

Adventures for Wilderness



The Cochrane North Field Trip – Ice, Glaciers, Gravel, and Oil

By Tako Koning



One of the first of AWA's Adventures for Wilderness events which I attended was in 2019. Vivian Pharis led a group of attendees into the valley of Bighill Creek to see the environmental monitoring which the Bighill Creek Preservation Society was carrying out along the creek. I was amazed to discover that in the heart of Cochrane was a beautiful, heavily treed, deeply incised natural and intact valley with housing developments perched along its top. This led me to explore the area further and to developing a field trip that I have now led several times for the AWA.

Bighill Creek valley is a glacial melt water channel. Thick glaciers of up to a mile of accumulated ice, covered most of Alberta until 13,000 years ago. During an event known as the Holocene glacial retreat – although the reason is not fully understood – the glaciers suddenly melted away and the resulting massive volumes of runoff water eroded deep channels into the surface and subsurface of the landscape. The 25-kilometre-long Bighill Creek valley begins in the Lochend area and continues down to Big Hill Spring Provincial Park and then into Cochrane where it finally merges with the Bow River. In my field trips we traverse this valley a few times to appreciate the morphology of the valley, the associated wetlands and their abundant waterfowl.

When glaciation began some 100,000 years ago, the ice flowed southwards

pushing along enormous amounts of gravel. Consequently, in the Cochrane area, a great quantity of gravel lies just below the surface. As I explored the Bighill Creek valley, I learned of plans to develop a huge gravel mine within 800 metres of the western boundary of Big Hill Spring Provincial Park. This gravel mine will be upstream from the park. My field trip includes a viewpoint from where we can see the location of the proposed gravel mine and its proximity to the park. I explain that the spring in the park is highly unusual since it is a thermal spring which has a constant temperature of about 6°C. The spring continuously flows even in the depths of winter when air temperatures drop to as low as -40°C. The spring is also very unusual since it has high concentrations of calcium carbonate that have formed beautiful limestone columns – known as tufa formations – within the park.

I have five decades of experience as a geologist both in Canada and overseas developing subsurface reservoirs containing oil, gas, and water. I tell field trip attendees that based on my experience and knowledge this gravel mine could affect the hydrogeology of this area, or in simpler terms, the plumbing in the subsurface could become damaged and affect the spring. The gravel mine could go as deep as 30 metres, creating a pit almost equal



Tako Koning provides an explanation of various features – both natural and industrial – across the landscape to attendees on one of his Cochrane North Adventures for Wilderness.
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in depth to that of a 10-storey building. The extraction of gravel from this mine will be carried out for up to 40 years. It is unlikely that the removal of so much gravel and the associated noise from heavy machinery, gravel crushing, transportation, and dust will not have any negative impacts on the nearby park. Surely a better alternative would be not only to preserve this beautiful, relatively untouched area for our children, grandchildren, and future generations, but also to significantly expand the park's boundaries in all directions. I suggest to the field trip's attendees that we ought to recommend this park expansion to our government.

Our field trip then visits other nearby locations where hydraulic fracturing for oil is taking place. These "frac pads" have as many as seven pump jacks in one area. I explain the technology of fracking to the participants, and that the wells in these frac pads are drilled multi-directionally and horizontally for up to three kilometres. In some cases, these frac pads are constructed very close to acreages and houses. If there had been greater dialogue between the oil companies, affected residents, and the Alberta Energy Regulator (AER) prior to their construction, these frac pads could have been much better placed. As someone with a history of work in the oil industry, I recognize how Albertans have benefitted from oil and gas revenue, but I also express to attendees that the burning of oil, gas and coal contributes to global climate change and that Canada and the rest of the world must develop more sustainable forms of energy to avoid harmful impacts.

This adventure gives AWA supporters a chance to better understand this unique landscape and its geological position in southern Alberta. It also helps our supporters to see firsthand just how close the footprint of industrial activity encroaches on our communities and our wilderness spaces.