

# Kallisto Energy Corp.

Application for a Well Licence  
Crossfield East Field

July 23, 2013

**ALBERTA ENERGY REGULATOR**

Decision 2013 ABAER 013: Kallisto Energy Corp., Application for a Well  
Licence, Crossfield East Field

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# ALBERTA ENERGY REGULATOR

Calgary Alberta

**KALLISTO ENERGY CORP.  
APPLICATION FOR A WELL LICENCE  
CROSSFIELD EAST FIELD**

**2013 ABAER 013  
Application No. 1735722**

## DECISION

[1] Having carefully considered all of the evidence, the Alberta Energy Regulator (AER) approves Application No. 1735722, subject to the conditions set out in Appendix 1.

### Introduction

[2] During the proceeding, the *Responsible Energy Development Act (REDA)* came into force in Alberta. The *Energy Resources Conservation Act (ERCA)*, which established the Energy Resources Conservation Board (ERCB/Board), was repealed and the AER was created. In accordance with *REDA*, the AER assumed all of the ERCB's powers, duties, and functions under Alberta's energy resource enactments, including those under the *Oil and Gas Conservation Act (OGCA)*. Throughout the transition from the ERCB to the AER, the authority of the panel of board members assigned to hear this matter continued in accordance with the *Responsible Energy Development Act Transition Regulation*. Where appropriate, this decision refers to the AER anywhere the ERCB was mentioned in the hearing record.

[3] Findings concerning the public interest have been included in this report given section 3 of the *ERCA*, which required the ERCB to consider whether Application No. 1735722 was in the public interest, and section 4(c) of the *OGCA*, which provides for development of oil and gas resources in Alberta in the public interest. The panel is aware of its responsibilities under section 15 of *REDA* and section 3 of the *Responsible Energy Development Act General Regulation*, and is satisfied that throughout the proceeding and in its decision it has considered the factors identified in those sections. This includes, but is not limited to, considering the effects an approval of the application would have not only socially and economically, but also environmentally.

### Application

[4] Kallisto Energy Corp. (Kallisto) applied, pursuant to section 2.020 of the *Oil and Gas Conservation Rules (OGCR)*, for a licence to drill a well from a location in Legal Subdivision (LSD) 16, Section 26, Township 27, Range 1, West of the 5th Meridian (16-26). The purpose of the well would be to produce crude oil from the Elkton Formation. The maximum hydrogen sulphide concentration would be 10.30 moles per kilomole (1.03 per cent) with a corresponding emergency planning zone radius of 0.14 kilometres (km). The proposed well would be located about 1.3 km north of Airdrie, Alberta.

### Intervention

[5] CrossAlta Gas Storage & Services Ltd., TransCanada Pipelines Limited, and TransCanada Energy Ltd. (collectively referred to CrossAlta) own and operate a commercial natural gas

storage scheme in an Elkton reservoir using the depleted Crossfield East Elkton A and D pools, as approved by the ERCB in Approval No. 7607 (see figure 1). The nearest portion of CrossAlta's gas storage unit (Section 36-27-1W5M) is about 290 metres (m) northeast of the proposed 16-26 well. CrossAlta submitted that the integrity of its gas storage unit would be harmed and that the 16-26 well would produce royalty-paid storage gas since it was close to the boundaries of CrossAlta's gas storage unit and targeted the same formation as that of the Crossfield East Elkton reservoir.

[6] Submissions were also filed by Karsten Verbeurgt on behalf of the Jensen family, the Freehold owners of the minerals in the northwest quarter of Section 26-27-1W5M (Section 26), and Murray Taks, a Freehold owner of the minerals in the northwest quarter of Section 25-27-1W5M (Section 25). Mr. Verbeurgt and Mr. Taks supported the approval of the application, stating that drilling the well would provide information on the quality of the reservoir and determine whether it contains oil or gas, thereby establishing whether CrossAlta's gas storage unit affects their mineral rights.

## Hearing

[7] A public hearing was held in Calgary before the following panel of board members: G. Eynon, P.Geo., FGC (presiding), T. L. Watson, P.Eng., and B. T. McManus, Q.C. The hearing started on February 12, 2013, and closed on April 4, 2013. Those who appeared at the hearing are listed in Appendix 2.

[8] In reaching the determinations contained in this decision, the panel considered all materials constituting the record of the proceeding, including each party's evidence and argument. Any reference to specific parts of the record are to help the reader understand the panel's reasoning on a particular matter and do not mean that the panel did not consider all portions of the record with respect to that matter.

[9] The panel also finds it necessary to define the following terms as they were used interchangeably and ambiguously during the hearing:

- **formation:** a subsurface body of rock with similar geological attributes
- **reservoir:** a portion or area of a formation with sufficient porosity and permeability to store and transmit fluids
- **pool:** the area of a reservoir that has been designated with specific boundaries by the AER
- **gas storage unit:** the Crossfield East Elkton A and D pools used for gas storage by CrossAlta

## ISSUES

[10] The panel considers the issues concerning the application to be

- the rights of the parties,
- technical considerations,

- the risk of harm to CrossAlta's gas storage unit and proposed measures to mitigate the risk, and
- future development in the area.

