Where are we and how did we get here?
Drinking Water Infrastructure in the Kootenay Region of British Columbia
2013 Initial Impressions Report
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Introduction

The infrastructure deficit, a growing gap between the current state of infrastructure and the infrastructure needs across Canada, is becoming an increasingly important subject (Connelly, Markey, & Roseland, 2009; Federation of Canadian Municipalities, 2012; Kennedy, Roseland, Markey, & Connelly, 2008; Mirza, 2007). In 2011 a study examining regional development in Canada identified various infrastructure concerns being raised across the Kootenay Region[1] of British Columbia (BC) (Vodden et al., 2013). Of these concerns, issues related to drinking water infrastructure were prominent. These observations are reinforced by various reports highlighting the age and condition of BC's water distribution and supply systems (Federation of Canadian Municipalities, 2012; Ministry of Health Planning & Ministry of Health Services, 2002; Mirza, 2007). As a result a new project was initiated to study drinking water infrastructure and its links with regional development in the Kootenays. This project is in its initial phase, focusing on the current state of drinking water infrastructure, what decisions brought this about, and what the future may hold.

A review of regional development and/or drinking water infrastructure in the Kootenays and BC yielded a disjointed and confusing collection of information. The history of drinking water infrastructure in the Kootenays appears to be predominantly ad hoc, with systems either growing alongside communities or being built by the Province by way of compensation. Outside of initial investment, Provincial responsibility appears limited until the early 2000s[2] when changes to provincial drinking water standards put the spotlight on drinking water infrastructure.

The combination of disconnected provincial water legislation/regulation (e.g., quality vs. quantity), the involvement of multiple (changing) ministries with conflicting mandates, and competing uses in watersheds, with a range of infrastructure system sizes, governance structure, ages, and conditions results in what one interviewee described as "*a dog's breakfast*" (2013 interviewee). In order to gain a better understanding of what this puzzle looks like on the ground I visited the Kootenays in the spring of 2013. This report is based on a preliminary analysis of these 2013 interviews, describing common elements and themes identified by interviewees.

[1] For the purposes of this research the Kootenay Region includes the regional districts of Kootenay Boundary, Central Kootenay, and East Kootenay.
[2] This is not to say that water quality was ignored by the province prior to 2000, however concern for drinking water quality grew markedly following the Walkerton tragedy in Ontario (Government of British Columbia, n.d.; Ministry of Health Planning & Ministry of Health Services, 2002; Office of the Provincial Health Officer, 2000).

Methods

Eleven interviews were conducted in the spring of 2013, targeting people involved in the planning, operation, and maintenance of local drinking water systems (8), as well as provincial (2) and federal (1) ministries. These interviews were analysed for initial impressions, the results of which are below. Information from critical documents, as well as interview data collected in 2011 has been added for context as appropriate. This report was initially issued to interviewees only, allowing for review and feedback which was factored into this final version. It would be impossible to cover all aspects of the topic as detailed by interviewees in one report. As a result this report focuses on prominent themes.

Drinking water systems: a (brief) history

Abundance and quality of water in BC was indicated to be both a blessing and a curse. Relative to most other provinces, treatment systems in rural BC are generally behind, in part owing to a naturally high quality resource. The Kootenay region is unique even within BC, owing to differences not only in the physical setting, but in the size and number of water systems (large numbers of small systems with varied governance structures).

Similar to BC in general, there is a great deal of variability between and within drinking water infrastructure in the Kootenays. This research considers both municipal systems and small systems. Small systems were numbered by interviewees and documents to be up in the thousands, of which a small fraction is controlled by the Regional Districts, the rest being in the hands of Water User Communities or Improvement Districts. These small systems were noted as being unique to the Kootenays, owing to the settlement and geography of the region. Most were built independently and added to as needed. Typically establishment dates are unknown, some close to 100 years old, others dating to the 1950s-70s, as well as some more recent developments. Municipal systems were similar in time frame, many dating to the late 1800s or early 1900s, matching the settlement of the region. Other, more recent water systems were built by the provincial government as part of the compensation for the Columbia River Treaty.

