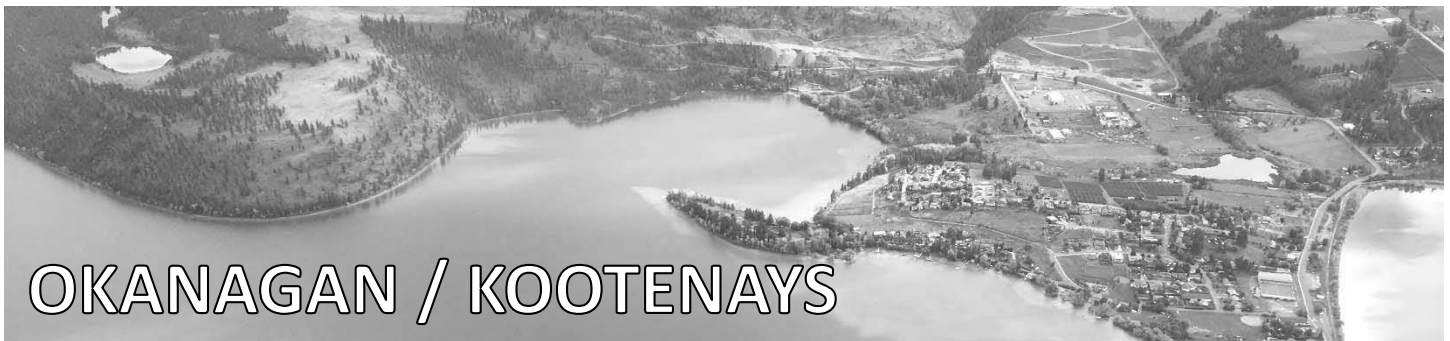
2017 BCGWA REGIONAL MEETING AGENDAS

Regional meetings will be held at 4 locations across the province this fall. Everyone is welcome! Meetings are free to all BCGWA members, and are \$30 for non-members. Please register on-line at: www.bcgwa.org before the deadlines shown. Only cash will be accepted at the door.



CARIBOO / NORTHERN BC

DATE	LOCATION	TIME	SPEAKER	TOPIC	
Saturday Oct 14, 2017	PRINCE GEORGE Sandman Signature Prince George Hotel 2990 Recplace Drive	11:45-12:00pm	Sign-In		Please register before Friday October 6
		12:00 - 1:00	Lunch		
		1:00-1:45	Kathy Tixier, BCGWA	Welcome and BCGWA Update	
		1:45-2:00	Dave Tamblin, Northern Health	How to avoid drilling a GARP well	
		2:00-3:00	Morly Bishop, Capri Insurance	Liability Insurance: a glass half full	
		3:00-3:30	Coffee Break		
		3:30-4:00	Jun Yin, Ministry of Forests, Lands, and Natural Resource Operations	Regional groundwater protection and licensing update	



