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Legal Issues Associated with the Adoption of Commercial Scale CCS Projects

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Legal Issues Associated with the Adoption of Commercial Scale CCS Projects

The legal and regulatory challenges associated with the adoption of commercial scale carbon capture and storage projects include property issues, regulatory issues and liability issues. This paper deals with only with the first two sets of issues. Under the heading of property issues the paper discusses three issues:

- ownership of pore space
- the need for a Crown disposition system
- surface rights

Under the heading of regulatory issues the paper discusses:

- how a storage/disposal project would be dealt with under the current regulatory framework
- the federal role in geological sequestration projects
- the implications of listing CO₂ as a toxic substance under the *Canadian Environmental Protection Act*

Property issues

There is considerable uncertainty as to the ownership of pore space rights for disposal purposes in Alberta. The stronger view is that such rights are likely owned by the owners of the mineral estate rather than by the owners of the surface estate. This means that there is both publicly and privately owned pore space in Alberta and therefore that a prospective CO₂ operator may need to acquire ownership consents from many

different owners. The position is more complicated where there is a split private mineral title (i.e. where X owns some of the mineral rights and Y owns other mineral rights in relation to the same piece of land). The Crown may be able to claim disposal rights in relation to aquifers but some would argue that Crown ownership of water does not extend to the aquifer containing the water.

The paper considers three options for resolving the pore ownership issue:

1. the status quo plus a right of expropriation to deal with “hold outs”,
2. a reverse rule of capture, and
3. a statutory vesting of disposal rights in the Crown.

The paper recommends the statutory vesting option.

The Crown needs to put in place a tenure system for CCS projects that use Crown owned pore space just as it has in place a tenure scheme for oil and gas rights, for natural gas storage, and for disposal projects (including acid gas disposal projects). The paper considers options based on each of these models but favours an approach that draws upon the current scheme for disposing of oil and gas rights.

The paper concludes that the Surface Rights Act already deals with the surface access rights that may be required for injection

facilities and that no further measures are required to deal with this issue.

Regulatory issues

A CO₂ storage project coming forward for approval at the present time would be regulated by the province through the Energy Resources Conservation Board and under the terms of the *Oil and Gas Conservation Act* and relevant Directives and the terms and conditions of scheme approvals. The most important Directive is Unit 4 of Directive 65 dealing with Storage and Disposal applications. This part of the Directive was drafted to deal principally with acid gas disposal and needs to be adjusted to deal with CO₂ disposal projects.

The federal role in relation to the regulation and approval of a CO₂ storage project (other than a project occurring on federal lands) will likely be very limited since the principal regulatory model is based on provincial oil and gas conservation legislation. Unlike the large upstream projects (e.g. oil sands mines and upgraders) that may generate CO₂ emissions, the actual injection part of a CCS project is unlikely to trigger significant federal involvement.

This assessment of the limited nature of any federal involvement is not significantly altered by the federal government's decision to list CO₂ as a toxic substance under the *Canadian Environmental Protection Act*. The immediate legal implications of listing a substance as a toxic substance are very limited unless the substance is also to be targeted for virtual elimination which is not the case for CO₂. Listing does not automatically result in intensive regulation of projects emitting CO₂, or projects capturing and injecting CO₂. Classification as a toxic substance does however open the door to more detailed regulation on a substance-by-substance or industry-by-

industry basis. The extent to which the federal government can (constitutionally) regulate activities that produce, capture and inject CO₂ under the toxic substances part of *CEPA* remains to be determined. In particular, while regulations under this part of *CEPA* might limit emissions, and while it seems reasonable to think that the federal government may impose various monitoring and reporting requirements for a sequestration project, I do not think that the federal government could use these provisions to develop regulations concerning the approval of sequestration projects. Even if the federal government were to attempt to regulate these matters (and were that decision to be upheld by the Courts as being within federal power) there would still be a strong argument for federal deference to provincial regulation (on the grounds of provincial expertise in relation to cognate matters of oil and gas conservation regulation) and for the recognition of that through an equivalency agreement.

1. Introduction

It is useful to categorize the legal and regulatory challenges associated with the adoption of commercial scale carbon capture and storage projects under three headings: property issues, regulatory issues and liability issues.¹ I adopt that framework here, but this paper will not address liability issues since these have been addressed in the companion paper prepared by Dr. Mary Griffiths.²

The questions at issue are both descriptive and normative. That is, we are interested in trying to ascertain what the current rules are (the descriptive question), but also what the rules ought to be (the normative question). The casual observer might expect the descriptive question to be relatively straightforward but there is little about the law that is certain in this area. That this should be so is not entirely surprising. Technological developments always throw up new questions for lawyers and regulators. Questions that appeared very abstract twenty years ago suddenly acquire new meaning, and generate both uncertainty and significant litigation.³

Legal and regulatory uncertainty poses a significant obstacle to the introduction of any new technology. It follows that government has an important role to play in clarifying (and where necessary establishing) the necessary ground rules. Many studies and task force reports have recognized this problem in the context of CCS. For example, the EcoEnergy Carbon Capture and Storage Task Force spoke to the need for immediate action by government to clarify the legal and regulatory issues:

Immediate Action #2 – *Authorities responsible for oil and gas regulation should provide regulatory clarity to move the first CCS projects forward by: quickly confirming legislation and regulation related to pore-space ownership and disposition rights; and increasing the transparency of regulatory processes ...*⁴

¹ Bankes, Poschwatta and Shier, “The Legal Framework for Carbon Capture and Storage in Alberta” (2008), 44 *Alberta Law Review* 585–630 (provides a general survey of the three sets of legal issues in Alberta) and Bankes and Roggenkamp, “Legal Aspects of Carbon Capture and Storage” in Redgwell et al, (eds) *Beyond the Carbon Economy*, Oxford, Oxford University Press, 2008 (a comparative analysis of approaches to CCS regulation).

² Mary Griffiths, “Policy Option Paper — Closing the Liability Gap”, October 2008.

³ Familiar and contemporary examples from the oil and gas industry include: (1) the *gas-over-bitumen debate* (can owners of natural gas produce gas found in association with bitumen if, in doing so, this may prejudice the ultimate recoverability of the bitumen resource?), (2) the *evolved gas debate* (who owns the gas that comes out of solution in a reservoir, the owner of the gas rights or the owner of the petroleum rights?), and, (3) the ongoing litigation on the *ownership of coal bed methane* (CBM) (who owns the CBM, the coal owners or the gas owners?).

⁴ See *Canada’s Fossil Energy Future: The Way Forward on Carbon Capture and Storage*, 2008 at ix, www.energy.gov.ab.ca/Org/pdfs/Fossil_energy_e.pdf Similarly, the US Government Accountability Office in a recent report, *Federal Actions will Greatly Affect the Viability of Carbon Capture and Storage As a Key Mitigation Option*, September 2008, GAO-08-1080, indicated (at 15) that “key barriers to CCS deployment include ... (2) regulatory uncertainties concerning CO₂ capture, injection and storage ...”.

This paper focuses on the property and regulatory issues in the context of Alberta. Since these are all issues that fall principally within the jurisdiction of provincial governments rather than the federal government it follows that while the questions may remain the same, the answers that emerge in other Canadian jurisdiction may differ.

What are the issues?

Under the heading of property issues the paper discusses three issues:

- ownership of pore space
- the need for a Crown disposition system
- surface rights

Under the heading of regulatory issues the paper discusses:

- how a storage/disposal project would be dealt with under the current regulatory framework
- the federal role in geological sequestration projects
- the implications of listing CO₂ as a toxic substance under the *Canadian Environmental Protection Act*

2. Property Issues

2.1 Ownership of pore space

It is important to maintain a distinction between ownership (and the rights that flow from ownership) and regulation. To take a simple and familiar example: only an owner can build or authorize another to build a house on her land, but municipal and other regulations will govern how many houses the owner can have on her land and the constructions standards that the builder will have to meet. In the case of a storage project the operator of the project will need to obtain the consent of the owner of the pore space but will also need to comply with any relevant regulations.

The first question we must answer therefore is who owns the pore space? Whose consent is required in order to initiate the project? A second question deals with the areal extent of the property rights that a CCS operator must acquire.

In most jurisdictions ownership of pore space is a non-issue because all rights to the sub-surface are held by the state. This is the case in most European countries and in Australia. It is also the case in relation to the offshore in Canada since there are no private ownership rights in the offshore.⁵ These jurisdictions all assume that state ownership of the subsurface or the mineral estate also gives the state ownership of the pore space for injection purposes. Thus the literature dealing with carbon sequestration in Europe and Australia does not contain lengthy discussion of pore space ownership.

But the position is more complicated in two types of jurisdictions. The first case is the case of a jurisdiction which recognizes that pore space ownership for storage and disposal purposes is held by the owner of the surface estate. By and large this is the case in the different states of the United States.⁶ The consequence of this is that pore space will generally be owned by many different private surface owners.

⁵ Private parties may have oil and gas rights under the terms of the relevant offshore petroleum legislation but the underlying estate is held by the Crown: *Oceans Act*, SC 1996, c.31, s.8(1): “For greater certainty, in any area of the sea not within a province, the seabed and subsoil below the internal waters of Canada and the territorial sea of Canada are vested in Her Majesty in right of Canada.”

⁶ For discussion of the position in the United States see IOGCC, *Storage of Carbon Dioxide in Geologic Structures: a legal and regulatory guide for states and provinces*, 2007, esp. Part I, 15–23: iogcc.publishpath.com/Websites/iogcc/PDFS/2008-CO2-Storage-Legal-and-Regulatory-Guide-for-States-Full-Report.pdf. There is some variation between the states.

