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The AER Panel Dismisses Appeal in Induced Seismicity Case But Reinforces the Case For a Regional Approach

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Decision Commented On: Obsidian Energy Ltd. Appeal of Environmental Protection Order March 7, 2025, 2025 ABAER 002

In this decision, an appeal panel of the Alberta Energy Regulator (AER) confirmed that the Compliance Liability Management (CLM) Branch had sufficient warrant to issue a remedial Environmental Protection Order against Obsidian on the basis that CLM could reasonably form the opinion that Obsidian's disposal activities were responsible for induced seismicity events. The decision reveals the complexity of determining cause and effect in cases such as this where there are multiple disposal injectors in the same area. As a result, the decision also supports the need for a proactive regional approach to the use of pore space for disposal (and perhaps other) purposes.

Introduction

On November 29, 2022, a cluster of seismic events occurred near the Hamlet of Reno, about 40 kilometres southeast of Peace River, Alberta. The largest was a 5.59 magnitude event. On March 6, 2023 there was a similar cluster of events in the same area, including one recorded at 5.09. While the Alberta Geological Survey (AGS) initially attributed the November events to natural tectonic activity, with the recurrence in March "the AGS began to think that the seismic events were induced by human activity." (at para 6) And, with the advantage of preliminary data from a local seismic nodal monitoring array that had been deployed after the first events, the AER (March 20) "attributed the seismic events to Obsidian's disposal operations at its 14-18-82-17W5M disposal well (the Obsidian well), which is authorized for disposal of fluids into the Leduc Formation." (at para 8) On March 22, 2023 AER staff met with Obsidian and shared the AER's position.The following day the relevant regional director of the CLM Branch of the AER gave Obsidian an Environmental Protection Order (EPO or Order) under sections 113 and 241 of the *Environmental Protection and Enhancement Act* RSA 2000, c E-12 (*EPEA*) (s 241 deals with additional conditions that may be included in an EPO, there is no discussion of the section in this decision or in this post).

The Legal Framework for the Order

Section 113(1) provides that

> Subject to subsection (2), where the Director is of the opinion that
> (a) a release of a substance into the environment may occur, is occurring or has occurred, and

(b) the release may cause, is causing or has caused an adverse effect,
the Director may issue an environmental protection order to the person responsible for the substance.

Subsection 2 provides that

> Where the release of the substance into the environment is or was expressly authorized by and is or was in compliance with an approval, code of practice or registration or the regulations, the Director may not issue an environmental protection order under subsection (1) unless in the Director's opinion the adverse effect was not reasonably foreseeable at the time the approval or registration was issued, the code of practice was adopted or the regulations were made, as the case may be.

Perhaps surprisingly there is no discussion of subsection (2) in the decision at all. I assume that Obsidian must have concluded that it was not relevant or that it simply chose not to rely on it.

In order to trigger s 113, the Director must first be "of the opinion" that "a release of a substance into the environment may occur, is occurring or has occurred". Most of these terms are defined terms. For the "environment" it is perhaps sufficient to say that the term as defined clearly includes the subsurface as well as the surface (the Panel noted at para 224 that "Obsidian did not take issue with the director's finding that there was a release into the environment").

"Substance" means

(i) any matter that
  (A) is capable of becoming dispersed in the environment, or
  (B) is capable of becoming transformed in the environment into matter referred to in paragraph (A),
(ii) any sound, vibration, heat, radiation or other form of energy, and
(iii) any combination of things referred to in subclauses (i) and (ii);

"Release" includes "spill, discharge, dispose of, spray, inject, inoculate, abandon, deposit, leak, seep, pour, emit, empty, throw, dump, place and exhaust". "Adverse effect" means "impairment of or damage to the environment, human health or safety or property." Finally, "person responsible" *with reference to a substance* means

(i) the owner and a previous owner of the substance or thing,
(ii) every person who has or has had charge, management or control of the substance or thing, including, without limitation, the manufacture, treatment, sale, handling, use, storage, disposal, transportation, display or method of application of the substance or thing,
(iii) any successor, assignee, executor, administrator, receiver, receiver-manager or trustee of a person referred to in subclause (i) or (ii), and
(iv) a person who acts as the principal or agent of a person referred to in subclause (i), (ii) or (iii),
(I have omitted certain exclusions from this definition.)
(all definitions can be found at *EPEA*, s 1)

The Recitals and Terms of the Order

The EPO is included as Appendix 2 of the AER's decision.

