March 9, 2022

Alberta's Carbon Capture & Storage Land Grab And The Potential For Conflicts Of Subsurface Rights

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Matter Commented On: Alberta's Request for Full Project Proposals for Carbon Capture and Sequestration Hubs

On March 3, 2022, the Government of Alberta issued a province-wide Request for Full Project Proposals (RFPP) for carbon capture and sequestration hubs (CCS Hubs). This followed a more limited RFPP for CCS Hub(s) to service emissions from Alberta's Industrial Heartland (IH), which closed on February 1, 2022. By the end of March 2022, Alberta Energy is expected to announce the successful proponents of the IH RFPP, who will receive permits to evaluate large amounts of publicly owned pore space for the eventual permanent sequestration of millions of tons of carbon dioxide (CO_2). The RFPP for the rest of the province closes on May 2, 2022. Nigel Bankes has previously commented on the evolution of this process for pore space tenure dispositions (see here, here, and here). We've previously described the potential for conflicts arising from the subsurface convergence of CCS and critical minerals such as helium and lithium in Alberta (read our article here). This post examines the potential for conflicts of competing subsurface rights and interests arising from the current legislative scheme and the province's rapid roll-out of CCS Hub dispositions.

Background

The first serious efforts to evaluate the suitability of Alberta's subsurface for CCS and the legislative amendments necessary to enable industrial-scale saline aquifer sequestration took place well over a decade ago (see Bachu et al 2000 and the Regulatory Framework Assessment). Yet only one commercial-scale saline aquifer CCS project is operating in the province today – Shell's Quest CCS Project. The Alberta Carbon Trunk Line (ACTL) – a CO_2 pipeline connecting industrial emissions from the IH to central Alberta – has been operational since 2020; however, it currently has only one off-taker who uses the CO_2 for enhanced oil recovery. The ACTL has no dedicated permanent sequestration projects yet. Despite slow uptake to date, Alberta's Minister of Energy, Sonya Savage, recently stated that CCS is her "number one priority file at the moment", and Alberta Energy has indicated that it is "working to ensure all industrial facilities can sequester captured CO_2 and capitalize on the economic and environmental opportunity [CCS] technology provides" (Daily Oil Bulletin, 2022). In addition to climate concerns, the newfound urgency behind CCS in Alberta should also be understood from the perspective of carbon pricing. The Federal Government's promise to incrementally increase the price on carbon emissions to $170/ton this decade offers a strong incentive for the province and heavy-emitting industries to abate emissions via CCS to preserve their profitability and natural resource royalties. Project financing

and associated jobs will also depend on the availability of CCS to abate the emissions of new industrial facilities going forward.

The Rapid Rollout of Pore-Space Dispositions for CCS Hubs

In January 2021, Alberta Energy reserved the Crown-owned pore space of the Elk Point Group across a huge swathe of southern Alberta for CCS without any public process or notice. The effect of this sweeping decision was to restrict all Crown dispositions of petroleum and natural gas (PNG) tenure to the same subsurface area indefinitely (see Ettinger, 2021, Fig. 1B). In May 2021, Alberta released an Information Letter announcing its intention to host a competitive process for the disposition of tenure rights for CCS Hubs. Within weeks, a coalition of companies representing 90% of oil sands production announced their intention to connect emissions from the oil sands sector in northeast Alberta to a CCS Hub near Cold Lake via a CO_2 trunkline. Alberta's formal solicitation of expressions of interest for CCS Hubs followed in September 2021. After receiving significant interest in a diversity of competing projects throughout the Province, Alberta Energy announced it would select proponents sequentially by geographic area, beginning with CCS Hubs that would service the IH (IH RFPP at 3). Minister Savage then indicated that the next priority would be the abovementioned oil sands CCS Hub in the Cold Lake area, however, the province unexpectedly issued its RFPP for the entire province on March 3, 2022.

Those frustrated with the historical lack of uptake of permanent CO_2 sequestration in Alberta since the initial planning and scoping in the 2000s should be pleased with the current enthusiasm for new projects. However, the fast pace and opaque *ad hoc* process by which the Alberta government is granting dispositions of pore space tenure rights for CCS should cause current and future subsurface participants, as well as Albertans generally, to take pause. There are many economic and political complexities to these developments, including the significant potential for conflicts to emerge between CCS Hub project proponents and other stakeholders who have competing subsurface rights and interests within the same or adjacent subsurface pore space.

