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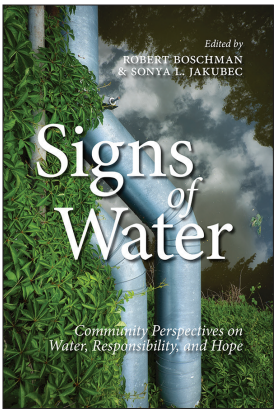


# SIGNS OF WATER: COMMUNITY PERSPECTIVES ON WATER, RESPONSIBILITY, AND HOPE

## Edited by Robert Boschman & Sonya L. Jakubec

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# 14

# The New Thunderbirds: The Waters of Uranium City, Saskatchewan

*Bill Bunn and Robert Boschman*[1]

*This chapter is dedicated to the memory of Patrick Deranger*

In front of us on a battered couch sits Patrick Deranger, a Dene man who was born on the north shore of Lake Athabasca (Figure 14.1). He is an elder. His long grey hair is pulled back. After he receives the tobacco we bring, his dark eyes spark as the stories he's about to tell inhabit him. He is uniquely qualified to speak about the water of Uranium City: as a child, he and his family lived on the land that would hold that community. They were removed from the site in order to make way for this mining town, planned and built by Eldorado Mining, a Crown Corporation, in the mid-twentieth century. As an elder, Patrick Deranger knows the stories of water from the old people; the Dene have occupied these Treaty 8 lands from time immemorial.

As we meet, he pulls a barnacled abalone shell from the shelf near the front door. The shell is the size of an ashtray and brims with cinder. He's backlit by the morning sun pouring in the front room picture window. He takes a pinch of tobacco from a cigarette and places it in the middle of the abalone shell and lights it with a lighter. Smoke, glowing with light, snakes into the still air.

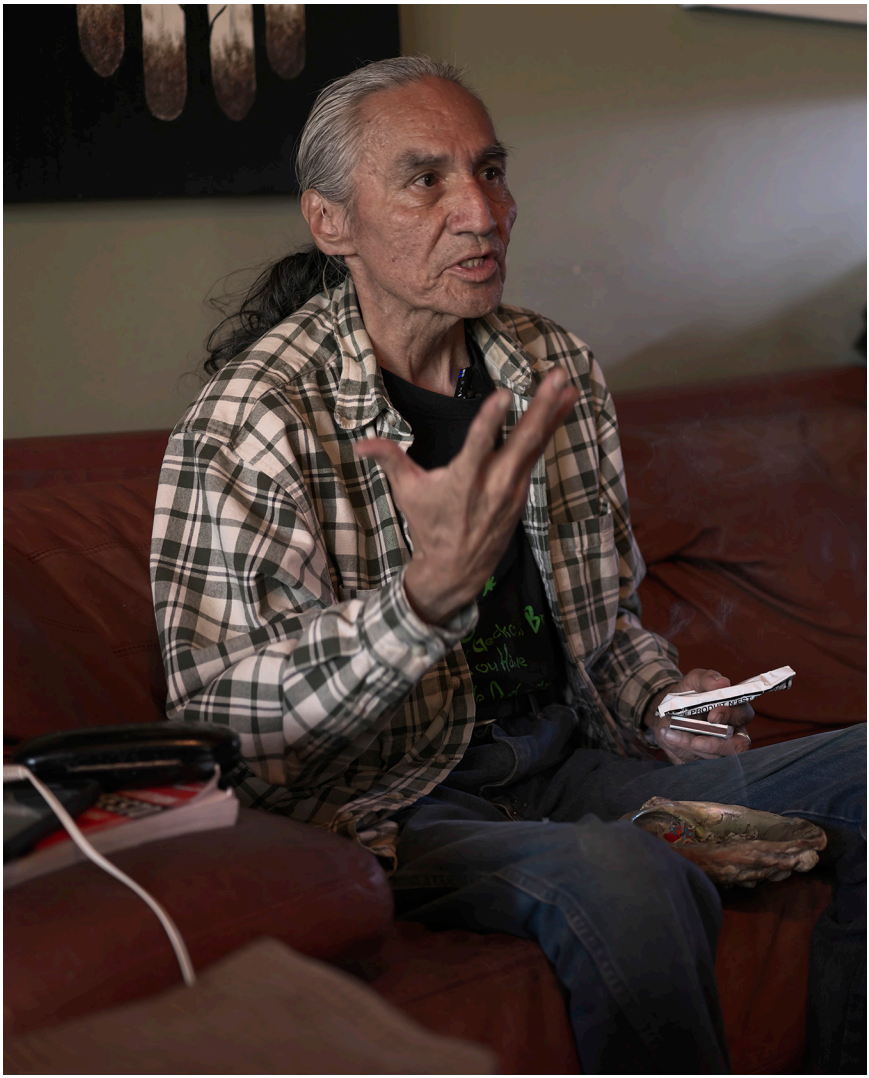

Figure 14.1. Dene Elder Patrick Deranger, 2019. Photo courtesy Robert Boschman.

> The old people say any time you're going to be talking about things having to do with the land, you have to acknowledge the things you're going to discuss. It has to do with spirits; it has to do with the lay of the land. The Creator put things there. We're inviting dignitaries here, we shake hands, and we thank them. We do this with the smoke. The old people always say be careful what you talk about and how you talk about it, that you don't make mistakes and you don't make it up. You work to keep the original story intact as to how it was presented in the past. I offer some tobacco, so I don't upset what was put into place. These ancient spirits are very powerful, so it's important that these protocols are kept.

With that, he gently grabs two handfuls of smoke and smooths them into his hair. Another handful he pats to his chest, over his heart. He invites us to do the same, and we do. He pinches some smudge herb from a braid on the coffee table and places it on the burning tobacco.

> The fire has to do with the Mystery, the Creator, the mystery. The smoke is the breath of this mystery. Some of these stories are imbued with a lot of power. Telling stories in the summer can also affect the weather. There is a time and place for storytelling. Usually, we tell stories in the winter.

He explains that it is not wise to jump straight into a story.