This does not appear to be the position in Canada. The general rule in Canada is that ownership of the pore space likely accrues to owners of the mineral title and not to owners of the surface title.⁷

The second more complicated case is the case of a jurisdiction that admits of the possibility of private ownership of minerals. This is the case in Canada. Canadian law recognizes that mineral rights may be privately held.⁸ Although public ownership of mineral resources is dominant in the western provinces (in Alberta 80% of the mineral rights are held by the Crown in right of the province), and is particularly dominant in northern part of the province and the foothills, there is still significant private ownership of mineral rights.

In such a case, the pore space under any particular tract of land may be owned either by the Crown or by a private owner. Furthermore, if the minerals are privately owned it is entirely possible that conveyances back in the chain of title will have created what are known as “split titles” to different elements of the mineral estate.⁹ A split title is created whenever there is a conveyance (a land or minerals transfer) which conveys only a part of the owner’s mineral title. As a result of this we may have the following types of scenarios:

- C owns the coal estate and D owns the petroleum estate; or
- E may own the natural gas estate and F may own the petroleum estate

Other combinations are possible and it is also possible that Crown ownership of all water including saline groundwater may also be relevant, at least where the injection target is a saline aquifer rather than a depleted reservoir.¹⁰

In 1994 the Province of Alberta attempted to clarify the rules with respect to the ownership of pore space for the purposes of natural gas storage projects.¹¹ In summary I think that that legislation did two things.

⁷ I say “likely” since some would argue that the point is not free from doubt and that the outcome might, for example, turn on the terms of the instruments severing the mineral estate from the surface (i.e. vesting the two estates in two different people). This then is something that the legislature could usefully clarify as it did in the case of natural gas storage rights in 1994 in Alberta: see now *Mines and Minerals Act*, s.57. Glen Acorn and Michael Ekelund “An Overview of Alberta’s New legislation on Natural Gas Royalty Simplification and Storage” (1995), 33 *Alberta. Law Review* 342–364; Robert J. McKinnon, “The Interplay between Production and Underground Storage Rights in Alberta” (1997–1998), 36 *Alberta. Law Review* 400–4.

⁸ There is also significant private ownership of mineral rights in the territories as a result of land claim agreements.

⁹ The classic case is *Borys v. Canadian Pacific Railway Co.*, [1953] A.C. 217 (P.C.) concerning a reservation by CPR of “coal, petroleum and valuable stone”.

¹⁰ *Water Act*, s.3. See Bankes, Poschwatta and Shier, *supra* note 1. Opinions may differ here. The argument in favour of Crown ownership of the pore space in an aquifer will be that if ownership of petroleum and natural gas affords ownership of pore space in a depleted reservoir, then ownership of water might afford ownership of pore space in a saline aquifer. Others may say that ownership of water does not give ownership of the physical container and that that must still be owned by the owners of the mineral estate (or somebody else). In any event the Crown may still argue that its consent to inject into saline aquifer will be a necessary condition for a geosequestration project in a saline aquifer (because the Crown owns the water and some CO₂ will dissolve in the water). The Interim Report of the Carbon Capture and Storage Council, *Accelerating Carbon Capture and Storage in Alberta*, 2008 (www.energy.gov.ab.ca/Org/pdfs/CCSInterimRept.pdf) concludes (at 19) that the Crown does indeed own the disposal rights in relation to saline aquifers.

1. The legislation confirms that storage rights are held by the petroleum and natural gas rights owners rather than the surface owners
2. The legislation tried to deal with the question of split title (at least as between split gas and petroleum estates) by stipulating that in such a case the storage rights are co-owned.

There are several reasons for thinking that this legislation does not address issues (or all of the issues) associated with injection of CO₂ for disposal purposes. In particular:

- The amendment deals with storage not disposal.
- The amendment deals with the storage of fluid mineral substances and while the definition is broad it is not clear that it would include CO₂ produced from all industrial processes from which a CCS operator might wish to capture.
- The amendment deals with some of the split title permutations but not all.
- The amendment does not deal explicitly with saline aquifers.

In sum, while it is likely that pore space rights for disposal purposes are owned by the owners of the mineral estate rather than by the owner of the surface estate, private ownership of minerals in Alberta suggests that in some areas pore space rights will be privately owned by the owner of the mineral estate. Where there is a split mineral title it may be difficult to establish which of the mineral owners owns the pore space (or whether it is owned by all). Thus there remains considerable uncertainty as to pore ownership and it is possible that a CCS operator will have to approach many such owners depending upon the answer to the next question.

2.2 The areal extent of property rights that must be acquired

In any situation where ownership of pore space is not uniform throughout the projected storage site (e.g. where some of the pore space is privately owned and some publicly owned) there will be a question as to the areal extent of the property rights that the CCS operator will be required to obtain to avoid becoming liable to adjacent owners. This may also be an issue where ownership rights are uniform (e.g. all Crown) but presumably this issue can be fairly readily resolved without needing to deal with public ownership.

The question of how much pore space needs to be acquired probably depends upon the legal status in Alberta of something known as the reverse rule of capture theory. I will begin by explaining the rule of capture and then explain the reverse rule of capture.¹²

2.2.1 The rule of capture

The rule of capture is clearly part of Canadian oil and gas law. The rule addresses the legal implications of drainage i.e. the situation where a well drilled and completed on one tract of land

¹¹ SA 1994, c.22.

¹² There is a short discussion of the reverse rule of capture approach in Bankes, Poschwatta and Shier, *supra* note 1, but the principal reason for addressing the issue at such length here is that it emerged as an important option for discussion at a workshop sponsored by the Alberta Saline Aquifer Project (ASAP) in June 2008, Calgary. For an overview of ASAP see www.albertaasap.com/

(A) produces oil or gas that originates from that portion of an oil or gas reservoir that directly underlies tract A but also produces some oil or gas that originates under neighbouring tracts of land (tracts B, C and D).¹³

In this situation do the owners of the adjacent tracts have any cause of action that would permit them to get an injunction preventing production of “their” oil or gas from tract A or to seek damages from the owner or operator of the tract A lands? The rule of capture says “no”. The rule of capture holds that B, C and D will not have a cause of action even if the owner/operator of the tract A lands deliberately engages in this activity.

The rule of capture addresses both ownership and liability issues. In terms of ownership the rule tells us that while the owners of the tract B, C or D lands may be entitled to a certificate of title to the petroleum or natural gas estate under her lands, she has no absolute right to have that substance remain in place under her lands. Her title is, as the courts have held, “subject to defeasance”. In terms of liability the rule is said to be a “no liability rule”. This simply means that the owner/operator of the tract A lands owes no liability to her neighbours and cannot be restrained from draining the neighbouring properties.

This is not a complete picture of the rule of capture since, as is well known, the rule has been modified in Alberta and in other jurisdictions where the rule applies, through the introduction and operation of oil and gas conservation legislation. These modifications include: spacing rules, target requirements, rules relating to good production practice and allowables, rateable take orders and the common orders (purchaser, carrier, and processor). But these are simply regulatory modifications to the rule of capture and the Energy Resources Conservation Board (ERCB) has been at pains to emphasize in several decisions that the background default rule is still the rule of capture.

2.2.2 The reverse rule of capture

What then is the reverse rule of capture? The reverse rule of capture would presumably hold that if a CCS operator acquires the rights to inject CO₂ from the owner of the pore space for tract A, the CCS operator will owe no liability to the adjacent owners B, C and D if the plume of injected CO₂ migrates beyond the boundaries of tract A. Similarly, and crucially, those owners will not be able to restrain the operator (i.e. get an injunction) from continuing to engage in that activity, provided that the bottomhole location of the injection well is immediately under the tract A lands.

¹³ For a recent and detailed assessment of the status of the rule of capture in Canada see Cecilia Low, *Alberta Law Review*, forthcoming.

2.2.3 The implications for a CCS project if the reverse rule of capture applies or does not apply

If the reverse rule of capture does not apply

If the reverse rule of capture does *not* apply, a CCS operator will have to acquire consents from all of the owners of pore space rights who may be physically affected by the injection and migration of the CO₂ plume. At a minimum this would include the pore space owners for the lands that the CO₂ plume will extend to on the basis of the operator's modelling. At a maximum the operator would need to acquire consents from those owners who own pore space areas to which the plume may migrate to over time.¹⁴

If the reverse rule of capture does *not* apply and if the operator fails to obtain the consent of B, C, D or others, what risks does the operator face? The operator faces the risk of liability in tort¹⁵ (most likely trespass) for causing a substance to invade lands owned by another. One possible remedy is an injunction to protect the property interests of B, C and D, and another remedy is damages. The general rule is that trespass is actionable without proof of damage; in other words, a plaintiff need not prove that it has actually suffered loss before it can gain a remedy. Of the two possible remedies available it is the injunction that will be of greatest concern to the operator since it effectively affords the adjacent owner a veto. While an award of damages will be of concern to an operator, the general rule is that damages in tort are compensatory i.e. the plaintiff is entitled to be restored to her original position at the time the tort was committed. If all that the adjacent owner can show is plume migration but no material injury it seems likely that damages will be nominal. But still, the threat of a more substantial award or an injunction will create significant uncertainty for a potential CCS operator.