Potential Conflicts With Existing Subsurface Rights

Competition Arising from the Legislative Framework

Alberta's legislative framework for commercial-scale carbon capture and storage began to take shape in 2010 with the enactment of the *Carbon Capture and Storage Statutes Amendment Act, 2010*, SA 2010, c 14, the objectives of which were to (i) clarify ownership of pore-space, (ii) establish a pore-space disposition scheme for CCS, (iii) enable the transfer of long-term liability for injected CO_2 to the Province post-closure, and (iv) establish a stewardship fund for injected CO_2 monitoring and remediation costs (see Massicotte et al (2011) at 315).

Of particular importance to the present-day landscape of pore-space ownership, dispositions, project approvals, and permitting were a series of amendments made to the *Mines and Minerals Act*, RSA 2000, c M-17 (the *MMA*), including:

1. a declaration vesting title to pore space across all non-federal lands in the Crown in right of Alberta (s 15.1); – a *de facto* expropriation of the pore space associated with freehold mineral title despite the accompanying clause that declares otherwise [s 15.1(4)];
2. the Minister of Energy (the Minister) was granted discretionary authority to enter into "contracts" [s 9(a)] and "agreements" with third parties for the disposition of pore-space tenure rights for CCS (ss 16, 116); and
3. a pore-space disposition scheme for carbon sequestration permit and lease agreements was established (Part 9).

Part 9 of the *MMA* ("Sequestration of Captured Carbon Dioxide") specifies two types of the aforementioned "agreements" that the Minister may enter into with CCS proponents:

1. a permit "to evaluate the geological or geophysical properties of a subsurface reservoir in a location to determine its suitability for use for the sequestration of captured carbon dioxide" [a "CCS Permit"; s 115(1)]; and
2. a lease granting "the right to inject captured carbon dioxide into a subsurface reservoir for sequestration" [a "CCS Lease"; s 116(1)].

The *Carbon Sequestration Tenure Regulation*, Alta Reg 68/2011 (the Tenure Reg) constrains the Minister's discretion to issue a CCS Lease by stipulating that the Minister must be satisfied on the evidence submitted by the applicant "that the location specified in the application is suitable for use for the sequestration of captured carbon dioxide" [s 9(2)(d)]. Further, a CCS Lease under s 116 cannot be issued by the Minister unless the potential lessee submits, *inter alia*, "a monitoring, measurement and verification plan" [MMV Plan; s 9(2)(e)]. MMV Plans must account for the potential for operations under a CCS Lease to "interfere with mineral recovery" [s 15(b)], which ostensibly includes a host of natural resources including PNG, helium, lithium, and other metallic and industrial minerals [*MMA*, s 1(1)(p)]. The accounting for third-party mineral rights is to be submitted "based on the geological interpretations and calculations the lessee is required to submit to the Regulator pursuant to Directive 65 in its application for approval of the injection scheme under the *Oil and Gas Conservation Act* [RSA 2000, c O-6]" [the *OGCA*; Tenure Reg, s 15(b)].

Among those approval requirements under the *OGCA* is the obligation of the applicant to obtain the consent of any existing lessees of Crown land whose subsurface tenure rights the CCS scheme might intersect (Directive 65 at 4-9). In effect, this may give the holders of Crown PNG agreements – and possibly metallic and industrial mineral lessees – a veto over the approval of CCS schemes that intersect their tenure, regardless of the economic and development potential of the hydrocarbons or other minerals in the reservoir of interest. We can anticipate scenarios where an existing lessee might be willing to give consent on the basis of no adverse impact, but such lessee would want to retain the right to bring a legal claim (e.g., in tort) where CCS operations do result in an adverse impact (unless the Alberta Energy Regulator (AER) were to prohibit conditional consent). In practice, the risk of breaching the geologic seal of a reservoir containing sequestered CO_2 might preclude the future drilling of wells by a third party (or the hydraulic fracture-stimulation of nearby wells), such that the existing lessee's consent to a CCS scheme could require them to waive the right to all future exploratory drilling in that reservoir. This scenario is supported by the fact that the selection and design of CO_2 sequestration sites prioritizes reservoirs with a

minimum number of well penetrations and focuses on ensuring the seal integrity of existing penetrations (Couëslan et al 2021; see 2012 ABERCB 008 at paras 125-130).