> A story, in itself, is a spirit. Physics tells us that energy can neither be created nor destroyed. Knowledge is a form of energy. So we're talking about sets of powers, interrelated. So we invite these dignitaries, these spirits, and they are stories. We are greeting a moving entity, a life, a spirit. A story is a tangible life form. So we recognize and acknowledge that this spirit exists. Just like my dog, when he comes up to you and wants an exchange.

> When I was young, going to school, I read about these creatures. These creatures were large creatures of all different kinds and shapes, big and small. At one time, they roamed the country. These creatures were ferocious. At one time they numbered in the millions. But they all disappeared. I'm learning this from teachers and books. But behind me, I hear whisperings of the old people. The old people said "Look, these creatures are still around. We've seen them. They have emerged from the land." The old people say one time, these large creatures were causing too much of a problem for people. So this mystery that created life realized it was a serious problem because people were getting killed. It was decided that they would not kill off these creatures. We will change how they live on the earth. We're going to send them into the earth. That's where they are to remain. Life is not stationary; it moves. So sometimes they come up. Then it becomes dangerous for us, as human beings. The majority of times we see them in the water. Anywhere there is water, the ground underneath that water is soft. It's easier for the creatures to come out. Most of the time this happens in the summertime. The Thunderbird is to round up these creatures and herd them back into the earth using its powers, and its powers have to do with the thunder and lightning. Its eyes have to do with the lightening. Its voice has to do with the thunder. So when they start to emerge, and the old people are travelling the land, and you see these huge cumulous clouds forming, the old people say there is a chance something tried to emerge. (Deranger, 2019)

The Uranium City site, set close to the eastern shores of Lake Athabasca, has an abundance of water (Figure 14.2). Striated stone bowls carved into the Canadian Shield cradle thousands of lakes. This abundance of water made the area a rich territory for the Cree and the Dene peoples. Patrick's people wandered this territory for thousands of years, depending on water for life, food, hygiene, and transport. Thus, the Dene's creation story bears strong connections to water.

Figure 14.2. Uranium City Ruins, 2018. Photo courtesy Bill Bunn.

The Dene creation story involves giant beaver and strong water elements (Deranger, 2017). The giant beaver stories may seem, at first glance, to be a fanciful narrative element. In our research, we learned that giant beaver are a matter of archeological fact, the last ones roaming the area between ten and fourteen thousand years ago (Guthrie, 2006). These beaver, or *castoroides*, weighed between 198 and 300 pounds, about the size of a black bear. Ethnologist Jane Beck notes the presence of the large beaver in a host of Indigenous stories from many times and places, and her one conclusion is that the presence of these creatures in multiple Indigenous cultures suggests the approximate age of the stories. In Beck's words, "When it can be established that a folktale is anchored in fact it may very well be as revealing about a people's past as any archaeological discovery" (1972, p. 109). The prevalence of the giant beaver in Indigenous stories, taken together with carbon dating, suggests that these stories are at least 10,000 years old.

The beaver's connection with water is evident. The beaver and the Dene people, in their ancient stories, live in conflict: beavers alter watercourses, tip canoes, attack, and even eat humans. The beavers act in many cases as agents of aquatic control, and in the Dene recounting of their stories, beaver are the enemy of the people.

Figure 14.3. Lake Athabasca, 2018. Photo courtesy Robert Boschman.

The beaver, in all these stories, live underground. So when Dene heroes Hachoghe, Yamôözha, or Yamõria defend their people against the beaver, it involves digging underground, digging into a beaver lodge, and attacking the beaver where it lives. The beaver is associated with water, but also lives underground. Part of the Thunderbird's duty, then, is to keep an eye out for the beaver, an underground and waterborne threat.

The manifestations of these stories still exist in the Uranium City area. Ironically, the site of one Eldorado mine is Beaverlodge mountain, the storied home of a family of giant beaver, where a Dene hero entered and fought with the beaver he found there, and prevailed, turning the soil and rock red with the beavers' blood. On a nearby island on Lake Athabasca (Figure 14.3), there is a huge, naturally occurring hole in the ground. According to the locals, this is the hole from which some of the giant beaver emerged.

The centrality of water to the Dene expresses a theme carried through many ancient cultures and religions. The role of water in human existence

was and is so critical that most ancient world cultures and religions regard water as sacred. Our foundational need for drink and hygiene is one of the reasons water has often played a sacred role in religion and culture. Water met these twin needs, and in response, people held it as sacred. Why does water play a central role in these ancient cultures? Terje Oestigaard notes that

> Water is a medium for everything—it has human character because we are humans; it is a social matter but also a spiritual substance and divine manifestation with immanent powers; and, still, it belongs to the realm of nature as a fluid liquid. The hydrological cycle links all places and spheres together, and water transcends the common categories by which we conceptualize the world and cosmos. (2011, p. 38)

As a practical cultural centre, water absorbs and holds a social significance. Water, as Oestigaard notes, forms the heart of ancient cultures, their view of the world, and their culture:

> The pervasive role of water-worlds in society and cosmos unites micro and macrocosmos, creates life, and legitimizes social hierarchies and religious practices and beliefs. Water is a medium which links or changes totally different aspects of humanity and divinities into a coherent unit; it bridges paradoxes, transcends the different human and divine realms, allows interactions with gods, and enables the divinities to interfere with humanity. (p. 38)

Water, in Oestigaard's view, played a unifying and legitimizing role in ancient cultures. In a sense, it helped to structure and govern ancient cultures. This seems true of the Dene, and their stories of the world's beginning.

The Dene's view of water is one that historian J. L. Manore would argue is "organic." Manore suggests that

> When Europeans first made contact with the aboriginal nations in what was to become Canada, an "organic" view

> prevailed within aboriginal cultures. For many of the First Nations, the rivers of Turtle Island, as they called North America, were and are the veins of Mother Earth. As such they give the Earth its life-blood, they function as the earth's circulatory system, transporting waste and nutrients from one area to another, and participating in the circulation of vital materials. (2006, p. 233)

As Dr. Manore points out, original peoples exhibited an "organic" attitude towards water. These cultures honoured and respected water as "the source of individual and collective life" (p. 231). In their world view, water is a living thing, autonomous and free to act. The job of the human was to respect the water, track it as though it were any other living thing. Water is sacred, organic, autonomous, and self-governing.

