



Fracking, First Nations and Water

Respecting Indigenous rights and better protecting our shared resources

by Ben Parfitt

JUNE 2017



CCPA
CANADIAN CENTRE
for POLICY ALTERNATIVES
BC Office

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Summary

Today, in the more remote reaches of northeast BC, more water is used in fracking operations than anywhere else on earth.

FIRST NATION COMMUNITIES ARE ON THE FRONT LINES when fossil fuel developments occur and have the most to lose when things go awry in an industry that has such a vast and often destructive reach.

This paper looks at the growing concerns that First Nations in British Columbia have with the fossil fuel industry's increasing need for large volumes of water. It proposes what steps should be taken to create a more meaningful pre-development consultation process; one that gives First Nations a long overdue and more substantive role in shaping the scale, timing, frequency and location of fossil fuel developments within their territories.

Of particular concern in this paper is the natural gas company practice of pressure-pumping immense quantities of water deep below the earth's surface to fracture dense rock formations in order to release trapped gas. Today, in the more remote reaches of northeast BC, more water is used in fracking operations than anywhere else on earth—and substantial increases in water use will have to occur in the event a liquefied natural gas industry emerges in BC.¹

For example, in 2015 a fracking operation north of Fort St. John consumed 160,000 cubic metres of water. That amount exceeded by almost eight times the average amount of water used in fracking operations in the United States. It is easy to see how all of that water use—which ultimately results in the water becoming heavily contaminated—poses increased risks both to surface waters and belowground or groundwater sources such as aquifers.²

This is not to mention related infrastructure that might have deleterious effects on water availability and quality. This includes: dozens of unauthorized dams built by natural gas companies to trap freshwater used in the fracking process;³ extensive road networks and ditches, which in some cases are designed to direct water into the reservoirs created by those dams; seismic lines; water pipeline and gas pipeline corridors; compressor stations and gas processing plants; water pits and wastewater containment ponds; frack sand mines and gravel pits; and, finally, all of the trees that must be logged to make way.

1 Andrew Nikiforuk, "Mega-Fracking in BC Linked to Earthquakes, Study Finds," The Tyee.ca, April 18, 2017, <https://thetyee.ca/News/2017/04/18/Mega-Fracking-Quake/>.

2 Council of Canadian Academies, *Environmental Impacts of Shale Gas Extraction in Canada: The Expert Panel on Harnessing Science and Technology to Understand the Environmental Impacts of Shale Gas Extraction* (Ottawa: Council of Canadian Academies, 2014).

3 Ben Parfitt, "A Dam Big Problem: Regulatory breakdown as fracking companies in BC's northeast build dozens of unauthorized dams," PolicyNote.ca, May 3, 2017, <http://www.policynote.ca/dam-big-problem/>.

While it is predominantly urban and industrial consumers in southern BC, Alberta and the United States who benefit from the gas liberated in BC fracking operations, it is residents in the northeast of the province who bear the greatest health and environmental costs.

First Nations living in northeast BC, where the vast majority of the province's natural gas deposits are found, are signatories to Treaty 8, a document that commits the Crown to protect First Nations' rights to hunt, fish and trap. Such rights depend on the maintenance of healthy ecosystems, including streams, rivers and lakes where water flows and water quality are sufficiently high to support the web of life on which First Nation communities have depended for thousands of years.

At present, the region's First Nations are frequently frustrated by their inability to shape the rate and scale of industrial developments on their traditional lands. First Nations living in BC's energy-rich northeast corner see little evidence that the industry or the provincial government take seriously the Crown's obligation to consult with them about developments on their traditional lands, or to fully appreciate the nature and scope of their treaty rights.

At best, First Nations receive advance case-by-case notice of fossil fuel industry developments slated to take place in their territories. But they have little influence on the timing, rate or location of company operations. And they have almost no means to engage with the provincial government or energy companies on the broader, more substantive issue of cumulative impacts and what constitutes a reasonable amount of industrial activity within given watersheds or sub-regions.

The paper outlines the trouble with the province's lack of meaningful consultation with First Nations and lack of cumulative effects planning overall. Its findings inform 10 key recommendations made at the conclusion of this report, which include:

- Enacting new co-management regimes, in which First Nation and provincial government designates work together, government-to-government, rather than First Nations simply responding to government and industry referrals;
- Setting maximum allowable extraction limits of natural gas on a watershed-by-watershed basis;
- Creating drill-free and frack-free zones, including protected areas where healthy, functioning ecosystems are maintained so that Indigenous rights can be fully exercised;
- Charging more for industrial use of water and investing the new funds collected in water studies and enhanced water protection; and
- Requiring fossil fuel companies to detail exactly where they intend to operate over long periods, so that important decisions limiting industry developments and water withdrawals can be made with a view towards cumulative regional impacts.

There is an urgent need to embrace these recommendations and more in light of what First Nations contend with in the face of modern-day natural gas industry operations. All natural resources, particularly water resources, are finite. They sustain lands and resources that First Nations have relied on since time immemorial. They must be managed with that in mind.

First Nations are frequently frustrated in their ability to shape the rate and scale of industrial developments on their traditional lands.

Introduction

In order to manage water resources in a way that adequately addresses treaty-protected rights, First Nations must have a meaningful role in shaping the scale and intensity of energy company operations on traditional lands.

THIS REPORT ADDRESSES THE URGENT NEED to embark on a new course when planning energy developments in First Nations' territories, particularly with regard to the cumulative impacts that fossil fuel company operations have on water resources.

The report looks at how water use is increasing dramatically as fossil fuel companies intensify their hydraulic fracturing, or fracking, operations to release more natural gas from below ground. It also notes a rise in First Nations concerns about how these growing industrial demands for water and the accruing effects of many industrial activities in northeastern British Columbia are threatening sensitive streams, rivers and lakes in the region. And it provides specific examples to illustrate both of these points.

It also notes deficiencies in how the provincial government has been issuing water use approvals to fossil fuel companies and it provides specific examples of where the provincial government erred in granting fossil fuel companies rights of access to water and other resources on lands governed by a historic treaty signed with the region's First Nations.

Specifically, the report examines recent legal victories before a provincial court and tribunal by the Fort Nelson First Nation, one of the nations to sign Treaty 8. It also notes how another Treaty 8 signatory, the Blueberry River First Nation, is before the courts in a potentially precedent-setting civil suit that seeks damages for "cumulative impacts" on its traditional lands. These impacts have made it virtually impossible for the Nation's members to carry out their treaty-protected rights to hunt, fish and trap across vast swaths of land.

After exploring the significant deficiencies in the current "consultation" process, wherein individual First Nations are simply referred numerous industrial development applications and asked to respond to them one by one, the report concludes with 10 recommended policy changes. The thrust of the recommendations is that in order to manage water resources in a way that adequately addresses treaty-protected rights, First Nations themselves must have a meaningful role in shaping the scale and intensity of energy company operations on traditional lands *well before* such operations proceed.

The recommendations are informed both by recent events in the region and their impact on specific First Nations; by interviews with First Nation leaders, legal experts and hydrologists; and by court documents and other sources.