Given that the injection plume for a commercial scale injection well may cover a large area, this may require the operator to require consents from a large number of parties in a jurisdiction that recognizes private and public ownership of pore space. This is likely to be problematic for the operator for a number of reasons. First, efforts to obtain consents may be time consuming and expensive. Second, owners may have unrealistic expectations as to the economic benefit they should be entitled to for consenting to an operation. Third, owners may simply refuse to consent (the hold out problem) either because the operator offers inadequate consideration or assurances, or because the owners would prefer not to take the risk. Alberta does not have compulsory acquisition legislation or analogous unitization legislation that would permit a CCS operator to acquire pore space owned by a hold-out.

¹⁴ Some would call this an anti-commons problem – a situation in which too many people have a potential right of veto. The “tragedy” of an anti-commons is non-use (or less than optimal use) rather than over-use: Michael A. Heller, “The tragedy of the anticommons: property in the transition from Marx to markets” (1998), 111 Harvard Law Review 622–688

¹⁵ The law of torts is that branch of the law that deals with the circumstances in which a person who causes damage to another (e.g. physical, economic, reputational) may be required (or not) to compensate the person who suffers the loss.

If the reverse rule of capture applies

On the other hand, if the reverse rule of capture *does* apply, it would seem to follow that the challenge facing a CCS operator in putting together an appropriate package of tracts of land in a mixed ownership jurisdiction has suddenly become much easier and more tractable. Now, instead of needing to put together a large block of land, the operator need only be concerned with acquiring rights with respect to the bottom hole location of an injection well or series of injection wells. This all seems so simple. What is the snag?

The key snag is that there is little reason for thinking that the reverse rule of capture is currently part of Alberta law and many reasons for thinking that a court would be unlikely to adopt it if asked. The reasons for believing that the court would not adopt it as part of the law include the following:

- The rule of capture itself has long been under attack on the grounds that it creates incentives to over-invest in the drilling of wells and associated infrastructure, it unnecessarily increases the footprint of the industry, and it sacrifices maximizing recovery in favour of entrepreneurial initiative. In short the rule of capture does not have a good press.¹⁶
- The rule of capture is inconsistent with modern ideas on liability and it is unlikely that a court would create a new “no-liability” rule. There are indications that the courts have been seeking to limit the application of the rule of capture at the margins.¹⁷
- Nobody would claim that the rule of capture would apply in an unmodified manner (witness all the rules of the Oil and Gas Conservation Act and regulations designed to modify its application). The same types of limits would likely have to be developed to deal with the reverse rule.
- And related to this last point, while the bare outlines of a reverse rule might be clear, the precise content of the rule would likely be highly contested.

There is nothing “self-implementing” about the idea of the idea of the reverse rule of rule of capture. Even if we think that such a rule “makes sense” and should be adopted, the best advocacy in the world cannot make it part of the law of Alberta. It cannot make solicitors advising geosequestration project proponents (and their lenders) opine that it is the law of Alberta with such and so consequences for the project. Only the courts or the legislature can do that. In sum, while the reverse rule of capture, if adopted, will simplify the task of a CCS operator in acquiring necessary project lands, the operator can have no comfort that it is the law without a decision of the Supreme Court of Canada decision to that effect (and perhaps a series

¹⁶ The rule is closely associated with commons resources and the “tragedy of the commons”. In the case of a disposal operation the analogous problem would be competitive injection rather than competitive drilling and production.

¹⁷ For example, the Ontario courts have sought to limit the application of the rule in the context of groundwater, *Pugliese v. National Capital Commission* (1977), 79 DLR (3d) 592 (Ont. C.A.), varied 97 DLR (3d) 361 (SCC).; the rule does not apply across phases (i.e. a gas owner cannot rely on the rule of capture to take the petroleum owner’s oil, *Anderson v. Amoco Canada Oil and Gas*, [2004] 3 SCR 3. In addition there are many regulatory limits on the application of the rule.

of such decisions to map out the precise contours of the rule) or an Act of the provincial legislature.

It would take a long period of time for the reverse rule of capture to appear if we left the process to the courts. Even if we take the actual outcome for granted (i.e. that the courts, contrary to what we suggested above, would endorse such a rule), recent experience with somewhat analogous issues (gas-over-bitumen, CBM, characterization of royalties, phase ownership) all suggest that we should not expect clear rules to emerge within much less than a decade.

2.3 Summary of the key uncertainties in the property rules relating to CCS

To this point the analysis has shown two things. First, Alberta is a mixed ownership jurisdiction in which some pore space is likely owned by the province and some by private parties. In the case of split mineral titles with private owners it may be difficult to determine which of the mineral owners owns the relevant pore space. Second, it seems unlikely that Alberta law recognizes a reverse rule of capture.

Given these two conclusions a CCS operator faces considerable risks, uncertainties and challenges. In particular, a CCS operator of a large scale commercial operation may be confronted by the need to obtain the ownership consents, not just of the Crown, but also of a series of private owners and must do so without the benefit of compulsory acquisition legislation.

2.4 Options for dealing with the uncertainties

Given these uncertainties and given what we said in the introduction about the consequences of uncertainty and the role of government in reducing uncertainty, what are the options available to the provincial government?

The following sections briefly discuss three main options:

- Option one: The status quo plus
- Option two: Declare that the reverse rule of capture is part of the law of Alberta
- Option three: Declare by way of statute that CO₂ disposal rights are vested in the province

2.4.1 Option one: Status quo “plus”

The elements of the “status quo plus” would be as follows:

- No statutory declaration with respect to ownership of pore space.
- No statutory statement providing for the application of a reverse rule of capture
- Existing ownership rules continue whatever they might be and as clarified by the courts over time.

The “plus” element would be the introduction of expropriation legislation designed to allow an operator to acquire disposal rights from an owner. This legislation would likely be based on the

expropriation provisions that we see in the gas storage legislation of some jurisdictions such as British Columbia or Ontario (Alberta has no similar legislation).

Pros

- By definition the least interference with existing entitlements (whatever they may be).
- Deals with the specific problem of holdouts i.e. a very targeted solution.

Cons

- Does not resolve the uncertainty relating to pore ownership and therefore invites litigation. And in particular, while it gives the operator the right of expropriation, it does not tell the operator from whom it must expropriate.
- Does not solve the problem of multiple owners although it does provide a mechanism for dealing with holdouts.
- Requires the introduction of expropriation legislation while the province has been very reluctant to do take this step in analogous areas (e.g. unitization and gas storage).

2.4.2 Option two: Declare that the reverse rule of capture is part of the law of Alberta

The elements of this approach would be as follows:

- A clear legislative statement of the reverse rule of capture and its application to CCS projects.
- Appropriate qualifications of the reverse rule so as to deal with potential issues of competitive injection etc.

Pro

- It has the potential to resolve the problem of having to acquire pore space ownership rights from multiple owners.

Cons

- It may be difficult to define the rule with the precision required for a statutory statement.
- There is not a lot of precedent for the statutory creation of a “no-liability” rule.
- It may be hard to square with the general liability regime that we put in place for CCS operations (depending upon what that regime looks like).
- It is hard to explain and justify (it looks like a blank cheque and does not seem “fair” to adjacent pore space owners).
- It does not resolve the problem of pore space ownership but it minimizes its significance.

2.4.3 Option three: The Crown vesting approach

The elements of this approach would be the following:

- A new provision of the *Mines and Minerals Act* or some similar legislation declaring that pore space ownership for the purposes of CO₂ injection is hereby declared to be vested (and always to have been vested) in the Crown.¹⁸
- A clear statutory statement that the statutory vesting would not give rise to a claim to compensation or any other cause of action.¹⁹
- A commitment by the Crown in any subsequent disposition agreement to indemnify the party acquiring the rights with respect to any claims made by a third party in relation to ownership of pore space.
- It will be necessary to ensure that any statutory vesting is without prejudice to: (1) any rights with respect to the use of pore space for the purposes of natural gas storage, and (2) any rights in relation to the use of pore space for the purposes of injecting CO₂ for enhanced oil recovery.
- The statutory vesting might clarify that it does not apply to federal lands such as national parks and military reserves although it might be preferable to leave this as necessarily implied.²⁰

Pros

This approach will significantly simplify the ownership issues with respect to implementing commercial scale CCS project in Alberta.

- It will make it clear that there is only one owner of pore space in Alberta and that the claims and potential claims of others can be ignored. It will resolve all of the ownership problems including split mineral title problems.
- It will reduce transaction costs in developing a CCS project.
- There will be no need to aggregate mixed ownership parcels of land and it will facilitate the development of a common set of rules for the entire province.
- It has the virtue of simplicity and transparency. It will be much easier to explain than the reverse rule of capture.
- Unlike the reverse rule of capture it helps to maintain a clear distinction between ownership and liability.

¹⁸ I would argue that this should extend to storage in saline aquifers as well, even though (see *supra* note 10) some might take the view that such rights are already vested in the Crown. This is a situation where it is worth clarifying the point from the outset. In the case of the *Water Act* this might be done by clarifying that the current provision does indeed extend to disposal rights. I made this suggestion earlier in Bankes, Poschwatta and Shier, *supra* note 1.

¹⁹ The key argument *against* compensation is the claim that there are as yet no investment backed expectations i.e. nobody has gone out and tried to purchase private mineral titles for the purpose of acquiring CO₂ disposal rights. This claim is little more than a hunch on my part; it may or may not be correct.

