

Final Report:

March 3, 2023

Council for Agricultural Water Supply and Producer- Led Watershed Data Collection Project

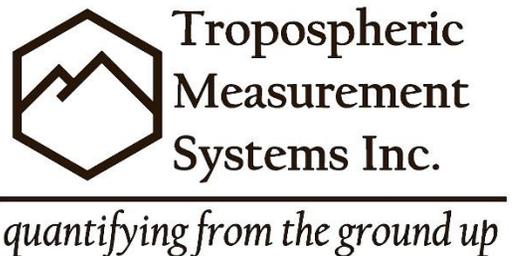


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EXECUTIVE SUMMARY

In the summer of 2021, Tropospheric Measurement Systems Inc. (TMS) began working towards goals the Alberni-Clayoquot Regional District (ACRD) had set to establish a Council for Agricultural Water Supply and implement a Producer-Led monitoring component.

The project began by starting to gather available information related to climate and water in the Alberni district. This information gathering included:

- Research and review of existing and historical monitoring projects and assessment related to the area.
- Interviews and surveys of local producers surrounding their usage and history with water resources in the district.
- Conversations with local fire services regarding delivery of water to producers.
- Discussions with the ACRD and other applicable parties regarding the development of a community water license.

This background work helped to identify the producers, stakeholders, and other interested parties whose participation would be relevant. This laid the groundwork for the formation of the Council for Agricultural Water Supply, with the inaugural meeting occurring in October 2021. From this point, the council continued to meet on a quarterly basis. During the term of the contract the Council solidified a terms of reference, submitted formal communications with the province regarding their watershed security strategy and fund, the creation of policy recommendations for the ACRD, industry and the province. Meetings consisted of discussion of the overall project work progression and identification of emerging key items, as well as presentation of relevant materials by council members and other parties.

From the review of the available climate and water related data for the Alberni District and discussion of measurement feasibility, it was determined that the information related to groundwater wells would provide the greatest overall value using a producer-led collection model. The producer-led monitoring aspect of the project was focused on the measurement of groundwater well depth and static height measurements using a well depth measurement tool that was acquired for the project and is available for loan by producers and other interested people by the Alberni Farmers Institute (AFI).

Since the project convened, several inroads have been made to bring ongoing issues and concerns surrounding water in the Alberni Valley to the forefront, so that the current and future issues can continue to be assessed and acted upon. As the dynamic of the Alberni Valley changes from both a population and climatic standpoint, the following are some of the key items for future related work:

- Continuation of the water council to forward local involvement and interest in the ongoing assessment of water resources and climate patterns in the Alberni Valley. The council will also

forward local interest in the sustainable use of water resources and the prevention of impacts for agricultural producers, other users, fish, wildlife and maintenance of the overall area environment.

- A detailed climate assessment to assure that the existing meteorological measurement stations are representative of the Alberni Valley and are adequate to quantify the parameters related to water resources (e.g., Precipitation).
- Review of the existing hydrometric monitoring network in the Alberni District to assure that surface water resources are adequately quantified against future changes.
- The installation of a groundwater observation well(s) in the Alberni District as part of the provincial ground water monitoring network to assist in area aquifer assessment and future changes to groundwater levels in the district.

OUTREACH AND ENGAGEMENT SUMMARY

All the sources of information that produced the findings and recommendations contained within this report came through engagement with local producers, residents, nations, stakeholders, as well as provincial and federal employees. While some of the project aspects were specific in nature (e.g., agreement in principle regarding water delivery) others were to gather thoughts, ideas, and generalities to find commonalities creating a basis for which water and climate related concerns in the Alberni Valley can be discussed in the short and long-term basis. The stories and input provided have added to the overall knowledge base for the ACRD and will continue to add value to any activity applicable to the area.

Agreement in Principle regarding the delivery of water

“To draft an agreement in principle between the Alberni Farmers’ Institute, ACRD, and local fire departments, with prescribed protocols for delivery of water during training events”.

Findings:

Conversations to investigate the parameters of delivery of water to agricultural producers were conducted with Charlie Starret (ACRD Regional Fire Services Manager) who liaised with the fire chiefs from the electoral fire departments (Beaver Creek, Cherry Creek and Sproat Lake) as well as the municipal Port Alberni Fire Department. The fire departments are not inclined to distribute water for agricultural producers during periods of drought or low water tables. Looking across the province of British Columbia water delivery falls outside of any job description for fire departments.

Some of the concerns that the fire departments brought up around the possibility of discharging water on farm sites during a training exercise were:

- Potential of contamination of water from residual contents of tanks. There is no guarantee that the water would be potable or uncontaminated.
- The city and volunteer fire department chiefs unanimously expressed they were not on board with the idea.
- Pumping water and then spraying water in an agricultural producer well, pond, cistern, holding tank would not be considered an appropriate training exercise.
- The potential underlying liability would exceed the benefit.

- Fire departments cannot allow an individual to hook up to a hydrant as issues with water pressure and stability can arise.

The Alberni Farmers' Institute was amenable to drafting a protocol for the delivery of water.

Recommendations:

- Potable water delivery is a service that is already provided within the Alberni District. Compile a list of current water distributors and associated surcharges.
- Explore creative alternatives. For example, use a flat deck truck with a portable tank or utilize a dump truck with a water tank which could be collectively owned and operated by the Alberni Farmers' Institute.
- Investigate the possibility of an irrigation district. This direction was identified by agricultural producers, was a recommendation in the 2017 Water for Growth report and has been reinforced by ACRD staff. A community irrigation system would require significant financing and requires a feasibility study. Look for funding to do the feasibility study.
- The ACRD McKenzie Road water supply pump station has been mothballed but could investigate as a possible water source that agricultural producers could access.

Development of protocol for ACRD community water license

The ACRD holds an existing water license for the Stamp River. With the Beaver Creek Electoral Area now being tied into the municipal water system, the McKenzie Road Water Supply Pump Station is currently not in use (this was where the ACRD utilized their Stamp River water license).