The risk that future wells could pose to the storage integrity of a reservoir might present a particularly thorny issue for reservoirs that are subject to both Crown and freehold mineral title. While Alberta Energy can mitigate future well drilling by restricting Crown dispositions of PNG or metallic and industrial mineral tenure to reservoirs that are ideal for CCS [*MMA*, s 17(1)], freeholders (and their lessees) still retain the right to drill in or through such reservoirs indefinitely (see, 2012 ABERCB 008 at para 123). At the regulatory approval phase of the Quest CCS Project, for example, the Regulator asked Shell how it would accommodate any future applications by existing rights holders to drill within its CCS Lease at Quest. Shell simply submitted that "the existing process and protocols under Directive 56 should be sufficient to ensure communication between parties" (2012 ABERCB 008 at para 124). Directive 56 sets out the license application requirements for energy development projects, including the drilling and operation of CO_2 injection wells. With the recent enactment of the *Mineral Resource Development Act*, SA 2021, c M-16.8 – which brings the regulation of metallic and industrial minerals under the jurisdiction of the AER – an amended Directive 56 will be necessary to account for mineral extraction operations such as lithium extraction from subsurface brines.

With reference to the above Shell comment, Directive 56 also lays out a "Participant Involvement" protocol (Part 3) for the engagement of all other mineral and leasehold interest holders, including a framework for addressing concerns/objections and alternative dispute resolution for the coordination of licensed operations in the same area of the subsurface. Critically, however, the disposition of tenure rights for CCS precedes the regulatory approval of licensed operations and the application of Directive 56, which raises the question of whether this regulatory instrument is adequately suited to preserving the interests of multiple competing stakeholders. For example, Directive 56 will be of little comfort or use to freehold mineral holders whose lands are impacted by CO_2 sequestration when, in future, they may wish to extract resources from those lands or use the pore space for purposes other than CCS.

These potential consequences aside, the ultimate approval of a CCS scheme and its licensing falls under the AER's jurisdiction. The *OGCA* confirms that "[n]o scheme for ... (d) the storage or disposal of any fluid or other substance to an underground formation through a well ... may be proceeded with unless the Regulator, by order, has approved the scheme on any terms and conditions that the Regulator prescribes" [*OGCA*, s 39(1)]. Further, the AER

> may not approve a scheme for the disposal of captured carbon dioxide to an underground formation ... pursuant to an agreement under Part 9 of the *Mines and Minerals Act* unless the lessee of that agreement satisfies the Regulator that the injection of the captured carbon dioxide will not interfere with (a) the recovery or conservation of oil or gas, or (b) an existing use of the underground formation for the storage of oil or gas. [s 39(1.1)]

Regarding (a), there will (or at least there should) also be a requirement for proponents to identify and mitigate any interference with the recovery or conservation of metallic and industrial minerals

such as lithium given the AER's oversight of such resources pursuant to the newly enacted *Mineral Resource Development Act* and its forthcoming regulations.

Regarding "storage" under (b), s 57(1) of the *MMA* stipulates that the titleholder(s) to the petroleum and natural gas resource also own the storage rights to the same subsurface formations. We interpret "storage" in this instance to mean the short-term injection of oil, natural gas, or (in future) hydrogen, where those substances would eventually be circulated to surface and marketed. "Storage" is thus distinct from "sequestration," which is defined in the *MMA* as "permanent disposal" [i.e., of waste products like CO_2, acid gas, or produced water; s 1(1)(y.1)]. This distinction is important insofar as freehold mineral titleholders might construe s 57(1) of the *MMA* as codifying their unilateral right to sequester CO_2 within their lands as well. Further, s 57(2) of the *MMA* provides that where "operations for the recovery of the mineral ... have resulted in the creation of a subsurface cavern in that land ..." the mineral titleholder also owns the storage rights within the portion of the cavern that intersects their lands. This provision implicitly refers to the solution mining of evaporite deposits (i.e., salt) which creates caverns that can be used to store large volumes of gas – it does not, in our opinion, refer to depleted oil and gas reservoirs where pore space has been vacated by production.