²⁰ In technical terms this would mean that the legislation would be read down or simply treated as inapplicable insofar as there was an effort made to apply it to Indian reserves or national parks. The advantage of silence is that it might avoid difficult issues as to the precise ambit of any federal property claim. Silence seems to have been the preferred approach in the drafting of the gas storage amendments to the *Mines and Minerals Act*.

Cons

- The most significant argument against any Crown vesting rule is that some will characterize it as expropriation and expropriation without compensation. That is, while some pore ownership rights are already vested in the Crown, such a statutory provision will do much more than simply clarify the rules, it will actually (negatively) change entitlements for some people.
- It may be difficult to draft a provision that will vest the target rights in the Crown and yet at the same time not disturb the status quo with respect to gas storage rights.

Crown vesting provisions have been used in the past to resolve uncertainty and protect the public interest. Other examples of the use of this approach in Alberta include: the natural gas storage provisions of the *Mines and Minerals Act* (already discussed); provisions in the *Law of Property Act* dealing with so-called surface minerals and provisions in the same Act dealing with the meaning and content to be accorded to “mines and minerals”; and the water related declaratory provisions of the *Water Act* and the *Public Lands Act*. The original deep rights reversion provisions of the *Mines and Mineral Act* can also be seen as a form of statutory re-vesting.²¹ Examples from British Columbia include the statutory vesting of geothermal resources in the Crown, the statutory vesting (subject to compensation) of storage reservoirs in the Crown, and the statutory vesting of water in the government.

In my view, this assessment of the options favours option three, the Crown vesting approach.

2.5 A Crown disposition system for publicly owned pore space

If we assume that the Crown owns some, or all of, the pore space for CO₂ disposal purposes, then it follows that CCS developers need to have some means of acquiring rights to use that pore space.²² In other words, the Crown needs to put in place a tenure system for CCS projects, just as it has in place a tenure scheme for oil and gas rights, natural gas storage, and for other disposal projects including acid gas disposal projects.

2.5.1 Current schemes

Elements of the current tenure system for oil and gas rights

The *MMA* provides only the barest outlines of a petroleum and natural gas tenure scheme. The details are found in the actual practices of the Department of Energy and the *Petroleum and*

²¹ SA 1981, c.24. Under these provisions, lessees of Crown mineral rights with leases conferring rights down to the basement were served with statutory notice to the effect that they would lose all their rights to formations below the deepest productive wells on the lands within a period of time. Lessees had the opportunity to prove up these lands but after the prescribed time unproven deeper rights simply reverted. This policy now applies on a prospective basis as part of the continuation process (which can hardly be controversial) but the Crown also saw the need to deal with existing rights. No compensation was paid.

²² If some pore space is privately owned it will be up to each owner to determine how it will dispose of its rights subject to the possible application of compulsory acquisition legislation as discussed above.

*Natural Gas Tenure Regulations*²³ and some of the more general regulations under the *MMA*.²⁴ Key elements of the regime include the following:

- Land are selected for bidding on the basis of industry nominations.
- There is interdepartmental review of proposed nominations to identify environmental and concerns.
- Key resource use conflicts are identified in bidding documents.
- Disposition of rights is almost exclusively by way of bonus bidding.
- Increasingly there is only a single form of tenure available (the petroleum and natural gas licence²⁵) covering both exploration and production phases.
- The licence provides the exclusive right to drill and the right to produce.
- The licence will also authorize the use of the lands as part of an enhanced oil recovery project but it would not authorize use of the lands for a natural gas storage project.
- Non-exclusive rights to carry out exploration short of drilling (e.g. seismic) are authorized by way of exploration licences and permits under Part 8 of the *Mines and Minerals Act* and the relevant regulations.²⁶
- Licence continuance requires the drilling of a validating well and further continuance beyond an intermediate term requires that the licensee establish to the satisfaction of the minister that the area of the licence is capable of production.²⁷
- Deep rights revert to the Crown (i.e. a licence is continued only down to the horizons for which the licensee has established are capable of producing petroleum or natural gas in paying quantity).
- Once the licence is continued by production it continues indefinitely.

Elements of the current system for disposal rights

The current system for disposal rights is based on s.56 of the *Mines and Minerals Act* which provides as follows:

Injection wells

56(1) Subject to section 57 [this section deals with natural gas storage], a person has, as against the Crown in right of Alberta,

²³ Alta. Reg. 263/1997. This description is drawn from Bankes and Poschwatta, *Australian Legislation on Carbon Capture and Storage: A Canadian Perspective*, Research Report, Report prepared for the Institute for Sustainable Energy, Environment and Economy (ISEEE), June 2008, 78pp, online at www.iseee.ca/files/iseee/bankes_research_paper.pdf

²⁴ *Mines and Minerals Administration Regulation*, Alta. Reg. 262/1997.

²⁵ The Department still uses leases as well but the focus here will be on the licence tenure form.

²⁶ *Exploration Regulation*, Alta. Reg, 284/2006.

²⁷ Note that the key concept is “capable of production” — not actual production. There is no formal “holding tenure” in the Alberta system (and arguably not necessary given market conditions and a highly developed pipeline infrastructure). The federal oil and gas leasing scheme does have a holding tenure in the form of the significant discovery licence.

(a) the right to use a well or drill a well for the injection of any substance into an underground formation, if the person is required by or has the approval of the Energy Resources Conservation Board to do so, and

(b) the right to remove and withdraw any machinery, tool, plant, building, erection and fixture used in or in connection with the operation of that well, if the removal or withdrawal is approved by the Board.

(2) A person who exercises a right referred to in subsection (1)(a)

(a) shall indemnify the Crown in right of Alberta for loss or damage suffered by the Crown in respect of any claims or demands made by reason of anything done by that person or any other person on that person's behalf in the exercise or purported exercise of that right, and

(b) shall abandon the well when so directed or authorized by the Energy Resources Conservation Board, in accordance with the directions of the Board.

Based on this section, the Department of Energy issues so-called letters of consent authorizing a proposed disposal activity provided that the project has the approval of the ERCB. In my view the letter of consent is effectively a licence to do something that in the absence of the letter would be a trespass.

Elements of the current system for natural gas storage projects

The holder of Crown petroleum and natural gas rights does not have the right to use those lands for natural gas storage.²⁸ Instead a gas storage proponent must acquire those rights by way of a separate agreement, typically by way of the Crown's standard form gas storage unit agreement²⁹ authorized under s.102 of the *Mines and Minerals Act*. The premise of such an agreement is that the applicant for natural gas storage rights already has other petroleum and natural gas rights by way of a petroleum and natural gas lease or licence which it acquired in the ordinary course (i.e. by way of competitive bidding).

2.5.2 Options for a Crown disposition system

The options for a Crown CO₂ disposal disposition scheme would include:

- Option one: The status quo
- Option two: Adaptation of the natural gas storage rules
- Option three: Development of a dedicated CO₂ tenure scheme.³⁰

²⁸ See s.56 (5) of the *Mines and Minerals Act* which provides that "Where the Crown in right of Alberta owns storage rights in respect of a subsurface reservoir, no person has, as against the Crown, any storage rights in respect of that reservoir except under (a) a unit agreement to which the Crown is a party, (b) a contract entered into under section 9(a), or (c) an agreement issued with the authorization of the Lieutenant Governor in Council, that expressly conveys storage rights in respect of that reservoir."

²⁹ Available at www.energy.alberta.ca/Tenure/forms/unitgasAgreement.pdf

³⁰ In addition, the Interim Report of the Carbon Capture and Storage Council, *supra* note 10 suggests in the early going, and for the first few projects, that we might make use of so-called Crown agreements under s.9 of the *Mines*

2.5.2.1 Option one: The status quo: letter of consent

The status quo would see the Crown continue to provide a letter of consent to authorize a CO₂ injection project, just as it currently provides similar letters for acid gas disposal projects.

Pros

- No change required to authorize.
- Very simple and cheap procedure.

Cons

- Not very transparent.
- No clear way for dealing with competing or potentially overlapping proposals; the letter of consent does not provide exclusive rights.
- It is not clear that this approach can readily accommodate a proponent that wishes to explore the disposal potential of a particular target and then retain the area if it proves up; there is, in a sense, a chicken and egg problem³¹ between the ERCB and the Department of Energy.
- No security of tenure for the proponent; may make it difficult to secure financing.

2.5.2.2 Option two: Adapt the natural gas storage scheme

In some jurisdictions (e.g. British Columbia or Ontario) the Crown disposition scheme for gas storage projects seems ideally suited to being adapted to CO₂ disposal projects but the statutory schemes for gas storage projects in these jurisdictions are very different from the Alberta gas storage regime. This is because the paradigm scheme in an Alberta context assumes that the operator already has existing petroleum and natural gas rights and is seeking to expand those rights to embrace gas storage. This will simply not be the case for a saline aquifer project. Accordingly, it does not seem fruitful to further explore this option in the context of Alberta.

2.5.2.3 Option three: A dedicated CO₂ tenure scheme

In an earlier publication with Jenette Poschwatta on Australia's proposed offshore CCS tenure proposal with consideration of lessons for Alberta, we identified the elements of a possible tenure scheme for Alberta. The elements are premised on the adaptation of the current petroleum and natural gas tenure scheme for CCS purposes.

and Minerals Act. This provision of the Act allows the Minister, with the approval of cabinet to enter into an agreement notwithstanding anything in the Act or the regulations to permit, inter alia, "the storage of substances in subsurface reservoirs". While this section might need to be amended to also encompass disposal it does provide a way of dealing with a project on a case by case basis. The section does not provide for the publication of any such Crown agreement but arguably transparency should require it.