## The Birth of Canada: Water Flows in a New Light

Water was central to the Dene culture, and it was and continues to be crucial in connection to the abandoned mines and town of Uranium City. The centrality of water did not change when the mining companies explored and commandeered the land. Water of the new world was to play as central a role as it had in Indigenous cultures. It was the heart of what was to become Uranium City. It was the core of what made mining in that remote region possible. It endures as the critical feature of what remains of Uranium City and the area. What changed was the attitude towards water. The mining community displaced the original peoples and their "organic" world view with what Dr. Manore calls a "mechanistic" one.

The mechanistic view of water has origins as far back as Macedonian culture, 6,000 BCE. Humans then learned that water was a powerful tool and could be used as a machine, a medium, and for transport (Kornfield, 2009). And that attitude eclipsed the reverence for water, the "organic" view, and replaced it with an engineering view: water should be used, manipulated, and controlled. This mechanistic view meant that water had

> no value except in terms of cash flow. [Waters are] … not divine; not a means of creating and recreating life. They are commodities to be bought and sold … [Water] (and nature)

> cannot be allowed to run their course; their integrity as natural systems are not respected. (Manore, 2006, p. 239)

The mechanized possibilities of water intensified in the late 16th century, as the options for human control increased in terms of scale (Manore, 2006). Oxford Civil Engineer Leveson Francis Vernon-Harcourt dedicated his 1882 volume, *A Treatise on Rivers and Canals*, to "the control and improvement of rivers." He distilled mechanistic thinking to this:

> Rivers are not always suitable for navigation, in their natural condition, even in the lower portions of their course; and, owing to the continual changes they tend to produce in their channels and at their outlets, they are liable to deteriorate if left to themselves. Accordingly, the maintenance, control, and improvement of rivers constitute one of the most important, and at the same time one of the most difficult branches of civil engineering. (p. 1)

In Canada, mechanized thinking concerning water was in place from the outset as European traders learned from First Peoples the economic possibilities of this vast land; they realized that the easiest way to move goods and services across the continent was to use its bodies of water, flowing or frozen. For traders and colonials, water was not part of a venal, life-sustaining flow but rather a useful commercial distribution system. Harold Innis, the mid-twentieth-century Canadian historian and geographer, notes the importance of the First Nations technologies in early Canada, particularly in transportation (Figure 14.4). The canoe allowed for the transportation of goods, primarily furs: "It was their transportation technology, most notably the birch-bark canoe, that allowed for the shipment of furs and goods over great distances" (1930/2017, p. 234).

In 1833, William Dunlop in a book offering advice to would-be immigrants said this of Canada's water systems: "No country under heaven is so completely adapted for internal navigation" (p. 58). Wayland Drew, a popular Canadian writer and teacher, went so far as to declare,

Figure 14.4. Canoe, Uranium City, 2017. Photo courtesy Robert Boschman.

> The canoe is to Canada what the horse is to the United States—the prime vehicle by which the land was first explored and first grasped imaginatively. American myths involve heroic rides, but the great Canadian journey is a canoe trip. (n.d.)

Drew's point implies the centrality of water to the foundation of Canada. For the Canadian context in general, water is a key part of its founding. John Ralston Saul notes that

> The canoe … was to be used as our principal means of transportation—personal, governmental, military and commercial—for several centuries. Why? Because the First Nations had developed the appropriate means of transport for our road system, that is, our rivers and lakes. (2009, p. 38)

Finally, the economic uses of water corresponded precisely with the rise in the political uses of water. Innis notes, "It is no mere accident that the present Dominion coincides roughly with the fur-trading areas of northern North America" (Innis, 1930/2017, p. 392). Business interests, as always, were bound, inextricably, to politics, to governments who exploited the new territories and the waters they required to harvest resources and bring them to global markets.

Thus, the Dene's organic conception of water was replaced by a mechanized one (Figure 14.5). The mechanization of water was understood as "'lines of power and time carrying empires from source to expansive breadth'. … [Waters] became symbols of imperial power … they were no longer the source of individual and collective life; they were vehicles or transporters of nationalist identities" (Innis, 1930/2017, p. 231). Nearly thirty years after Canada was formed, the young government claimed ownership of all water. In 1894, the *North West Irrigation Act* vested all water rights in the Federal Crown. Rights were transferred to individual provinces. In Saskatchewan's case, water rights were assigned by the *Water Rights Act* of 1931. As the *Water Rights Act* of Saskatchewan declares,

> the property in and the right to the use of all water at any time in any river, stream, watercourse, lake, creek, spring, ravine, canyon, lagoon, swamp, marsh or other body of water shall … be deemed to be vested in the Crown. (p. 5)

These acts codified the new tide of thought: where one finds water, one finds colonial government.

From a literary perspective, we note an interesting genre shift here. Whereas for thousands of years before, water lore and information were carried and passed through the medium of story, water information under colonial governmental control was now transferred through law and policy. The organic story of water was passed through narrative moments from old to young. The mechanized view suppressed and displaced narratives and worked with courts and enforcement instead. Narrative was durable, effective, emerging from deep time, having lasted millennia. Law and policy are not nearly as durable and require constant adjustment and

Figure 14.5. Water Line, Fredette R, 2018. Photo courtesy Robert Boschman.

enforcement as the context changes. Colonial settler law and policy require colonial settler government.

This new view of water, mechanized and governmentalized, informed prospectors as they explored, surveyed, claimed, and mined the Athabasca region at the tail end of the gold rush that had already impacted the Canadian north. These water systems had indeed also transported the fish and fur of earlier booms. Gold and uranium reflected commercial concerns of the new era. Prospectors in floatplanes and small boats swarmed through the area looking for anything of value (Figure 14.6). The Gold Rush established an idea, a metaphor, that fueled the ambition to explore and exploit northern lands, which led to the discovery and recovery of uranium and the founding of Uranium City.