The natural gas industry, fracking and water use

FRACKING HAS BEEN AROUND in one form or another from the moment that the first oil and natural gas resources were tapped in the latter half of the 19th century. But only in the past decade has the controversial, brute-force fossil fuel extraction practice taken on its present character.⁴

When companies drill and frack for natural gas today, it is almost always a given that immense amounts of water will be used, and that the water will be pressure-pumped underground at extreme force to “liberate” gas trapped deep below the earth’s surface. Today, in the more remote reaches of northeastern BC, more water is used in fracking operations than anywhere else on earth.⁵ And sometimes the outcomes are dangerous. In August 2015, for example, Progress Energy pumped more than 160,000 cubic metres of water underground at a fracking operation 100 kilometres northwest of Fort St. John, an amount more than eight times higher than the typical fracking operation in the United States.⁶ Progress’s actions triggered a 4.6 magnitude earthquake whose tremor was felt 180 kilometres away.

Not only do BC fracking operations consume dramatically more water than in other jurisdictions, but that water use will increase substantially in the event a liquefied natural gas (LNG) industry emerges in the province. Given the huge growth in gas production that would be required to supply LNG plants, it is sometimes said that liquefied natural gas should more appropriately be called liquefied fracked gas.

While it is predominantly urban and industrial consumers in southern BC, Alberta and the United States who benefit from the gas liberated in BC fracking operations, it is residents in the northeast of the province who bear the greatest health and environmental costs. Such costs would clearly escalate in the years ahead should an LNG industry emerge, or should shipments of natural gas and liquid gas from BC to Alberta’s tar sands industry increase.

This outcome is illustrated by work done by J. David Hughes, a former geoscientist with the Geological Survey of Canada. In a report published by the Canadian Centre for Policy Alternatives,

4 Andrew Nikiforuk, *Slick Water: Fracking and One Insider’s Stand Against the World’s Most Powerful Industry* (Vancouver: Greystone Books, 2015).

5 Andrew Nikiforuk, “Mega-Fracking in BC Linked to Earthquakes, Study Finds,” *The Tyee.ca*, April 18, 2017, <https://thetyee.ca/News/2017/04/18/Mega-Fracking-Quake/>.

6 *Ibid.* The principal owner of Progress Energy is Petronas, the national oil company of Malaysia.

While it is predominantly urban and industrial consumers in southern BC, Alberta and the United States who benefit from the gas liberated in BC fracking operations, it is residents in the northeast of the province who bear the greatest health and environmental costs.

Hughes notes that the volume of water used by the natural gas industry continues to climb at each well drilled. Hughes examined reported water-use data by the fracking industry and found that in the two years following 2012, industrial water use in northeastern BC climbed by approximately 50 per cent at fracked gas wells in the region's two major basins—the Montney and Horn River Basins.⁷

For a typical fracking job in the Horn River Basin, at least 2,300 truckloads of water must be moved into place for pressure-pumping underground. After the fracking is completed, tanker trucks must make another 700 trips to haul all the contaminated wastewater away. In addition, trucks deliver thousands of tons of sand and chemicals to each well site for use in the fracking process.

Repeated again and again, the cumulative effect of all such activities constitutes a formidable assault on water and land resources across the landscape. To illustrate the point, Hughes projected the impact on water resources if a liquefied natural gas industry emerged in the province and five LNG processing plants were built. In that scenario, 55 million cubic metres of water per year would be required for fracking operations across northeastern BC. In other words, the gas industry would need the equivalent of 22,000 Olympic-sized swimming pools per year, or roughly half the annual water consumption in major Canadian cities such as Vancouver and Calgary. Much of that water would be moved by trucks, which only adds to the overall environmental impacts associated with such intense water usage.

A big difference exists, however, between water used in Western Canada's biggest cities and water used by the fracking industry. In cities, the bulk of wastewater generated by residents and businesses is gathered, treated and stripped of most toxins, and then discharged into rivers. The natural gas industry's contaminated wastewater receives no such treatment. Laden with chemicals, heavy metals, hydrocarbons and carcinogens, wastewater created by fracking is typically reused where possible and then pumped deep underground for disposal. That is, once the fracking industry uses freshwater, it is lost to the hydrological cycle forever.

Considerable risks are associated with polluting large volumes of water. Unless it is properly treated, stored or disposed of, contaminated wastewater can pollute surface waters such as streams, rivers, lakes and reservoirs. Or it can contaminate water at ground level or below, such as water in wells and aquifers that is used for drinking.⁸ These sources, in turn, may feed and later contaminate surface water sources as well.

The Canadian Centre for Policy Alternatives recently reported that fracking water laced with toxic heavy metals, including arsenic, barium, cadmium, lithium and lead, had not only contaminated groundwater below a site where the highly contaminated wastewater was stored, but that the same contaminants had also been found many kilometres away in a tributary of the Peace River. The pollution occurred near the northeast BC community of Hudson's Hope.⁹

7 J. David Hughes, *A Clear Look at BC LNG: Energy Security, Environmental Implications and Economic Potential* (Vancouver: Canadian Centre for Policy Alternatives, May 2015) The reason water usage per well is far higher in the Horn River Basin is that the shale rock formations below ground are very tight and require more high-pressure water pumping to release their gas.

8 Council of Canadian Academies, *Environmental Impacts of Shale Gas Extraction in Canada: The Expert Panel on Harnessing Science and Technology to Understand the Environmental Impacts of Shale Gas Extraction* (Ottawa: Council of Canadian Academies, 2014), http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/shale%20gas/shalegas_fullreporten.pdf.

9 Ben Parfitt, "Toxic landslides into the Peace River continue, add to fears about impacts of Site C and fracking," *Policy Note*, June 8, 2016, <http://www.policynote.ca/toxic-landslides-into-the-peace-river-continue-add-to-fears-about-impacts-of-site-c-and-fracking/>.

Laden with chemicals, heavy metals, hydrocarbons and carcinogens, wastewater created by fracking is typically reused where possible and then pumped deep underground for disposal. That is, once the fracking industry uses freshwater, it is lost to the hydrological cycle forever.

In the event of a marked upswing in natural gas prices and/or the construction of liquefied natural gas processing plants on BC's coast, the amount of natural gas drilling and fracking will increase significantly. With such developments, the risk of further pollution will also grow. The people and communities facing the greatest health and environmental risks will be those in northeastern BC, including the region's First Nations, who have been among the most vocal critics of the ongoing impacts that gas-drilling and fracking operations are having on local water resources.

Regulating the water use and cumulative environmental and health impacts associated with fracking is a significant challenge in BC. To date, no serious attempt has been made to come up with comprehensive land-use and management plans that define where gas extraction activities can take place and where they cannot. Nor has serious effort been expended to set limits on the pace or the scale of developments within defined watersheds or First Nations' territories. Responsibility for setting such limits lies largely with the provincial government, which has placed a high priority on getting an LNG industry established in BC.

Those facing the greatest health and environmental risks of increased natural gas development are in northeastern BC, including First Nations in the region.

First Nations and the gas industry's unquenchable thirst for water

The fish, wildlife and plant communities that First Nations have hunted, gathered, processed, traded and in some cases sold for generations all depend on healthy watersheds for their survival.

IN THE HORN RIVER BASIN in remote northeastern BC, members of the Fort Nelson First Nation (FNFN) are at the forefront of efforts to reform how water resources are allocated and used. The FNFN is a signatory to Treaty 8, which became law in 1899, and involved 39 First Nations whose traditional lands stretched across 840,000 square kilometres in parts of present-day Alberta, Saskatchewan, the Northwest Territories and British Columbia. Treaty 8 specifically guarantees the right of FNFN members to hunt, fish and trap as before; however, the treaty is silent as to water governance and management.