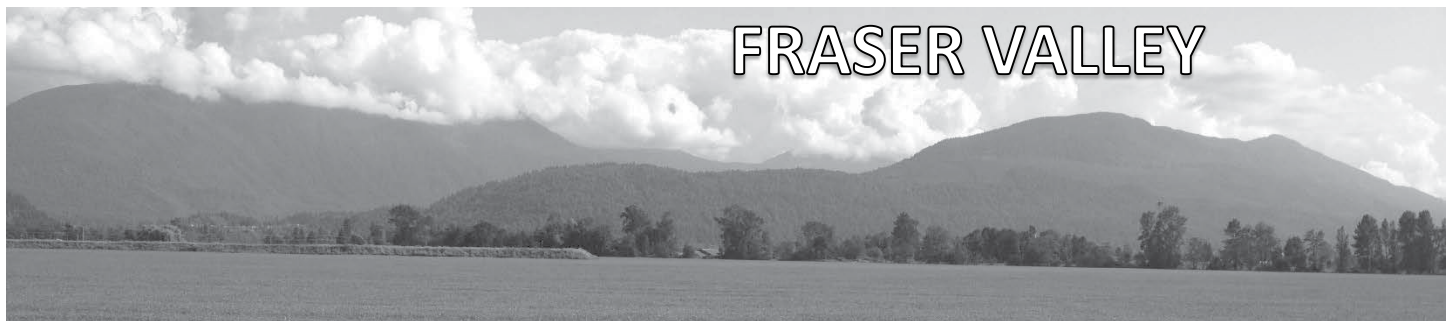
OKANAGAN / KOOTENAYS

Friday Oct 20, 2017	VERNON Village Green Hotel 4801 -27 Street	12:45-1:00pm	Sign-In		Please register before Friday October 13
		1:00-1:30	Kathy Tixier, BCGWA	Welcome and BCGWA Update	
		1:30-2:30	Morly Bishop, Capri Insurance	Liability Insurance: a glass half full	
		2:30-3:00	Coffee Break		
		3:00-3:30	Nicole Pyett, Rich McLeary (To be confirmed) Ministry of Forests, Lands, and Natural Resource Operations	Hydraulic Connection between Groundwater and Surface Water and Environmental Flow Needs	
		3:30-4:00	Marta Green, Associated Environmental Consultants	Case Studies: Environmental Flow Needs and Water Budgeting in the Okanagan	
		4:00-4:30	Q&A		

2017 BCGWA REGIONAL MEETING AGENDAS Cont'd



DATE	LOCATION	TIME	SPEAKER	TOPIC	
Saturday Oct 28, 2017	PARKSVILLE Quality Resort Bayside 240 Dogwood Street	8:45-9:00am	Sign-In		Please register before Friday October 20
		9:00-10:00	Kathy Tixier	Welcome and BCGWA Update	
		10:00-10:45	Lindsay Macfarlane (To Be Confirmed) Ministry of Environment and Climate Change Strategy	New functionality for development of GWELLS database	
		10:45-11:15	Coffee Break		
		11:15-12:00	Ben Robinson Ministry of Forests, Lands, and Natural Resource Operations	Regional groundwater compliance and outreach activities	
		12:00-1:00	Lunch		



Saturday Nov 4, 2017	LANGLEY KPMG Boardroom 8506 - 200 Street	8:45-9:00am	Sign-In		Please register before Friday October 27
		9:00-10:00	Kathy Tixier	Welcome and BCGWA Update	
		10:00-11:00	Jill Sacre, Golder Associates	Outcomes of Groundwater Budgeting for the Hopington-Salmon River Area, Township of Langley	
		11:00-11:30	Coffee Break		
		11:30-12:00	Michele Lepitre Ministry of Forests, Lands, and Natural Resource Operations	Regional groundwater knowledge and protection update	
		12:00-1:00	Lunch		

Regional meetings will be held at 4 locations across the province this fall. Everyone is welcome! Meetings are free to all BCGWA members, and are \$30 for non-members. Please register on-line at: www.bcgwa.org before the deadlines shown. Only cash will be accepted at the door.

Report from the Provincial Government

In this issue of the September 2017 BC Ground Water Association Newsletter, we are providing an update regarding:

- Regional groundwater program activities,
- Improvements to the WELLS Database/Application,
- Well record submission and EWELLS training,
- Registration requirements for well drillers and well pump installers, and
- Current groundwater staff contacts with a regulatory role.

Regional Groundwater Program Update – South Area

The following is a brief update on some of the activities being carried out by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNR) South Area groundwater staff working within the Thompson, Okanagan, Cariboo, and Kootenay Boundary Regions.

Science

Groundwater Program staff across the province are working to expand the understanding of groundwater resources within British Columbia to support the implementation of the *Water Sustainability Act (WSA)*. Groundwater science projects range from small, site-specific investigations to inform individual groundwater licensing or compliance questions to larger scale water budgets to inform regional scale groundwater management decisions and planning. Active projects of note in the South Area include an aquifer delineation project in Kelowna (to support a revised hydrogeological conceptual model) and a water budget project in the Nicola (to support water allocation decisions and expand our knowledge of groundwater flow).