## Uranium City's Place in the Uranium Prospecting Narrative

Uranium City's conception and construction could almost be viewed as inevitable, as a confluence of world events and a series of mining attempts created the circumstances for its seeming necessity. Such circumstances

Figure 14.6. Uranium City Region Boat, 2017. Photo courtesy Robert Boschman.

depended on water's presence, on its being mechanized and governmentalized. Decisions made in the mid-twentieth century continue to impact the waters of Uranium City and its area to this day.

Canada has a very long history of prospecting and mining. Uranium mining began to be established thirty years after the end of the Klondike Gold Rush from 1896 to 1899. This intense event brought an estimated 100,000 prospectors to the Yukon. Decades after its close, the gold rush, fresh in the world's collective mind, became a pattern and a metaphor that would shape and drive the approach to Canada's uranium. Canada's northern region, especially in the province of Saskatchewan, became a prospecting frontier and the parent of many a mining fortune.

Uranium City begins its history at the half-way point of the uranium boom in Canada. Surveyors noticed uranium's presence as early as the summer of 1900, when James McIntosh Bell and Charles Camsell, on behalf of *The Geological Survey of Canada*, recorded evidence of uranium among other useful resources as they toured the Canadian north. Using

the observations of the Geological Survey of Canada, prospector Gilbert LaBine staked the first major discovery of uranium, or pitchblende, in early 1930. LaBine opened the Eldorado Gold Mines operation to extract uranium from Cameron Bay, later renamed Port Radium, North West Territories in 1932. The ore he transported to Port Hope, Ontario, where it was milled into "radium salts," was used to treat cancer. At that time, Belgium had a monopoly on the making of radium salts, which sold for $70,000 per gram. Port Radium closed in 1940.

Closer to where Uranium City would eventually be built, prospectors Tom Box and Gus Neiman struck gold in 1934 and built a mine, which was followed by the creation of a town to support the mine two years later. To power the mine and the new townsite of Goldfields, their mining company built a small run-of-the-river hydroelectric station. The Wellington Power Station commissioned its first unit in 1939 to service the mine and townsite. Goldfields was located twenty-four kilometres to the south of where Uranium City would subsequently be built. At first, Goldfields and its box mine glowed with promise. For a few years during the 1930s, it was thought that Goldfields would become an important hub for the north, but the numbers reporting the ore body size and concentration had been fudged, and the mine and town were abandoned in 1942 (Figure 14.7). However, the war effort and the atomic bomb development put a new and urgent value on uranium. In 1941, the United States and the United Kingdom asked Canada to furnish uranium for the war. At the time, Canada was the only known source of uranium not under German control (Edwards, 2014).

Port Radium reopened in late 1941 in utter secrecy; at this point, the only operational uranium mine in Canada was LaBine's Eldorado Mine. Within two years, the Canadian government expropriated and nationalized it as Eldorado Mining and Refining Limited. All prospecting activity was strictly limited, except on behalf of the federal company or the Geological Survey of Canada. The top-secret 1943 Quebec Agreement on the Atom Bomb Project meant that Canada agreed to supply uranium to the Allied war effort and that it would mine that uranium from Canada's north. Ironically, the Agreement was signed by President Roosevelt and Prime Minister Churchill alone. The uranium was to be milled at Port Hope, Ontario, and a secret lab in Montreal would be used to study the

Figure 14.7. Gold Smelters, 2018. Photo courtesy Robert Boschman.

making of plutonium (Edwards, 2014). These events, and the agreements struck to meet the challenges they presented, had a large impact on the waters in the Uranium City area. The Quebec Agreement also led to Canada's first experimental Nuclear Reactor at Chalk River, Zero Energy Experimental Pile (or ZEEP), when it began operating in September 1945 (Edwards, 2014). ZEEP was a prototype for the CANDU line of reactors. As one of the earliest reactors, the ZEEP created another potential use for uranium: electrical generation. Wartime demand, combined with the emerging possibility of power generation, meant that the world wanted more uranium than it had.

Eldorado prospectors located and staked the Beaverlodge site in 1945, which was developed slowly into a mineable site over the next four years. In 1950, the company built a modern town, also called Eldorado, to service the 350 miners and mill workers employed there. Following the war, the Canadian government lifted the ban on uranium prospecting, and prospectors returned to the area. Gilbert LaBine, now head of the nationalized Eldorado Mining and Refining Limited, realized there was still room

for increasing the uranium supply and thus resumed looking for other sources of uranium once the prospecting ban was lifted. While prospectors continued to search and stake their claims, they weren't welcome in Eldorado, which only had room for its own employees. As early as 1948, a tent community had begun at the site of what is now Uranium City. Once the Goldfields mine closed, the town of Goldfields quickly declined, and on April 1, 1950 its incorporated status was revoked. Given the Uranium City site's then remoteness, its new residents began to visit Goldfields to find and even move its resources. Entire homes would eventually be moved to the new townsite dedicated to uranium extraction.

The new townsite was also the traditional ancient homeland of the Dene. The Deranger family lived here, and Patrick Deranger, interviewed at the outset of this chapter, was born here at about this time. As the growing group of prospectors and miners began to populate the area, the Derangers, along with other Indigenous families, were relocated to an area south of town, an area that became known as Saskatchewan Government Airlines Hill, or SGA Hill. SGA Hill was cut off from the new town with its resources and emerging infrastructure. By removing the Dene from the heart of the town, indeed from the place where even today a sign remains for the Uranium City Hotel on an empty lot, the "organic" view of the world and its waters was also removed to the margins of the settlement, away from the uranium extraction business (Figure 14.8).

