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Renewed Interest in Potential Carbon Capture and Storage Projects in Alberta

By: Nigel Bankes

Matter Commented On: Alberta Energy, [Information Letter 2021-19](#), Carbon Sequestration Tenure Management, May 12, 2021

In a recent [Information Letter](#), Alberta’s Department of Energy noted that it “has received a very large number of inquiries related to carbon sequestration tenure (i.e. projects that will undertake dedicated geologic storage [of carbon dioxide captured at industrial facilities within the province], without associated oil or gas recovery)” (at 1). This renewed interest is consistent with developments in the rest of the world, spurred on by the growing commitment to reach net zero carbon dioxide (CO₂) emissions by 2050. See, for example, International Energy Agency, [Net Zero by 2050: A Roadmap for the Global Energy Sector](#) (2021).

In response to these expressions of interest, the Department evidently felt it appropriate to provide parties with guidance as to its choice of a “path forward to manage carbon sequestration tenure” (at 1). Alberta can fairly claim to be one of a handful of global leaders in the geological sequestration of carbon dioxide, and it is therefore important to examine this Information Letter to see if it signals any change in direction.

Alberta’s leadership claim in relation to CCS rests on a number of foundations including: favourable sequestration geology, significant prior experience with acid gas disposal projects (see ABlawg post [here](#)), and at least some experience with CO₂ miscible flood enhanced oil recovery scheme (CO₂/EOR), as well as an evaluation of the suitability of Alberta’s legal and regulatory framework (known as the [Regulatory Framework Assessment](#) (2013)). Amendments to the *Mines and Mineral Act*, [RSA 2000, c M-17](#) (*MMA*) adopted in 2010 vest the pore space to be used for sequestration purposes in the Crown (s 15.1) and also created a two-step disposition scheme (*MMA* Part 9) which was further elaborated in 2011 with the adoption of the *Carbon Sequestration Tenure Regulation*, [Alta Reg 68/2011](#). The tenure scheme is a two-step tenure scheme: an exploration permit and a sequestration lease. For details see ABlawg posts [here](#) and [here](#). In addition, sequestration projects also require the approval of the Alberta Energy Regulator (AER) under the scheme approval provisions of the s 39 of the *Oil and Gas Conservation Act*, [RSA 2000, c O-6](#) (*OGCA*). Two AER Directives are of particular interest for all disposal projects including CCS projects: [Directive 065](#), Resources Applications, Unit 4, and [Directive 051](#), Wellbore Injection Requirements.

Sequestration projects generate offset credits under Alberta’s regulations dealing with large final emitters (currently *Technology Innovation Emissions Reduction (TIER) Regulation*, [Alta Reg 133/2019](#)) and these credits will evidently become more valuable if the carbon price rises [as promised by the federal government](#) (\$50/tonne in 2022, and then rising \$15 per year until reaching

\$170/tonne in 2030) (and see ABlawg post by David Wright [here](#)). Projects must be approved for crediting under the [Quantification Protocol for CO₂ Capture and Permanent Storage in Deep Saline Aquifers](#), adopted in June 2015. Credits are available for a 20-year period with the possibility of 5-year extensions. This is longer than the usual offset crediting period of 8 years plus a possible extension. For the usual rules see, *The Standard for Greenhouse Gas Emission Offset Project Developers (Version 3.0)*.

Alberta also has experience with one industrial scale sequestration project, [Shell's Quest](#) project, which has been injecting more than one million tonnes per year since it entered into service in 2015. The project involves capture of CO₂ at Shell's Scotford facility where methane is reformed into hydrogen and CO₂. The CO₂ is then transported by pipeline through an 84 km pipeline to the injection site. For the ABlawg post on the approval of the Quest project ([AERCB Decision 2012 - 008](#)) see [here](#). In addition, Alberta has supported the development of a CO₂ pipeline network, the Alberta Carbon Trunk Line ([ACTL](#)).

Finally, Alberta has numerous large final emitters. The most recent report of the [Federal Greenhouse Gas Reporting Program](#) (2019) notes that Alberta has 690 reporting facilities (emitting more than 10Kt of CO_{2e}) responsible for 157 Mt CO_{2e} and 54% of all reporting facilities. CO_{2e} is a common unit of account that takes into consideration the different global warming potentials (GWP) of different greenhouse gases (GHGs). For example, while a unit of CO₂ has a GWP of 1, methane (CH₄) [is considered](#) to have a GWP of 25.