Map showing Natural Resource Regional Boundaries

Public and Environmental Safety

Flooding, forest fires and drought in the Southern Interior shifted the focus of some groundwater staff towards a more active role in the Provincial priority of public safety. In addition to monitoring water levels in several areas, groundwater staff have received a number of public questions regarding proactive flood-proofing of wells. The Ministry of Environment and Climate Change Strategy has a reference sheet available outlining appropriate steps for flood-proofing wells at http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/wells/factsheets/PFRA_wells_before_flood.pdf.

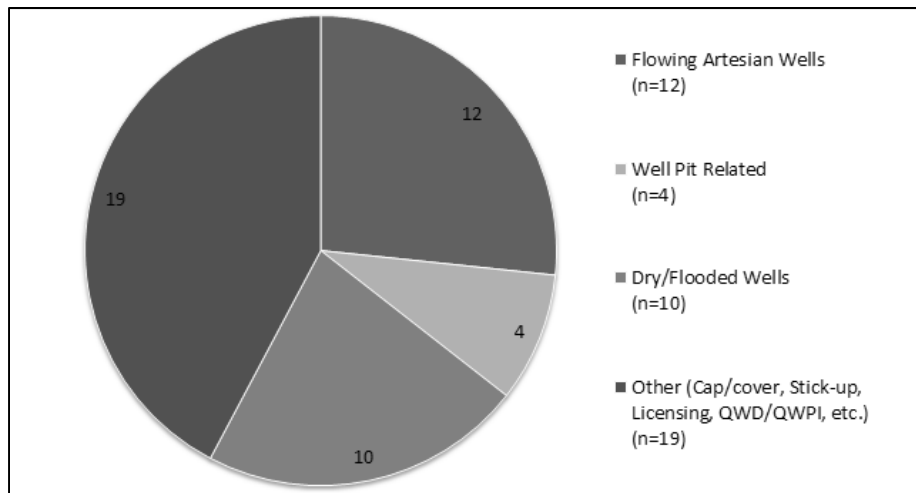
In the coming months, flowing wells may create a public safety hazard through uncontrolled water release near infrastructure or saturation of unstable soils. Please report flowing wells to your local provincial groundwater contact or through the emergency reporting line (RAPP 1-877-952-7277).

Information on known artesian flowing wells is available through publically available mapping platforms iMapBC (<http://maps.gov.bc.ca/ess/sv/imapbc/>) and the BC Water Resources Atlas (<http://maps.gov.bc.ca/ess/sv/wrbc/>). Further information and resources are available through the

Report from the Provincial Government

Provincial Groundwater page (<http://www2.gov.bc.ca/gov/content/environment/air-land-water/water/groundwater-wells/information-for-well-drillers-well-pump-installers/well-drilling-advisories>).

In addition to flowing artesian well files, other compliance activities related to dry or flooded wells,



issues with well pits, and other Groundwater Protection Regulation (GWPR) violations (Figure 1).

For more information related to the GWPR, please visit: http://www.bclaws.ca/civix/document/id/complete/statreg/39_2016.

Figure 1: Distribution of recent South Area compliance files

Staffing Update

John Pogson has started in the position of Groundwater Protection Officer covering the FLNRO South Area. John is a Professional Geoscientist with a strong background in contaminated sites and engineering design. John will primarily focus on compliance and enforcement work within the South Area.

WELLS Database/Application

GWELLS

An exciting new project is underway to re-develop and modernize the WELLS Application. The project is called "GWELLS" and is being developed using a DevOps/Agile systems approach and is being led by a core team of staff. This approach encourages a more rapid and flexible development process that integrates user feedback at regular intervals.