In 1952, one of LaBine's prospectors, Albert Zeemel, found himself on the Crackingstone Peninsula, not far from the Beaverlodge find. Zeemel was to send a radiogram immediately if he found anything. And he did. According to the well-known story, he radioed this message: "Come quick, I've shot an elephant" (Schiller, 1954, p. 12). Zeemel was, of course, referring to an enormous uranium discovery, the Gunnar strike. He called it an elephant, unaware of the Dene creation myth with its idea that huge living forces lived in the ground and could emerge threateningly, accompanied by widespread harm to humans. Zeemel's strike caught the world's attention. Robert Schiller, a reporter for *Mclean's Magazine*, noted,

> News of the discovery set off reactions around the world. In many parts of Canada and the United States, and as far away as Saudi Arabia and South Africa, mining men


Figure 14.8. Deranger Family Site, 2017. Photo courtesy Robert Boschman.

> dropped what they were doing and bought plane tickets north. (1954, p. 12)

The swell of prospectors further altered the landscape:

> The Gunnar strike swelled what had been a mere trickle of prospectors to Athabaska into an avalanche. Undiscouraged by geologists' warnings that the chance of making a successful find was only one in a thousand, storekeepers, salesmen, clerks, farmers, accountants, cooks, even a Polish count and countess swarmed into the bush. They laid claim to every rock and gully for a hundred miles around. To keep the prospectors alive and supplied, the Saskatchewan provincial government laid out the townsite of Uranium City, eight miles from the Eldorado company's community at

Figure 14.9. Uranium Adit [horizontal entrance to a mineshaft], 2017. Photo courtesy Robert Boschman.

> Beaverlodge. The first two buildings erected were the claim recorder's office and a liquor store. (p. 12)

The boom drove people to plunder the Goldfields townsite. Goldfields' permanent homes had been abandoned to the elements. In the winter of 1952, however, many houses were moved to Uranium City.

The abandoned components of Goldfields supplied some of the essential infrastructure and created momentum for the building of Uranium City. For one thing, electrical power from the Wellington Station was diverted to Uranium City. A number of the Goldfields buildings were moved over: "A movie theatre, hospital, police station and iron-barred jail were dragged over the ice from the nearby ghost town of Goldfields" (Schiller, p. 51).

Just as with the gold rush, there was a booming market serving uranium prospectors, too. The prospector would make a find, stake the claim, and mine the uranium (Figure 14.9). Uranium City newspapers would often announce news and regulation changes to help facilitate the prospector culture in the area. By 1957, prospectors could stake as many claims as they liked, but the first nine cost five dollars apiece while additional claims were ten dollars each (Mining Regulations, 1957). From time to time, when claims would lapse, prospectors would disappear in a shroud of secrecy to re-stake their claims (Mining Regulations, 1957). Current Uranium City residents tell stories of mom and pop miners and prospectors driving their pickups loaded with uranium ore to one of the mills in the area. They would be paid for the load by the mill.

## Water, Please. Mine first.

If water facilitated the exploration and exploitation of the Canadian North, many uranium discoveries were fortuitously positioned because they were close to water. In the case of Uranium City, mining concerns were expeditiously outfitted for water long before citizens received it. The uranium mining and milling processes use huge quantities of water. Water is one of the great problems at other uranium mine and mill sites around the world. In Australia, for example, conservation groups object to the amount of water that uranium mines require: "BHP Billiton's Olympic Dam uranium mine has been for years taking 35 million litres of water

each day from the underground aquifer" (Wise International, 2012). The staggering amount of water used in Australia, the article notes, is "one that has been taken for granted for decades. In the past, groundwater supplies were treated as an infinite resource, and subject to an 'out of sight, out of mind' attitude" (Wise International). In the case of Uranium City and its environs, remoteness allowed for an "out of sight, out of mind" attitude. In Uranium City's case, there was an ample supply of water. More than enough to do the job. The remoteness of the location meant that accountability, especially in the early days, was almost non-existent.

At the height of uranium extraction in the Uranium City area, there were numerous mines operating, ranging in size and approach. There were three major mill sites operating as well: Gunnar, Lorado, and Beaverlodge. The water use in the area was enormous. The uranium mill sites drew their water from the nearby lakes where they were built: Laredo Mill, Nero Lake; Eldorado Mill site, Beaverlodge Lake; Gunnar, Lake Athabasca. The mill sites drew water from these lakes to make their slurries; the slurry was dumped into tailing ponds where the water could evaporate. In the case of the Gunnar and Eldorado mill sites, slurry was pumped directly back into the environment until regulatory bodies required tailings ponds instead.

At the Beaverlodge uranium mill near Uranium City, vast quantities of radioactive waste were dumped into Fookes Lake via an outlet pipe, ultimately converting the lake into a tailings reservoir (Figure 14.10). This tailings reservoir lies in the Fulton Creek watershed (Prebble & Coxworth, 2013). During an inquiry into the mine's practices, Eldorado staff noted that "the site operated without an effluent treatment process for approximately 25 years" (p. 9). Proper water treatment was finally installed in 1977 to adhere to the federal Metal Mine Liquid Effluent Regulations (Prebble & Coxworth). In the latter case, as in numerous others, the mechanized, governmentalized waters of Uranium City were certainly put to use. The Gunnar, Eldorado, and Laredo mill sites serviced the numerous smaller mines prospected and dug by individual prospectors.

Given the growing power needs of the mines and mills in the Uranium City region during the early years of extraction and refining, additional hydroelectric projects near the 1939 Wellington Power Station were constructed and came online. A hydroelectric generating unit was added to Wellington in 1959, while Waterloo Power Station was commissioned in

Figure 14.10. Fookes Lake. Photo courtesy Simon Enoch.

1961, adding eight megawatts. Charlot River Power Station was commissioned in 1980, just two years before Eldorado shuttered its operations, and supplemented a final 10 megawatts to the pool. All three power stations continue to operate as run-of-the-river type stations, meaning that not much water is stored to generate energy. Sixteen percent of Saskatchewan's total electrical power generation is produced by hydroelectric means. These three dams generate approximately .03 percent of the province's total electricity (SaskPower, n.d.).

