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Who Owns Brine-Hosted Minerals in Alberta?

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Matter Commented On: Application by Enhance Energy for a Scheme Approval for its Origins Carbon Capture and Storage Project, December 2024, AER Application No. 1956215

In December 2024 Enhance Energy Inc filed an application with the Alberta Energy Regulator (AER) for a scheme approval (see [Directive 065](#) and *Oil and Gas Conservation Act*, [RSA 2000, c O-6 \(OGCA\)](#) for its Origins Carbon Capture and Storage Project. The open file is currently available through the AER's Integrated Application Registry (IAR) using application # 1956215. This link is currently [functional](#). A large number of Statements of Concern (SOC) have been filed with the AER in response to this application. Many of these SOC filers are owners of mineral titles of one form or another who claim that the injection of carbon dioxide into the Leduc formation will be prejudicial to their mineral interests because of the potential to impair recovery of brine-hosted minerals, specifically lithium, in the reservoir. The underlying premise for SOC's that are framed in this way (i.e. specific to brine-hosted minerals rather than, for example, alleging prejudice to the recovery of hydrocarbons) must be that the SOC filer's mineral title includes brine-hosted minerals. In this post I question that premise or assumption. I begin with a brief discussion of the nature of brine-hosted minerals and then discuss the relevant case law and statute law. My working conclusion is that since brine-hosted minerals are dissolved in water, and since the Crown in right of Alberta or the government of Alberta owns all the water in the province (at least outside federal lands), then brine-hosted minerals are part of that water title and not part of a mines and minerals title. It would follow from this that SOC's that are based solely on an interference with a brine-hosted mineral title have no merit.

The Nature of Brine-Hosted Minerals

Brine-hosted minerals are dissolved minerals found in natural saltwater solutions (brines) rather than in solid rock formations. While such brines may occur in the form of saline lakes, or evaporite deposits, they may also be found in oil and gas reservoirs, which is significant in this province. Minerals dissolved in brine may include lithium, potassium, magnesium, and bromine. Various techniques exist for extracting these minerals, specifically lithium, from the brine [including adsorption, ion exchange, and solvent extraction processes](#).

Some General Principles and The Relevant Case Law

I begin with the general principle that the owner of the estate in fee simple in any land includes all property interests at the surface, below the surface and above the surface of the particular tract of land (*ad caelum, ad inferos* – from heaven to hell). That title may subsequently be severed by a conveyance that grants or reserves certain interests (e.g. a reservation of coal, petroleum and

valuable stone), or by a statutory vesting provision. But the balance of any interests after taking account of any reservations or statutory vesting provisions accrues to the holder of the surface fee simple title, although that title may be encumbered by the working rights necessary to exploit the severed mineral interests so as to avoid a “derogation from grant”.

The well-known decision of the Privy Council in *Borys v Canadian Pacific Railway*, [1953 CanLII 414 \(UK JCPC\)](#) is illustrative. The CPR obtained an all-in fee simple title from the Dominion Crown to a tract of land which it subsequently conveyed to the Borys interests, reserving out coal, petroleum, and valuable stone. In reliance on that reservation the CPR granted Imperial a lease of “all petroleum that might be found within, upon or under the said land together with the exclusive right to work, win and carry away the same for a period of 10 years, subject to the right of renewal.” (PC at 67) Imperial aimed to drill a well on the tract which was in what became known as the Leduc-Woodbend field. Justice Parlee in the Court of Appeal described the field in the following terms:

There are two main producing horizons—the first being Nisku (D-2) and the second Leduc (D-3), the latter being the more prolific of the two. Above the Nisku (D-2) horizon oil and gas may also be encountered.

The field has been tested and it may be concluded with certainty that on the plaintiff's land oil in paying quantities will be found in the Nisku (D-2) formation. The oil in this horizon will have gas in solution but without any gas-cap. Then, lower down, in the Leduc (D-3) formation will be found the more prolific horizon with gas in solution and with a gas-cap. A gas-cap is described as free natural gas, in contact with, resting on, or floating on the oil beneath. It should be added that the oil and the gas, whether free or in solution, is while in the earth under great pressure. ([1952 CanLII 337 \(ABCA\)](#) at 229)

Lord Porter, speaking for the Privy Council, added to this description the fact that both the oil and natural gas were underlain by water. (PC at 67). Before Imperial had reached target depth Borys brought an action against both CPR and Imperial seeking, *inter alia* a declaration that he was the “owner of the natural gas within, upon or under this land” and an injunction restraining the defendants from “using, removing, wasting, interfering with or otherwise disposing of said natural gas.” (CA at 219)

All three levels of court concluded that natural gas and petroleum were different substances albeit both were hydrocarbons. It followed from this that “[t]he substance which is found in the form of gas *in situ* is therefore not the subject of reservation and remains the property of [Borys].” (PC at 70) And while not an issue in the litigation, the Privy Council clearly understood that water was a different substance from either petroleum or natural gas.