The Recitals

The recitals to the EPO summarize many of the facts referenced in the introduction to this post noting that Obsidian's well is "authorized for disposal of water via injection into the Leduc formation (the Disposal Operation)". One might have thought that the water would be the "substance" of the EPO but instead the EPO recites as follows:

> WHEREAS seismic activity and seismic events are vibrations and/or the release of energy into the environment, and vibrations and the release of energy are defined as substances in section 1(mmm)(ii) of EPEA (the Substances);

The first part of this clause seems profoundly odd to me. It makes "seismic activity and seismic event" the subject of the clause and therefore ultimately the "substance". But that cannot be. It is one thing to say that the introduction or disposal of water under pressure, or the energy effects of such an introduction/disposal, constitutes the release of a substance but seismic activity cannot constitute the release of a substance even if it is the consequence of the release of a substance. Similarly, it is one thing to say that Obsidian is the person responsible for the water injection activities since it controls those activities, but Obsidian is not "the person responsible" (within the meaning of *EPEA*) for the seismic activity. Why? Because "person responsible" is used in *EPEA* only with reference to substance; seismic activity is not a substance and certainly not a substance that Obsidian ever had management or control of.

In any event, the Director in this case compounded the solecism by going on to provide that

> WHEREAS the Substances, when released, may cause adverse effects as defined in section 1(b) of *EPEA*;
>
> …
>
> WHEREAS the Director is of the opinion that a release of the Substances has occurred, and that the Substances have caused, are causing, or may cause adverse effects;
>
> WHEREAS Obsidian is a "person responsible" for the Substances as defined in section 1(tt) of *EPEA*;

But all of this is an aside, since neither Obsidian nor the AER Panel seem to have made anything of this (I would argue important – at least for future similar orders) semantic point.

The Terms of the Order

The Order itself has four separate headings: immediate action, mitigation plan, information for submission, and "general". As for immediate action the Order required Obsidian to develop an Immediate Action Plan (IAP) "to reduce the frequency and magnitude of induced seismic events caused by the Disposal Operation" and "to establish real-time passive seismic monitoring in the area surrounding the Disposal Operation. The monitoring network must be capable of detecting all seismic events above 2.0 ML within a 10 km radius of the Disposal Operation." The Mitigation Plan is to expand on the IAP by, *inter alia*, providing "emergency and communication protocols that Obsidian will follow in the event of an induced seismic event that may have adverse impacts on infrastructure or public safety." The required information includes information on "injection pressure, water injection rate, and cumulative water injected data" from the commencement of injection.

Finally, clause 12, under the heading "general" stipulates that:

> This Order will remain in effect until such time as a permanent regulatory instrument is in place or the induced seismic hazard from the Disposal Operation has reduced to the satisfaction of the Director.

The Appeal

The general issue on the appeal was whether "the order, including all of its content, should be confirmed, varied, suspended, or revoked" (at para 18) but the AER Panel asked the parties (Obsidian and the AER's CLM Branch) to address two questions: (1) Were the seismic events specified in the order induced by human activity? And (2) Is Obsidian's disposal operation responsible for the seismic events?

But before getting to these questions the AER Panel addressed two preliminary questions: the nature of the proceedings and the onus of proof. As for the nature of the proceedings the Panel noted that s 31.1 of the AER's Rules of Practice, Alta Reg 99/2013 authorized the Panel to "allow new information to be submitted in a regulatory appeal if the information is relevant and material to the decision appealed from and was not available to the person who made the decision at the time the decision was made." The Panel allowed considerable new material to be filed that had been collected by both parties in the interim. Apparently because of this the parties and the Panel all

> … agreed that no standard of review analysis need be applied to the decision under appeal. Obsidian argued that instead, the panel should make its decision having regard for all the evidence on the record of this proceeding, including the record of the decision maker and the new evidence. We agree with the parties that no standard of review should be applied and considered both the record of the decision maker and the new evidence in coming to our decision. (at para 21)

It is far from clear what the Panel means by this. There is still a decision that is under appeal; the panel is not being asked to make the decision or order that it thinks the director ought to have made (or not).