## Water Please. Citizens Second.

Though the environmental dangers surrounding uranium mining weren't as well understood as they clearly are today, the mining community knew enough to keep the town and mill water systems as separate as possible. The general water flow in the region is east to west; mining and mill operations would contaminate western waters, so it was decided to use Fredette Lake, northeast of the townsite, as the source for Uranium City's potable water. City planners believed Fredette's waters would remain unaffected

by uranium production. Still, once this water source had been designated, Uranium City's progress towards modern water and sewage systems was incremental. Indeed, it continued to depend on barreled water, as it had from its earliest period when it was a tent town. Water delivery, though it functioned as a system, could never seem to keep up with residents' demand (Good, 1954).

Ronald Schiller expressed disappointment when he visited the area early in 1954. Uranium City was, he wrote, "a raw drab-looking pioneer settlement that stands like an open gash in the bush. There is neither plumbing nor a water system; drinking water, hauled up from the lake, sells for a dollar a barrel." For Schiller, one mark of a dignified town had to do with its water. By contrast, he much preferred the small community of Beaverlodge, a company town five miles away that had been installed to service Eldorado Mine and Mill, for its "hot and cold running water" (p. 13).

Early in 1954, around the time of Shiller's visit, the administration of Uranium City promised improvements to the water supply situation. The town pledged to install "street taps at intervals through the town supplied with chlorinated water pumped from Fredette Creek." The tap system was to be installed during the summer of 1954 and was to "enable the residents to haul their own water by the bucketful and alleviate the overburdened water delivery system" (Good, 1954, p. 4). The tap system also meant that the town could install a hydrant system to help protect the city from the threat of fire. In 1957, the town was finally able to install a water and sewage system at a cost of almost $500,000 CAD. This new system included a series of fire hydrants (Figure 14.11) to better protect buildings and the growing investment in the area (The Municipal Corporation of Uranium City and District, 1957).

Water's role in the community was not simply industrial and connected with the functions of living. Given water's centrality in Uranium City life, it is also not surprising that recreational boating played a huge part in the leisure activities in the area. Uranium City was a temple of water recreation. Boating, swimming, fishing, anything and everything connected with water became part and parcel of the Uranium City lifestyle. There was even a scuba diving club.

Though the potable and industrial water systems were separate, the latter nevertheless intruded on some of the best recreational waters in the

Figure 14.11. Hydrant, 2018. Photo courtesy Robert Boschman.

area. Beaverlodge Lake, for example, is a large lake good for recreation. Nero Lake, the dumping site for some of Laredo Mill's tailings, wasn't used for recreation when the Lorado Mill site was operating and is still not used for recreation now. But Nero also flows into Beaverlodge and that lake is often used for fishing, boating, and even swimming and diving. Though there are many smaller lakes to the east of Uranium City, the preferred boating lakes tended to be the ones on the west side: Beaverlodge Lake, Martin Lake, and Lake Athabasca, lakes where citizens could encounter mine or mill contaminants.

## Transport

As it always had, water meant transportation, both by barge and amphibious plane in spring, summer, and early fall, and by means of ice road and ski plane during the winter. The region's westerly side offered the best access to transportation opportunities. This side also offered the largest volumes of water for mining and milling and provided the best access to Lake Athabasca.

The region's extensive aquatic transportation system, especially from the west, is noted by geologist L. P. Tremblay in a 1963 report:

> The area can … be reached by rail from Edmonton to McMurray and from there by boat or barge from Waterways to Bushell, where a dock and hangars for storage space have been installed at the north end of Black Bay on Lake Athabasca in the southwest corner of the map-area. The train part of the trip is 305 miles and the boat part 260 miles. There are also winter roads from McMurray and Lac La Ronge. Most of the heavy freight, such as food, equipment for the various mines, and building material, is carried by barge during the summer when Athabasca River is navigable, or by tractor trains on the winter roads in cold weather. (1963/1972)

Most of the processed uranium was flown from Uranium City to points where it could be shipped by rail. Lisa Piper notes that sometimes lakes were used to land planes to transport uranium to rail points like Waterways, Alberta. From there, it could be shipped using the Northern Transportation Route, a route built and used to move uranium from Port Radium to Port Hope (2010).

## Current Waters

In our two field trips to Uranium City in May 2017 and May 2018, we noted water as a powerful and ubiquitous presence across the land (Figure 14.12). Flying north from Saskatoon via Prince Albert, Point's North, and Fond du Lac, we could see thousands of rivers, creeks, ponds, sloughs, and lakes. Saskatchewan boasts around 100,000 lakes and most of these are located in the top half of the province, between Prince Albert and Uranium City, on the north shore of Lake Athabasca, which by itself takes up about 3,000 square kilometers.

On our first field trip to Uranium City in early May 2017, we arrived at break up, the moment the ice road is too soft to offer a viable driving surface. The decomposing ice forms long pencil-like crystals called candles that stand crowded and upright. As the ice rots, the candles break away in

Figure 14.12. Approaching Uranium City, 2018. Photo courtesy Robert Boschman.

small clumps, creating a sound like chimes as the thin ice crystals knock together before falling into the water. The candles chime when the water moves as well (Figure 14.13).

Break up means that the cheapest form of transport to and from this region is now over. There are no permanent roads to Uranium City; in 2019, one can drive in all seasons as far as Fond du Lac, on the far eastern end of Lake Athabasca, where the winter road begins. Dean Classen, the town's mayor, makes several major hauls during winter in order to provision himself and the city for the following year. He makes trips south with an empty truck and trailer, then back again with both loaded to the limit.

## Uranium City Water Today – the Struggle is Water

The water system installed in the summer of 1957 is the same system Uranium City relies on today. Water flows from Fredette Lake, down Fredette Creek, and empties into a small reservoir where it is drawn to a pump house and piped to a treatment facility before being distributed to homes and businesses in town. At its peak population, Uranium City

Figure 14.13. Break Up, 2017. Photo courtesy Robert Boschman.

was home to as many as 5,000 people. At 342 litres per person per day, the town's total possible water usage would amount to approximately 1,710,000 litres per day. In a year, 624,150,000 litres, or 137,293,806 imperial gallons, were used.