³¹ The ERCB will say, "show me the property basis of your licence application"; while the Department will say, "show me your ERCB approval".

- Nomination of lands for GHG storage purposes by industry, subject to review by interdepartmental committee prior to posting.³²
- A new single form of tenure in the form of a GHG storage licence with a short initial exploration term followed by an intermediate term provided that the licensee meets the minimum work requirements.
- Disposition by way of cash bidding or work bidding³³ but with a single bidding variable; bidding documents would warn potential bidders to make themselves aware of existing petroleum and natural gas dispositions that might inhibit approval of any disposal project.
- A minimum work requirement of drilling at least one exploratory well during the initial term of the licence in order to identify the disposal characteristics of a target formation(s).
- By the end of the intermediate term the licensee must identify an area within the GHG licence that is suitable for GHG storage purposes and file an application for approval of a site plan or plans with the ERCB. Parts of the GHG licence not subject to a site plan would revert to the Crown.
- Indefinite continuation at the end of the intermediate term for areas covered by the ERCB approved site plan.
- As with the Australian scheme, the approved site plan would form the central part of the regulatory scheme.

While much of this would track the existing scheme for oil and gas interests it would differ particularly with respect to the decision on continuation and especially with respect to the area subject to continuation. In the oil and gas context, the Department of Energy is responsible for the continuation decision and the decision is made on a spacing unit by spacing unit basis.³⁴ Clearly this makes little sense in the context of a CCS project for a couple of reasons. First, the area of continuation needs to be based not on the concept of a spacing unit but on the basis of modeling the expected performance of the injected plume of CO₂. And second, the decision should likely be driven more by the government as regulator (the ERCB) rather than the government as owner (the Department of Energy).

Pros

- Provides clear rules and security of tenure.
- Transparent.
- Has a mechanism to deal with competing proposals.

³² We actually suggested the need for a more open and transparent review process than that which currently exists. One possibility here is for the Department to issue some guidelines indicating for example, preferred target formations and perhaps simply excluding others. There is no reason why the entire province should be open to nominations all of the time.

³³ In a work bidding system the property is awarded to the party who commits to spend the most resources on seismic and drilling of wells etc. Work bidding is the typical way of disposing of oil and gas rights in Yukon and in federal lands in the NWT and on the east coast.

³⁴ Or in the case of moving from the initial term to the intermediate term, the spatial area continued depends upon the depth of the well(s) drilled to evaluate the licence area.

Cons

- The introduction of such a scheme would require new regulations and perhaps amendments to the *Mines and Minerals Act*.
- Has the appearance of complexity.

In my view this assessment of the options favours adoption of this third option, a dedicated tenure scheme.

2.6 Surface rights

Regardless of who owns the pore space for the purposes of CO₂ injection, the CCS operator will need to acquire some surface rights for necessary injection and compression facilities at the site of the injection well(s). Given developments in drilling technology and the large scale of at least some of the target formations, it is likely that a CCS operator will have a fair degree of flexibility in selecting one or a series of surface locations for injection facilities. The preferred means of acquiring such a site will likely be negotiations with the surface owners resulting in a surface lease or even a more permanent title such as the purchase of the full estate in fee simple of the surface owner. In an application for a well licence the ERCB will expect the applicant to have closely consulted with affected landowners as to possible locations and alternatives even where the parties could not agree upon terms for a lease or purchase.

The question for present purposes is, what happens if the parties cannot agree upon terms? Can the operator gain the necessary rights by application to the Surface Rights Board for a right of entry order, or in some other way? Along with colleagues I have concluded that, at least in Alberta, this issue is already addressed in the *Surface Rights Act*³⁵ and that it is fairly clear that a CCS project operator would have the right to apply to the Surface Rights Board for a right of entry order for a CO₂ injection well and related facilities.³⁶ This is not a case where further clarification is required and therefore the paper does not present a series of options to deal with this issue.³⁷

³⁵ R.S.A. 2000, c. S-24.

³⁶ Bankes, Poschwatta and Shier, *supra* note 1.

³⁷ This conclusion is based on s.13 of the Surface Rights Act. The position is less clear in other provincial jurisdictions. One reviewer of a draft of this paper argued that this conclusion might be suspect on the grounds that injecting substances is “worse” than production and might devalue lands more than in the case of a producing well. I have two responses to that observation. The first is that the statement in the text deals with the clarity of the law as it stands. I think that it clearly covers injection wells and extends to the injection of substances that are not hydrocarbons or derived from initial processing of production. The second point is that the Surface Rights Board system should be flexible enough to take account of the devaluing effect of a right of entry order for a well for injection purposes in the terms of the compensation order. It would be an interesting research question to consider whether the Board applies (or should apply) a different methodology or different compensation standards when dealing with injection wells rather than, say, sour gas producing wells.

3. Regulatory Issues

This section of the paper is organized around three questions:

- how would a storage project be dealt with under the current regulatory framework
- the federal role in the regulation of CO₂ injection projects
- as part of responding to the second question, the implications for geosequestration projects of listing CO₂ as a toxic substance under the federal *Canadian Environmental Protection Act*

The first question focuses on the provincial regulatory processes of the *Oil and Gas Conservation Act* as administered by the Energy Resources Conservation Board (ERCB).

3.1 How would a storage project be dealt with under the current regulatory framework?

The regulatory framework that would *currently* apply to CO₂ geological sequestration project is principally a provincial rather than a federal regulatory framework. This is because the existing rules are contained in oil and gas conservation legislation, all of which is provincial (barring the schemes that apply in the offshore and in Northwest Territories and Nunavut). Even if efforts are made to develop a tailored regulatory approach specific to CCS in the coming months and years, the provincial role will still, in my view, be dominant.

This stands in stark contrast to the position in the United States where the current and future regulatory approach will be framed by the Underground Injection Control (UIC) Program of the Environmental Protection Agency developed to meet the terms of the federal *Safe Drinking Water Act (SDWA)*. While that Program may be implemented at a state level in those states that have the capacity and have chosen to assume “primacy”, the basic framework and standards are still federal standards and are principally directed at protecting a particular value, namely safe drinking water.³⁸ State standards may supplement federal standards (e.g. to take account of other values) but they may not derogate from them.

3.1.1 The Oil and Gas Conservation Act

Any proposal to dispose of CO₂ in a geological formation will trigger at least two groups of provisions under Alberta’s *Oil and Gas Conservation Act (OGCA)*: the well licensing provisions of ss.11–32 and the scheme approval provision, s.39. These are the two principal statutory hooks

³⁸ See Federal Requirements Proposed Rule, 73 (144) Federal Register 43492, July 25, 2008. The proposed rule emphasizes this focus in several places. See for example at 43497 – 43498.

for regulation of a sequestration project by the Energy Resources Conservation Board (ERCB).³⁹ If past practice is any guide, much if not all of the details of the regulatory approach will be expounded in Board Directives and in the terms and conditions of individual project approvals rather than in the *OGCA* or the regulations.

The next few paragraphs describe the two groups of provisions in the *OGCA* and refer to the relevant Directives.

Section 11 of the *OGCA* states that no person shall drill a well, or undertake any operation associated with a well, without a licence, and no person (s.16) may apply for a well licence without the (property) right to do so.⁴⁰ The Board may grant or deny an application for a licence and a licence may be issued subject to terms and conditions. In the event of a decision to deny a licence there is effectively an appeal to the provincial cabinet (s.18). Most licence applications are dealt with administratively by Board staff, but contentious matters (e.g. cases of irresolvable conflict between surface owners and licence applicants) will proceed to a public hearing and the Board will ultimately issue a reasoned decision rejecting or granting the application.⁴¹

A licensee is required to suspend or abandon a well when directed by the Board (s.27). Abandonment (s.29) does not relieve a licensee from responsibility for control or further abandonment of a well and it appears that a person continues as a licensee even after abandonment. No other person may carry out an operation on a suspended or abandoned well without the approval of the Board. And if the Board does approve such operations by another party, the former licensee is relieved from all obligations under the *OGCA* with respect to that well (with the exception of outstanding obligations to the Board or the Orphan Fund) (s.23(3)). This provision may be significant in the context of old abandoned wells within the area of review of a CCS project.⁴²

Other specific provisions within this group of sections deal with liability for suspension and abandonment but that topic is the subject of Dr. Griffiths' companion paper.⁴³

Beyond these licensing provisions, the *OGCA* is very much premised on the idea that well operators should be able to get on with the job (provided that they observe the regulations and good production practices) without the need for a lot of prior approvals. Section 39 of the *OGCA*

³⁹ Other sections of the *OGCA* dealing with liability and remediation issues are dealt with in Dr. Griffiths' paper.

⁴⁰ This is the section of the Act (s.16) that links the property issues with the regulatory issues; a relevant property right is a condition precedent to an application for a licence; but the property right may be as informal as the letter of consent for disposal operations issued under s.57 of the *Mines and Minerals Act* although a third party might still be able to question that. In recent years s.16 has been the vehicle for raising entitlement questions before the Board: see Bears paw Petroleum (the Board's key CBM decision): www.ercb.ca/docs/documents/decisions/2007/2007-024.pdf.

⁴¹ There were 19,144 wells drilled in Alberta in 2007 and 22,127 in 2006: CAODC, www.caodc.ca/wellcounts.htm

⁴² But it may not go far enough since it would only apply if the proponent of the geosequestration project applies to do work on that well. I have argued elsewhere (Bankes, Poschwatta, Shier, *supra* note 1) that perhaps the CCS operator should be required to assume responsibility for all abandoned wells within the area of review.