Perhaps the better view is that since new evidence may be introduced, the standard of review must be that of correctness and not reasonableness. This comports with the standard applied by the Court of King's Bench on appeal from an Applications Judge: *Bahcheli v Yorkton Securities Inc*., 2012 ABCA 166 (CanLII) under the Rules of Court. It is also, I think, consistent with the Panel's view as to onus of proof:

> In a regulatory appeal, the onus is on the requester, who must provide evidence that supports their position on the balance of probabilities; that is, the requester must bring sufficiently clear, convincing, and cogent evidence to satisfy the balance of probabilities test, to succeed in the regulatory appeal. (at para 25)

Were the Seismic Events Specified in the Order Induced by Human Activity?

The AER Panel concluded "on a balance of probabilities that the seismic events in November 2022 and March 2023 specified in the order were induced by human activities." (at para 74). Its summary reasoning was as follows:

> The recurring nature of the seismic events since November 2022 in an area which previously experienced little seismic activity is consistent with the pattern observed for other induced seismic events. Additionally, the induced seismicity assessments completed by CLM, Obsidian's independent consultant, and several independent researchers all indicate an induced origin for the seismic events. While the strength of the association between different disposal wells and seismic events varies depending on the assessment framework used and the evaluator's judgement, the results are consistent across all assessments. This increases our confidence that the seismic events were caused by human activity and are not natural. (at para 75)

Is Obsidian's Disposal Operation Responsible for the Seismic Events?

This was ultimately by far the most contentious issue.

Obsidian contended that the evidence linking its disposal well to the seismic event was ambiguous and that it was "substantially more likely" that two other injection activities (the relatively shallow 6-14 Belloy well (790m) and a group of wells referred to as the high-volume Leduc wells (and specifically the 13-11 Leduc well) caused the seismic events rather than Obsidian's disposal well.

The AER Panel described its understanding of the regional geology and then applied the same methodologies to each well based on the evidence adduced in order to address the issue of causation. The Panel specifically discussed, for example, the temporal correlation between injection activities at each of the three wells and the seismic events as well as the depth of injection activities and seismic events including possible faulting pathways. The Panel's summary conclusions for each of the three disposal activities were as follows.

> ***The Obsidian Well***

> Given that [the] … induced seismicity assessments [of both parties] indicate a possible linkage between disposal operations in the Obsidian well and the seismic events specified in the order, a plausible mechanism exists to connect disposal operations at the Obsidian 14-18 well to the mainshock fault plane in the Precambrian basement, and that some degree of temporal correlation between the disposal operations and the seismic events cannot be ruled out, we are not persuaded on the balance of probabilities that the Obsidian well did not cause the seismic events specified in the order. (at para 134)
>
> ***The 6-14 Belloy Well***
>
> While we accept that the 6-14 Belloy well may have contributed to causing the seismic events specified in the order, given uncertainties associated with the characteristics of the fault connecting the Belloy Formation to the Precambrian basement, we have insufficient information to conclude on a balance of probabilities that the 6-14 Belloy well caused the seismic events. (at para 164)
>
> ***The High-Volume Leduc Disposal Wells***
>
> Based on our review of the evidence, we find that the high-volume Leduc wells may have contributed to causing the seismic events referred to in the order. However, given the evidence available, we cannot conclude on a balance of probabilities that the high-volume Leduc disposal wells caused the seismic events. (at para 204)
>
> ***Overall***
>
> In summary, Obsidian has not persuaded us that the Obsidian 14-18 well did not cause or contribute to causing the seismic events specified in the order. While we find that it is plausible that the 6- 14 Belloy well and the high-volume Leduc wells may have contributed to causing the seismic events, based on the evidence available, we cannot conclude on a balance of probabilities that these operations caused the seismic events. (at para 215; and see also at paras 227 & 265)