Between the period of initial investment/construction and present day drinking water infrastructure coasted, operated and maintained in a casual, ad hoc manner with minimal, if any reinvestment. Several interviewees pointed to local-level mismanagement, specifically a failure to adequately charge customers in order to ensure systems were operated and maintained properly. Establishment of reserve funds was rare until recently and is still not a consistent practice. These critiques are at stark contrast to the 2011 interviews where interviewees by in large pointed to a lack of reinvestment from higher levels of government as the key issue. The 2013 interviews however did note changing provincial standards and regulations and downloading of responsibility as being responsible for increased local costs.

The recent push for improvements in water infrastructure began in the 1990s-2000s, with the culmination of natural wear and tear/end of infrastructure life combined with the

enhancement of drinking water standards. These changes in regulations and standards put the state of infrastructure into harsh relief. Many distribution systems were nearing the end of their natural lifespan, needing replacement. Additionally, treatment facilities, if there were any, no longer met provincial standards. New regulations emphasizing treatment appear to have diverted attention from distribution systems, with immediate needs dominating over long term needs. During this era funding programs such as the Municipal Rural Infrastructure Fund began as a reaction to the infrastructure deficit combined with new requirements. There are examples of communities that have made the decision to proactively upgrade their systems, while others have been reactively fixing infrastructure as it degrades, and others that have done nothing.

Current state

The current state of drinking water infrastructure varies across the region. An issue common in rural BC, including the Kootenays, is that the original purpose or driver of systems (e.g., agriculture or industry) is not the same as the current situation, making systems out of context for present day. Interviewees indicated that small systems are often in poor condition as a result of aging, but that there are also issues of design and structure stemming from why and how systems were initially built. Municipal systems, generally larger, more complex, and more expensive, also have more resources at their disposal. Some interviewees indicated their municipal systems have, both proactively and retroactively, made great improvements with both treatment and distribution infrastructure, while others continue to try and catch up.

Deteriorating distribution systems were noted by interviewees, some specifically pointing to water loss (leaks) and system risk as a result of outdated materials, many nearing or past their projected lifespan. There are some examples of proactive attention being paid to distribution systems, for example systematically updating worn out pipes, some dating back over 100 years. However overall distribution systems in large part appear to be of secondary concern, dealt with as needed (i.e., as broken) as a result of the focus on treatment.

Treatment systems appear to consume the bulk of resources, excepting those small systems that have no treatment in place. Technology improvements, for example UV treatment either as a primary or secondary treatment, while expensive, were noted as offering new options. Other technological solutions, such as the use of point of entry/point of use treatment, were noted as a source of conflict between local groups and provincial regulatory bodies. For the most part, interviewees indicated that treatment technology exists; the issues are with the expense of the technology, the regulatory process, and perceptions over the need (or lack of) for treatment.

In terms of the current state of water quality, this conversation was dominated by different perceptions of water quality, including risk associated with untreated water as well as treatment methods (e.g., use of chlorine). The spectrum of interviewee responses indicated both actual quality issues (i.e., health risks) and perceived water quality issues (i.e., legal risks). Some interviewees pointed to ‘pristine’ or low risk watersheds and a lack of scientific evidence

of need for treatment, while other interviewees pointed out that most BC watersheds are multi-use watersheds which carries inherent risk, as well as documented incidences of waterborne disease as a serious health issue. In some cases boil water advisories resulted from nonexistent or inadequate treatment. In others, advisories were as a result of changes to standards as opposed to infrastructure issues. The critical issue appears to be that expensive treatment systems are a hard sell when people see no difference in their level of risk.

Governance, management, and planning

The governance structure surrounding water infrastructure systems, inevitably linked to surrounding issues of water quality and quantity, is complex. With differing types of system ownership, varying levels of management, ever changing provincial ministries and a variety of other factors, many interviewees readily admitted to some level of uncertainty. Appropriate governance is considered to be a central component of the multi-barrier system. However, many interviewee comments surrounding governance and jurisdiction indicate that despite well intentioned regulations, programs, policies and the like, water governance is not working the way it was intended, and the governance issue further exacerbate the infrastructure issue.