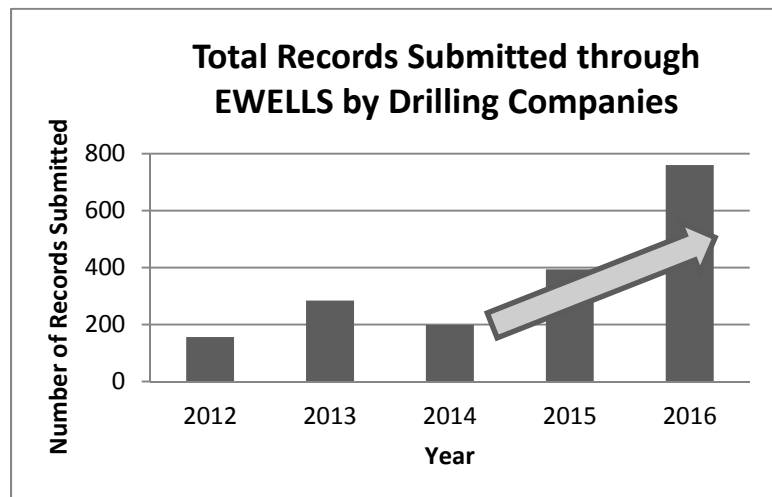
To date, we have approached a small number of government staff and individuals from outside government representing a cross-section of users of the WELLS application to gather feedback on the use of the current application. As the project progresses we will be reaching out to additional individuals as part of a citizen-centric design approach to product/application development.

If you have any questions regarding the project or are keen to provide feedback on some aspect of the current WELLS or future GWELLS application, please feel free to contact Lindsay Macfarlane at Lindsay.Macfarlane@gov.bc.ca.

Report from the Provincial Government

EWELLS

We are seeing a significant increase in the number of drilling companies submitting their well reports using EWELLS – our online submission tool. Between 2015 and 2016 alone, there was an increase in records submission by approximately 50%. This increase can be attributed to the enactment of the GWPR on February 29, 2016.



As the Ministry moves towards electronic-only submission, we anticipate seeing the number of well records submitted electronically increase significantly.

If you or your company would like to learn more about EWELLS or are interested in EWELLS training, please contact Groundwater@gov.bc.ca to indicate your interest.

Well Record Submission

Well records can be submitted electronically (EWELLS) or by mail to the Ministry of Environment and 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 and Climate Change Strategy, PO Box 9362 STN PROV GOVT, Victoria BC V8W 9M2.**

Registration of Well Drillers and Well Pump Installers

To ensure you are registered with the Province or if your contact information is up-to-date, please 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, please email Groundwater@gov.bc.ca.

New Staff in Victoria

We would like to welcome Maria Nguyen to the Aquifer & Watershed Science team in Victoria. Maria started on August 14 as a Groundwater Data Specialist and is filling in for Erin McGinnis who is currently on maternity leave. Maria graduated this year from Simon Fraser University in the Earth Science Program, specializing in environmental geosciences with a focus in hydrogeology.

Report from the Provincial Government

Contact Information for Groundwater Staff with Statutory Designation under the WSA

Office	Name	Statutory Designation	Phone	E-mail	Ministry
West Coast (Nanaimo)	Pat Lapcevic, P. Geo. Graeme Henderson Sylvia Barroso, P. Geo. Ben Robinson	Assistant Water Manager Officer Assistant Water Manager Officer	250-751-3149 250-751-7119 250-751-3265 250-751-3266	Pat.Lapcevic@gov.bc.ca Graeme.Henderson@gov.bc.ca Sylvia.Barroso@gov.bc.ca Ben.Robinson@gov.bc.ca	FLNRO
South Coast (Surrey)	Mike Simpson, P. Geo. Bryan Jackson Michele Lepitre, P. Geo.	Assistant Water Manager Officer Assistant Water Manager	604-586-2809 604-586-2801 604-586-4413	Mike.Simpson@gov.bc.ca Bryan.Jackson@gov.bc.ca Michele.Lepitre@gov.bc.ca	
South Area (Penticton)	Skye Thomson, P. Geo. Nicole Pyett, P. Geo. Twyla Legault, P. Eng. John Pogson, P. Geo.	Assistant Water Manager Assistant Water Manager Officer Officer	250-490-8276 250-490-2285 250-490-8287 250-490-8220	Skye.Thomson@gov.bc.ca Nicole.Pyett@gov.bc.ca Twyla.Legault@gov.bc.ca 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. Laurie Lyons	Assistant Water Manager Officer	250-371-6206 250-371-6280	Melissa.Wade@gov.bc.ca 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. Lindsay Macfarlane	Deputy Comptroller Officer (Sr. GW Data Specialist)	250-356-5062 250-953-3408	Mike.Wei@gov.bc.ca Lindsay.Macfarlane@gov.bc.ca	ENV