## RIGHTS OF THE PARTIES

### Evidence

[11] Kallisto confirmed that it acquired the right to explore for and produce minerals in the northeast quarter of Section 26 through a Crown petroleum and natural gas lease. Kallisto is seeking approval to drill an oil well to access the minerals at the 16-26 location, which is outside of the area currently approved for gas storage in the Crossfield East Elkton reservoir. Kallisto also confirmed that it acquired a surface lease from the landowner of the proposed site.

[12] Kallisto argued that Approval No. 7607 allows CrossAlta to store gas by injection through certain wells into a specific pool and on specific lands that do not include the northeast quarter of Section 26. Kallisto submitted that CrossAlta's rights under the approval are limited compared with Kallisto's rights under its mineral lease. Kallisto further argued that the issue is really about recognizing and accommodating competing or correlative rights. Kallisto maintained that it is within the AER's mandate to balance such rights so that each party can exercise them.

[13] CrossAlta argued that Kallisto intends to use storage reservoir energy as part of a gas-cycling enhanced oil recovery scheme. CrossAlta submitted that the doctrine of correlative rights does not apply to the use of private property—which in this case is the storage gas—to produce native hydrocarbons.

[14] CrossAlta submitted that Kallisto's rights are limited to those of a lessee under a Crown petroleum and natural gas lease, which would give Kallisto a *profit à prendre* but would not make it the owner of the oil until it brings it to surface. CrossAlta stated that Kallisto's rights to explore under its mineral lease are limited to evaluating formations other than the Elkton. CrossAlta argued that Kallisto has no right to produce storage gas. Therefore, it must show that it is entitled to produce oil and gas from the 16-26 well in order to be granted the well licence. CrossAlta contended that storage gas is private property and cannot be a leased substance under the Crown lease. CrossAlta argued that even though the proposed 16-26 well would be outside of its gas storage unit boundaries, Kallisto has no right to produce storage gas or interfere with storage operations.

[15] CrossAlta submitted that in *Decision 2012 ABERCB 005: Kallisto Energy Corp., Application for a Well Licence, Crossfield East Field*, the ERCB found that a well licence does not give Kallisto the right to breach the gas storage reservoir or to produce storage gas. CrossAlta noted that *Decision 2012 ABERCB 005* also stated that if the well were to communicate with the gas storage reservoir, it would be shut in. CrossAlta further submitted that an injunction<sup>1</sup> by the Alberta Court of Queen's Bench on a Bonavista Energy well at LSD 7-25-27-1W5M (7-25) that produced storage gas supported the position that storage gas is personal property and that incidental production of any amount of storage gas is prohibited.

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<sup>1</sup> Alberta Court of Queen's Bench – Injunction, Docket 0901 15314 20100112.

[16] CrossAlta submitted that the 16-26 well would result in trespass and conversion because storage gas would be produced and that using storage gas without the owner's permission results in conversion. CrossAlta submitted that its customers own the storage gas and that, because the gas is their private property, they have the right to exclude others from possessing or using their property. CrossAlta contended that the courts protect private property rights and have found such rights to be sacrosanct.

[17] CrossAlta submitted that, without express authority, the AER does not have the jurisdiction to approve a well that will interfere with property rights or to expropriate the property of CrossAlta and its customers and give it to Kallisto, even if Kallisto returns it. CrossAlta argued that Kallisto has not pointed to any such statutory authority. CrossAlta submitted that the common carrier and common processor type applications are specifically provided for in the *OGCA* but have not been applied for in this situation.

[18] Kallisto referred to paragraph 64 of the Alberta Court of Appeal's decision on *Alberta Energy v. Goodwell*,<sup>2</sup> which states that

If mining and recovering the minerals results in a known and inevitable consequence, that consequence is construed to be an implied term, and holders of lands or other mineral rights affected by that consequence cannot enjoin mining and recovery of the minerals.

[19] Kallisto also referred to paragraphs 78 and 83 in which the Alberta Court of Appeal recognized that mineral extraction may interfere with property rights. Kallisto submitted that it has the necessary rights to produce oil, therefore meeting section 16 of the *OGCA*, and that, under common law, incidental production of storage gas is permitted. Regarding CrossAlta's reliance on the decision by the Alberta Court of Queen's Bench to grant the interim injunction to shut in the 7-25 well, Kallisto noted that an interim injunction is not based on a full evidentiary record. Kallisto argued that *Alberta Energy v. Goodwell* ought to be given greater weight since it was a fully-argued matter.

[20] CrossAlta argued that the *Alberta Energy v. Goodwell* case and the "right-to-work" cases cited by Kallisto do not apply in this circumstance as they relate to the production of native hydrocarbons and not storage gas, which is personal property. CrossAlta noted that, as stated in *Alberta Energy v. Goodwell*, exploitation rights may be restricted by relevant legislation and wordings of specific instruments. Therefore, CrossAlta argued that the right to work should be read subject to Approval No. 7607.