In November of 2020, Koers Engineering did a reactivation vs decommissioning cost review. From the review: "Water Treatment Allowances have been made for reinstatement of the water disinfection (chlorination) however this will not meet the Island Health requirements for potable water. This review has not reviewed the treatment methods required, to bring should the water facility be required to make potable water. The intent of this review is for an emergency water supply only where non potable water would be provided to the system".

The Beaver Creek Water Tower is a reservoir and in use. There is an active line coming in from the central pumping station at Strick Road and this water is distributed from the water tower via several lines to service an area with a 16 square kilometre radius. The Beaver Creek Water Advisory Committee is in favour of seeing agricultural producers being able to utilize this resource. However, conversation with the ACRD general manager of Community Services made it very clear that utilizing the Beaver Creek Water Tower would not be a viable option. The water tower is also a chlorinating station and producers would need to pay the full cost of the water. No rate reduction for agricultural users would be provided.

Recommendations:

- Investigate if the water license reallocated under a community license to various producers along the Stamp River for irrigation purposes if the pumphouse is permanently mothballed. ACRD Staff indicated they would make inquiries with Front Counter BC.

- From the Province of BC webpage regarding Irrigation Districts: "The B.C. government does not generally create new improvement districts, add new service responsibilities to existing improvement districts, or consider a major boundary extension to an existing improvement district where there is a local government willing and able to provide the required service." So perhaps this further supports the approach for the ACRD Water license to be reallocated for producers rather than creating a separate Irrigation District entity.
<https://www2.gov.bc.ca/gov/content/governments/local-governments/improvement-districts-governance-bodies/improvement-districts/history-powers>

Primary issues documented along the base of the Beaufort Range.

Producers with water sources along the Beaufort Range of the Alberni District have expressed repeated concerns about the impact of forestry activities taking place along the Beaufort Range. These concerns address issues on their water quality and the overall integrity of the watershed. This is a sensitive political issue that has significantly impacted some of the region's largest agricultural producers and residents and resulted in a lack of trust of upstream forestry operations.

Over the years, the ACRD has received complaints and accompanying documentation of the impact of poorly executed forestry operations on Beaufort producers. These impacts range from the forced relocation of a home due to a landslide, to multiple damaged irrigation systems and blocked culverts, as well as reports of herbicides, rocks, and debris entering irrigation systems.

The Beaufort Mountain Range is a high rainfall area with steep and unstable terrain. Often, logging operations including road building have occurred there during times of the year when precipitation is the highest with the greatest opportunity for impacts related to water.

Producers have noted that a more communicative approach is now being taken by those operating forestry practices along the Beaufort Range. The general feeling among producers, is that operations on private managed lands are basically self-policed. Some of the observations noted while conducting the survey of agricultural producers about the impacts of upstream activities included:

- When logging was conducted during times of high precipitation the creek became very turbid and made one spring unusable. Creeks started diverting to new areas.
- There was less volume in the spring as with less trees there is no retention of water. Since 2016 there has been a noticeable difference.
- Machinery was refueling close to creeks and going through drainages which resulted in a sheen in the water.
- High turbidity issues associated with forest harvesting and clearing.
- A property in proximity to McLean's Mill had a decade of sick livestock (calves born with defects, thyroid issues, cysts, enlarged liver, etc.) which the property owner states is due to contaminated water. These issues were resolved after only utilizing water from the Cherry Creek Water District.
- Since logging activity occurred upstream, the primary culvert must be cleared out every summer due to filling with gravel and appearance of new watercourses.

Producers that have not had any upstream activities to date did not experience the same sort of impacts noted above. They expressed trepidation around future upstream activities after hearing the accounts of neighbouring properties and would like to ensure that their access to water remains trouble-free. Having clear communication and access to the forestry operators is a high priority for all producers.

Survey regarding the agricultural use of water

The intent of the survey was to connect with producers to assess current water usage as well as identifying limiting factors to maintaining or increasing current production. Other objectives included collating observations of impacts of upstream activity on water availability and quality, determining existing meteorological measurements that have been done on an individual level, as well as assessing the primary concerns of producers.

Eleven in-person surveys were conducted from November 10th to December 12th, 2021. A further distribution of the survey was conducted online, with notification of the survey going through the Alberni Farmers' Institute email list as well as circulated to the membership of the ACRD Agricultural Development Committee and the ACRD Agricultural Advisory Committee. The online survey was open until Dec. 21st. Two additional surveys were submitted online. A list of survey questions can be found in [Appendix B](#).

Most farms were based along the base of the Beaufort Range with some representation from the Sproat Lake area, along the Somass River, Beaver Creek and by Cox Lake (Franklin River).

Surveyed participants had been in operation ranging from the late 1800's to a farm that has operated for the past 11 years. Most farms have been in operation since the 1920's with acreages ranging from 2 acres to more than 800 acres. The average size of farms was a quarter section.

Primary production of farms surveyed included 2 dairy operations, 7 beef and hay operations (only 2 farms sold hay, the rest was for personal use), 1 vegetable, 1 blueberry and 2 mixed operations (vegetables and livestock). Primary sources of water included gravity fed aquifers, creeks, municipal systems, reservoirs, shallow wells, and a river.

Six of the thirteen farms recorded meteorological data with a range of observations (daily precipitation along with high and low daily temperature to occasional journal entries about general weather and patterns). The range of data on file was from 11 years to over 50 years. Two of the sites host meteorological stations.

Most farmers had noticed some sort of impact of activity regarding water quality due to upstream activities. (e.g., logging, encroachment of development surrounding property impacting the water table, industrial operations, and in one case jet boats). 90% of producers consider water to be the primary limiting factor impacting production on their farms.

The key themes and primary concerns around climate change were:

- Extreme heat events, drought, and seasonal flooding.
- Observed increase of mean annual temperature over time.
- Farming is hard work and you at the mercy of the elements.
- Need to be flexible, adaptable, and resilient.
- Emergence of wildfires, changing wind patterns, and microclimates within the district.

Council for Agricultural Water Supply

The Council for Agricultural Water Supply convened its inaugural meeting in the fall of 2021. A coordinator work plan was co-developed with the assistance of ACRD staff which included a Terms of Reference to guide the Council ([Appendix A](#)). Throughout the duration of this project there have been seven (7) council meetings and a subcommittee meeting which focused on the development of policy recommendations ([Appendix C](#)).