The FNFN is concerned not only about the volume of water being used by natural gas companies, but also about the pollution and cumulative environmental impacts associated with all gas-drilling and fracking operations in the wider basin. Much of the Nation's territory is muskeg, a unique ecosystem of many shallow lakes, bogs and marshes in which the upper layers of soil hold substantial volumes of water. That water is a magnet for important fish, game and fur-bearing species that FNFN members have relied on for generations. As one FNFN elder explains: "Rivers are our means of life—where we hunt, fish, trap and travel. The river is not just the water; it's the vegetation, the fish, the medicines, the moose that come down to drink, the beaver that swim by, the muskrat. It has more value than all the parts of the land. It needs to be protected."¹⁰

The fish, wildlife and plant communities that First Nations have hunted, gathered, processed, traded and in some cases sold for generations all depend on healthy watersheds for their survival. All may be affected negatively by the intensity and the frequency of industrial water withdrawals. Less appreciated is that other industry activities not directly related to withdrawing and contaminating water during the fracking process also degrade water quality and reduce water flows. For example, roads built for the numerous trucks that service the fracking industry end up cutting across numerous streams and wetlands, disturbing local fish and wildlife populations and

¹⁰ Fort Nelson First Nation, *Hydraulic Fracturing: Fort Nelson First Nation's Perspective*. (PowerPoint presentation made to the Yukon Select Committee on Hydraulic Fracturing, February 1, 2014), http://www.legassembly.gov.yk.ca/pdf/rbhf_FNFN-Presentation.pdf.

interrupting and diverting water flows. Logging trees to make way for seismic lines,¹¹ pipelines, well pads, compressor stations and other physical infrastructure used to move and treat natural gas, simultaneously removes one of nature's most important water filters and eliminates wildlife and fisheries habitat. Excavating thousands of deep pits to store freshwater used in the fracking process or to hold the large amounts of wastewater produced in fracking operations traps rain and snow that would otherwise fall to the ground and feed local streams, rivers and lakes.

Only when all activities associated with the gas-drilling and fracking process are considered together can the cumulative impacts of natural gas industry operations be understood and proactive action be taken to reduce threats to critically important water resources.

Incidents in the spring of 2010 illustrate what local First Nations confront when dealing with gas industry operations. That year, the FNFN learned that a gas-drilling and fracking operation at Two Island Lake in the heart of its territory had surpassed all previous industry records for water use.¹² Apache Canada, an early LNG proponent, had installed a series of pumps and pipes to pull water from the lake for use in extracting gas. The water level in the lake dropped to dangerously low levels, however, and Apache was ordered to halt its pumping. It was subsequently discovered that the pumps and pipes had been set up in such a way that water could be diverted past the water meters so that no one knew the true extent of the water being used.¹³

Prompted in part by that incident, the FNFN filed several requests for information with the provincial fossil fuel industry regulator, the Oil and Gas Commission (OGC). The OGC responded by requiring more frequent and stringent reporting of water used by the industry from all sources, including natural sources such as streams, rivers and lakes, and manmade sources such as dugouts that trap rainwater and melting water from snowpacks.

Several months after the revelations at Two Island Lake, FNFN leaders learned that in December 2010 Apache was part of a consortium that had applied to the National Energy Board (NEB)—which regulates the export of natural gas, oil and natural gas liquids—to export liquefied natural gas from coastal BC. If the NEB approved the export application, sharp increases in gas drilling and fracking could be expected in the Horn River Basin. With that expansion, FNFN members knew, would come corresponding increases in the number of roads, seismic lines, water pipelines, pipeline corridors, compressor stations, water pits, wastewater containment ponds, gas processing plants and frack sand mines. Those developments and more might have deleterious consequences on the availability and quality of the water in the region.

Appearing before the NEB panel, FNFN leaders noted how increased gas industry activities “may result in significant harm to freshwater and groundwater resources, delicately balanced muskew ecosystems, and wildlife habitat and populations,” thereby harming the “traditional way of life” of FNFN members as well as creating “economic hardship” for individuals and the community.¹⁴

In its decision and in response to concerns raised by the FNFN and others, the NEB wrote: “Even if there were a necessary connection between the gas export licence and Apache's and EOG's

It was subsequently discovered that the pumps and pipes had been set up in such a way that water could be diverted past the water meters so that no one knew the true extent of the water being used.

11 Seismic lines are long, linear cuts through forests that may run for many kilometres. Once the trees have been cut, the lines are used to conduct below-ground tests that assess the potential for hydrocarbons.

12 Ben Parfitt, “Fracture Lines: Will Canada's Water Be Protected in the Rush to Develop Shale Gas?” (conference paper presented to the Program on Water Issues, Munk School of Global Affairs, University of Toronto, September 15, 2010), http://munkschool.utoronto.ca/wp-content/uploads/2012/07/Parfitt_FractureLines_POWI_2010.pdf.

13 Ibid.

14 National Energy Board, *Reasons for Decision: KM LNG General Partnership, GH-1-2011. LNG Export*. October 2011, http://publications.gc.ca/collections/collection_2011/one-neb/NE22-1-2011-4-eng.pdf.

upstream gas development in northeastern British Columbia (which the Board does not find on the facts of this Application), the Board recognizes that the Province of British Columbia regulates upstream oil and gas development in that area... The Board is satisfied that there is a comprehensive regulatory and environmental assessment scheme that will consider environmental and socio-economic effects related to development in the Horn River Basin.”¹⁵

In October 2011, just 10 months after receiving the application, the NEB granted Apache, Encana Corporation and EOG Resources their request to export LNG from the province.¹⁶ This approval marked a pivotal point in the FNFN’s relations with federal and provincial government regulators and the gas industry. It also coincided with a change in approach by natural gas companies when it came to accessing water resources in the region.

Companies were required to request permits for short-term water use from the OGC, but Fort Nelson First Nation members were never sent copies of the permits granted to energy companies operating on their traditional lands.

Up to that point, most of the water use by the industry throughout northeastern BC had been poorly tracked and only vaguely understood. Companies were required to request permits for short-term water use from the OGC, but Fort Nelson First Nation members were never sent copies of the permits granted to energy companies operating on their traditional lands. Consequently, they had no means of consenting to such permits being issued or of independently verifying industry water use and its impacts on sensitive terrestrial and aquatic environments. Only after the Nation began filing requests for information with the OGC did the agency issue a list of the short-term water withdrawal approvals it had granted. The list showed that dozens of such permits had been awarded each year, allowing companies to withdraw water from hundreds of different streams, rivers and lakes.

The authorizations, known as Section 8 permits, had a maximum duration of one year at the time (the period has now been extended to two years) and provided access to most of the water used by Progress Energy, Encana, Talisman Energy, Shell, Chevron, Nexen, Apache and other companies drilling and fracking for natural gas in northeastern BC. But as the FNFN soon discovered, many of the same companies had also applied for much larger volumes of water under far more secure, renewable water licences that would have lasting consequences for the region’s delicately balanced ecosystems. Companies servicing the natural gas industry¹⁷ were also applying for rights of access to other natural resources on treaty lands, including mining companies that wanted to excavate the large quantities of sand needed in the fracking process.¹⁸

Alarmed at the scale of the industry’s fracking plans and at the speed with which the OGC and other government agencies approved them, the FNFN launched and later won legal reviews against the province. Two victories, in particular, underscored the need for new consultation and co-management regimes that give First Nations more say on the scale of industrial developments

15 Ibid.

16 The NEB is currently undergoing a review, with an aim to “modernizing” what the agency does. In November 2016, the NEB’s chair and chief executive officer, Peter Watson, portrayed the agency’s rulings as seeking to balance “environmental, social and economic interests.” He explained: “Through the hearing process, the Board is able to consider socio-economic, safety and environmental factors and integrate them into its overall recommendation as to whether a particular project is in the public interest . . . This integrated review process, that includes environmental assessments, allows for a public interest determination which includes a comprehensive assessment of safety, technical, environmental, societal and economic interests. Public interest decisions cannot be made in the absence of an environmental assessment.” Recommendation 2 of this report proposes that the Canadian Environmental Assessment Agency, not the NEB, be tasked with assessing and approving major energy industry projects.