In sum, and on a balance of probabilities, the evidence did not allow the Panel to refute the Director's conclusion, as expressed in the EPO, that Obsidian's well caused the seismic events. In a strict sense it was not necessary for the AER Panel to go on from this to determine the causative role of the Belloy and high-volume Leduc wells once it had decided that there was no basis for interfering with the finding in the EPO. The Panel itself makes this clearer later in its decision when it deals with Obsidian's argument to the effect that the AER should have issued an EPO against the other operators - either instead of Obsidian or in addition to Obsidian. The Panel responded as follows:

> Under *EPEA*, the director has significant discretion about who to name in an order. It is not necessary for the director to name every person responsible for a release. Although out of fairness, it is desirable that the decision maker name everyone they believe caused or contributed to the release. [Here the Panel referenced *Imperial Oil Ltd. and Devon Estates Ltd. v. Director, Enforcement and Monitoring, Bow Region, Regional Services, Alberta*

> *Environment*, 2002 ABEAB 23 (CanLII), at paras. 196-197.] At the time the order was issued, the CLM director was of the opinion that the Obsidian well and no other operation were responsible for causing the seismic events. This was sufficient for him to name Obsidian in the order as the person responsible. Obsidian, as operator of the well, had management and control over the substance released (the vibrations and release of energy associated with the seismic events). This meets the definition of "person responsible" under sections 113 and 1(tt) of *EPEA*. We find no error in the CLM's initial decision to issue the order only to Obsidian. (at para 234)

This (subject to my reservations articulated above as what the "substance" was) is clearly correct. The Director only needed to satisfy himself that Obsidian met the preconditions in order to issue an EPO to Obsidian.

> To confirm the order, it is not necessary for us to find that Obsidian caused the seismic events. Finding that Obsidian *may have caused* the seismic events is sufficient to confirm the order. The onus was on Obsidian as the regulatory appeal requester to demonstrate that the Obsidian well was not responsible for causing the seismic activity. (at para 228, emphasis in original)

It would only be necessary for the Director to satisfy himself as to the causative role of another party if he also intended to issue an EPO against that other party. That was not an issue that the AER panel needed to consider.

Revocation etc of the Order

The Panel also went on to consider whether it was appropriate to revoke, vary, or suspend the EPO. One possible ground for varying the Order was the paragraph in the recitals that provided that:

> WHEREAS the Director is of the opinion that a release of the Substances has occurred, and that the Substances have caused, are causing, or may cause adverse effects;

In a sense this directly contradicted an earlier paragraph to the effect that:

> WHEREAS the AER is not aware of any adverse effects resulting from the induced seismic events to date;

The Panel was of the view that nothing turned on this discrepancy. The Director was simply listing all three options in s 113(1)(b) of *EPEA* (quoted above) (at para 231) and that so long as the Director "was of the opinion that *a future release may occur* and that it may cause an adverse effect" that "was sufficient for him to issue the order." (at para 232, emphasis added)

Another possible ground for revoking the Order was perhaps that the EPO was no longer necessary given the amendments to Directive 065 that the AER had promulgated in November 2024, specifically amendments directed at assessing the induced seismicity risk of disposal wells including a traffic light system that operators must adopt. The Panel's decision contains a useful summary of some of the new key requirements as follows:

- If the AER determines the disposal well to be seismogenic, the disposal scheme approval holder must submit a seismic risk assessment and a monitoring, mitigation, and response (MMR) plan.
- If the AER determines the disposal well to be seismogenic, the disposal scheme approval holder must provide operational data, passive seismic monitoring information (including waveform data), and data required under the scheme approval to the AER upon request.
- All applications for new fluid disposal wells must include an induced seismic hazard assessment. A seismic risk assessment and an MMR plan are also required if the seismic hazard assessment shows that the area is prone to induced seismic events.
- Applications to amend the operating conditions of an existing fluid disposal well must include a seismic hazard assessment. A seismic risk assessment and MMR plan must also be included if the seismic hazard assessment shows that the area is prone to induced seismic events.
- A disposal scheme approval holder with an MMR plan must follow the traffic light protocol described in the directive should seismicity occur within ten kilometres of their disposal well, or a greater distance if directed by the AER). (at para 238)