Key representatives from identified stakeholder groups were invited to participate on the council and sent invites, minutes, and slide decks of presentations if they were unable to attend. Stakeholders sat on the Council with varying levels of participation including representation from:

- ACRD planning staff and Agricultural Coordinator
- ACRD Electoral Director
- Professional Biologist
- Climate & Agriculture Initiative BC (CAI)
- Farmers within the Alberni District (7)
- Fisheries and Oceans Canada (DFO)
- Hupacasath First Nation (HFN)
- Ministry of Agriculture and Food (MOA)
- Mosaic Forest Products
- Nanaimo Regional District (RDN)
- Tseshah First Nation (TFN)

There was collaboration with DFO to participate in World Rivers' Day as well as arranging logistics with the Department of Agriculture and Food and the Irrigation Industry of British Columbia to assist in hosting a day long water workshop which focused on the importance of drainage, dugouts, and water storage, for calculating annual water use and peak flow, as well as, how to make the most use of your water.

The diverse range of individuals and stakeholders that stepped up to take part in the Council is indicative of the broad range of interests related to water resources in the Alberni District. While consensus agreement on the points of discussion and recommendations made by the council was not always the case, to have this diverse body enabled an expanded discussion model with many different facets taken into account.

WATER COUNCIL POLICY RECOMMENDATIONS

With the emergence of climate change impacts alongside population growth putting an increasing demand on water resources, an opportunity to proactively adapt and build opportunities for long term planning for a resilient water supply exists. To do so requires improved communication and coordination between various levels of government, producers, and adjacent land use operations.

One of the outcomes identified in the initial application for funding was to draft policy recommendations that could be endorsed by the Council. The intention is that the recommendations will be brought forward to ACRD staff to be further refined and then appropriately submitted to regional and provincial government as well as appropriate industry.

The provincial government is examining legislation and drafting policies which may make some of the recommendations a moot point. It will be important to track the emergence of new policies to ensure alignment of the recommended policies. (e.g., The Stewarding Agricultural Watercourses Project Action Plan will be distributed in 2023). It will be important to lobby the government to ensure proper financial supports are in place, so that water legislation is not prescriptive, as a one size fits all policy will not work across the province of British Columbia.

Food security and food sovereignty are prominent topics and undeniably attached to the availability of water. Having the ability to grow and produce food is an inherent right and integral part of life, therefore the use of water for agricultural purposes should be prioritized. Some organizations are pushing to link the Agricultural Land Reserve (ALR) with the function of water and any sort of production on those lands. This is the concept of agricultural water reserves.

It is important to acknowledge and highlight the relationship between watershed use and agricultural producers, watershed governance and capacity building within the Alberni Valley to deliver watershed initiatives. A solution focused approach, building relationships, connections between producers and industry along with a platform for information sharing are integral. The policy recommendations aim to designate the agricultural use of water as a priority, securing a safe supply of accessible water for agriculture.

Summary of Policy & Other Recommendations

Policy Recommendations for the Alberni-Clayoquot Regional District (ACRD):

- 1.1 Implement the permanent establishment of the ACRD Council for Agricultural Water Supply
- 1.2 Develop criteria that considers potential or expected impacts to agriculture in upstream land use or development rezoning applications.
- 1.3 Work with Department of Fisheries and Oceans (DFO) to implement no-wake zones on vulnerable shoreline of Somass River

Other Recommendations for the ACRD:

- 1.4 Explore options for implementing approvals for the agricultural usage of the ACRD Stamp River water license.
- 1.5 Apply for funding for an assessment and feasibility study of Alberni District's capacity for an irrigation district and twinning of water distribution lines.
- 1.6 Support and advocate for the identification and placement of at least one observation well within the Alberni District (advocate to the Ministry of Environment and Climate Change for this – through direct requests to Ministry staff and through the elected officials - i.e., UBCM conferences).
- 1.7 Tie in existing weather station at the AV Sort'nGo Centre to the provincial Farmwest site

Policy Recommendations for Industry:

- 2.1 Employ an independent qualified registered professional (QRP) when operations could impact adjacent +/- downstream surface water works OR advocate for an opportunity for independent oversight / review of various operations – reporting to the ACRD or water council.
- 2.2 Include 'agriculture' as a key consideration in planning processes for industry partners.
- 2.3 Have a defined / approved communication strategy for interacting with agricultural producers and the ACRD.

Policy Recommendations for Provincial Government:

- 3.1 Enact mandatory protective buffer from agricultural intakes and water sources.
- 3.2 Require that the insurable liabilities of industry operations include compensation for downstream damages during and after resource extraction or development activities.
- 3.3 Increase funding sources and opportunities for water storage.
- 3.4 Require that independent hydrologists are utilized by industry in areas with licensed water intakes.
- 3.5 Support, encourage and mandate regional governments to take a more active role in local watershed management.
- 3.6 Ensure priority of use for agricultural users in water allocation.

See [Appendix C](#) for complete policy recommendations table.

RECOMMENDATIONS FOR THE STRUCTURE, RESOURCING, MEMBERSHIP, AND AUTHORITY OF A LONG-TERM COUNCIL BODY

With the formation of the Council for Agricultural Water Supply, there is a platform for stakeholders (including producers) and other interested parties to be able to bring forward their concerns and ideas for managing water within the Valley. Given the combined experience and knowledge base within the council, these concerns and ideas can be further investigated, or be forwarded to regulatory agencies or other bodies to be able to enact policy and influence activities securing required water sources across the range of needs.

The baseline of a solid working group has been established within the Council. It is imperative that this momentum continue with the support of the ACRD. Some common goals have emerged between the province, producers, various local governments, DFO, First Nations, and industry. The overarching theme is the need for clear communication which could be facilitated through the continuation of the Council. A dialogue has begun and an element of trust has been established.

The key next step of the Council is to provide face to face opportunities between potentially effected water users and industry stakeholders. This information sharing will provide a conduit for continued dialogue, so water users can request and have input regarding mitigation strategies as well as direct communication with contractors. This mitigation procedure is especially important for work occurring along the Beaufort Range where most of the Valley's farmers with larger land holdings have existing surface water licenses.