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How to Hire a Water Well Contractor

What You Need to Know

Prior to selecting a water well contractor for a job, it is a good idea to obtain information about several contractors in the area before making a choice. Here are some considerations:

- Is the contractor licensed by the state? (Not all states require licensing.)
- Is the contractor certified through the National Ground Water Association? The highest level a contractor can achieve is MGWC (Master Groundwater Contractor), passing all specialty NGWA certification exams and a general exam.
- Does the contractor submit well logs?
- Does the contractor have adequate equipment in good condition to do the job?
- Does the contractor have adequate liability and workers' compensation insurance to protect you?
- Is the contractor familiar with applicable health and safety codes?
- What is the contractor's reputation with previous customers?
- Will the contractor furnish a written contract specifying the terms and conditions of the job?
- Is the contractor a member of the National Ground Water Association? Does he have a current NGWA sticker on his truck? NGWA members support the industry, have access to new technology and improved approaches, are dedicated to quality of workmanship, and promote and protect the groundwater resource. They know their stuff and will work with you to get the job done right. You can contact the NGWA customer service department at (800) 551-7379 or visit NGWA's website for well owners, www.wellowner.org, and click on "Contractor Lookup" for a list of member contractors in your area.

Written Contracts

It is important to obtain a written contract when preparing to have a well constructed. Unless you know what each contractor will do for his specified price, you cannot compare offers and decide which one to hire. NGWA makes available standard contract forms to its members. For a drilled well, the contract might include:

- Liability insurance coverage held by both the owner and the contractor
- A statement that all work is to comply with local and state regulations and codes
- The diameter and well thickness of the casing to be used
- The type of well development and yield evaluation procedures to be used
- The type of screen to be installed, where needed
- The type of well cap or seal to be provided
- The disinfection procedure
- The cleanup after drilling, which includes all material abandoned without authorization at a drill site except drill cuttings and waste-water

- An anticipated date for start of drilling
- A guarantee of materials and workmanship. The contract should specify that the contractor will return to do or to correct the initial work if necessary.

Costs

An itemized list of charges is better than a lump sum. The list could include:

- Cost of drilling per foot
- Cost of casing per foot
- Cost of other materials such as drive shoe, grout, and well cap
- Cost of other operations such as grouting, developing (if longer than one hour, as in screened wells), test pumping, and disinfection
- Cost of drilling deeper and/or second well, if required to ensure an adequate water supply
- Cost of abandonment should it prove necessary (for instance, if saltwater is encountered and another site is selected)
- What costs are not included in the specifications.

Finished Well Checklist

After the well has been constructed and before the contractor removes his equipment from the site, you should inspect the well. Here is a list of items to check.

Well Depth—This is easily done by tying a weight on a tape. Verify the measurement against the well construction report made out by the contractor.

Well Yield—Ask the contractor at how many gallons per minute (gpm) the well was tested, what distance the water level dropped during the test, and how quickly the water level recovered after the test.

Well Cap—Ensure that the well is capped and secure and that the cap is at least 6 inches above ground level.

Disinfection—Ask the contractor if the well was disinfected.

Well Construction Record—Make certain that you receive your copy of the well record. The contractor is required to deliver copies of the record to the owner. It would be advisable to keep your well record with your house deed so that the information is passed on to future owners.

Keep in Mind . . .