While it is not clear whether s 57 *storage* rights for petroleum and natural gas within a subsurface reservoir are subordinate to CO_2 *sequestration* rights within the same reservoir based on the Crown's ownership of title to pore space, freeholder storage rights conveyed by s 57 will nonetheless compete with the dedicated use of Crown-owned pore space that has been earmarked for CCS. For example, the Province's "Natural Gas Vision and Strategy" released in 2020 calls for an aggressive expansion of Alberta's petrochemicals and hydrogen sectors using steam methane reforming and CCS (so-called "blue hydrogen"). Such production increases could dramatically increase the demand for high-pressure subsurface storage of both natural gas and hydrogen because subsurface storage is an economical option relative to other methods of energy storage, and it also permits the short-term absorption of excess seasonal production. A recent study, however, has suggested that if consumer natural gas streams in the US were blended with even 10% hydrogen, 1,000 billion cubic feet of hydrogen storage capacity would be required, yet only 5-6 billion cubic feet of storage capacity in the US is currently designated for hydrogen (Shuster et al 2021). Even at low rates of hydrogen production, there is an overwhelming need for additional storage which may not be possible to meet by access to suitable pore space alone. And the need for a 200% increase in hydrogen storage capacity does not take into consideration either (i) the potential loss of pore space for current sequestration activities (water disposal, acid gas, etc.), in favour of dedicating that capacity to hydrogen storage instead, or (ii) the need to also secure additional pore space to support current sequestration activities over the long term. What we face is the allocation of a finite (increasingly valuable) resource that cannot serve all competing interests for all time.

The reality is that confined reservoirs such as reefs and salt caverns happen to be ideal locations for both CO_2 sequestration (Bachu et al 2000) and the storage of natural gas and hydrogen (Lemieux et al 2020). However, the need to circulate hydrogen or natural gas from the subsurface renders economical hydrogen storage options far more limited than reservoirs available for permanent CO_2 sequestration (Shuster et al 2021). It is still unclear how the province intends to deal with situations where CCS plans might conflict with freehold storage rights conveyed by s 57

and the legitimate need for future natural gas and hydrogen storage. It is also unclear whether Alberta Energy has contemplated the impact its apparent prioritization of pore space for CCS will have on future subsurface storage needs for natural gas and hydrogen. The decisions the province is making today will have long-term, impactful and irreversible consequences for future resource development and energy sector diversification in Alberta.

An example of where this might come to a head in Alberta is the area proposed by the "Pathways to Net Zero" consortium of oil sands producers for a CCS Hub between Cold Lake and Lloydminster. This area is densely populated with freehold mineral title and encompasses at least three salt horizons that are viable for both CO_2 sequestration and natural gas/hydrogen storage (the Lotsberg salt, Cold Lake salt, and Prairie Evaporite; Bachu et al 2000, figs 40-48). We anticipate that the Pathways to Net Zero consortium intends to primarily utilize the underlying Basal Sandstone Unit for its sequestration needs; however, if those needs exceed the capacity of the Basal Sandstone Unit or if those companies develop a need for hydrogen storage, competition for storage and sequestration in the overlying salt formations is foreseeable (not to mention the competing CCS Hub proposal for the same pore space from a coalition of First Nations). Further, the same salt horizons will presumably serve as auxiliary seals for CO_2 sequestered in the Basal Sandstone Unit (see 2012 ABERCB 008 at para 138) such that access to those formations for hydrogen storage or other uses could be restricted by CO_2 sequestration in the underlying reservoir.