Luis-Enrique Arrazola quotes Ian Brewster on the struggle facing Uranium City: "What is left of the city is threatened by the discontinuation of water and hydro services but, according to Brewster, the remaining residents are committed to keeping the area alive" (2012, p. 12). The current Uranium City residents know the importance of water to the survival of their community. The infrastructure is old; it works because the community's sole employee, Wayne Powder, attends to it full time. Powder monitors and maintains the pump house and water purification plant as well as the distribution system (Figure 14.14).

Of the 630 plus homes and forty-two commercial buildings that once made up Uranium City, only about 40 homes and 11 commercial buildings still require water today. Homes that remain viable are close to the water

Figure 14.14. Tending Infrastructure, 2018. Photo courtesy Robert Boschman.

works. Remaining homes, condominiums, and apartment blocks have been salvaged for copper and fixtures (Figure 14.15). Uranium City's water supply is currently under a boil water advisory in addition to a precautionary drinking water advisory. The latter has been in effect since 2001, the longest running precautionary drinking water advisory in the province (Schick, 2019). According to the provincial government, Uranium City received about $695,000 for drinking water projects between 2002 and 2009. However, the community is still under the advisory, along with a more recent boil-water order.

According to Mayor Classen, most residents drink from their taps anyway. The town did install a bottle filling station, which issues good quality drinking water, but no one uses it (Schick, 2019). "Honestly, to meet provincial and federal standards, somebody has to pump a couple million dollars into the water treatment plant here," said Classen. There are other things which need attention first, such as repairs to water and sewer lines. The federal and provincial governments have run grant programs, and

Figure 14.15. Abandoned Homes, 2017. Photo courtesy Bill Bunn.

Classen has applied for funding, but the $2 million needed exceed those grant allocations. At this point, the mayor seems resigned to the advisory staying in place (2019).

Signs of the old water systems are everywhere in Uranium City (Figure 14.16). The numerous abandoned homes confirm their former water connections. Indeed, the townsite is haunted by Freud's sense of the "uncanny," which he described as "nothing new or foreign, but something familiar and old—established in the mind that has been estranged only by the process of repression" (1919, p. 13). In Uranium City's case, the repression expresses itself through a combination of silence, decay, and the forces of nature slowly consuming the townsite.

In addition to Uranium City's fight to maintain its water and sewer systems with water from Fredette Lake to the east, there is the continued presence of 14.8 million tonnes of contaminants threatening the water systems to the west (Figure 14.17). Canada's mechanized governmental view of water has brought Uranium City to a crisis point. The Sierra Club of Canada includes it as one of its "Toxic Thirteen sites," stating that "Uranium City is a city living with what Ralph Klein once called one of Canada's worst environmental nightmares" (Sierra Club of Canada and

Figure 14.16. The Uncanny, 2018. Photo courtesy Robert Boschman.

MiningWatch Canada, 2005). They note that the "Local communities are left to deal with the toxic legacy, or, frequently, to cope and live with the contamination and its impacts on their health and the health of their children." The Sierra Club criticizes the government's Federal Contaminated Sites Inventory, which currently lists 778 contaminated sites in Canada requiring attention (Government of Canada, n.d.). Uranium City, the Club notes, is conspicuously absent from that list (Sierra Club of Canada and MiningWatch Canada, 2005). Billions of litres of water were used in the mining process, some of which ended up in tailings ponds, isolated from the freshwater systems. Slurry and sludge were piped to the tailing pond; then the water evaporated, separating itself from the contaminants and leaving them behind. Tailings can easily leach into the system and some in this region have never been processed at all. During the earlier period of uranium mining and milling here, most mine waste was piped straight into freshwater systems until the practice was finally banned. Much of this contamination settled to the bottom of the lakes. There are


Figure 14.17. Warning, 2017. Photo courtesy Robert Boschman.

Figure 14.18. Goldfields, 2018. Photo courtesy Robert Boschman.

also legacy tailings from mining operations other than uranium in the area. For example, the box mine at Goldfields was abandoned in 1942, leaving the tailings from its gold extraction near Lodge Bay on Lake Athabasca (Figure 14.18). The gold mining process, like the uranium process, also relied heavily on water. As one study optimistically observed, the presence of these tailings "might provide an opportunity for future comparison of abandoned uranium tailings with gold tailings" (Swanson & Abouguendia, 1981).

The uranium mining and milling processes "produce very large amounts of waste rock, and contaminated waters and sludges" (Nuclear Decommissioning Authority, 2014). According to Dr. Gordon Edwards, President of the Canadian Coalition for Nuclear Responsibility, of the more than 250 million tonnes of uranium mining tailings in Canada, approximately 14.8 million tonnes of tailings are buried or submerged in the Uranium City area. The tailings cover approximately 89 hectares or 220 acres (Swanson & Abouguendia, 1981). The submerged tailings are at

the bottom of Fookes Lake, a lake that eventually flows into Beaverlodge lake (Figure 14.19), where Eldorado Nuclear poured tailings directly into the lake from the opening of the Eldorado mine until 1977 (P. Prebble & A. Coxworth, 2013). Gunnar Mine's tailings lie at the bottom of Lake Athabasca, while Lorado's are located in Nero Lake.

The strategy for remediating tailings is to leave them in place precisely because they are so toxic. As the Saskatchewan Research Council has conducted remediations, accessible tailing ponds have been buried, though many in the community want the toxicity moved. The SRC argues that to dig up the tailings and move them would create further damages.