- Trust the contractor's judgment in solving unforeseen difficulties that may come up, and discuss unforeseen costs.
- If original construction plans must be changed, discuss the options with the contractor.
- Don't expect the contractor to work for free if the well does not fulfill expectations.

Where can I get more information?

For more information on your private water well, contact your local contractor. Also, visit the website of the National Ground Water Association, www.ngwa.org, and its site just for well owners, www.wellowner.org.



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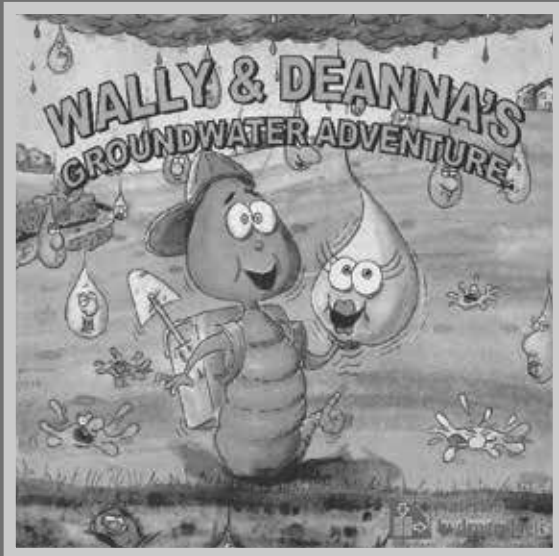
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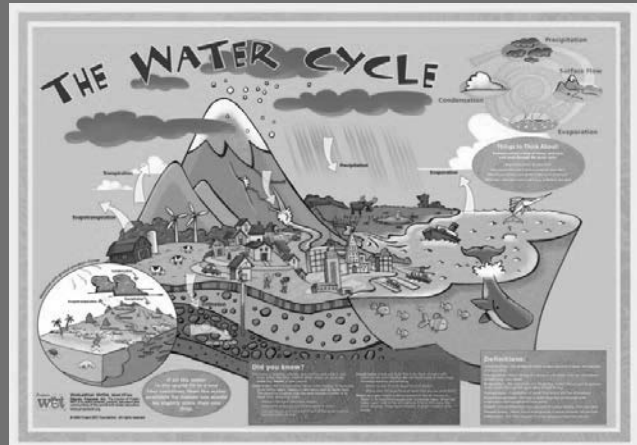
Groundwater Teaching Resources for Kids

Available on-loan from BCGWA Contact secretary.bcgwa@shaw.ca

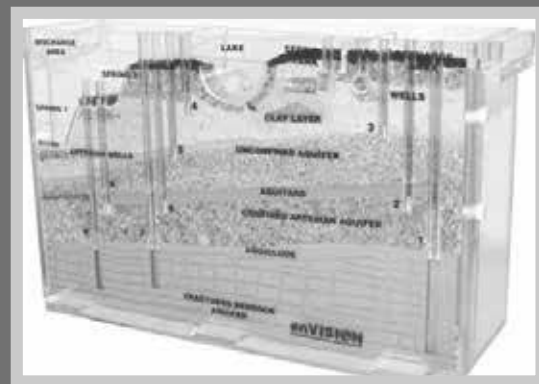
Storybook



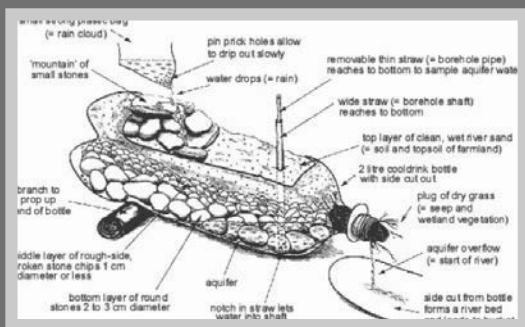
Poster



Demonstration Model



DIY Aquifer Model ideas



Activity Book



Fun Fact Flash Cards



BCGWA CLASSIFIEDS

JOB POSTINGS

PRECISION SERVICE & PUMPS, a Canadian owned and operated family business since 1992, located in Abbotsford, is interviewing candidates for the following positions. These are full-time permanent positions, working four, 10 hour days a week. Offering a highly competitive wage commensurate with experience, as well as comprehensive benefits, RSP matching, tool and gear allowance, and lots of training that is fully covered. Please send resume to hr@precision-pumps.com.