RESULTS FROM THE PRODUCER-LED MONITORING PROJECT

From a regional perspective, current meteorological measurements in the Alberni district provide moderate to good coverage of the general climate patterns within the ACRD. With these meteorological measurement sites, the need for additional producer collected weather data in the district was determined to not be a primary need. For this reason, the producer led monitoring project focused on ground water well measurement.

The focus of the Producer-Led monitoring aspect of this project is to expand the dataset related to existing ground water wells in the Alberni District. The initial phase of this monitoring was to provide the tools and knowledgebase for producers and other interested ground water users to access the equipment required to better document and profile groundwater wells that are in use.

The producer-led monitoring plan focuses on the quantification of existing wells (e.g., measurement of static water levels), provides a means for producer data collection that gives producers a hands-on understanding of how their groundwater levels change through an annual cycle and the impact under different usage patterns. These measurements can be recorded to create a dataset that can be used for future aquifer assessment work, or to aid in prioritizing the Alberni District for the installation of a groundwater observation well(s).

The uptake of the producer led monitoring project have been poor. The training seminar of the use of the measurement tool had low attendance and there has been no request to utilize the measurement tool by area residents since its inception. The likely primary reason for this low uptake is due to hesitance by ground water users to report the measurement of their wells in fears of regulation.

Coupled with this hesitance, ground water availability is historically moderate to good in the district, where most ground water users do not experience dry wells year-round, or those that do, during the dry months have mitigation measures (rainwater collection, water delivery, secondary source) in place as this issue has been ongoing. Most existing agricultural producers in the Alberni district utilize surface water sources (access to new licensed surface water sources is limited).

Known area aquifers have low to moderate production with overall low well density. The mapped aquifers are delineated based on existing well information and further studies are required to determine recharge sources. With the possibility of an increasing population, an expansion of agricultural production utilizing a ground water source, overlaid with changing climate patterns, the current state of relatively good ground water availability has the possibility to be threatened. To mitigate this risk, continued quantification is required. This can be done through education and increased supports the water users.

The desired primary outcomes for this monitoring project are:

1. Identify groundwater wells that are not currently registered in the provincial database.
 - a. https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/water-wells/well_registration_form.pdf
2. Aid producers to be compliant with the 2016 BC Water Sustainability Act.
3. Allow for depth measurements to be taken throughout the year (and over years) to aid in the quantification of static aquifer levels and possibly to be used for future provincial aquifer assessment programs.
 - a. <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-science-data/water-data-tools/real-time-water-data-reporting/water-data-submission>
4. Give groundwater users, hands-on knowledge of their wells, and how they change under different water usage and climate patterns.

SUMMARY OF RECOMMENDED FUTURE PROJECTS

Water is a necessity for agricultural production. The Alberni Valley has a unique set of climatic, geological, and topographical attributes that have created a moderate climate that generally provides readily available surface and ground water. This availability is primarily based on the utilization by a small population with low overall usage. With changing climate patterns, increasing population and as the overall anthropogenic water demand and surrounding land uses expand, balancing this duality needs to be proactively addressed to ensure continued availability of use, while still having the required flows to maintain surrounding ecosystem components..

The review of climatic and hydrologic data, as well as, assessment work done in the ACRD provide a significant amount of historic data. The active measurement stations provide good overall baseline coverage for the area. Existing monitoring sites need to be maintained for the continued collection of data related to hydrometric and meteorological conditions.

Continuing with the producer-led ground water monitoring project, will provide easily measured information from private wells that can be submitted to provincial databases. This also provides groundwater users, hands-on knowledge of their wells, and how they change under different water usage and climate patterns.

With changes and variability become more apparent, these measurements can be quantified against historical information to assist in guiding activities. Knowledge based decisions can be made by users to maintain the overall environment of the district. The following are the key projects that should be started/continued into the future;

1. Continuation of the water council to forward local involvement and interest in the ongoing assessment of water resources and climate patterns in the Alberni district. The council will also forward local interest in the sustainable use of water resources and the prevention of impacts for agricultural producers, other users, fish, wildlife and maintenance of the overall area environment.
2. A detailed climate assessment to assure that the existing meteorological measurement stations are representative of the Alberni District and are adequate to quantify the parameters related to water resources (e.g., Precipitation).
3. Review of the existing hydrometric monitoring network in the Alberni District to assure that surface water resources are adequately quantified against future changes.
4. The installation of a groundwater observation well(s) in the Alberni District as part of the provincial ground water monitoring network to assist in area aquifer assessment and future changes to groundwater levels in the district.
5. Continuation of watershed and aquifer monitoring and assessment in the Alberni District.

As with projects of this nature there will always be another specific item to consider and decide upon, another measurement that will add to the knowledge base, it is continual and cumulative. Like a raindrop that falls from the sky, it will continue its journey until it is evaporated only to begin again, just never taking the exact same path twice.

APPENDIX A. TERMS OF REFERENCE

COUNCIL FOR AGRICULTURAL WATER SUPPLY TERMS OF REFERENCE

Guiding Principles

The Alberni-Clayoquot Region District (ACRD) Council for Agricultural Water Supply is a multistakeholder initiative in the Alberni Watershed that seeks to foster a collaborative approach to supporting agricultural producers' need for an adequate and secure source of water. Through an inclusive, constructive, and solutions-focused approach, the Council is dedicated to watershed management and initiating producer led water quality monitoring and research.

Timeframe

This Council will be in effect from October 2021 to February 2023.

Objectives and Goals

The objective of the Council for Agricultural Water Supply is to act as a communication platform where stakeholders come to work collaboratively. The platform is designed to act as an efficient and effective information-sharing venue, which will result in the overall improvement of agricultural producers' water supply within the Alberni District watershed. The council will serve as a venue to share information about municipal, regional, Provincial, or other stakeholder projects that may impact water supply for agriculture. Engagement and thoughtful dialogue of the collective stakeholders will help support policy making and define strategic priorities for ongoing and emerging projects, partnerships, and research.