17 Fort Nelson First Nation v. British Columbia (Environmental Assessment Office), [2015] BCSC 1180. This case involved Chief Liz Logan in her own right on behalf of the Members of the Fort Nelson First Nation (the petitioners) and Executive Director of the British Columbia Environmental Assessment Office, Canadian Silica Industries Inc. and Jeffrey Bond (the respondents).

18 Fine-grained sands known as “propants” are pressure-pumped down gas wellbores during the fracking process to prop up the fractured rock, allowing the trapped gases to flow out.

on their traditional lands and the rate at which they proceed. The National Energy Board may have had confidence in BC's "comprehensive" regulation of the energy industry as it chased after water and other critically important natural resources. The province's courts and tribunals, however, took a somewhat different view.

The Province says yes. The courts/tribunal say no.

In two separate and successful legal actions initiated by the Fort Nelson First Nation, the courts overturned provincial government decisions that paved the way for significant increases in fracking-related activities in FNFN territory.

IN TWO SEPARATE AND SUCCESSFUL LEGAL ACTIONS initiated by the Fort Nelson First Nation, the courts overturned provincial government decisions that paved the way for significant increases in fracking-related activities in FNFN territory. In the first instance, the FNFN challenged a decision by BC's Environmental Assessment Office (EAO) to exempt a mining company's plans from a more rigorous provincial environmental review. In the second, the Nation challenged a provincial government decision to grant a natural gas company long-term rights of access to large volumes of freshwater used in the fracking process. Both decisions point to the need for more robust, pre-planning processes, especially where the future health of water resources is concerned.

In the first instance, in which the FNFN challenged the EAO's decision in BC Supreme Court, the case hinged on whether the assessment office had acted properly in exempting Canadian Silica Industries Inc. from a provincial environmental assessment review process. The company had proposed operating not one but up to six open-pit mines within FNFN territory. The company intended to excavate large quantities of fine-grain sand from the mine sites and to sell the sand to companies for use in fracking operations.

Lawyers acting for the First Nation noted that the first of the proposed mines lay along a trapline held by FNFN families, and that the scale of development at the mine site would be more than "three times the maximum density" permitted under a special land use plan that had been prepared by the FNFN Lands Department and subsequently endorsed by its members. The plan was intended to protect lands and resources while also identifying areas where industrial developments could occur.¹⁹ In July 2015, the Supreme Court ruled that the EAO's decision to exempt the mining project from review was "unreasonable" and that the government had "failed" to properly consult with the First Nation about the proposed project.²⁰ The judge ordered that the EAO's decision be set aside. The provincial government has challenged the decision, and it is now before the province's highest court—the Court of Appeal.

¹⁹ Fort Nelson First Nation v. British Columbia (Environmental Assessment Office), [2015] BCSC 1180.

²⁰ Ibid.

In the second case, the FNFN asked BC's Environmental Appeal Board to overturn a decision by the Ministry of Forests, Lands and Natural Resource Operations (FLNRO)²¹ to grant the natural gas company, Nexen, a water licence giving it access to water from the Tsea Lakes system. Water withdrawn under the licence was to be used in the company's fracking operations.

The Nation's lawyers argued that the BC government's decision to grant Nexen a water licence was "flawed," that serious environmental harm could result from the high volumes of water to be withdrawn under the licence and that the province had failed to properly consult with the FNFN prior to issuing the licence, the first of its kind in the Nation's territory. The provincial government and Nexen acknowledged that consultations had been limited. However, they argued that the level of consultation was reasonable or "adequate" under the circumstances. Because "no significant adverse environmental effects" were associated with the proposed water licence, the company and provincial government claimed, there was no need for a particularly detailed consultation process with the First Nation.²² After reviewing the voluminous information before it, the EAB reached a far different conclusion.

The Board stated there was good reason to believe that Nexen's proposed water withdrawals could, indeed, have serious environmental impacts. For one, the maximum amount of water that the company proposed to withdraw from the Tsea Lakes system was twice what the waterways could reasonably sustain during low-water or drought years. Evidence reviewed by the appeal board showed that during one 45-day period in 2012, Nexen had withdrawn nearly 183,000 cubic metres of water from North Tsea Lake during a time of "significant drought" across north-eastern BC when the OGC had ordered companies to suspend their water withdrawals because of the extremely dry conditions.

The OGC's hydrologist, Allan Chapman, subsequently reported the region's rivers "reaching extremely low levels" by the end of that spring.²³ In fact, because of Nexen's withdrawals, the water level of North Tsea Lake dropped by nearly half a metre, or one-third of the shallow lake's total depth. This decrease in the water level was nearly five times greater than the maximum that the company was allowed and resulted in extensive damage to shoreline plant life. In a revealing assessment of the events at the lake, Chapman later concluded that the most plausible explanation for why Nexen eventually halted its water withdrawals was not because it suddenly recognized its actions had severely depleted the lake but because it had completed its fracking operations in the immediate vicinity and it no longer needed the water.²⁴

The Board also heard evidence that a computer model called the Northeast Water Tool, or NEWT, which the OGC used to make water allocation decisions and which Nexen had partly relied on to make its water licence application, was flawed. And because the NEWT was flawed, the

Because of Nexen's withdrawals, the water level of North Tsea Lake dropped by nearly half a metre, or one-third of the shallow lake's total depth. This decrease in the water level was nearly five times greater than the maximum that the company was allowed and resulted in extensive damage to shoreline plant life.

21 Responsibility for granting water licences to oil and gas companies was subsequently transferred from the Ministry of Forests, Lands and Natural Resource Operations to the Oil and Gas Commission.

22 BC Environmental Appeal Board, Decision no. 2012-WAT-013(c) between Chief Sharleen Gale in her own right and on behalf of the members of the Fort Nelson First Nation and Assistant Regional Water Manager and Nexen Inc. and EOG Resources Canada Inc. and Devon Canada Corporation, September 2015, <http://www.eab.gov.bc.ca/water/2012wat013c.pdf>.

23 Allan Chapman, Letter to Stephanie Haight, Senior Water Stewardship Officer, Ministry of Forests, Lands and Natural Resource Operations, January 21, 2013.

24 Ibid. Chapman noted: "Information provided to the Oil and Gas Commission through the FracFocus (www.fracfocus.ca) reporting requirements shows that Nexen completed and hydraulic fractured 18 wells in their Dilly Lease, ending on August 24, 2012, using a total of 869,913 cubic metres of water... The majority of this water appears to have been acquired from North Tsea Lake, based on Nexen's reporting of water withdrawals from the lake of 715,197 cubic metres from May 4, to August 25, 2012... One can hypothesize that Nexen stopping (sic.) pumping from North Tsea Lake simply because they no longer needed the water, rather than because they now recognized the flow was zero."