The consequences of mining and milling activity in the area is difficult to estimate. Peter Prebble and Ann Coxworth note that

> Both the Ace Creek and Fulton Creek watersheds drain into Beaverlodge Lake, a water body with a surface area of 57 square kilometres, and water depths commonly in the 40 to 60 metre range. Beaverlodge Lake suffered the consequences of Eldorado Nuclear Ltd.'s decision not to install a proper effluent treatment system for the first 25 years of its mining and milling operation. (2013, p. 4)

The outlet pipe from the uranium mill at Beaverlodge dumped "vast quantities of radioactive waste … into Fookes Lake, converting it into a tailings reservoir. The tailings reservoir lies in the Fulton Creek watershed" (p. 4). Fookes Lake flows into Beaverlodge Lake and

> under normal conditions, the large size of Beaverlodge Lake would quickly dilute pollution. However, Beaverlodge Lake has been so badly contaminated by the polluted discharge from the Ace Creek and Fulton Creek watersheds that concentrations of uranium in surface waters in Beaverlodge Lake are now 7 times higher than Saskatchewan Municipal Drinking Water Quality Objectives. Depending on sampling locations within the lake, uranium concentrations in surface waters are 8 to 9 times higher than Saskatche-

Figure 14.19. Beaverlodge, 2017. Photo courtesy Robert Boschman.

> wan Surface Water Quality Objectives for the Protection of Aquatic Life (p. 4, 5).

The overall 14.8 million tonnes of contaminant must sit in place. Some of it is buried. Some of it sits where it settled at the bottom of lakes. Some still lies where it was placed many years ago, open and exposed. The net result is this: this area now needs constant monitoring. In most cases, the tailings do tend to sink to the bottom of any bodies of water. Uranium itself is 1.6 times denser than lead. When it settles, it doesn't tend to move. But it can, and sometimes it does. Because water circulates, because it has access to some of the deepest toxicities buried in the area, there is always a chance it will waken some disaster, allowing these buried beasts to emerge again. Into the future, indefinitely, and for as long as human cultures exist, this area, with its numerous surface and subsurface toxicities, will require vigilant monitoring.

## A New Thunderbird

The role of thunderbird, the job of keeping buried things buried, has been taken up by many, including most notably the Saskatchewan Government. Like the thunderbird, the provincial government now keeps a weather eye out. Water consultants, ornithologists, biologists, and other scientists regularly visit the area to monitor the environment. The Saskatchewan Research Council (SRC) is one such government group; it contracts with various scientists to monitor water and wildlife throughout the Uranium City region on the north shore of Lake Athabasca.

Additionally, the Athabasca Working Group also monitors water in the area. The Athabasca Working Group is an arm of Canada North Environmental Services, "a private environmental consulting company that is 100% owned by Kitsaki Management Limited Partnership**,** the business arm of the Lac La Ronge Indian Band." They began monitoring the environment in the Uranium City area in 1999. Their "focus … is to monitor certain parameters related to uranium operations that are of concern to human and environmental health. These include: copper, lead, nickel, molybdenum, zinc, radium-226, uranium, selenium, and arsenic." They provide "residents with opportunities to test the environment around their communities for parameters that could come from uranium mining and milling operations." Their main focus is the area's water system, because contaminants can "spread by water flowing from lakes near the uranium operations" (http://cannorth.com). As we already state in this chapter, waterflows move east to west in the area; following this, the Athabasca Working Group compares samples between Fredette Lake, to the east of most operations, and Black Bay on Lake Athabasca, west of operations and the townsite. Wayne and Sandy Powder, two current Uranium City residents, have collected samples for this program. Ken Mercredi is very active in the area, guiding scientists and other visitors as well as monitoring watersheds as a citizen scientist.

All of these individuals and organizations reflect a new, hybrid view of nature aptly described by David Suzuki:

> The way we see the world shapes the way we treat it. If a mountain is a deity, not a pile of ore; if a river is one of the

> veins of the land, not potential irrigation water; if a forest is a sacred grove, not timber; if other species are biological kin, not resources; or if the planet is our mother, not an opportunity—then we will treat each other with greater respect. This is the challenge, to look at the world from a different perspective. (Parry, 2016)

If the ancient thunderbird kept an eye out for threats rising out of the earth, particularly the water, the new thunderbirds are concerned with much the same thing. But, the new thunderbird views water differently than the old people did, and differently again from the geologists and prospectors who came here. It is not a return to the ancient view of water, nor is it a mechanized view, entirely. The new perspective is a blend of both views. It is a view that relies heavily on the ancient perspective, one that sees the interconnectedness of all things, that respects water and cares for it, that remembers its sacredness. At the same time, it also relies on a mechanized view that accounts for the molecular composition of the water, tests and measures chemicals, and monitors water systems. In the post-uranium mining world found not only in the region described here but also throughout the world, both are needed. Both views have roles to play in the restoration of place.

And both understandings of water are in the eye of the new thunderbirds. The new thunderbirds respect the water and understand it is the mother of all things, that water is interconnected to all things. But this new thunderbird also watches thresholds met and exceeded through water samples, animal counts, and physical inspections. If these underground beasts rise, it might not be their physical threat that we see. Instead, we might note elevated selenium levels and abnormal gamma activity. This is the new threat brought on by the governmental, mechanized use of water in Uranium City in the mid-twentieth century.

In a more forward-thinking plan, the Saskatchewan Research Council has outlined a monitoring program for the next 100 years (MacPherson, 2019). But this falls short of the true monitoring window needed for Uranium-234. Some of these nuclear contaminants mean that monitoring should continue for the next 24,000 years, mirroring, in some ways,

Chernobyl's fate. And monitoring is the cost of exploiting this business opportunity, of unleashing this force of nature from the ground.

Likely, Canadian federal and provincial law and policy regarding Uranium City will not be sufficient. Policy and law continue to reflect the mechanized view, although we can hope that the 2015 Truth and Reconciliation Commission Report (TRC) will engender change in the underlying views that support policy and law. Policy and law need to be managed and, of course, imply a government working to maintain these things. But to be fair, a 24,000-year monitoring program is unrealistic; story might be a better way to pass on the knowledge, and story is a value inherent in Indigenous ways of knowing and outlined as such in this book as well as in the TRC Report.

Hence, like the Dene story of creation described at the outset of this chapter, the watching of these waters needs to continue both as governmental policy, for as long as our governments last, and as story so that those living in the area, when Canada perhaps no longer exists, continue to act as the new thunderbirds and keep their watchful diligence.

## NOTE

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