Specific to small systems, interviewees noted various levels of committees, commissions, and councils involved in governance at the local level, in addition to the provincial agencies such as the Interior Health Authority (IHA). Interviewees pointed to some of the layers of governance (e.g., committees) as an unnecessary level of government, occasionally dominated by special interest groups and noted that the multiplicity made decision making difficult. Additionally, regional districts are being asked to take over increasing numbers of small systems, as the regional districts have trained operators, more (relatively) staff, access to money (funding, grants, borrowing), and can accept liability. Occasionally the province has requested that the regional district take over a system, but generally this process is voluntary, driven by the aforementioned advantages, as well as rising costs and a decline in volunteer culture. However, it was noted that non-governmental operators of small systems (e.g., improvement districts) are not eligible for funding, raising questions as to the use of programs to further download (upload?) responsibility to the regional districts. Each regional district in the Kootenays has, or is creating, a process for bringing on new systems. Currently, all three regional districts also have queues of small systems waiting to come on board that they are unable to address. For the remaining independent small systems, interviewees pointed to fear of amalgamation or take over and loss of independence as driving the desire for wanting to remain as is. Governance of municipal systems appears to be less complex, being governed by the community/city council.

In terms of infrastructure planning responses from interviewees were mixed. General literature searches turned up various municipal and regional district plans including (but not limited to): official community plans, integrated community sustainability plans, and water management plans. Only one local interviewee's agency did not have a water management plan, but it was noted as being in progress. Source water protection plans appear to lack across the region,

either not existing, not being current, or being undermined by multiple and conflicting uses in the watershed. Plans for small systems outside of regional district jurisdiction are unknown.

While the existence of plans was noted, in some cases interviewees admitted to not having read the plans on account of day to day operational needs. Additionally questions about the integration of water/water infrastructure plans with other community plans resulted in responses largely indicative of a lack of integration of local level plans. This is particularly noteworthy as one interviewee pointed out that the inclusion of water planning is required in official community plans and integrated community sustainability plans, raising the question of whether some plans are completed to tick boxes on grant applications, but are not necessarily integrated and implemented in day to day operations.

All local level interviewees indicated that IHA is the key player in governance of water infrastructure. Local interviewees were quick to point out that while the local governments and users bore the cost, the authority rested with IHA. Many local interviewees were critical (to some extent) of IHA, particularly citing a lack of understanding of day to day operations, lack of on the ground experience, clash in priorities between the local and provincial levels, and general negative relationships. However, while these critiques were ubiquitous, so was the acknowledgement that IHA also struggles with a lack of resources, a huge management area, and a large portfolio of responsibilities. Additionally, there was acknowledgement that IHA often tried to negotiate and to be flexible. There were few local comments pertaining to relationships with other provincial agencies (e.g., Ministry of Environment or FLNRO), although conflicting mandates between provincial organizations were noted, as was the seeming lack of formal integration methods provincially (although informal processes were discussed).

Infrastructure programs

Interviewees discussed various policies and programs related to infrastructure. The Water Act and the Drinking Water Protection Act were cited as the critical legislation associated with water infrastructure. In terms of infrastructure programs, water has fairly consistently been a priority. The programs uniformly identified by interviewees as critical were: the gas tax/community works fund, the Columbia Basin Trust's (CBT) Water Smart program, and infrastructure planning grants (linked with asset management). New money for infrastructure is expected as a result of the 2013 federal budget.

The Water Smart program, while not infrastructure funding, was noted as an important local level program, mentioned by nearly every local 2013 interviewee. Higher level interviewees pointed to the BC community water improvement program; however this was not noted by the local level interviewees, likely in part because the focus of the community improvement program is on saving water to increase capacity, and it has been found that water conservation is not a driver in the Kootenays.

In terms of access to infrastructure funding, higher level interviewees noted that while rural communities are never deliberately excluded from funding (and in some cases they have been the only recipients at the exclusion of urban areas), both 2011 and 2013 interviewees pointed to capacity limitations as an application issue. More financially stable communities have in house grant writers or are able to hire someone to write them, however some rely on help from the granting agencies themselves. At least 3 (municipal) interviewees from 2013 indicated that grants were nice to have, but could not be counted on for fiscal responsibility/stability. It was also noted that priorities and criteria of provincial and federal funding programs can dictate what happens at the local level – an effective top down push.

Collaboration

Various types of collaboration were discussed by interviewees, indicating that collaboration is recognized as beneficial to a large extent. Exceptions to this were where immediate internal situations precluded both external and internal collaboration. A minority of interviewees indicated that they were not actively collaborating at that moment, but that it was on their to do list. Collaborative activities included professional working groups (e.g., Public Works Forums and Associations, BC Water and Waste Association, Asset Management BC), ties between municipalities, ties between regional districts, and involvement of the public and industry. There was little crossover noted between municipalities and regional districts, although neither group precluded this from happening in the future. Generally the majority of collaborative efforts were from within the same sector, although some internal exceptions regarding collaboration with planning and environment departments were noted. Other gaps existed, for example, a gap between human consumption related groups (public works) and local environmental stewardship groups. Columbia Basin Trust programs were noted as providing a forum for collaboration within the region, with the Carbon Neutral Kootenays and Water Smart being noted most often, as well as the Trust's role in generally encouraging and facilitating regional collaboration.