“BC now needs to pay attention and needs to start looking at critical environmental values throughout all of our territories — not just my territory or the other neighbouring territories, but all of British Columbia”
—Fort Nelson First Nation Chief Liz Logan

Board noted, there was “no way of knowing the accuracy of [its] results.” The Board cancelled the water licence, ruling that the FNFN had not been adequately consulted and that there was compelling evidence that water withdrawals under Nexen’s proposed plans could have adverse environmental impacts.

“I think it’s going to set a precedent,” FNFN Chief Liz Logan said following the ruling. “BC now needs to pay attention and needs to start looking at critical environmental values throughout all of our territories — not just my territory or the other neighbouring territories, but all of British Columbia... They need to have the proper science, they need to have facts they rely on. They need to have experts they rely on. They just can’t arbitrarily make a decision because of industry’s request.”²⁵

Following an investigation by BC’s Conservation Officer Service, which is responsible for enforcing many of the province’s environmental laws, Nexen subsequently pleaded guilty and paid a \$75,000 fine for violating the terms of its Tsea Lakes water licence. Lana Lowe, FNFN’s lands manager, called the fine a “slap on the wrist” and of little consequence in addressing the broader challenges of water management within the Nation’s territory. “There’s very limited water monitoring and there’s still no water management planning happening in our territories and that’s something we want to do with BC,” Lowe said following Nexen’s guilty plea in November 2015.²⁶

25 Gordon Hoekstra, “Fort Nelson First Nation wins ruling against Nexen: Water licence for fracking operation cancelled,” *PostMedia News*, September 8, 2015, <http://news.nationalpost.com/news/world/fort-nelson-first-nation-wins-ruling-against-nexen-water-licence-for-fracking-operation-cancelled>.

26 Mike Hager, “Nexen fine for taking water from BC lake a ‘slap on the wrist’,” *The Globe and Mail*, November 26, 2015, <https://www.theglobeandmail.com/news/british-columbia/nexen-fine-for-taking-water-from-bc-lake-a-slap-on-the-wrist/article27504995/>.

Moving beyond a death by a thousand cuts

FOR MOST FIRST NATIONS, THE TYPICAL WORKDAY BEGINS with the arrival of a new batch of development applications from the Oil and Gas Commission, Ministry of Forests, Lands and Natural Resource Operations or other government offices. Usually, these documents—some of which come by courier and run to several hundreds of pages—are copies of company applications that the government may seek comment on before approving. In 2014 alone, personnel at the Fort Nelson First Nation Lands Department received 1,000 such referrals, an average of slightly more than four per working day. This relentless stream of applications places predictable strains on First Nations resources.

Not only must First Nations try to respond strategically and proactively to the many applications, they must also try to control events on the land itself—gas-drilling and fracking operations, logging, mining and hydroelectric developments—that negatively impact or eliminate opportunities to hunt, fish and gather plants over vast swaths of Treaty 8 land. In other words, they must ensure that the terms of the agreement, which guarantee First Nations access to this land for their traditional practices, are respected.

In March 2015, the Blueberry River First Nations filed a potentially precedent-setting lawsuit in which it sought damages from the province for the cumulative impacts to Treaty 8 lands caused by various resource industry activities approved by the government. Like the FNFN, the Blueberry River First Nations are a signatory to Treaty 8, though their traditional territory is to the south of the FNFN's. Filed in BC Supreme Court, the Blueberry River First Nations' civil claim notes that in signing Treaty 8 the Crown acknowledged that it was in both parties' interest that First Nations "be able to carry on their traditional and economic activities so as to maintain themselves productively, in good health and well-being, and so as not to become dependent on the Crown." The claim alleges that instead of "furthering and protecting" the First Nation's interests, the provincial government "consistently made choices to undertake or allow land alienation, resource extraction and industrial activities in the traditional territories upon which the Nations' culture, economy and Treaty rights depend. These activities have damaged the forests, lands, waters, fish and wildlife that are integral to the Nations' mode of life, and upon which the Nations rely. Rather than protecting the Blueberry River First Nations' mode of life, these Crown choices have contributed significantly to an impoverishment of it."²⁷

Not only must First Nations try to respond strategically and proactively to the many applications, they must also try to control events on the land itself that negatively impact or eliminate opportunities to hunt, fish and gather plants over vast swaths of Treaty 8 land.

²⁷ Yahey v. British Columbia, [2015] BCSC 1302.

Regardless of the outcome of the civil action, which may ultimately take years to resolve, mounting evidence suggests that First Nations lands and resources are being systematically degraded, suffering a death by a thousand cuts. Current planning and consultation processes are clearly lacking, as the Auditor General of BC noted in a report released in May 2015. That report was sharply critical of the province's lack of cumulative effects planning, especially as it applies to natural resource industry developments approved by the province's Ministry of Forests, Lands and Natural Resources Operations. It states: "We found that neither legislation nor other government directives explicitly requires this ministry, or any other government ministry or agency, to manage cumulative effects when authorizing the use of natural resources. And current legislation and directives do not effectively support the management of cumulative effects across all of BC's natural resource sector ministries and agencies. Each body operates under its own mandate and, therefore, may undertake its decisions and activities without considering the impacts on, or by, other sectors."²⁸

Mounting evidence suggests that First Nations lands and resources are being systematically degraded, suffering a death by a thousand cuts.

In other words, whether it's the OGC issuing a water licence to a gas company or the FLNRO issuing a cutting permit to a logging company, the same conditions apply. Neither agency takes into account all of its approvals nor the approvals of other agencies when making decisions that can have lasting, negative consequences for the landscapes and resources to which First Nations enjoy treaty-protected and constitutionally protected rights. Furthermore, current land-use planning processes do not provide meaningful opportunities for First Nation members, many of whom live closest to where resource industries operate, to provide input. As a result, First Nations are frustrated by their inability to shape the rate and scale of industrial developments on their traditional lands. First Nations themselves have been saying for some time that they want to be included in the decision-making, especially when multiple developments will impact the most precious of all natural resources—water.

This report proposes 10 recommendations to help reduce the negative impacts that numerous energy industry developments place on water resources on First Nations treaty land. In some cases, these recommendations build on those made by the Fort Nelson First Nation, whose territory overlays the Horn River Basin, where the most water-intensive fracking operations have taken place. In other cases, they draw on the experiences of other First Nations that have achieved breakthroughs in managing natural resources within their territories. They are also informed by ideas gleaned from First Nations leaders, and legal and hydrological experts.

28 Auditor General of British Columbia, *Managing the Cumulative Effects of Natural Resource Development in B.C.* (Victoria: Office of the Auditor General of British Columbia, May 2015), <http://www.bcauditor.com/sites/default/files/publications/reports/OAGBC%20Cumulative%20Effects%20FINAL.pdf>.

New directions

Recommendation 1: Create new co-management or co-governance agreements with First Nations and empower them to develop new water sustainability plans.

After decades of protest and negotiation, co-management regimes are in place on Haida Gwaii. Members of the Haida Nation have long been at the forefront of efforts to conserve parts of the archipelago from industrial developments and have worked hard with members of the islands' non-Indigenous communities to ensure a greater, more meaningful say in how the region's forests are managed.