With this “different substances” conclusion in hand, Lord Porter then turned to the question of what was included within the term petroleum, particularly with reference to gas that would be in solution in the petroleum in the reservoir. Should such gas in solution be treated as gas that accrued to Borys’s natural gas title or to CPR’s petroleum title? Lord Porter first established the appropriate methodology for answering such a question. Lord Porter favoured an approach that emphasised the vernacular over the scientific (especially at 73 & 74). And that led him to adopt the position of

Justice Parlee in the Court of Appeal to the effect that petroleum is first and foremost a liquid, the reservation is a reservation of petroleum in the ground, and therefore CPR's petroleum title includes natural gas in solution in the reservoir. Stated at greater length, Justice Parlee, as endorsed by the Privy Council reasoned as follows:

What was reserved to the railway company was petroleum in the earth and not a substance when it reached the surface. It is true that by change of pressure and temperature, gas is released from solution when the liquid is brought to the surface but such a change out not to affect the original ownership...

In my opinion, all the petroleum reserved, including all hydrocarbons in solution or contained in the liquid in the ground, is the property of the defendants who are entitled to do as they like with it, subject, of course, to the observance of all relevant statutory provisions and regulations. (PC at 74)

This conclusion, together with the "different substances" conclusion above, resolved the ownership issues presented by the parties – but what about the right to work? It will be recalled that the reservation itself did not expressly include the right to work the reserved substances (coal, petroleum, and valuable stone). Furthermore, the evidence showed that any production of petroleum from the reservoir would also result not only in the production of CPR's natural gas in solution, but also some of the gas in the gas cap (i.e. a substance not the subject of CPR's reservation of petroleum) (PC at 75).

As to the first point, Lord Porter reasoned that the right to work was necessarily implied by the reservation.

... the absence of a clause giving a right to work does not abrogate or limit the powers of [CPR and Imperial]. Inherently the reservation of a substance, which is of no advantage unless a right to work it is added, makes the reservation useless unless that right follows the grant. The true view is that such a reservation necessarily implies the existence of power to recover it and of the right of working. (PC at 75)

It was understood that an express grant of the right to work would be required if working one of the reserved substances would "let down the surface", but that was not at issue in this case. Nevertheless, Borys sought to argue that the escape of his gas cap gas was analogous to letting down the surface, and thus that Imperial should not be allowed to proceed without his consent. Lord Porter was not persuaded by that analogy and instead concluded that the right to work associated with the reservation necessarily allowed CPR, and its lessee, to work the petroleum in the ordinary way, even if that caused the production of some of Borys' gas. Lord Porter did not comment on whether there might be a duty to account for any gas cap gas associated with the petroleum; perhaps the understanding was that such gas at the time would necessarily be flared. Neither did he resolve the question of priority as between the petroleum and natural gas although he did allude to the issue:

It may well be that [Borys] can recover his own substance by any usual and customary method, but cannot prevent [CPR and Imperial] from following a similar course. It is not,

however, necessary to come to any conclusion on this matter, since the claim is concerned only with [CPR and Imperial's] right to work and method of working and does not involve any decision as to how [Borys] may deal with the gas. (PC at 77)

As it happens of course, for conservation reasons associated with maximizing the production of petroleum, oil and gas conservation legislation (see *OGCA* above) has long prioritized production of petroleum before natural gas – but it does so as a matter of public interest regulation rather than as a matter of property.

Three principal lessons emerge from *Borys*. The first is the recognition that in any case in which the conveyancing documents establish different categories of substances, the initial task is to recognize that those categories are different and cannot be subsumed, the one within the other. The second lesson is that in assessing the content of each category of substances the correct approach is the vernacular approach as applied to the substances in the ground rather than a scientific approach. And the third lesson is that a grant or a reservation will ordinarily imply an incidental right to work that which is the subject of the grant or reservation.

The second decision of interest is *Anderson v Amoco Canada Oil and Gas*, [2004 SCC 49 \(CanLII\)](#), affirming [2002 ABCA 162 \(CanLII\)](#) which varied [1998 ABQB 620 \(CanLII\)](#). *Anderson* is a follow-up to *Borys* and specifically addresses one issue on which *Borys* was at least ambiguous. That issue was the status of evolved gas. Evolved gas refers to natural gas that was originally in solution in the reservoir at original pressure and temperature conditions, but which changes phase and becomes a gas in the reservoir over time as conditions in the reservoir change as a result of producing substances from the reservoir. Consistently with *Borys*, the Court held that ownership determination was to be based on original reservoir conditions and that therefore evolved gas fell with the category of petroleum, since, under original reservoir conditions, that gas was in liquid form. But much more important than that conclusion for present purposes are the observations of both the Court of Appeal and the Supreme Court of Canada with respect to natural gas dissolved in water in the reservoir (referred to in the decisions as connate water) under original reservoir conditions. The judgments adopted the following definition of connate water: "all water present in a pool. It includes water present within the voids or pores, edge water and bottom water." (See the glossary of terms at the end of the SCC judgment.)