Though Alberta Energy can (and should) issue tenure for CCS where there are no competing rights or mineral prospects, such reservoirs are hard to come by and will be in high demand as carbon pricing makes CCS more attractive and storage needs for natural gas and hydrogen increase. Unfortunately, Alberta Energy does not appear to have seriously considered the potential for conflict amongst rights holders or the opportunity cost of prioritizing pore space for CCS. For example, the abovementioned pre-emptive reservation of the Crown-owned pore space from the top of the Elk Point Group to the basement across a large swathe of southern Alberta for CCS restricts the disposition of PNG tenure rights indefinitely, which includes highly valuable helium gas (see Ettinger 2021, Fig. 1B). This restriction has prevented proponents from posting for prospective lands and exploring the reserved area (see Daily Oil Bulletin 2022), despite the fact that helium explorers have been making discoveries and producing helium from the equivalent zone across the border in southwest Saskatchewan. Unsurprisingly, the Pathways to Net Zero consortium's proposed CCS Hub is located in the northeast corner of the reserved zone, which includes the abovementioned prospective salt horizons and helium potential.

Mines and Minerals Act Section 9 Contracts versus Part 9 CCS Leases

In its Request for Full Project Proposals, Alberta Energy indicated it will initially proceed by granting CCS Permits for proponents to evaluate the suitability of the permitted location for long-term sequestration of CO_2 (RFPP at 12). Notwithstanding the availability of the CCS Lease under s 116(1) of Part 9 of the *MMA* or the fact that Shell's Quest CCS project is governed by such a lease, the province has indicated that the definitive form of legal document that will be tendered subsequent to CCS Permits for new CCS Hubs will be an *ad hoc* contract issued under s 9(a)(iii) of the *MMA* (a Section 9 Contract) that will reflect some – but possibly not all – of the provisions associated with a formal CCS Lease (RFPP at 12; also see commentary from Nigel Bankes here).

Section 9(a) of the *MMA* confers on the Minister the wide discretion to "enter into a contract with any person or the government of Canada or of a province or territory respecting ... (iii) the storage or sequestration of substances in subsurface reservoirs." Unlike with CCS Leases under Part 9, the Tenure Reg is silent on the need for CCS proponents under Section 9 Contracts to submit an MMV Plan that considers the potential for CO_2 sequestration to interfere with other mineral rightsholders. Likewise, the AER's scrutiny of whether a CCS scheme will interfere with the production, conservation, or storage of oil and gas pursuant to s 39(1.1) of the *OGCA* only applies to CCS Leases under s 116 of Part 9 of the *MMA* and not to Section 9 Contracts. While the Request for Full Project Proposals indicates that Section 9 Contracts will require an MMV Plan (at 3), there is no guarantee that those plans will be vetted by the AER, whose technical competence and independence are best suited for reviewing MMV Plans. Moreover, by the time CCS schemes reach the regulatory approval phase, Alberta Energy will already have granted legally enforceable tenure rights to the proponents, and both the provincial and federal governments may have committed significant public funds to those projects. Hence, even if the competing rights of existing mineral-interest holders to the lands disposed of for CCS Hubs under a Section 9 Contract are raised at the regulatory approval phase, it is quite possible that a CCS project may have advanced to the point where the AER's discretion to weigh and accommodate competing interests in the approval of a scheme will be significantly diminished. These realities increase the likelihood for affected third-party judicial review applications and litigation.

Section 9 Contracts are also silent on one of the most important features of Part 9 CCS Leases: the ability of the licensee to transfer post-closure liability for the safely sequestered CO_2 to the province (*MMA* at s 121). While these gaps could theoretically be filled by the AER's residual jurisdiction to regulate the disposition of "public lands" pursuant to its mandate under s 2(1)(i) of the *Responsible Energy Development Act*, SA 2012, c R-17.3, there is presently no framework for such regulation and no indication that the AER will impose on the Minister's broad discretion to grant tenure rights to CCS Hub proponents. Whereas the AER's mandate requires it to consider socioeconomic, environmental, and other public interest concerns, the Minister of Energy is under no such obligation in the planning and disposition phases of CCS projects, nor are they under an obligation of transparency or public justification. This is the case, even though significant public funds will inevitably be allocated to these projects (through tax credits and other subsidies) and even though CCS Hubs have the potential to interfere with a host of other important subsurface resources and pore-space uses. The Minister's discretionary selection of CCS Hub proposals may be prejudicial (unintentionally or otherwise) to present and prospective stakeholders in PNG, helium, metallic and industrial minerals, storage, disposal and other subsurface rights – particularly given the Minister's public prioritization of CCS Hubs to offset the emissions of the oil sands sector and the shrouded reservation of significant pore space exclusively for CCS.