Crew Lead Hand (\$22-\$29/ hr to start)

Responsibilities:

Much of your time will be spent in the field, working at different installation sites throughout the province and even out of country, installing and maintaining water, waste water systems, and de-watering systems. Your work will help provide communities with clean drinking water, keep sewage out of lakes and rivers, and provide essential flood relief.

Qualifications:

- 5 – 10 years' experience in the Groundwater Industry
- Qualified Well Pump Installer ticket
- Industrial plumbing fundamentals
- Electrical fundamentals
- Understand industrial piping processes.
- Valid Class 5 driver's license with clean driver's abstract
- Ability to drive a manual transmission vehicle
- Ability to drive a 5-ton truck towing a trailer
- Must be physically fit and able to perform physically demanding tasks, including lifting and carrying heavy loads
- Ability to work out of town and long hours
- Class 1 driver's license considered an asset

Pump Repair Mechanic / Technician (\$22-\$31/hr to start)

Responsibilities:

Much of your time will be spent in the shop, working on different repairs and overhauls on various pump motors and valves, troubleshooting, inspecting and repairing centrifugal ground water, waste water & process pumps, with an aptitude and understanding for machining and tolerances.

Qualifications:

- Minimum two years' experience overhauling and repairing rotating equipment and components, preference will be given to centrifugal and turbine pump experience.
- Aptitude and understanding for machining and tolerances
- Able to read and understand engineered drawings, manuals, and schematics.
- Demonstrate strong leadership and supervisory skills.
- Able to organize time and assets in an ever changing schedule.
- Class 5 drivers license with clean drivers abstract, able to drive manual transmission
- Basic First Aid



BCGWA CLASSIFIEDS

JOB POSTINGS

The environmental division of **ASSOCIATED ENVIRONMENTAL CONSULTANTS** is looking to fill the following full-time hydrogeologist positions at their Vancouver or Vernon offices. For more details, visit their website at <https://www.ae.ca/careers.php>.

Senior Hydrogeo. (Vernon/Vancouver)

Responsibilities:

- Providing senior technical leadership
- Designing and implementing hydrogeological assessments
- Preparing reports
- Managing projects and client relationships
- Team building and mentoring
- Business development



Qualifications:

- Post-graduate degree (M.Sc. or equivalent) in hydrogeology, physical geography, earth science, or water resources engineering
- Min. 8 years' post-graduate work experience
- Thorough understanding of water supply, mining, and/or waste management sectors
- Professional registration (e.g., P.Geo. or P.Eng.) or eligibility to register
- Etc. (see website for further details)

Intermediate Hydrogeo. (Vancouver)

Responsibilities:

- Designing and implementing hydrogeological assessments
- Interpreting physical and chemical data
- Preparing reports
- Managing projects and client relationships
- Team building and mentoring
- Assisting in business development

Qualifications:

- B.Sc. or post-graduate degree (M.Sc. or equivalent) in hydrogeology, physical geography, earth science, or water resources engineering
- Min. 4 - 6 years' post-graduate work experience
- Demonstrated understanding of hydrogeological mapping and testing methods
- Professional registration (e.g., P.Geo. or P.Eng.) or eligibility to register
- Etc. (see website for further details)

EQUIPMENT FOR SALE

Water / Support Truck

2001 Peterbilt 357 C-10 Cat engine, 350hp, with 2005 Montana flat tank.

6 compartments, 1300 gallon tank, 20ft deck. 163,000 miles. 3 water outlets, 300 gallon fuel tank with pump, 2 miller welders with generator power, tires in good shape. Truck has had no problems.

\$39,000 obo. Contact Peter Niemans Water Well Drilling in High River Alberta dtnmusic@gmail.com





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