First Nations were mentioned in some interviews, particularly on the subject of engagement and collaboration. Interviewees expressed a desire for further inclusion of First Nations, although all were quick to note an understanding of the additional complexities surrounding involvement of First Nations. This was also noted in the 2011 interviews, particularly surrounding the challenges of involving First Nations, considered federal bodies, at the local and regional level.

Higher level ministries indicated a focus on regional relationships; in particular the importance of relationships with local level operators. This was reciprocated in large part by local level interviewees who noted the recognized need, and attempts, to build more open and communicative relationships with provincial bodies like IHA. Additionally, at the provincial level collaboration between and within ministries was discussed, in particular related to specific issues such as source water protection. The federal agency focused on collaboration with the

provinces. On the subject of determining priorities for funding programs, both provincial and federal interviewees pointed to consultation, as opposed to collaboration.

Overall, all examples discussed fell short when it came to integration, something recognized by the majority of the interviewees. It would appear as though the current governance systems, while accommodating to collaboration or consultation, are not set up to accommodate or facilitate integration.

Place-Based Development

Consistently mentioned was the need to examine applicability or appropriateness of policy/regulation/programs, in particular surrounding the application of provincial standards at the local level. In large part this was focused on treatment as opposed to distribution. The frustrations mentioned in the governance section above are applicable here, namely IHA not understanding local context and priorities. In some instances priorities differed widely, while in others they were not far off. There was also a difference in mindset towards liability and risk. While a minority of comments critiqued IHA for applying a uniform approach, this was countered by the majority of interviewees, as well as documentation noting that IHA's outcome based policies allow for flexibility in process, technology, and timelines. Although interviewees were also quick to point out that the outcomes themselves are not flexible. In large part local interviewees felt that there was flexibility and adaptation that allows for development of plans and processes that suit local context, so long as they are working toward provincial outcomes. However, there are only so many options available for treatment, mostly with large price tags, which face opposition where a mindset of pristine local water and low water rates dominates.

When it comes to the above mentioned funding programs the 2011 interviews pointed to grant applications that required knowledge, information, and capacity beyond many communities' capacity, as well as programs whose priorities were far from what is needed locally. The 2013 interviewees indicated that some programs are more flexible than others and that staff would attempt to work with applicants to see how to best fit them into programs, to varying degrees of success. CBT programs were noted as being particularly well suited to the local context, such as the Water Smart program that provides a framework, while allowing communities to set locally appropriate targets. As noted, federal and provincial priories for funding were created in consultation, but strong top-down forces remain: "*ultimately it is our political masters…who decide what programs should look like*" (2013 interviewee). Additionally, these programs often try to be all things to all people within Canada, an impossible mandate that results in various unique local contexts being left out. In the case of the Kootenays this further builds on attitudes of isolation and being forgotten.

Challenges

There are those challenges that interviewees mention when asked what their challenges are. These are generally the same everywhere and most often focus on a lack of money and skilled

people. In the Kootenays these general challenges also include the size of the region and the variance across the region, also posing a challenge to region wide initiatives. While everyone could always use more money and more/better people, it is rare that this is realistic and as a result various creative solutions were discussed. Generally these challenges were well understood, excepting some responses from the provincial level interviewees noting a need for further work to tease out barriers to success at the local level.

However, there are also those challenges that are not explicit, that come across through responses to other questions. Water governance as a whole comes across clearly as a challenge, much of which was discussed in the governance section above. Capacity and resources are part of this, but also the idea that what is needed is not always possible and these decisions are often out of the hands of the people who need to make things work. The cost of compliance and replacement is high, in particular for smaller systems where economies of scale do not exist. Access to financial resources, either through borrowing or funding is not always guaranteed, nor is it always possible. Tied to this are questions of rates and revenues - getting the public to understand, accept, and pay the real cost of water, something contrary to a culture of plentiful, pure, and cheap water. Public education programs and campaigns exist surrounding these issues, but to varying degrees of implementation and success. The lack of skilled operators poses a significant challenge to both operations and compliance. Time is also a critical challenge related to management and governance, as the short term drive for compliance and day to day operations overshadows planning for long term community needs. Also included under governance are the aforementioned challenges with integration, both between and within organizations, including the dangers of conflicting plans and programs.