⁴³ And see also Brezina and Gilmour, "Protecting and supporting the Orphan Fund: Recent Legislative and EUB Policy Amendments to Address Unfunded Liabilities of Oil and Gas Facilities in Alberta" (2003–04), 41 *Alberta Law Review* 29.

however creates a list of activities that no person may engage in without the prior approval of the Board. These activities include any scheme for the “storage or disposal of any fluid or other substance to an underground formation through a well”.⁴⁴ This paragraph would capture a CO₂ sequestration project and the requirement for prior approval allows the Board to specify in the relevant Directive the requirements of any such application. Once again, most such applications (e.g. acid gas disposal applications) are dealt with administratively by the Board and rarely result in public hearings.⁴⁵ Scheme approvals may impose detailed terms and conditions dealing with injection rates and pressures and monitoring requirements. While such documents are public documents they are not readily available on the Board’s website.⁴⁶

3.1.2 The ERCB Directives

We can now turn to the relevant Directives, which include Directive 65⁴⁷ on Resources Applications and Directive 20 on Well Abandonment.⁴⁸

Directive 65 is relevant both because it prescribes notification requirements (and stipulates that applicants are to engage in meaningful discussions to resolve the questions or concerns of those who may be affected by a project) but also because of the detailed requirements of Unit 4 dealing with Disposal and Storage proposals. At the present time, a CO₂ sequestration project would be dealt with under s.4.2 dealing with acid gas disposal. This is not the place to provide a detailed

⁴⁴ This paragraph contemplates that all such applications will be referred to the Minister of the Environment. It is possible that the Minister might require an environmental assessment of a CCS scheme under Division 1, of Alberta’s Environmental Protection and Enhancement Act (EPEA) before granting its approval. Under the EPEA (ss.41 and 44) any Director may refer a proposed activity for further assessment. Upon referral the EIA Director must require a proponent of a “mandatory activity” to prepare an EIA but has somewhat more discretion with respect to other activities. The EPEA (s.59(b)) also contemplates categories of exempt activities which are *prima facie* (subject to an overriding ministerial discretion, s.47) exempt from the application of the “environmental assessment process.” The relevant regulation is the *Environmental Assessment (Mandatory and Exempted Activities) Regulation*, Alta. Reg. 111/1993. That regulation exempts oil and gas wells but not injection or disposal wells. Mandatory activities that may have a CO₂ capture process include oil sands upgrading and processing plants, thermal generating plants and sour gas processing plants.

⁴⁵ Applications that resulted in public hearings and reasoned decisions are discussed in Bankes and Poschwatta, “Carbon capture and storage in Alberta: learning from the acid gas disposal analogy” (2007), 97 Resources 1–6, online at cirl.ca/Archive

⁴⁶ The Board’s current practice is to post approvals for 30 days and then remove them. While it is relatively straightforward for the industry to obtain copies of Board approvals it can seem much more challenging and relatively expensive for members of the public.

⁴⁷ ERCB Directive 065: Resources Applications for Conventional Oil and Gas Reservoirs (January 2007) at 117. All Directives can be found online at on the ERCB’s website at www.ercb.ca/portal/server.pt/gateway/PTARGS_0_0_323_253_0_43/http%3B/ercbContent/publishedcontent/public/ercb_home/industry_zone/rules_regulations_requirements/directives/

⁴⁸ See also Directive 51 dealing with the classification of wells. There is some suggestion that wells for geological sequestration should have their own classification. This, for example, is the proposal in the US, see Proposed Rule, supra, note 38.

account of the requirements of that part of the Directive. In an earlier paper I along with co-authors summarized as follows:⁴⁹

The EUB [now the ERCB] states that an application for acid gas disposal will likely be approved if the EUB is satisfied that (a) the disposal will not impact hydrocarbon recovery; (b) the disposal fluid will be confined to the injection formation; (c) that the offset owners within 1.6 km of the disposal well(s) have been consulted and have no objections or concerns to the disposal scheme, and (d) the applicant has the right to dispose into the requested formation.⁵⁰ In order to satisfy itself as to each of these matters the EUB's Directive 65 requires an applicant for AGD approval to provide information on containment of injected substances, reservoir characteristics, hydraulic isolation, equity and safety.⁵¹

Under the heading of *containment* the EUB expects the applicant to be able to show that the injected fluids will be contained within a defined area and geologic horizon and ensure that there will be no migration to a hydrocarbon-bearing zone or groundwaters. Hence the applicant will be expected to provide a complete and accurate drilling history of offsetting wells within several kilometres as well as information on the permeability of the cap rock and any fracturing. The applicant will also be expected to identify folding and faulting and comment on how this relates to seismic risk – both the effect of seismic activity on the integrity of the project and the effect of disposal schemes on (increased) seismic activity. Under the heading of *reservoir characteristics* the applicant will need to describe and analyse the native reservoir, the composition of the waste stream and phase behaviour as well as migration calculations and proposed bottom hole injection pressures. Board approvals will be limited to 90% of formation fracture pressures. The EUB will expect an assessment of the effect of the acid gas on the target zones. Under the heading of *hydraulic isolation* the EUB expects the applicant to demonstrate that all potable water bearing zones as well as hydrocarbon bearing zones are hydraulically isolated from the proposed injection wells by cement and/or casing with all injection occurring through tubing appropriately isolated from the casing by packer with casing integrity confirmed by an inspection log.

Many of the *safety* concerns that apply to AGD projects are the same as those that apply to all sour gas wells and facilities including pipelines. These include a requirement for the development of an emergency response plan (ERP) including an emergency planning zone that is the area of land that may be impacted by an H₂S release and may include the processing plant, the injection well and the connecting pipeline. The EUB expects to see evidence of broad public consultation on both the ERP and all other matters related to the proposed project. Finally, under *equity* issues the EUB expects the applicant to provide evidence that all offsetting mineral rights owners have been contacted as well as details of outstanding objections or concerns.

⁴⁹ Bankes, Poschwatta and Shier, *supra* note 1.

⁵⁰ Directive 65, at s.4.1.3.

⁵¹ In addition to the text of the Directives there has been some discussion of the EUB's regulatory requirements in the technical literature. See in particular H.L. Longworth, G.C. Dunn and M. Semchuk, "Underground Disposal of Acid Gas in Alberta, Canada: Regulatory Concerns and Case Histories" in *Proceedings of the Gas Technology Symposium*, 28 April–1 May, 1996, Calgary Alberta, paper # SPE 35584, pp.181–192.

It is not apparent that an ERP would be required for a CO₂ injection project, since the ERP requirements relate to the level of H₂S in the gas. The ERCB is currently reviewing its regulatory requirements to determine how to address the long-term storage/disposal of CO₂. One matter which it is likely to address is the need for long-term monitoring of the movement of a CO₂ plume after injection ceases.

The ERCB responsibilities relate to the safe storage or disposal of a gas, and they require monitoring and reporting of injection pressures, etc., but they do not require operators to collect data on the total volume of CO₂ stored or how much leaks back to the surface. Indeed, at the current time the ERCB allows venting of CO₂ to the atmosphere.⁵²

The Alberta *Climate Change and Emission Management Act* permits the government to make regulations with respect to sequestration, which includes geological storage of CO₂.⁵³ It seems likely that the injected volumes of CO₂ and any deductions for leaks back to the atmosphere will be regulated under this Act. The current EPA proposals are very instructive in thinking through how existing requirements for other injection programs might be altered to better address the specific concerns associated with CO₂ sequestration projects.⁵⁴

Our comments on the AGD model at the time of our original analysis were as follows:⁵⁵

While the AGD regulatory model represents a compelling analogy to be applied to CCS projects it will require some modification to account in particular for the much larger scale of CCS projects. It is anticipated that CCS schemes will be approximately 10 to 100 times larger than current acid gas disposal schemes.⁵⁶ Similarly it is unrealistic to maintain the emphasis that the Directive places on structural trapping. While this may be appropriate in the case of depleted oil and gas reservoirs it is less applicable in the case of injection into a saline formation where the plume of acid gas is no longer physically contained as it is in reservoirs. Thus instead of emphasising containment there will be a need to develop regulations and guidance on plume spread and migration and associated monitoring requirements. Given that transparency is a concern it may also be important to provide for the explicit treatment of CCS issues in the statute and regulations rather than deferring everything to the much more discretionary guidelines. Finally, a CCS regulatory scheme will

⁵² ERCB. 2006. *Directive 60: Upstream Petroleum Industry Flaring, Incinerating and Venting*, p.66, www.ercb.ca/docs/documents/directives/Directive060.pdf

⁵³ Government of Alberta. *Climate Change and Emission Management Act*, sections 1(e)(ii) and 60(1)(q). This Act, section 9, also identifies a sink right as a property right.

⁵⁴ EPA, Federal Requirements, Proposed Rule, *supra* note 38.

⁵⁵ Bankes, Poschwatta and Shier, *supra* note 1. In addition to the comments here it may be important to require that project proponents engage in baseline monitoring (e.g. soil and groundwater sampling) at the outset to establish a baseline against which to measure the effects of project activities.