The rise of co-management regimes on the islands has its roots in the protests against, and ultimately the blockading of, logging activities on the southern islands of the archipelago. In 1993, the federal government and the Council of the Haida Nation reached an agreement stating that Gwaii Haanas—the park created in response to the protests—would be covered by a new agreement in which the reserve and Haida heritage site was co-managed, with an emphasis on protecting Aboriginal rights, including allowances for the Haida to hunt and fish in the park.²⁹

A decade after that landmark decision, the Haida Nation won an important legal victory when the Supreme Court of Canada ruled that the provincial government had not adequately addressed the First Nation's interests when it allowed a large tree farm licence on the archipelago to be transferred from one company to another.³⁰ That decision was the catalyst for a new management council consisting of two Haida members and two provincial government employees, with a chairperson jointly approved by both parties.³¹

With the creation of a new Water Sustainability Act in BC, a golden opportunity exists for the provincial government to embrace the concept of co-management more broadly. Members of both the University of Victoria's POLIS Project on Ecological Governance and the university's Environmental Law Centre (ELC) note that this legislation opens the door for new governance models.

With the creation of a new Water Sustainability Act in BC, a golden opportunity exists for the provincial government to embrace the concept of co-management more broadly.

29 Louise Takeda, "War in the Woods: 1974–2001," in *Islands' Spirit Rising: Reclaiming the Forests of Haida Gwaii* (Vancouver: UBC Press, 2015).

30 *Haida Nation v. British Columbia (Minister of Forests)*, [2004] 3 SCR 511.

31 *Kunst'aa Guu—Kunst'aayah Reconciliation Protocol, 2009*, between the Haida Nation and Her Majesty The Queen in Right of the Province of British Columbia.

The act contemplates the possibility of shared and delegated decision-making, which offers significant opportunity for improved partnerships, co-governance with First Nations, and innovative decision-making.

This potential must be fulfilled by government committing to completing three water sustainability plans and piloting innovative watershed governance arrangements within the first five years of the act coming into force.³²

Given how much water the energy industry is withdrawing in the Horn River Basin, the Fort Nelson area—and the Fort Nelson First Nation—would be a strong candidate for one of the three pilot studies. The Nation has already invested in special land-use designations on its territory. It has clearly signalled to the province and the natural gas industry that the status quo is unacceptable. And recent decisions by provincial courts and tribunals have affirmed that belief.

Recommendation 2: Direct the Canadian Environmental Assessment Agency, not the National Energy Board, to conduct environmental assessments of pipeline projects.

Interprovincial and international pipeline projects typically have big ecological footprints, with environmental impacts that are more severe in some places and less so in others. For that reason, they should be subject to review by the appropriate federal government department. That responsibility properly rests with the Canadian Environmental Assessment Agency (CEAA).

Here's why. A pipeline carrying natural gas from northeastern British Columbia to a proposed liquefied natural gas facility on the coast will have varying environmental impacts depending on what infrastructure and natural resources are looked at and where. Many of the impacts will have implications for navigable waters, fisheries resources and in some cases trans-boundary waters, all of which are federal responsibilities.

At the upstream end of the pipeline where companies drill and frack for gas, the impacts on surrounding waters and lands are of immediate concern. At the downstream end where the LNG plant is located, the focus is more on air quality, fisheries resources, public health and marine safety. In between are site-specific concerns at points along the pipeline corridor; for example, at stream and river crossings. And all along the proposed pipeline corridor, including at both ends, are concerns about increased greenhouse gas emissions and their contribution to climate change.

Under Prime Minister Stephen Harper and his Conservative government, federal responsibility for conducting environmental assessments on interprovincial and international pipeline projects passed from joint review by the National Energy Board and the Canadian Environmental Assessment Agency to review by the NEB alone. The proposed Enbridge Northern Gateway pipeline became the last project to receive a joint environmental assessment. This change, which took effect in 2012, sent the signal that such energy projects would be only narrowly assessed and that a project's impacts on domestic energy security would come ahead of any environmental considerations.

Chris Tollefson, a law professor at the University of Victoria, believes that today's pressing climate concerns demand that the Canadian Environmental Assessment Agency "should lead the environmental review of major new pipelines, currently a job solely entrusted to the National

A pipeline carrying natural gas from northeastern British Columbia to a proposed liquefied natural gas facility on the coast will have varying environmental impacts depending on what infrastructure and natural resources are looked at and where.

³² Oliver Brandes et al., "Awash with Opportunity," *WaterCanada* (January/February 2016).

Energy Board.”³³ The same could be said of a project’s impacts on critically important water resources. Environmental reviews of projects that have significant impacts on water resources are properly the domain of environmental, not energy industry regulators. The bottom line is that responsibility for conducting such reviews should be with the federal environmental regulator.

Recommendation 3: Include the cumulative impacts on water resources in federal and provincial reviews of proposed major energy industry projects.

Both BC’s and Canada’s Environmental Assessment Acts provide opportunities to assess proposed major projects. BC’s legislation also allows for a “strategic economic and environmental assessment” of proposed developments, while federal legislation allows for broader regional studies, says the University of Victoria’s Environmental Law Centre.

In 2013, the ELC requested that the Ministers of Environment for Canada, then Leona Aglukkaq, and for BC, Mary Polak, conduct a broader strategic assessment of proposed liquefied natural gas developments in the province. At the time, there were a dozen separate proposals to build LNG plants in BC. The ELC report noted that existing provincial and federal assessments were wholly inadequate in the face of numerous, simultaneous proposals. “Unfortunately... each proposal is being developed and environmentally assessed in isolation from the other,” the ELC noted. “Government—and the public—are responding ad hoc to each individual proposal as it is filed. No environmental assessments will be done on the thousands of gas wells. Assessments (of varying levels of rigour) will proceed on individual LNG and pipeline projects—but there is no comprehensive assessment of the overall development being proposed.”³⁴

That report accompanying a letter to the federal and provincial environment ministers noted the pressing need for a broad strategic assessment of the gas industry’s numerous LNG proposals, which would mean huge increases in gas drilling and fracking. The report noted, in particular, concerns about industry impacts on water quantity and quality saying: “Massive water withdrawals from northeastern BC’s surface and groundwater resources could diminish drinking water and hydroelectricity sources. Watershed ecosystems could be disrupted, impacting wildlife habitat and humans who eat wildlife.”³⁵

Ad hoc reviews of proposed energy projects ensure that the true environmental threats posed by natural gas industry developments are never adequately addressed. Broad, strategic assessments of proposed energy developments and government energy policies should be a prerequisite before assessments of individual projects occur.

Such assessments would, by their very nature, consider how many gas wells would be required to meet the production needs of proposed LNG plants, where those wells would likely be located, where the water needed to frack the gas wells would come from, where the toxic wastewater would likely be disposed and whether or not the landscape to be drilled and fracked could sustain such activities without compromising water quality and quantity and other ecological impacts.

Ad hoc reviews of proposed energy projects ensure that the true environmental threats posed by natural gas industry developments are never adequately addressed.

33 Chris Tollefson, in conversation with the author, 2016.

34 Environmental Law Centre at the University of Victoria, Letter to The Honourable Leona Aglukkaq, Minister of Environment and Member of Parliament for Nunavut, and The Honourable Mary Polak, Minister of Environment, Province of British Columbia, August 2013.

35 Ibid.

Recommendation 4: Set maximum allowable natural gas extraction limits on a watershed-by-watershed basis.

British Columbia's forest industry has long been governed by rules that limit the number of trees that can be logged in geographically defined areas. The provincial government exercises powers to set "allowable annual cuts" in regions throughout BC. Before final decisions are made, the government publishes documents outlining its intended direction and public input is solicited. Timber supply review (TSR) processes are also ongoing, meaning that as on-the-ground realities change in various regions or districts new decisions are reached as to how much may be logged.