Specific goals include the following:

- Working to protect agricultural intakes and water sources from upstream activities.
- Working to improve agricultural producers access to water that is of decent quality and affordable.
- Working towards adequately protecting riparian buffers.
- Increasing awareness of (off-farm) runoff impacts to agricultural land.
- Identifying opportunities and solutions for agricultural producers to ensure long-term access to groundwater.
- Building agricultural producers' capacity to engage in water monitoring and data collection.
- That monitoring undertaken does not incur monetary costs for participating producers.
- That the council can provide input on localized projects that may impact producers water supply as referred by the ACRD.
- Sharing recommendations to the ACRD Board of Directors regarding policy and lobby action that would support achievement of, or have impact upon, securing the agricultural producers access to an adequate water supply, and any related updates.

Membership

The Council will strive to include a minimum of 12 members, with representation from the agricultural producers, forestry sector, environmental perspectives, Department of Fisheries and Oceans, First Nation governments, and academia.

Diversity & Inclusion

The Council for Agricultural Water Supply will uphold diversity in all forms. As a result, the council members will reflect the diversity of the region. The council understands that diversity and inclusion go hand in hand in creating a culture of innovation, collaboration, engagement, and productivity. In selecting members, the council will aim to design processes that are transparent, accessible, and free of discrimination.

Expectations and Code of Conduct

The council will strengthen the content and validity of various identified project deliverables through the contribution of valued and diverse community perspectives. Parties will work toward development of a shared understanding of the problems, priorities, strengths, points of leverage, and limitations regarding agricultural activities within the Alberni Watershed.

Members are expected to attend meetings and participate in adequate review of ongoing project deliverables and meeting packages.

All members shall strive to serve the public interest by abiding and upholding Federal, Provincial, Municipal and Regional laws and policies. Members are to be transparent in their duties to promote public confidence. All members are to respect the rights and opinions of other council members and conduct themselves in a manner that respects the inherent dignity of all.

How We Work Together

The Council for Agricultural Water Supply is dedicated to working collaboratively and developing innovative ways in which we can improve agricultural producers access to a secure water supply in the Alberni District. We are committed to work together by:

- Meeting six times throughout the course of the Council (Dec. 2022).
- Working under the principle of constant improvement.
- Reporting back to respective constituencies.
- Providing comment on materials, projects, and support where possible.
- Actively attending water council meetings and following up with meeting minute reviews.
- Adequately representing each sector: government (provincial, regional, First Nation), academic, industry, and not for profit organizations.
- Each representative is responsible for providing updates on their agency's current initiatives, comments, or concerns regarding water supply.

Council Chair and Secretary

Anna Lewis will be the chairperson/secretary of the Council until December 2022.

Quorum

A majority of the Council Members present shall represent a quorum.

Decision-Making

Where decisions are required, motions shall be brought forward and:

- discussed and improved upon if indicated.
- assessed against established group priorities and the goals identified in this Terms of Reference
- assessed as per available resources and expected outcomes.

Members shall allow decisions to emerge from that process, trusting and expecting that this structure for decision-making will lead to good decisions. Final decisions will be made by consensus. If consensus cannot be reached and appropriate time has been dedicated to thoughtful discussion, a majority vote shall be utilized. Any member can abstain from voting on localized or specific issues if they deem it appropriate.

Minutes

Council meetings will be documented in the form of minutes which will be distributed within one week of the meeting. Minutes will be distributed to all attendees and those wishing to receive updates on the discussions of the meeting. Minutes will be available to the public upon request. Meeting minutes will include the confirmed date and location for the next upcoming meeting.

Reporting to the Board

Tropospheric Measurement Systems will report to the ACRD Board on the activities of the Council.

Recommendations from the Council to the ACRD Board must be adopted by the Council prior to presentation to the Board.

Records, files and Report Management

All council records, files, and reports will be stored and saved by the chair of the Council for Agricultural Water Supply. Documents will also be stored by ACRD staff, additionally; any documents created in collaboration with other agencies/organizations will be saved and stored on the agencies account to ensure secure measures have been met.

Date Ratified

APPENDIX B. PRODUCER SURVEY QUESTIONS

1. What is your name?
2. What is your contact information? (phone & email)
3. What is the name of your farm?
4. What is the address or ID# of the farm?
5. How long has this farm been in operation?
6. How many acres is your farm?
7. Of your acreage how much of is irrigated/utilized?
8. What is your primary crop/livestock?
9. What is your primary source of water?
10. Do you have an alternate source of water?
11. Are you aware of alternative water supplies you could utilize?
12. Do you have a water license on title?
13. Do you know how much water you utilize?
14. Do you record any sort of meteorological data?
15. If yes, what type of data do you collect?
16. How many years of data do you have on file?
17. Have you observed upstream or downstream impacts of activity on your farm water supply?
18. Can you expand on any observations or correlations you have observed.
19. Do you notice the impacts of climate change?
20. With regards to climate change what are your key concerns?
21. Do you consider water to be a limiting factor for maintaining current or increasing production levels?
22. Are you interested in having your farm being one of the sites for the producer led component of the project?
23. Any additional comments?

APPENDIX C. POLICY RECOMMENDATIONS

Policy Recommendations for the Alberni-Clayoquot Regional District:

1.1 Implement the permanent establishment of the ACRD Council for Agricultural Water Supply	
RATIONALE	A long-term interjurisdictional water council will help ensure there is a legitimate, efficient, and effective platform for lobbying watershed planning and management processes.
	There is a need for consistent multi-year funding with long term mechanisms to ensure continuity, relationships, and community.
	Farmers lack a formal and coordinated voice when speaking to industry. An opportunity exists for a single producer to come forward with specific concerns and have endorsement and support from the water council to strengthen their voice.
	Climate change brings significant risks of drought, flooding, and inconsistent water resources – both availability and quality.
POLICY DETAILS	Dedicated ACRD staff time for facilitation of council is suggested.
	Further research into models being used in other jurisdictions to ensure long-term access to groundwater for producers. (I.e. Arizona and California Water Districts, or the South East Irrigation District in the Okanagan, or the Quincy-Columbia Basin Irrigation District).
	Develop a strategy to help protect the quality and volume of surface and aquifer-based water supplies supporting agricultural operations in the district.
	Develop local strategies to provide access to irrigation water for agricultural lands to sub-regional areas of the district considering the potential of existing community water systems and/or licenses, new sources specific and the role for new developments and land use initiatives to contribute the infrastructure.
	Research options for generation of long-term funding, including parcel tax, for related programs, such as: <ul style="list-style-type: none"> • Honoraria for producer participation in monitoring programs and council meetings • Reduced rates for agricultural users of community water systems • Rebates for water storage options, cisterns, etc. • Funding avenues could include parcel tax, endowments, operating budgets, grants, gas tax revenue, carbon credit