In sum, with all this background experience, expertise, suitable geology, regulatory framework, and source emissions, Alberta should be well placed to further develop its CCS industry in response to the policy drivers of net zero and the increased price of carbon.

In light of this, what are the key messages in this recent Information Letter?

I think that there are three key messages.

First, the Department recognizes that while CCS may represent an important potential use of pore space, CCS also requires large areas for dedicated storage - to accommodate both the injected CO₂ and its associated pressure plume. For example, Shell's six leases for the Quest Project cover some 40 townships. The Department is therefore signalling that it is not seeking to encourage a proliferation of projects, but rather a smaller number of sequestration hubs. This will help achieve efficiencies of scale and prevent unnecessary sterilization of other uses of pore space, as well as conventional oil and gas operations (a value also reflected in s 39 of the *OGCA*). At the same time, by focusing attention on areas where there have been fewer perforations (i.e., drilled wells) of potential storage zones (as was the case for example with the area targeted by the Quest project) the Department hopes "to preserve the integrity of Alberta's pore space" and support "stronger risk management practices" (at 1).

Second, unlike the Quest model of a vertically integrated operation in which Shell (or its joint venture partners) was responsible for the entire value chain from industrial process and capture and pipeline transportation through to injection, reporting, and crediting and acquired its leases on the basis of "an application" (see the tenure provisions referenced above), the Department

anticipates that future projects will be based on a competitive process that will lead to the appointment of a hub operator that will “provide carbon sequestration services to a number of industrial facilities” (at 1). The Letter indicates that the Department is still working on the details of this competitive process which it hopes to finalize by “late Spring.”

There has been no public call for consultations on this issue, but the design of such a process will be far from straightforward. Clearly, the Department will not be able to use a single bidding variable such as a bonus bid, or a work commitment bid. Instead, the Department will likely need to develop a weighted list of criteria. Some of these criteria will likely relate to such factors as the potential for sterilizing other uses of pore space and numbers of perforations of proposed storage zones within an area of interest; others will focus on the ability to tie into existing carbon infrastructure; while others, as the Letter notes, will focus on identifying an operator with the “technical, financial and operational capacity” to operate the facility (at 2). This will lead to a complex evaluation process that will likely be highly contested. For an example of another government’s approach to evaluating “cluster proposals” see the UK government’s consultation document “Carbon Capture Usage and Storage: Market Engagement on Cluster Sequencing” (2021) available [here](#) along with the government’s response to comments received. I acknowledge that my attention was drawn to this document by [Bennett Jones’ post](#) on this same Information Letter.

Third, the Letter anticipates that the hub operator will “ensure open access to the hub” (at 2) at fair service rates. It is entirely unclear how this will be achieved, especially as the Letter also indicates that the Department is not currently contemplating changes to existing statutes and regulations. Instead, the Letter suggests, rather vaguely, that the successful bidder in the competitive process “will be expected to enter into further discussions with Alberta Energy to explore these aspects in more detail and establish the conditions and agreement under which the hub will operate” (at 2).

I do not see how a contractual arrangement between the Crown and the successful bidder will provide an appropriate basis for non-discriminatory access to storage by third parties (which I assume is what the Department means by “open-access”). As pressure increases to abate emissions, access to disposal facilities will become increasingly important and valuable. And if the Department intends to limit the number of disposal facilities and operators for the sound reasons indicated above, then it is likely that a hub operator will have significant market power. This alone suggests that there will likely be a need for economic regulation in some form. I explored this possibility (along with co-author Rick Nilson) and the different models for such economic regulation some ten years ago in an essay on “Economic Regulation and the Design of a Carbon Infrastructure for Alberta” in Roggenkamp et al., eds, *Energy Networks and the Law* (Oxford: Oxford University Press, 2012). The issue is also discussed in the *Regulatory Framework Assessment* at D-55 to D-59. But if there is a need for economic regulation, this will need to be stipulated in some new statutory provisions; and it would be best for all concerned if these rules were in place *before* the competitive process commences - so that parties know what they are bidding on.

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