Asset management deserves special mention as a challenge, because it is an issue on multiple levels. In part a lack of asset management means that what infrastructure exists, its age, and condition are largely unknown, making planning and management difficult locally. Also, a lack of inventory makes it difficult at the provincial and federal levels to understand what needs exist. Interviewees indicated that asset management is being tackled in some places, but not all.

Cultural issues in terms of water quality and water cost, both discussed above, pose a challenge, as does dovetailing a culture of independence with a primarily top-down system. Part of this is the issue of risk. What actually is the risk? What is acceptable risk? And what is the cost of addressing the risk? Linked to this, as discussed in the place-based section, are issues regarding context and what to do when the policy or program does not fit where you are or what you need.

Sustainability

"*Sustainability has value to be mocked*" (2013 interviewee). This comment is highly illustrative of some of the fundamental challenges with sustainability: it is a hard concept to define, it is

used far too often, and the drive to tackle it in a meaningful way is generally overrun by day to day operations that require immediate attention.

When asked about sustainability practices, application of the term 'sustainable' seemed to fall into 1 of 2 categories: environmental or financial. Mention of other elements of sustainability (e.g., social sustainability) was by in large lacking. Discussion of environmental sustainability by interviewees generally referred to compliance with environmental regulation, although a few also mentioned additional initiatives above and beyond (e.g., use of solar power). Financial sustainability comments were targeted toward fiscal responsibility, building reserves, etc. There was a clear drive among most interviewees to ensure that individual projects and programs were environmentally responsible, meeting regulations, and including sustainable elements where possible. However, overall a cumulative, holistic perspective was generally lacking, something acknowledged by a few interviewees. There was only one example of an overarching approach to community sustainability. And while some agencies noted their commitment to sustainability, the day to day operations indicate that this commitment has not entirely translated into actions. The difficulty of changing approaches while maintaining critical services is a key challenge of sustainability planning, particularly surrounding infrastructure.

As indicated above, water conservation is not a driver in the region as there are few source and quantity issues, something also noted by various interviewees. Rather, infrastructure resiliency and water efficiency were noted as being key. The CBT is targeting resiliency and sustainability, and while they are attempting to shift regional mindsets they readily admit that the overarching integration piece is beyond them at the moment.

Interviewees noted a lack in consistency in the importance government places on sustainability as criteria for funding programs. For example, sustainability criteria was heavily factored into early iterations of the gas tax, but largely left out of the recent infrastructure stimulus package. This illustrates how the emphasis on sustainability changes with the politics at the time, generally seen 'nice to have' but not critical.

One prominent element of sustainability success appears to be the move to new (cleaner) technology, including low energy plans, use of solar panels, simplified technology that is context appropriate, and generally looking for opportunities to make improvements as water systems are upgraded. Overall, interviewees gave the impression that there is a desire and ability to move toward sustainability once a solid, functional foundation has been laid. Several municipalities provided examples of this, as did some smaller systems, raising questions as to how to get less fortunate systems to this point. This points to another challenge for sustainability, not only is it difficult to change approaches while maintaining services, but it is difficult to focus on sustainability when basic functionality is lacking.

Linking drinking water infrastructure and development

Overall interviewees agreed that **there is a clear link between water infrastructure and development**, substantiating observations from 2011 interviews, as well as various studies and reports. A simple example provided was that you cannot subdivide a lot without potable water. Other examples linking the two included liability issues, increased development costs, limitations for services (e.g., firefighting), restricting capacity for expansion and new development, diversification, etc. Without allocation and source security a community cannot develop or expand. One interviewee summed the issue up simply: "*you can't have development without water*" (2013 interviewee). However, while generally interviewees found it hard to separate water from development, one interviewee pointed out that on a policy and planning scale the connections between economic development, water infrastructure and community resiliency have not happened because of the scale and depth of this challenge.