	<p>and natural capital grants from senior levels of government</p> <ul style="list-style-type: none"> • The above should fall under the purview of the ACRD Grant Coordinator and Asset Management
	<p>Actively seek out opportunities for cross pollination opportunities such as connecting with the BC Agriculture Council which has made water security for agricultural producers a key priority.</p>
	<p>Facilitation and development of an information-sharing / community or sector alert network within the region, such as advising all impacted participants when flood gates are being opened or key data is available.</p>
<p>1.2 Develop criteria that considers potential or expected impacts to agriculture in upstream land use or development rezoning applications</p>	
<p>RATIONALE</p>	<p>With the ACRD currently updating its bylaws, it is pertinent to include language that provides special consideration for any rezoning applications / developments which may result in downstream impacts for farm use – specifically where it may impact the availability or quality of water sources. Ensure that the definition and language around farm use stays in the bylaws.</p>
	<p>Rezoning application are the critical juncture whereby the ACRD can intersect to ensure appropriate precautions are taken to protect water sources for agriculture.</p>
	<p>Protection of water sources is critical and crucial.</p>
<p>POLICY DETAILS</p>	<p>Enact policy (with zoning, development permits, or otherwise) to ensure agriculture is explicitly considered within rezoning applications upstream of agricultural lands.</p>
	<p>Applications Must include a professional assessment of impact to the water basin to identify impacts and restrictions.</p>
	<p>Working with the Water Council, ACRD staff can develop criteria to evaluate future developments requiring OCP and zoning bylaw amendments to minimize impacts to surface water and groundwater supplies on ALR lands and operating farms. (Ie. Runoff; if a new subdivision forecasting the water usage and the related impact on the aquifer; blockage of natural drainage. Ie. Holly’s golf course).</p>
<p>1.3 Work with Department of Fisheries and Oceans (DFO) to implement no-wake zones on vulnerable shoreline of Somass River</p>	
<p>RATIONALE</p>	<p>Bank erosion is increasing due to higher river flows and river traffic.</p>

	<p>One farm along the Somass River attributes 10 feet of bank erosion in 40 years due to wakes from jet boats.</p>
	<p>Increasing marine traffic is reported (jet boats travelling at high speed) and currently no posted guidelines for safe operations in sensitive zones exist, such as Paper Mill Dam and the confluence of the Stamp and Sproat Rivers.</p>
<p>POLICY DETAILS</p>	<p>Coordinate with Provincial and Federal bodies to put up signage along riverbank in identified vulnerable areas “No Wake Zone” and communicate this to the public.</p>
	<p>Identify potential community partners. (e.g., AV Enhancement Association is currently looking at identifying sensitive zones as they want to protect certain areas along this river system as they are looking at protecting fish habitat in these river systems; DFO has indicated they are supportive of this initiative.</p>

Other Recommendations for the ACRD:

1.4 Explore options for implementing approvals for the agricultural usage of the ACRD Stamp River water license	
RATIONALE	The Stamp River water license belonging to the ACRD is underutilized with the MacKenzie Pump Station being mothballed.
	Two farms have asked if they could access a portion of this water allocation (one on Stamp River, one on the Somass River).
	The ACRD also has a water license designation on Great Central Lake. This could mean producers could pull water if necessary but would not include any distribution. (I.e., Producer could pump water into a portable holding tank).
RECOMMENDATION DETAILS	Investigate with Front Counter the possibility of reallocating a portion of the existing, unused, ACRD water license on the Stamp River.
	Set up a protocol and formal agreements for reallocation or expanded use.
	Develop protocol for producers to access water from Great Central Lake using a community license.
1.5 Apply for funding for feasibility of irrigation district and twinning of water lines	
RATIONALE	Water availability varies quite dramatically across the Alberni District.
	Communal irrigation water systems can provide cost effective, non-potable water for irrigation of crops and pastures.
	In October, 2017 a staff memo to ACRD Board of Directors indicated <i>"The installation of a new irrigation district that provides non-potable water for agricultural use would be financially unattainable in our region. However, one option would be twin the existing water systems with a non-potable line as waterline replacements are completed on our existing systems."</i> Recommendations were made to investigate options for twinning community water lines with non-potable irrigation lines and to identify corridors where this would be beneficial. This remains a priority for AV agricultural producers and a continued focus on this issue by the ACRD is suggested.
RECOMMENDATION DETAILS	Seek and apply for funding to determine the feasibility of a new non-potable irrigation district for agricultural users and twinning of water lines.
	Identify specific corridors where twinned lines or a new irrigation district would be beneficial.

1.6 Support of the identification and placement of at least one observation well within the Alberni District	
RATIONALE	Important baseline data should be collected, as an observation well monitors the static levels of groundwater level over time and provides important baseline data. Of particular interest would be to observe if groundwater levels are dropping and aquifers are being drawn down faster than they can recharge.
	The only existing observation well within the ACRD is in Ucluelet, which provides little value to the AV, and is located within a different aquifer.
	BC Observation Network has indicated it has overlooked the Alberni District and would be more inclined to put well in if there is support from regional government.
	TMS has provided template documentation for users to enter information, so that the information be uploaded to the BC wells database or alternatively Aquarius. (Alberni Farmers' Institute holds a well depth logger for its membership to utilize).
RECOMMENDATION DETAILS	To endorse, advocate and assist the BC Observation Network to put in an observation well.
	To have the ACRD Board of Directors endorse a letter to go forward to the government indicating support, advocacy and cooperation.
1.7 Tie in existing weather station at the AV Sort'nGo Centre (Landfill) to the provincial Farmwest site to improve water usage for irrigation	
RATIONALE	Farmwest provides free weather information for agricultural producers, including forecasting, weather calculators, evapotranspiration and more. www.farmwest.com
	Knowing the evapotranspiration rate gives producers the ability to forecast water consumption per day / per plant and lower water usage while increasing irrigation efficiency.
	Farmwest currently only has the Port Alberni airport weather station information, whereas more stations would increase the accuracy for different areas of the District.
RECOMMENDATION DETAILS	Expand the Farmwest weather information network by providing opportunities for upload of the data from the AV Sort'nGo Centre weather station.
	Connect with Megan Wainwright email: megan.wainwright@gov.bc.ca to develop an MOU.