A similar approach is long overdue when it comes to governing how the province's finite fossil fuel resources are exploited, particularly in light of climate change. Setting limits on natural gas extraction rates on a watershed-by-watershed basis would also provide far greater protection to our shared, irreplaceable water resources.

In past years and decades, the government has approved logging increases in response to natural events such as wildfires, insect attacks and disease outbreaks.³⁶ Rates of logging have also been lowered—sometimes dramatically so—in response to evidence that certain forests have been logged too intensively. And calls for increased conservation have led to declines in the logging rates in a few forests. For example, in February 2016 a deal was reached to protect significant tracts of the Great Bear Rainforest (GBR) on BC's central and north coasts and to allow logging in other parts of the region.

BC Premier Christy Clark praised First Nations, environmental leaders, forest companies and government employees for working together to reach that deal, saying: "You did it... It is proof of the strength of what we could do if we decide to find common purpose."³⁷ The premier has taken a far different tack, however, with First Nations and their supporters who object to a massive LNG plant proposed for Prince Rupert over concerns about the impacts that this development will have on marine resources. The premier characterizes these opponents as "the forces of no."³⁸

Such inconsistencies send a wrong signal to the people of the province as a whole and to First Nations in particular. All natural resources, particularly water resources, are finite and must be managed with that idea in mind. Evidence abounds that when this reality is ignored, the result is lasting social and environmental harm.

At this time, rules that limit the exploitation of natural renewable resources such as fish and timber do not apply to fossil fuels. Fossil fuel developments in BC occur almost exclusively in the northeast of the province, and of all the natural resource industry activities in the region, fossil fuel extraction has by far the largest ecological footprint. To ensure that water resources are not overdrawn and placed at undue risk of contamination, limits should be placed on fossil fuel extraction rates. The boundaries of large individual watersheds or those of wider drainages should be used to set site-specific limits on extraction rates. Placing limits on natural gas extraction rates is one of the most effective ways to control water withdrawals and limit water contamination in watersheds and would significantly increase efforts to protect ecosystems.

36 Ben Parfitt, *Battling the Beetle: Taking Action to Restore British Columbia's Interior Forests* (Vancouver: Canadian Centre for Policy Alternatives, July 2005), https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC_Office_Pubs/bc_2005/pinebeetle.pdf.

37 Elizabeth McSheffrey, "Premier Clark announces landmark Great Bear Rainforest agreement," National Observer, February 1, 2016, <http://www.nationalobserver.com/2016/02/01/news/premier-clark-announces-landmark-great-bear-rainforest-agreement>.

38 Dirk Meissner, "BC Premier Christy Clark strikes back at LNG opponents," *The Canadian Press*, January 26, 2016.

At this time, rules that limit the exploitation of natural renewable resources such as fish and timber do not apply to fossil fuels.

Recommendation 5: Require fossil fuel companies to say well in advance where and when they will drill and frack, what water sources they will draw from and how much water they will use.

Forest companies operating in BC were once required by law to say where they would log and to hold public meetings to hear feedback on their plans. No historic or present-day corollary exists in the fossil fuel industry. Instead, First Nations communities typically learn about energy industry developments on an ad hoc basis.

On a given day, a First Nation might receive notice from the OGC that Encana has applied for a temporary water-use permit on a local river, that Petronas has applied to excavate a large borrow pit to store water pumped from a local lake, that Chevron has applied to clear a patch of forest for a gas well pad, and that Shell has applied to build a new compressor station. All of these proposals might arrive separately, yet all of them might occur within a single watershed. It is easy to see how this fragmented, incremental process complicates efforts to protect the environment and how it results in repeated violations—either in law or in spirit—of the Crown’s fiduciary duty to consult with First Nations. If First Nations only learn of projects one at a time, they cannot analyze what the impacts of a company’s operations will be over space and time, let alone assess the impacts associated with many companies operating in the same general geographical area. The limited number of staff and budgets that many First Nations have only exacerbate the problem.

Knowledge is power, and being armed with the right knowledge at the right time is the most powerful tool of all. To ensure that the Crown meets its legal obligations to properly consult with First Nations, to ensure that First Nations and rural communities have sufficient opportunity to help shape the pace and scale of developments, and to ensure that the least possible damage is done to shared water resources, fossil fuel companies must be required by law to file 20-year development plans with all relevant provincial and federal government agencies as well as with local and regional governments and First Nations. These plans must be approved by First Nations and be reassessed and updated every five years to reflect changing circumstances.

The requirement to submit such plans would help bring an end to the “death by a thousand cuts” phenomenon, in which lands and waters are progressively degraded by one development after another until local communities realize—too late—that the damage has been done. By that point, it cannot be easily undone, and often cannot be undone at all.

Recommendation 6: Zone drill-free and frack-free zones before developments occur.

When he signed the Great Bear Rainforest Order in 2016, BC’s Minister of Forests, Lands and Natural Resource Operations Steve Thomson formalized the protection of a “natural forest” covering nearly 3.2 million hectares, and created a legally defined “managed forest” within which forest companies can log and extract up to 2.5 million cubic metres of timber per year.³⁹ Similar arrangements exist on Haida Gwaii, where the Haida Nation successfully negotiated with forest companies and the provincial government to dramatically reduce logging rates on the archipelago. That process also resulted in increases to forest conservation.

If First Nations only learn of projects one at a time, they cannot analyze what the impacts of a company’s operations will be over time, let alone assess the impacts associated with many companies operating in the same general geographical area.

³⁹ British Columbia Minister of Forests, Lands and Natural Resource Operations, Great Bear Rainforest Order, January 21, 2016, https://www.for.gov.bc.ca/tasb/slrp/lrmp/nanaimo/CLUDI/GBR/Orders/GBR_LUO_Signed_29Jan2016.pdf.

In cities across the province and around the world, legislators use zoning bylaws to reduce noisy industrial activities near schools. And they employ zoning bylaws to create high-density neighbourhoods and transportation corridors. Similarly, zoning can be applied to protect water resources by requiring land-use plans to identify areas of primary importance for water conservation and then ruling such areas off limits to industrial development. For example, to ensure that First Nations can carry out their constitutionally protected and treaty-protected rights to hunt, fish and gather, areas can be zoned off limits to oil and gas industry drilling and fracking operations. Other areas might be zoned to allow for some level of industrial activity based on strict limits on how much water could be withdrawn from specific sources at specific times.

The concept of zoning is well understood by members of the Fort Nelson First Nation. In documents filed in court challenging the provincial government decision to exempt a company's mining plans from rigorous environmental review, the First Nation noted that the first of the company's six proposed mines lay within both in a trapline area that is actively used by its members and within a "special management zone." The First Nation had even identified and shared this information with provincial government regulators and resource industries in its strategic land use plan.

Recommendation 7: Protect groundwater.

In 2014, when the BC government introduced a new Water Sustainability Act for the province, it indicated that for the first time commercial and industrial groundwater use would be licensed and priced. Groundwater typically refers to water that begins at the earth's surface and percolates through, or flows from, the ground. Less well appreciated is that groundwater sources also feed surface waters such as rivers and lakes.