Issues related to water infrastructure and water quality are quality of life issues, which relate strongly to sustainability in terms of the social, economic, and environmental elements. It was noted that the complexities of the governance of water infrastructure generally make development difficult. And yet despite this, development manages in large part to avoid being sustainable. Not only is the existing system challenging to development, but it does little to ensure that what development is approved is sustainable.

Ideas for the future

Interviewees had various ideas as to what they would like to see in the future including a critical examination of small water systems and a review of policy surrounding treatment technology. Most interviewees agreed that there needs to be a larger, fact based, discussion on water quality risk and what treatment should actually be required. Resident buy-in and understanding was noted as a requirement for future changes, as was a need for practical solutions and political recognition of the issues. Continued improvement of relationships and collaborations was noted by all. There was also a recognized need to design systems from source to tap including: source water protection, appropriate economies of scale, the right (context appropriate) solutions for treatment, and appropriate financing.

Regarding funding programs some interviewees indicated that it is good to have checks and balances on where and how money is spent and that rewarding good management practices in the future would be preferable, as opposed to rescuing those who mismanaged their systems. This was echoed by funders. Interviewees also noted that funding requirements can act as a driver for change.

Discussion

While there are various themes present in the above overview, many of them are linked through a common element: governance. For example, issues surrounding top-down policies and programs, downloading of responsibility and cost, and a lack of consideration of place all

point toward governance and management as being a key issue that needs to be addressed. While interviewees noted flexibility within the current drinking water infrastructure system, it was obvious that further improvements need to be made, not only to reflect the local context, but to better facilitate long term planning. The current bureaucracy places large amounts of cost and responsibility both locally (municipalities, regional districts, and small system operators) and regionally (IHA), however the ability to affect change within the system is outside of the hands of these agencies as a result of a largely top-down system.

Additionally it is clear that there are various challenges and gaps to be addressed surrounding drinking water infrastructure. As it relates to development and sustainability the critical gap appears to be surrounding integration. From a regional perspective there appears to be room for coordination and facilitation of drinking water systems at a more regional level, affording better consideration of the local context, although this would require some changes surrounding the roles and jurisdictions of current agencies.

It is clear that infrastructure systems require a functional foundation in terms of infrastructure operation and maintenance (i.e., the day to day functions must be under control) in order to further build on this foundation. Little progress toward sustainability, either specifically within the infrastructure systems or within the communities or the region, is likely to be made until this foundation is in place. And while there are many commendable and innovative efforts occurring, a piecemeal approach to sustainability without an overarching plan and shift in institutional culture is unlikely to result in lasting change. Portions of the system may be improved, but the system as a whole will remain largely the same.

This initial analysis points out that the infrastructure deficit, as it pertains to drinking water systems, is not an engineering or technological issue, but a policy/governance one. The data point to issues with governance, planning, and integration. Potential ways forward focused around the idea of what is needed locally, what communities would like to see in the future, and aligning what is needed now with that future. Because water is a critical service, the day to day operations, including meeting regulations and standards, appear to overshadow the larger picture of what kind of future communities want, and if this infrastructure is helping or hindering progress toward this future.

What is next?

The next step of this project will be a more in depth analysis of the current governance system surrounding drinking water infrastructure. The end goal of this research is to be able to provide recommendations surrounding 1) improvement of overall sustainability and 2) potential alternatives to improve the existing governance and policy surrounding drinking water infrastructure.

Acknowledgements

In the spring of 2013 I met and interviewed various people involved with drinking water infrastructure. The people I spoke with ranged from those involved in planning, operations, and maintenance, to those involved in policy, regulation, and funding, both at local and higher levels of government. Thank you to all of the people who took the time to meet with me, your information and experience provided a valuable foundation for my research and gave me a realistic perspective I would have otherwise been unable to get.

I would also like to thank the Social Sciences and Humanities Research Council of Canada for funding this project, as well as the *Canadian Regional Development* project for continued project support.

Research Ethics

Interviewees voluntarily participated in project and their names will be kept confidential to the best of my abilities. This research was reviewed and approved by the Simon Fraser University Office of Research Ethics (file # 2012s0754). If you have ethical concerns about the research you may contact Dr. Hal Weinberg, Director, Office of Research Ethics at SFU, at hal_weinberg@sfu.ca or 778-782-6593.

Availability

Electronic copies of this report have been provided to all interviewees for review and the opportunity to provide feedback. Once the report has been finalized, it will be available online at: http://cdnregdev.ruralresilience.ca/?page_id=227.

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