Policy Recommendations for Industry:

2.1 Employ an independent qualified registered professional (QRP) when operations could impact adjacent +/-or downstream surface water works OR advocate for an opportunity for independent oversight / review of various operations – reporting to the ACRD or water council	
RATIONALE	Forestry along the Beaufort mountains is primarily on private managed land and operates under a nonprescriptive act. The Beaufort Range is very steep terrain with high volume of rainfall.
	There have been multiple, significant events in the past where industry operations have negatively impacted downstream agricultural water intakes. (Unstable terrain, work being undertaken during winter, landslides, etc.)
	Maintaining integrity of slope requires technical assessment.
	An unbiased consideration of risks is important avenue in building trust with downstream interests.
	Water quality and water quantity must be maintained for downstream users.
POLICY DETAILS	Ensure that best management practices are used to manage hydrology.
	Employ an QRP (i.e. hydrologist) to ensure best practices are adhered to.
	Mandate a buffer area of 30 meters to water sources (10m for secondary sources) unless an independent qualified QRP suggests it could be increased or decreased.
	Have a clear communication process to inform or interact with downstream landholders.
2.2 Include ‘agriculture’ as a key consideration in planning processes for industry partners	
RATIONALE	Mosaic’s website notes that ‘Watersheds, sensitive ecosystems, visual quality, ground stability, veteran trees, and a multitude of other factors are part of the planning process.’
	‘Farmers of the forest’ – have forestry practices evolve and focus on more selective logging in areas with unstable terrain.
POLICY DETAILS	Add agriculture to the list of considerations in the forest management and harvest planning process.
	Ensure a rigorous risk management portion, including pre and post -harvest assessments, to ensure adjoining land

	uses coexist. (I.e. Could specify generous buffer distances to water intakes for downstream agricultural properties.)
2.3 Have a defined / approved communication strategy for interacting with agricultural producers and the ACRD	
RATIONALE	Consistent communication, outreach and engagement will lead to more trust and cohesive relationships. (If Water Council continues, input from industry is an important voice).
	Can demonstrate stewardship in action such as the collaborative work Mosaic is doing with the Regional District of Nanaimo community watershed monitoring network.
POLICY DETAILS	Include sharing projected and planned harvest activities along with a timeline. Seek and address comments and concerns from agricultural producers.
	Include industry-specific planning, visioning, and info-sharing (I.e. provide analysis of cut and rate cycles utilized).
	Actively support individual or public water monitoring programs on private forest lands and share related data and processes openly. Immediately share any known or anticipated issues – such as sedimentation of streams or debris flows into water intakes – so that collaborative solutions can be explored.

Policy Recommendations for Provincial Government:

3.1 Enact mandatory protective buffers from licensed water intakes and water sources	
BACKGROUND	Current buffers around water sources are not adequate, as evidenced by the multiple incidents along Beaufort range in recent years.
	Example of one local harvester, who feels that the timber requirement is at odds with environmental impacts, (i.e. logs closer to stream banks/riparian zones then comfortable with, in order to meet quota).
	Buffers can help protect vulnerable intakes and water courses.
POLICY DETAILS	Enact a buffer zones (30m) to protect water intakes and increase inadequate buffers that exist. 30m and 10m for secondary streams. Minimum standard of 30m unless a QRP indicates it should be more.
	Includes aerosol diffusion zone due to herbicides.
3.2 Require that the insurable liabilities of industry operations include compensation for downstream damages during and after resource extraction or development activities	
BACKGROUND	Multiple incidents in the past along the Beaufort range have resulted in significant damage to agricultural lands and no compensation has been provided.
	Documented impacts of poorly executed forestry operations on producers in the Beaufort region range from the forced relocation of a home due to a landslide, to damaged irrigation systems and roadways, and the entrainment of herbicides, rocks, and debris into irrigation systems.
POLICY DETAILS	Ensure compensation is provided for damaged capital investments of producers, agri-production losses, and time when downstream users need to repair intakes, blown-out water lines, or when they suffer upstream-activity related washouts, landslides or floods.
	Provide a mechanism or structure, outside of judicial court proceedings, for producers to initiate compensation requests in these instances, via the ALC or otherwise.
3.3 Increase funding streams for water storage	
BACKGROUND	Rainwater harvesting and storage systems help ensure that water from the region's significant seasonal rainfall is

	<p>available in drier seasons and reduces demand on wells and aquifers.</p> <p>A limited amount of funding has been available for water storage solutions through Environmental Farm Program (EFP) /Beneficial Management Program (BMP) but these are heavily subscribed and challenging for producers to apply for.</p>
POLICY DETAILS	<p>Change grant programs or provide new climate change funding sources to be more easily accessible and to remove application and reporting burdens from producer applicants (or provide assistance to encourage the success of these applications).</p>
	<p>Increase the amount of funding available and the number of ways to access it.</p>
<p>3.4 Employ an independent qualified registered professional (QRP) when resource extraction operations or development could impact adjacent +/-or downstream surface water works</p>	
BACKGROUND	<p>Land along the Beaufort mountains are primarily private managed land and operates under a nonprescriptive act. The Beaufort Range is very steep terrain with high volume of rainfall.</p>
	<p>There have been multiple, significant events in the past where industry operations have negatively impacted downstream agricultural water intakes. (Unstable terrain and bulk of the operations tends to be done in the winter which has seen the slides occur in the McClean Mill hatchery area, home had to be relocated, etc.)</p>
	<p>Maintaining integrity of slope requires technical assessment.</p>
	<p>An unbiased consideration of risks is important avenue in building trust with downstream interests.</p>
	<p>Water quality and water quantity must be maintained for downstream users.</p>
POLICY DETAILS	<p>Ensure that best management practices are used to manage hydrology and reduce the potential for downstream impacts.</p>
	<p>Employ an independent QRP (i.e. hydrologist) to ensure best practices are adhered to.</p>
	<p>Mandate a buffer area of 30 meters to water sources (10m for secondary sources) unless an independent qualified QRP suggests it could be increased or decreased.</p>
	<p>Have a clear communication process to inform or interact with downstream landholders.</p>