⁵⁶ Stefan Bachu and Kristine Haug, "In Situ Characteristics of Acid-Gas Injection Operations in the Alberta Basin, Western Canada: Demonstration of CO₂ Geological Storage" in Sally Benson (ed), *Carbon Dioxide Capture for Storage in Deep Geologic Formations — Results from the CO₂ Capture Project*, Volume 2, *Geologic Storage of Carbon Dioxide with Monitoring and Verification*, Elsevier, 2005 at 867–876.

need to make explicit provision for monitoring and verification of the behaviour of the CO₂ plume both during and after active injection....

In addition, it may also be necessary to deal much more explicitly with the potential for conflict between oil and gas operation and geological sequestration operations. This seems to be a very significant issue in Australia⁵⁷ and experience with the gas-over-bitumen issues in Alberta confirms the importance of dealing with this at the outset and in a transparent manner.⁵⁸

In earlier work we also examined the abandonment requirements of Directive 20. At that time our main conclusion was that:⁵⁹

Much of this regulatory scheme can likely be directly applied to the abandonment phase of a CCS project. But there is one significant gap: Directive 20 does not require ongoing monitoring or verification of a well after surface abandonment while monitoring and verification will certainly be required for a CCS project to ensure that the project remains both operationally safe and effective over the long-term.⁶⁰ CCS abandonment must consider both proper well-by-well abandonment and overall project abandonment.

In sum, the *OGCA* and the Directives provide a basic framework for regulating a CO₂ sequestration project. The Directives in particular need to be adjusted to speak more directly to the requirements of such a project rather than analogous projects such as acid gas disposal projects. But it is also appropriate to ask whether this is an appropriate and adequate response. In order to test that I briefly examine two options: the regulatory status quo plus, and a regulatory approach which is specific to CO₂ injection. In both cases I am primarily concerned with what might be termed the architecture of a regulatory approach rather than the detailed content of any regulations.

3.1.2.1 Option one: The status quo plus

The previous section describes the regulatory status quo. The “plus” here would refer to the types of adjustments to the Directives discussed above and draw upon the work of EPA and others.

Pros

- No need to change the legislation.
- Builds upon the existing approaches and processes of the ERCB.
- Familiar to the upstream oil and gas sector.
- Flexible; facilitates learning by doing.

⁵⁷ See Bankes and Poschwatta, *supra* note 23.

⁵⁸ *Giant Grosmont Petroleums Ltd. v. Gulf Canada Resources Ltd* 2001 ABCA 174

⁵⁹ Bankes, Poschwatta and Shier, *supra* note 1.

⁶⁰ Australian “Guiding Principles”.

Cons / Discussion Points

- It is not very transparent. It contemplates using a statutory framework designed for the conservation of oil and gas resources for an entirely different use of geological formations in Alberta. Is it not appropriate to reflect such a significant change in resource use in statutory text?
- It may not be appropriate to deal with all of the significant substantive issues by way of Directives and the terms and conditions of scheme approvals. Some consideration needs to be given to the question of: (1) what should be in the statute, (2) what should be in the regulations, (3) what should be in the Directive, and (4) what should be in the terms and conditions of scheme approvals? Accountability of the regulator, the rule of law, and transparency may be enhanced by moving some of the content of the Directives into the regulations or statute.

3.1.2.2 Option two: A regulatory approach specific to CO₂ injection

A more tailored regulatory approach would build upon the discussion points highlighted in the last section and perhaps consider whether it is appropriate to develop a new part to the *OGCA* or even a new statute. The new part or statute might deal with the regulatory aspects of the geological sequestration of CO₂, but it might also deal with proposals to use geological space for other disposal purposes. In addition to dealing with the regulatory issues, this part might also include sections dealing with liability, especially if there is a policy decision to create a special liability regime for CCS operations.

Pros

- More transparent.
- Signals the importance of the issue.
- Provides an opportunity to establish that an applicant must meet a particular statutory standard (e.g. the Board may not issue an approval unless the Board is satisfied that the proposal poses no risk to potable groundwater).⁶¹

Cons

- Would require legislative amendment.
- Runs the risk of fracturing the seamless and consistent application of the *OGCA* to a broad range of activities (i.e. special treatment of CCS may prompt calls for special treatment of other matters).
- May offer less flexibility.

I favour some variant of option two principally because I believe that it will enhance transparency and accountability.

⁶¹ At present all Board approvals are based upon some general and amorphous understanding of “public interest”. A more specific target such as this (which is somewhat similar to the SDWA standard in the US) would add additional rigour and accountability.

3.2 The federal role in the regulation of CO₂ injection projects

This section examines whether there is a role for the federal government in regulating the geological sequestration of CO₂. As background it is important to emphasize that, except in the NWT and Nunavut, the federal government is not involved with the day-to-day regulation of oil and gas activities (well drilling and completions, gathering pipelines etc). These are all provincial responsibilities.

This section does not address the broader question of the role of the federal government in developing and implementing climate change policy, but only the much more specific question of the regulatory standards to be applied to sequestration projects.⁶² I admit that the two are not completely separable. For example, federal caps on large emitters may effectively require those emitters to engage in geological sequestration if they are to remain in business.⁶³ Or the federal government might seek to encourage the adoption of CCS by enacting a carbon tax.⁶⁴ And a federal cap and trade plus offsets regime may seek to specify the grounds on which a merchant geological sequestration project might qualify for offset credits under such a scheme.

I also emphasize that the focus here is on the injection phase of a CCS project rather than the upstream emitter or the pipeline infrastructure. Any large upstream emitter such an oil sands project will engage some level of federal regulation, typically triggered by the *Fisheries Act* and in particular the habitat protection provisions of that Act. Federal decision-making under the *Fisheries Act* in turn triggers application of the federal *Canadian Environmental Assessment Act*. Similarly, transportation facilities (a pipeline) connecting an emitter with an injection site will clearly engage federal jurisdiction if they are international or interprovincial in nature. For example, the Souris pipeline linking the Weyburn EOR project with the CO₂ source in North Dakota, is subject to federal regulation under the *National Energy Board Act*⁶⁵. Federal

⁶² The paper does not discuss other relevant federal legislation including the *Kyoto Protocol Implementation Act*, SC 2007, c.30. Section 6 of that (which was not a government measure) contains extensive regulation making powers but nothing specific to geological sequestration.

⁶³ This is effectively what the federal government proposes to do. See *Regulatory Framework for Air Emissions* April 2007 and further documents released in March 2008 (1) Taking Action to Fight Climate Change, (2) Regulatory Framework for Industrial Greenhouse Gas Emissions, (3) Canada's Offset System for Greenhouse Gases, (4) Canada's Credit for Early Action Program, and (5) Detailed Emissions and Economic Modelling, all available at www.ec.gc.ca/default.asp?lang=En&n=75038EBC-1-m10. I commented on the implications of these proposals for CCS uptake in Bankes, "The federal government's climate change policy and the role of carbon capture and storage" (2008) 101 Resources 1–5 online at cirl.ca/Archive. The precise constitutional basis for such an initiative continues to be debated. Possible supporting heads of power include both the criminal law power and the residual peace order and good government power (POGG). For some of the literature see Rolfe "Turning Down the Heat: Emissions Trading and Canadian Implementation of the Kyoto Protocol," (Vancouver: West Coast Environmental Law Research Foundation, 1998) Barton, "Economic Instruments and the Kyoto Protocol: Can Parliament Implement Emissions Trading Without Provincial Co-operation?" (2002), 40 Alberta. Law Review 417; and Bankes and Lucas, "Kyoto, Constitutional Law and Alberta's Proposals," (2004), 42 Alberta. Law Review 355.

⁶⁴ A federal carbon tax would clearly be constitutional. The Norwegian carbon tax was instrumental in Statoil's decision to engage in carbon capture for the Sleipner project.

⁶⁵ *National Energy Board Act*, R.S.C. 1985, c. N-7 and National Energy Board, Reasons for Decision, Souris Valley Pipeline Limited, MH-1-98, October 1998.

jurisdiction will be much more limited in the case of intraprovincial pipeline infrastructure which will be provincially regulated (although stream crossings might still trigger some federal intervention and review).

But what about the injection facilities and the overall regulation of the geological sequestration project? Such facilities likely have a fairly small surface footprint and it should be possible to locate them so as not to interfere with fisheries habitat, the habitat of migratory birds, or other “federal” lands or interests such as Indian reserves. Traditionally, oil and gas conservation legislation has been a provincial matter on the basis that such laws are laws in relation to provincial heads of power under s.92⁶⁶ or 92A of the *Constitution Act, 1867*. I think that this would continue to be the case for a CO₂ geological sequestration project,⁶⁷ that is to say, a provincial regulatory scheme would clearly be valid.

Does this mean that there is no role for the federal government to play? This likely goes too far. The environment, as the Supreme Court has reminded us on several occasions,⁶⁸ is a shared responsibility between federal and provincial governments. The federal government can make laws to protect the environment based on a number of heads of power including the criminal law power (e.g. the toxic substances provisions of *CEPA*⁶⁹) and under the peace, order and good government power (e.g. the ocean dumping provisions of *CEPA*).⁷⁰

This gives rise to two questions. First, how far *could* such federal intervention go in the case of a geological sequestration, and second, how far *should* it go? Or is this a case where it might be more appropriate to defer to provincial jurisdiction even if we were to conclude that the federal government had a broad competence?

I cannot answer the first question in any definitive way here (ultimately any such analysis will turn on the specific terms of the regulatory proposal) but I have been asked to comment specifically on the implications for CCS projects of listing CO₂ as a toxic substance under *CEPA* and my answer to that question will go at least some way to answering the broader question.