The government's motivation for moving from a Part 9 tenure process to a s 9 process under the *MMA* is not evident from our review of the relevant statutes and other public disclosures. However, one possible reason why the Minister is invoking an *ad hoc* process to grant CCS rights by contract under s 9(a)(iii) instead of using the established regulatory regime applicable to Part 9 of the *MMA* could be because Alberta Energy recognizes the potential need to expropriate PNG and other rights where the consent from third parties cannot be obtained. Such expropriative action may not otherwise be lawful under Part 9 CCS Permits and Leases.

Suggestions

The provisions of the *MMA* create the potential for conflicts of priority as between storage or sequestration "contracts" under s 9(a)(iii), "agreements" regarding the "use of pore space" under s 15.1(3), storage rights under s 57, and "agreements" for carbon sequestration permits and leases under ss 115(1) and 116(1) of Part 9, respectively (i.e., CCS Permits and CCS Leases), not to mention conflicts with holders of water and acid gas disposal rights. At a minimum, these disparate provisions and the province's opaque process for approving CCS Hub proposals foster uncertainty for project proponents and other stakeholders seeking to navigate the statutory framework and regulations applicable to the full lifecycle of CCS. If the province does not sort out the uncertainty regarding consultation and competing interests, affected third parties may have to resort to the courts to enforce their priority or challenge Ministerial authority to issue CCS tenure rights that override preexisting subsurface interests.

We recommend Alberta Energy formally invoke CCS Lease "agreements" under s 116(1) of Part 9 to which the existing regulations unambiguously apply, as opposed to s 9(a)(iii) "contracts" for the disposition of CCS tenure rights. If it elects not to do so, Alberta Energy should at least publicly disclose the reasons for invoking s 9(a)(iii) and confirm whether the existing regulations applicable to s 116 of Part 9 will apply.

Secondly, under the present legislative scheme, CCS projects will have gained significant momentum prior to the regulatory approval phase, placing pressure on the AER to approve projects regardless of the potential for interference with existing rights and other valid uses of the same pore space that are in the public interest. In addition to natural resources such as oil, natural gas, helium, and metallic and industrial minerals such as lithium, CCS Hubs stand to conflict with the emerging need for the subsurface storage of natural gas and hydrogen, water and acid gas disposal, and the possible future pore-space needs for sequestration of CO_2 from direct air capture. While there is a legitimate need to reduce Alberta's industrial emissions through CCS, the rapid pace and opaque process by which Alberta Energy continues to roll out pore space reservations and dispositions for CCS Hubs risks sidelining those other interests. This risk should raise concerns about economic diversification, job creation, resource conservation, and Alberta's energy transition.

To mitigate the sterilization of competing pore space uses, we also propose that Alberta Energy involve the AER more heavily in this current disposition phase of tenure rights for CCS Hubs. In particular, the Alberta Geological Survey – a division of the AER whose role is to advise the public and the Government of Alberta on resource exploration, conservation, sustainable development and regulation – should advise Alberta Energy, industry, and the public on: 1) which provincial areas present the least potential for conflicts between the subsurface rights holders and competing interests so that those areas might be prioritized for CCS; 2) the potential future need for pore space that is dedicated to natural gas and hydrogen storage, water and acid gas disposal, and sequestration of CO_2 from direct air capture; and 3) the opportunity costs associated with allocating valuable pore space exclusively for CCS Hubs.

In the interest of disclosure, Renée Matthews and Nick Ettinger were advisors to a CCS Hub proponent as well as helium and petroleum explorers at the time of writing.

This post may be cited as: Nick Ettinger, Renée Matthews & Rudiger Tscherning, "Alberta's Carbon Capture & Storage Land Grab And The Potential For Conflicts Of Subsurface Rights" (March 9, 2022), online: ABlawg, http://ablawg.ca/wp-content/uploads/2022/03/Blog_NE_RM_RT_CCS_Conflicts.pdf

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