The trial Court in *Anderson* held that ownership of the evolved gas associated with connate water should be subject to the same regime as petroleum. Justice Fruman reasoned as follows:

[163] To my knowledge, this is the first litigated claim for hydrocarbons dissolved in connate water. The topic was not specifically raised in *Borys* ... Nevertheless, *Borys* provides considerable guidance.

[164] What we are to look for in construing a reservation, Lord Porter told us, is the vernacular meaning of "petroleum". He found it difficult to believe that landowners, businessmen, engineers, the staff of CPR or *Borys* would have differentiated between oil and the gas in solution. "They would, in the view of the Board, have included in petroleum all the liquid substances in the mine. . . "

[165] Under initial reservoir conditions, connate water is liquid, as are hydrocarbons dissolved in connate water. Using Lord Porter's vernacular meaning, hydrocarbons dissolved in connate water under initial reservoir conditions, being liquid substances, belong to the defendants, the petroleum owners.

It is important to observe that there are two elements to Justice Fruman's reasons. The first element is that liquids are liquids, and that gas dissolved in a liquid has the same property characterization as the liquid within which it is dissolved. The second element is that all liquids (water or hydrocarbons) should be subject to the same legal treatment.

Both the Court of Appeal and the Supreme Court of Canada seem to have accepted the first element of Justice Fruman's approach, but decisively rejected the second on the basis of the proposition that connate water is not a hydrocarbon and has a distinct legal status in Alberta (i.e., to use the language adopted above it is its own category of substance). The Court of Appeal put it this way:

...we do not agree with the trial judge's conclusion that gas which emerges from connate water belongs to the petroleum owner. *The reservation did not reserve water.* Therefore, gas which was in solution within connate water at initial reservoir conditions does not belong to the petroleum owner. (*Anderson ABCA* at para 53) (emphasis added)

This confirms that the initial task is to recognize that there may be different categories of substances and that chemicals dissolved in that substance assume the ownership characterization of the substance that they are dissolved in. The Supreme Court of Canada evidently agreed with this and went on to identify who might claim an ownership interest in the connate water, and therefore presumably the natural gas that evolved from the connate water. In the case of Alberta, this is the province by virtue of the vesting provisions of successive provincial water statutes:

The Court of Appeal did not determine who owned the hydrocarbons from connate water. It appears that in Alberta this water is owned by the province as a result of the Water Act, R.S.A. 2000, c. W-3. All of the parties to this appeal were content with this disposition by the Court of Appeal so that a determination of who is entitled to any hydrocarbons recovered from the connate water is no longer an issue here. (*Anderson SCC* at para 13)

Here are the relevant definition and vesting provisions of the current *Water Act*, [RSA 2000, c W-3](#):

(fff) "water" means all water on or under the surface of the ground, whether in liquid or solid state;

3(2) The property in and the right to the diversion and use of all water in the Province is vested in His Majesty in right of Alberta except as provided for in the regulations.

The definition of water and the language of the vesting provision has changed over time but groundwater was added to the definition of water, and as such subject to the vesting provision, in 1962: [SA 1962, c 99](#). The Department of Environment and Parks considers that saline groundwater is just as much subject to the *Water Act* as potable water, although the regulation of saline

groundwater may be more light-handed. For example, Schedule 3 of Water (Ministerial) Regulation, [Alta Reg 205/1998](#), exempts diversions of saline groundwater from the need to acquire a licence:

1. The following diversions of water and any operations of works associated with those diversions do not require a licence:
...
(e) a diversion of saline groundwater;

See also the definitions in the Brine-hosted Mineral Resource Development Rules, [Alta Reg 17/2023](#).

In sum, if we return to first principles, the treatment of water as an ownership category separate from the petroleum and natural gas interests (and more generally the mines and minerals interests) would ordinarily be sufficient to leave those interests vested in the surface owner of the estate in fee simple (i.e. if water is not included in the reservation of petroleum and natural gas or mines and minerals it must be with the surface owner). That might have been the case in Alberta prior to 1962. But since then, there has been a severed water estate in Alberta that is vested in the Crown.