3.5 Support or mandate regional governments to take a more active role in local watershed management.	
BACKGROUND	<i>“Local governments (i.e., municipal, and regional governments) have an important role in managing watersheds and achieving watershed security over the long-term.... Supporting governance at a watershed scale could result in changes to how decisions are made, providing a space for local communities and all levels of government to have their voices heard.” - from Province’s Watershed Security Strategy and Fund Discussion Paper</i>
	Will increase knowledge base and accountability from decision makers concerning risks to agricultural water.
	Regions are unique and each will have its own stakeholders, issues, and geography.
POLICY DETAILS	Provide funding and capacity development avenues for Regional Districts who convene community watershed tables.
	Provide guidelines for the development of local or regional governance frameworks.
	Support the ACRD to work with relevant agencies and ministries to implement a program to monitor and report on ground water, surface water and weather trends.
	Provide staff time so that Provincial Staff may participate on regional watershed tables to help share information and connect regional tables to Provincial resources and knowledge.
3.6 Ensure priority of use for agricultural users in water allocation	
BACKGROUND	If access to water for agricultural is curtailed (I.e., farms drawing water from the Koksilah watershed) it will significantly diminish the functionality of the Agricultural Land Reserve (ALR) for preserving and ensuring local food production.
	As food is an inherent right and integral part of life, use of water for agricultural purposes should be prioritized. This could be verified through a cost benefit analysis and a risk assessment of losing locally available food sources.
POLICY DETAILS	Designate agriculture use of water as a priority, securing a safe supply of accessible water for agriculture.
	Fully investigate the possibility of agricultural water reserves and develop appropriate (tailored to the region) water sustainability plans.

APPENDIX D. SUBMISSION TO WATERSHED SECURITY LETTER

February 28th, 2022

Water Protection and Sustainability Branch,
Ministry of Environment and Climate Change Strategy
PO Box 9362 STN PROV GOVT,
Victoria B.C.
V8W 9M2

Re: Watershed Security Strategy and Fund

The Alberni Clayoquot Regional District (ACRD) Council for Agricultural Water Supply was convened in fall of 2021 to support agricultural producers' needs for an adequate and secure source of water. It is part of a 2-year project funded in part by the Real Estate Foundation of BC and Climate and Agriculture Initiative BC.

In 2014, access to water was noted as one of the top two concerns of agricultural producers within the Alberni District, and in 2017, as part of an Agricultural Use of Water project, producers expressed concerns around water quality within the region. The ACRD's Agricultural Development Committee subsequently submitted a letter to the province in support of the UBCM Resolution: B115 - Task Force for Watershed Management.

Excerpts from the submitted letter include:

"Many of our region's largest producers draw their water directly from the Beaufort Range Watershed, and the integrity of their water supply is being compromised by commercial activities taking place on private lands within that watershed. This committee requests that the province create a task force to consult with local governments to determine their concerns on consumptive watershed management."

"The province must establish an avenue whereby local governments maintain some authority to manage the use and activities within their community's watersheds. Agriculture depends on safe and reliable water sources."

The objective of the Council for Agricultural Water Supply is to act as a communication platform where stakeholders come to work collaboratively. The platform is designed to act as an efficient and effective information-sharing venue, which will result in the overall improvement of agricultural producers' water supply within the Alberni District watershed. The council will serve as a venue to share information about municipal, regional, Provincial, or other stakeholder projects that may impact water supply for agriculture. Engagement and thoughtful dialogue of the collective stakeholders will help support policy development and define strategic priorities for ongoing and emerging projects, partnerships, and research. Specific goals include the following:

- Working to protect agricultural water intakes and water sources from detrimental upstream activities.
- Working to improve agricultural producers' access to water that is of decent quality and affordable.
- Working towards adequately protecting riparian buffers.
- Increasing awareness of (off-farm) runoff impacts to agricultural land.
- Identifying opportunities and solutions for agricultural producers to ensure long-term access to groundwater.
- Building agricultural producers' capacity to engage in water monitoring and data collection.
- That the council has the opportunity to provide input on local projects that may impact the water supply of agricultural producers as referred by the ACRD.
-

Primary outcomes of the council include improved trust and relationships between various watershed interests, an increase in relevant knowledge, resources, and influence for council members as well as a legitimate, efficient, and effective platform for watershed planning and management processes.

One of our members who brings a food security and climate adaption lens to the council stated: *"The most important thing you can do for your health and the health of the planet is to eat locally grown food. Climate disruption requires more local food production. On our farm, an adequate water supply is required to increase our food production. Financial support for farms from Provincial and Federal governments, to develop water supplies, will be necessary to alleviate food disruptions."*

The ACRD Council for Agricultural Water Supply would like to acknowledge and highlight the relationship between watershed use and agricultural producers, watershed governance and capacity building within the Alberni District to deliver watershed initiatives. The Watershed Security Strategy and Fund has the potential to play an important role for agricultural producers with regard to securing water supply and assisting with climate adaptation measures that agricultural producers are looking to integrate on their farms such as water storage. Future funding initiatives will be important to continue these integral conversations and the development of long-term platforms for regional watershed management. Please keep us apprised as to any opportunities to integrate our concerns around the sustainable use of our watershed.

Respectfully submitted,

Anna Lewis
Chair, ACRD Council for Agricultural Water Supply