While the Panel clearly took note of this development it ultimately concluded that revocation on this ground was not appropriate "until such time as the CLM director is satisfied that the requirements of *Directive 065* have been met for the Obsidian well and the order no longer required, as provided for in clause 12 [quoted above] of the order." (at para 268) It was also the Panel's view that the amended Directive could not be offered as a "justification to vary the order to name the operators of these wells in the order." (at para 243) That would also, I think, have been procedurally improper, absent notice to the relevant operators that this was a possible outcome of the appeal proceedings.

Another ground that seems to have been faintly argued by Obsidian for revoking or varying the EPO was that while the AER apparently intended the EPO to be remedial rather than punitive, the Order had, in fact, had reputational and other adverse consequences for Obsidian including the costs of implementing the Order. The Panel was evidently not impressed with this line of argument partly on causation grounds, but also (and especially in relation to the costs of implementation), on the sound basis that "if the order was properly issued, which we find it was, then the costs to comply with the order are justified and not a basis for revoking or varying the order." (at para 258)

But there was one theme that clearly resonated with the Panel (it also resonates with me) and that is the need for a proactive regional approach to induced seismicity, perhaps generally, but certainly with respect to the Peace River Arch Area. Much as we talk about cumulative impacts in relation to surface disturbances and thus the need for landscape level regional land use planning, so also with respect to a geological province such as the Peace River Arch. In the Panel's words:

> The Peace River Arch has a complex structural history with episodic structural deformation dominated by faulting during the Precambrian uplift of the arch, faulting during the Carboniferous period collapse of the arch, and a possible overprint of faulting and reactivation of these faults through the Cretaceous period. *There are numerous disposal*

> *operations in the area and several clusters of significant induced seismicity, including the North Peace River, North Heart, and Reno clusters.*
>
> *Identifying which disposal operation or operations are responsible for specific seismic events is challenging.* Historically, various regulatory tools have been applied to operations suspected of causing seismicity, including enforcement orders and voluntary MMR plans. However, these tools were generally applied reactively on a case-by-case basis rather than comprehensively. The new regulatory requirements for seismogenic wells in Directive 065 provide an opportunity to take a more comprehensive and consistent approach to assessing and mitigating induced seismicity in the Peace River region.
> …
> We encourage the AER to actively incorporate the observations and findings in this decision, ongoing AGS studies, and the new tools provided in Directive 065 to provide a comprehensive and regionally coordinated approach to understanding the causes and mitigating the effects of induced seismicity associated with disposal operations in the Peace River Arch area. (at paras 259, 260 & 263, emphasis added).

Conclusions

Although this decision deals with an EPO there is a sense in which the decision also concerns another issue that has been the subject of some of my earlier ABlawg posts, namely competition for pore space (see previous posts here and here). In effect, the decision confirms that there are pressure (and perhaps other) limits to the use of any particular bounded geological space such that regulators (perhaps both the AER and the Department of Energy and Minerals) need to think proactively about how to manage that space and how to allocate entitlements to that space. Disposal space is not unlimited. The public has an interest in ensuring that safe disposal capacity is not exceeded. Those who want access to available disposal space seek some assurance that disposal space will be allocated equitably (understanding that what equitable might mean in this context may be highly contested) and securely. One of things that this decision reveals is that an EPO is not the optimum instrument to achieve either objective. An EPO may serve to protect the public in ensuring that safe disposal capacity is not exceeded - but likely only after the event. In other words, it is not proactive enough. And the EPO is certainly not an effective instrument for equitable allocation of disposal space since by its nature it focuses on a particular actor rather than on all of those who contribute to what is in effect a cumulative effects and "commons" problem. We need a regional (geological province) approach in order to address both objectives.

This post may be cited as: Nigel Bankes, "The AER Panel Dismisses Appeal in Induced Seismicity Case But Reinforces the Case For a Regional Approach" (7 April 2025), online: ABlawg, http://ablawg.ca/wp-content/uploads/2025/04/Blog_NB_Obsidian_Appeal.pdf