Application to Brine-Hosted Minerals Such as Lithium

We are now in a position to examine the question of who owns the lithium that may be dissolved in brines in Alberta. Both *Borys* and *Anderson v Amoco* instruct that the first step is to examine the issue from a vernacular rather than a scientific perspective. And from a vernacular perspective, as informed by those two cases, saline ground water is simply water and is not H₂O minus all the other elements (such as lithium) that might be dissolved in that water. In other words, those dissolved elements are part of the water estate and not part of a petroleum, natural gas, or mines and minerals estate. And they do not become part of the mineral estate just because lithium might be included within the definition of a mineral in the *Mines and Minerals Act*, [RSA 2000, c M-17](#) just as natural gas dissolved in connate water is not part of the mineral estate, even though clearly included in the definition of a mineral in the *MMA*. It is important to recognize that, with some notable exceptions (see s 10 gold and silver and s 15.1 pore space), the *MMA* does not itself establish Crown ownership of anything. Rather the statute is principally concerned to say that if a mineral is owned by the Crown, then the Crown can (and indeed must) dispose of that mineral in accordance with the *MMA*. But again, with the notable exceptions of ss 10 and 15.1, the Crown must establish its title to minerals by way of other instruments, usually Crown grants reserving mines and minerals to the Crown, or by the absence of any patent at all for the lands in question.

I acknowledge that this conclusion seems to run contrary to the main conclusion reached by Tscherning and Chapman in an article published in the *Journal of Energy and Natural Resources Law* in 2021 (“[Navigating the emerging lithium rush: lithium extraction from brines for clean-tech battery storage technologies](#)” (2021) 39:1 *J Energy Nat Resources & Envtl L*, 13 – 42) but their analysis focused on the actual practice of the Department rather than first principles. For example, they note that “[t]he right to work lithium from enriched brines appears to be principally governed under Alberta’s mines and minerals regime, not its water regime.” (Ibid at 23 – 24) However, they too acknowledge that the *Anderson* decision creates some uncertainty:

The decision in *Anderson* therefore raises questions for the lithium industry regarding the property status of lithium and lithium-enriched brines in the subsurface. Lithium producers will want to be sure that their right under the *MMA* to lithium resources in an area includes the right to extract lithium from enriched brines. (Ibid at 26)

What are the Implications of this for the Crown (or Government of Alberta) and Lithium Developers?

The analysis above suggests that all minerals dissolved in brine (brine-hosted minerals) are vested in the Crown by virtue of its ownership of the host water (brine), and not by virtue of an ownership interest in mines and minerals (the province is generally reckoned to own 80% of mines and minerals by virtue of reservations contained in the original grants from the Crown). The government is therefore free to develop a leasing system for all such brine-hosted minerals and it has chosen to do so under the terms of the Metallic and Industrial Minerals Tenure Regulation, [Alta Reg 265/2022](#), (MIMTR) adopted under the *MMA* (although perhaps informed by an incorrect premise). Tscherning and Chapman (above) offer an extended discussion of an earlier version of this scheme. A significant puzzle however is the question of how the rights on which MIMTR purports to operate came to be under the administration of the Minister of Energy and Minerals under the *MMA* rather than under the administration and control of the Minister of Environment and Parks under the *Water Act*. Perhaps this anomaly might be addressed by the adoption of an appropriate Order in Council under the authority *Government Organization Act*, [RSA 2000, c G-10](#) transferring the administration and control of water below the base of groundwater protection (BGWP) from the Minister of Environment and Parks to the Minister of Energy and Minerals. This may not be the most precise formulation for the transfer since the BGWP may not provide a bright line rule, but it does seem to be workable for other regulatory processes (see [here](#)).

It may also be necessary to amend s 2 of the *MMA* the “application” provision. At the moment that section reads as follows:

This Act applies

- (a) to all mines and minerals, pore space and related natural resources vested in or belonging to the Crown in right of Alberta, and
- (b) where the context so permits or requires, to all wells, mines, quarries, minerals and geothermal resources in Alberta.

While it may be argued that connate water is a “related natural resource” it might be clearer if paragraph (a) also referred to any other resources over which the Minister has administration and control (assuming that this is clarified as above by way an order in council transferring administration and control).

The current government can also perhaps celebrate that the ownership simplicity achieved by the above interpretation, is achieved without the need for new, and perhaps controversial, vesting legislation. According to my analysis, any change in the property rights of surface owners to brine-hosted minerals occurred more than 60 years ago.

Companies that wish to develop brine-hosted lithium should also take some comfort from this analysis since it means that they don't have to deal with hundreds of different owners of mines and minerals or petroleum and natural gas interests. Neither do they have to think about problems of unitizing multiple ownership tracts in order to be able to put together a viable project.

And finally, neither surface owners nor mineral owners in the area of Enhance's Origins project can rely upon a claimed property interest in brine-hosted minerals as the basis of filing an SOC in relation to the project since they have no such interest. Mineral owners have never had a property interest in brine-hosted minerals, and surface owners lost whatever claim they might have had in 1962.

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