In 2013, the Canadian government provided information about its ongoing efforts to evaluate 30 important groundwater bodies known as aquifers, most of which were in southern regions of the country and supply water for large numbers of people. The report found that by the end of 2014, the government expected to have completed assessments on 19 of the targeted aquifers, with an estimated completion date of 2025 for all 30 aquifers. However, this initiative is of no benefit to First Nations and rural communities in northeastern BC because no aquifers in the region are targeted for study. Indeed, in many cases, aquifers in the more northerly regions of Western Canada where the bulk of the country's fossil fuel resources are found have never been mapped or assessed.⁴⁰

Monitoring groundwater flows is essential for sound water management. It is therefore time for the provincial government to step in with clear plans to augment federal groundwater studies. Funds must be invested to drill a series of test wells that can accurately monitor groundwater flows in key watersheds. Emphasis should be placed on watersheds that are likely to be the focus of fossil fuel extraction in future years. Provincial regulators and local communities, including First Nations, need this information to more effectively manage industrial activities in these watersheds.

More must also be done to monitor natural gas company operations to ensure that groundwater resources are protected from contamination. Documented water contamination has already occurred in northeastern BC as a result of highly toxic wastewater from the fracking process escaping from lined containment ponds and leaching into the ground.⁴¹ Methane can also leak from fracked gas wells and contaminate groundwater.⁴²

Monitoring groundwater flows is essential for sound water management. It is therefore time for the provincial government to step in with clear plans to augment federal groundwater studies.

40 Parfitt, "Fracture Lines: Will Canada's Water Be Protected in the Rush to Develop Shale Gas?," 2010.

41 Parfitt, "Toxic landslides into the Peace River continue, add to fears about impacts of Site C and fracking," 2016.

42 Nikiforuk, *Slick Water*, 2015.

Recommendation 8: Increase industrial water-use fees and direct added revenues to new co-management water committees.

Effective water planning requires substantial investments to track and understand changes over time and space using such strategies as multi-year water-flow studies. Industries that use large volumes of water should be required to cover at least part of the costs of doing those studies.

While the provincial government has increased the rates it charges large industrial water users, these rates remain low compared to fees in the rest of Canada, and particularly around the world. Increasing these fees would provide more money to fund much-needed baseline studies and would also send a strong signal to large water users that is in their interest to upgrade existing infrastructure or invest in new infrastructure and operating procedures that conserve water resources.

Currently, companies drilling and fracking for natural gas in northeastern BC pay as little as \$1,800 for all of the water they use at one gas well pad, where many wells may be located. In the Horn River Basin in Fort Nelson First Nation territory, such a rental rate works out to fracking companies paying the province just \$46 for every Olympic-sized swimming pool's worth of water consumed.⁴³ Much more money should be charged when such large volumes of water are used, and especially when that water is rendered highly toxic and lost to the hydrological cycle forever. Such a source of funds could help local First Nations complete new water management plans and underwrite the operating costs of new co-management arrangements with the province (see Recommendation 1).

In the Horn River Basin in Fort Nelson First Nation territory, the rental rate works out to fracking companies paying the province just \$46 for every Olympic-sized swimming pool's worth of water consumed.

Increases to the water rental fee should also be high enough to partially fund more monitoring and enforcement efforts as well as to build and maintain a comprehensive water-use database that is made available to the public. This recommendation was made in a previous report jointly published by the Canadian Centre for Policy Alternatives and the Water Sustainability Project, an initiative of the University of Victoria's POLIS Project on Ecological Governance.⁴⁴ These fee increases should also be used to fund studies on healthy water flows or "environmental flows" in various watersheds.

Recommendation 9: Protect environmental flows.

The recent droughts in northeastern BC and elsewhere in the province highlight one of the most pressing challenges for water managers: the fluctuation in water levels from year to year.

Deborah Curran, a lawyer at the University of Victoria's Environmental Law Centre, believes that companies using large volumes of water should be required to invest in studies that show the minimum requirements to keep surface water systems healthy. Once such studies have been done and environmental flow regimes established, companies would be allowed to withdraw water only down to the safe threshold level.

Curran is among a number of experts who believe the province's new Water Sustainability Act holds promise in this regard. As she says, "Environmental flow regimes provide the foundation for healthy and functioning aquatic ecosystems and the human communities that depend on these ecosystems. The act adds a host of new ways to protect environmental flow regimes, including the

43 BC Ministry of Environment, table of current and 2016 water rentals for a range of typical uses, February 2015, http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/water-rights/water_pricing-selected-users_feb_2015.pdf.

44 Ben Parfitt, *Counting Every Drop: The Case for Water Reporting in BC* (Vancouver: Canadian Centre for Policy Alternatives, June 2013), https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office/2013/06/CCPA-BC_POLIS_Counting-Every-Drop.pdf.

requirement for decision-makers to consider the environmental flow needs of streams in licence decisions.”⁴⁵ Companies granted long-term rights of access to water resources should gain those rights, Curran and others argue, only when the proper studies have been done upfront, and when the government has the powers to monitor and intervene to protect environmental flows when there is evidence that those flows have been placed at risk.

Recommendation 10: Place one provincial authority in charge of all water allocations.

To ensure that assessments of the cumulative effects are taken seriously — that different industrial impacts on water resources are considered together, not separately — the province should place one authority in charge of all water authorizations.

British Columbia’s oil and gas industry has its own dedicated regulator, the OGC. The provincial government created the OGC to oversee the speedy, coordinated review and approval of oil and gas company applications. As such, the OGC was granted powers that had once been the domain of provincial ministries such as the Ministry of Environment and Ministry of Forests, Lands and Natural Resource Operations. For example, the OGC can now issue both short-term water permits and long-term water licences to energy companies.

Energy companies are the only entities in the province that gain rights of access to water from their own dedicated regulator. Fairly or unfairly, this situation creates the impression of special treatment. To ensure that assessments of the cumulative effects are taken seriously—that different industrial impacts on water resources are considered together, not separately—the province should place one authority in charge of all water authorizations. This single agency should have broad powers to ensure that environmental flows are protected and to issue both short-term water permits and longer-term water licences such that water levels are not compromised by too many authorizations for withdrawal. A single agency would also make it much easier for those people and communities on whom industrial water use has the most direct impacts—First Nations, in particular—to work with the province to strengthen water management regimes in their territories.

45 Brandes et al., “Awash with Opportunity,” 2016.

Conclusion

THE FOSSIL FUEL INDUSTRY'S USE OF WATER poses significant challenges for First Nations and rural communities in the northeast of the province where BC's natural gas resources are most abundant. Many of those challenges can be addressed if reforms are made to the speed and timing with which non-renewable fossil fuel resources are exploited.

To date, the BC government has done a poor job of addressing the cumulative effects of resource industry activities more generally and fossil fuel industry activities more specifically on First Nation lands. The province's Auditor General has independently concluded this is the case and has flagged the need for fundamental reforms.

Healthy water flows anchor healthy ecosystems. They also sustain lands and resources that First Nations have relied on since time immemorial. It is both environmentally and socially responsible to chart a new path that better protects water flows and water quality for the benefit of all.

In years past, both the provincial and federal governments have embraced the idea that natural resources can be better protected and more soundly managed when governments work in true collaboration with First Nations. This report notes two examples governing forest resources that involved new approaches and new planning regimes. There is every reason to believe the same kind of success can be achieved when it comes to protecting our precious, irreplaceable, shared water resources. The 10 recommended reforms that conclude this report offer a roadmap of how to get there.

To date, the BC government has done a poor job of addressing the cumulative effects of resource industry activities more generally and fossil fuel industry activities more specifically on First Nation lands.

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