3.2.1 What are the implications for CCS projects of listing CO₂ as a toxic substance?

This section attempts to assess the legal consequences of listing CO₂ as a toxic substance under *CEPA* and especially in the context of a CCS project. The discussion is somewhat detailed and technical and so I highlight the main conclusions here:

⁶⁶ See in particular s.92(13) property and civil rights, s.92(16) matters of a local or private nature and s.92A(1)(b) conservation development and management of non-renewable natural resources.

⁶⁷ Section 92 is more relevant than the much more recent s.92A.

⁶⁸ *Friends of the Oldman River Society v. Canada*, [1992] 1 SCR 3, *R. v. Hydro Quebec*, [1997] 3 SCR 213.

⁶⁹ *Hydro Quebec, id.*

⁷⁰ *R. v. Crown Zellerbach*, [1988] 1 SCR 401

- The immediate legal implications of listing a substance as a toxic substance are very limited unless the substance is also to be targeted for virtual elimination (not the case for CO₂). Listing does not automatically result in intensive regulation of projects emitting CO₂ or capturing and injecting CO₂.
- Classification as a toxic substance opens the door for more detailed regulation on a substance-by-substance or industry-by-industry basis.
- The extent to which the federal government can regulate activities that produce, capture and inject CO₂ under the toxic substances part of *CEPA* remains to be determined. In particular, while regulations under this part of *CEPA* might limit emissions and while it seems reasonable to think that the federal government may impose various monitoring and reporting requirements for a sequestration project, I do not think that the federal government could use these provisions to develop regulations concerning the approval of sequestration projects.

Discussion

The federal government of Canada has listed CO₂ as a “toxic substance” under the terms of the *Canadian Environmental Protection Act*.⁷¹ The validity of the toxic substances provisions of *CEPA* (actually the predecessor of the current legislation) was tested and upheld in *R. v. Hydro-Quebec*⁷² in the context of an interim order relating to the listing of PCBs. The Court upheld the legislation on the basis of the criminal law power.⁷³ The interim order imposed restrictions on environmental releases of chlorobiphenyls.⁷⁴

Meinhard Doelle, a leading commentator on *CEPA*, has cautioned that while the case has undoubtedly “significantly increased the scope of power for the federal government to implement environmental protection measures” the case “was decided in the specific context of efforts to control PCBs. It is therefore unlikely that this one case will have ended the debate over federal jurisdiction to implement all aspects of *CEPA*”.⁷⁵ I agree with this, and, particularly in the

⁷¹ S.C. 1999, c. 33 at Schedule 1; Order Adding Toxic Substances to Schedule 1 to the Canadian Environmental Protection Act, 1999, P.C. 2005-2037, Canada Gazette. 2005.II.139, SOR/2005-345.

⁷² [1997] 3 SCR 213.

⁷³ At para 123: “I entertain no doubt that the protection of a clean environment is a public purpose ... sufficient to support a criminal prohibition. It is surely an “interest threatened” which Parliament can legitimately “safeguard”, or to put it another way, pollution is an “evil” that Parliament can legitimately seek to suppress.”

⁷⁴ 6. The quantity of chlorobiphenyls that may be released into the environment shall not exceed 1 gram per day in respect of any item of equipment or any receptacle or material containing equipment in the course

of the operation, servicing, maintenance, decommissioning, transporting or storage of (a) electrical capacitors and electrical transformers and associated electrical equipment manufactured in or imported into Canada before July 1, 1980”

⁷⁵ Meinhard Doelle, *Canadian Environmental Protection Act & Commentary*, at 5; Doelle’s qualification is reinforced by LaForest’s own comments in *Hydro Quebec* to the effect (at para 145) that: When one examines the original Schedule, as it appeared in the statute, it is evident that it comprises a very restricted number of substances, nine, and it is also apparent that they set forth asbestos, lead and mercury, substances that even to the uninitiated are well known to be toxic in certain circumstances when they enter into the environment.

case of CCS, I think that there is a lot of ground between, on the one hand, the power of parliament to prohibit an activity, or emissions of a particularly toxic substance (or even emissions/releases beyond a particular level, the actual issue in *Hydro-Quebec*), and, on the other hand, the power of parliament to require that a certain technique (CCS) be used to avoid emissions of a naturally occurring and ubiquitous substance, and the power of parliament to prescribe the manner in which a carbon sequestration project is to be implemented.

I think that the judgement itself suggests that it will be necessary to examine each regulatory effort in relation to different categories of listed substances. For example, Justice La Forest was careful to say (at para 128): “The national concern doctrine operates by assigning full power to regulate an area to Parliament. Criminal law does not work that way. Rather it seeks by discrete prohibitions to prevent evils falling within a broad purpose, such as, for example, the protection of health.” (emphasis supplied)

Once a substance is classified as toxic under *CEPA* there are two options for its management: virtual elimination or life-cycle management.⁷⁶ The virtual elimination path is to be adopted for those toxic substances that are “persistent and bioaccumulative”. These are not terms typically used to describe CO₂ and therefore the implications of listing CO₂ will be aimed at management rather than “virtual elimination”. The Act contemplates that “management” shall be effected by developing regulations over time either aimed at specific substances or at particular industrial sectors (e.g. mining).

Section 93(1) of *CEPA* maps out very broad regulation making powers with respect to substances listed as toxic substances. Relevant parts include the following:

(1) Subject to subsections (3) [advice of a national advisory committee] and (4) [substance subject to regulation under another Act], the Governor in Council may, on the recommendation of the Ministers, make regulations with respect to a substance specified on the List of Toxic Substances in Schedule 1, including regulations providing for, or imposing requirements respecting,

(a) the quantity or concentration of the substance that may be released into the environment either alone or in combination with any other substance from any source or type of source;

(b) the places or areas where the substance may be released;

(c) the commercial, manufacturing or processing activity in the course of which the substance may be released;

(d) the manner in which and conditions under which the substance may be released into the environment, either alone or in combination with any other substance;

(r) the manner, conditions, places and method of disposal of the substance or a product containing it, including standards for the construction, maintenance and inspection of disposal sites;

⁷⁶ Doelle, *id* at 17.

On the face of it, these provisions are very broad and allow the federal government to develop regulations to prescribe levels of CO₂ emissions, to require the reporting of CO₂ emissions, to prescribe the capture of CO₂, and to require the disposal of CO₂ including the standards for such disposal sites. While it may be possible for the federal government to justify a set of regulations covering all of these matters in relation to highly toxic persistent organic pollutants such as PCBs, I do not think it will be able to use the criminal law power to support such a sweeping range of regulatory control with respect to all substances that are listed as toxic substances. That is because, as Justice LaForest stated above, the prohibitions must be discrete. At some point, the character of the legislation dealing with the management of toxic substance (particularly a substance universally present in the natural environment) changes; instead of being legislation in relation to criminal law it becomes regulatory and legislation in relation to property and civil rights in the province.⁷⁷ Thus, while emission prohibitions and limits and ancillary reporting requirements might fall with a criminal and prohibitory regulatory scheme, it would be much more difficult to justify a regulation that purported to prescribe a mode of capture and a mode of sequestration and the details of any sequestration regime.

3.2.2 How far *should* the federal government go in regulating geological sequestration activities?

Even if one takes the view that the federal government *could* regulate sequestration activities in relation to a listed toxic substance such as CO₂, there is a question of whether it *should*. Any answer to this question is likely contingent and will depend on the quality of the regulatory scheme that the provincial government puts in place. But if the provincial government puts in place a robust regulatory regime that meets international standards (including standards with respect to certifying offset projects) then arguments in favour of deferring to provincial regulation become compelling. They include the following:

- The desirability of avoiding duplication and inconsistency.
- The recognized expertise and competence of provincial regulatory authorities in cognate areas already covered by oil and gas conservation legislation.
- The absence of obvious federal regulatory competence in these areas (except in relation to the northern territories).⁷⁸

CEPA itself is sensitive to these issues and values and s.10 of *CEPA* provides for equivalency agreements. An equivalency agreement is an agreement between the federal and another jurisdiction concluding that the other jurisdiction has in force a set of laws that is the equivalent of any particular set of regulations passed under various sections of *CEPA* including s.93. As a result of an equivalency agreement, the federal government may issue an order stating that the prescribed federal regulations are inapplicable within that jurisdiction. An Alberta example is the

⁷⁷ *Fowler v. R* [1980] 2 SCR 213; *Northwest Falling Contractors v. R.*, [1980] 2 SCR 292. In *Fowler* the Court struck down a provision of the *Fisheries Act* that prohibited the deposit of logging debris into water frequented by fish. As framed, the provision was too broad because it did not require proof that logging debris was harmful to fish.

⁷⁸ The National Energy Board is responsible for administering federal oil and gas conservation legislation in NWT and Nunavut.

Alberta Equivalency Order which renders federal regulations dealing with vinyl chloride, lead, and pulp and paper effluent inapplicable in Alberta.⁷⁹

This suggests that even if one believes that the federal government *could* legislate broadly in relation to geological sequestration of this particular toxic substance it may have two options:

1. not to legislate at all with respect to geological sequestration unless one or more jurisdictions prove to be incapable of handling the issue
2. legislate a set of standards but then be prepared to enter into equivalency agreements with any jurisdiction that can meet the standard established by s.10 of *CEPA*.

The latter option perhaps comes closest to the approach of *EPA* under its UIC Program.

⁷⁹ Alberta Equivalency Order, SOR 94/752.