[21] CrossAlta submitted that in issuing Approval No. 7607, the ERCB decided to dedicate the Crossfield East Elkton reservoir to gas storage. CrossAlta noted that the storage approval was issued almost 20 years ago, after a long history of resource development and after deemed royalty was paid on any remaining natural gas. CrossAlta noted that its gas storage unit has been operating ever since with commercial arrangements in place and capital invested.

[22] CrossAlta contended that the storage approval created settled expectations that the Crossfield East Elkton A and D pools would be used for gas storage and that customers could expect their personal property to be protected from border wells that may produce storage gas. CrossAlta alleged that Kallisto is attacking an AER order designating the Crossfield East Elkton A and D pools for gas storage. CrossAlta stated that since Kallisto's mineral lease was issued

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<sup>2</sup> *Alberta Energy Company Ltd. v. Goodwell Petroleum Corporation Ltd.*, 2003 ABCA 277.



after the storage operations were approved, the mineral lease should be read subject to the longer-standing storage approval if there were to be conflict between the two.

[23] Kallisto submitted that CrossAlta's customers could not expect that there would not be any development on lands outside the approved boundaries of CrossAlta's gas storage unit. Kallisto further argued that the Crown did not expect this either when it granted Kallisto the mineral rights next to CrossAlta's gas storage unit boundaries.

### Analysis and Findings

[24] The panel notes that the rights required to apply for and hold a well licence are set out in section 16 of the *OGCA*, which states that

- (1) No person shall apply for or hold a licence for a well
- (a) for the recovery of oil, gas or crude bitumen, or
  - (b) for any other authorized purpose

unless that person is a working interest participant and is entitled to the right to produce the oil, gas or crude bitumen from the well or to the right to drill or operate the well for the other authorized purpose, as the case may be.

(2) If, after 30 days from the mailing of a notice by the Regulator to a licensee at the licensee's last known address, the licensee fails to prove entitlement under subsection (1) to the satisfaction of the Regulator, the Regulator may cancel the licence or suspend the licence on any terms and conditions that it may specify.

[25] The panel notes that although CrossAlta does not dispute Kallisto's right to explore for oil in Section 26 under its mineral lease, it alleges that the lease does not give Kallisto the right to explore for oil in the Elkton Formation or to produce storage gas. The AER has the jurisdiction to consider whether the applicant's rights satisfy the AER's regulatory requirements. In *Decision 2007-024: Bearspaw Petroleum Ltd., Devon Canada Corporation, and Fairborne Energy Ltd.*,<sup>3</sup> the Energy Utilities Board (predecessor to the ERCB) stated the following:

It is important to note that the Board is not making final or conclusive decisions that bind the parties for all purposes when it finds that an applicant is the owner or otherwise entitled to produce the resource. That ultimate authority belongs to the courts. The Board is, rather, deciding that an applicant has demonstrated entitlement to the Board's satisfaction for the purpose of issuing well licences or similar requirements under the compulsory pooling and special well spacing (holding) provisions of the *OGCA* and the *OGCR*.

[26] In *Desoto Resources v. Alberta*,<sup>4</sup> the Alberta Court of Appeal confirmed the jurisdiction of the AER to consider leases to ensure entitlement to hold a well licence.

[27] The AER ensures the applicant has a valid mineral lease that grants the right to explore for and produce the applied-for substance from a specified geological formation before issuing a well licence. The panel confirms that the purpose of the 16-26 well would be to explore for and produce oil. The panel is satisfied that Kallisto's mineral lease grants it the rights required to

<sup>3</sup> *Decision 2007-024: Bearspaw Petroleum Ltd., Devon Canada Corporation, and Fairborne Energy Ltd., Part 2 of Proceeding No. 1457147—Review of Certain Well Licences and Compulsory Pooling and Special Well Spacing (Holding) Orders in the Clive, Ewing Lake, Stettler, and Wimborne Fields*, paragraph 150.

<sup>4</sup> *Desoto Resources Limited v. Alberta (Energy & Utilities Board)*, 2008 ABCA 349, paragraph 2.

explore for and produce oil from the 16-26 well, subject to obtaining a well licence from the AER.

[28] The panel notes that CrossAlta, based on an agreement with the Crown, has the right to use the East Crossfield Unit (see figure 1) for gas storage. CrossAlta also holds Approval No. 7607, granting it the use of the Crossfield East Elkton A and D pools for gas storage operations. As this approval was granted on a pool basis, the panel notes that it is not the entire Elkton Formation in the East Crossfield Unit that is dedicated to gas storage, but that the storage approval is limited to a specific area that defines the Elkton A and D pools.

[29] The panel notes that Section 26 is outside the area covered by CrossAlta's storage agreement with the Crown and the boundaries designated for gas storage under Approval No. 7607. The panel notes that CrossAlta's storage agreement with the Crown does not restrict the Crown's right to issue a mineral lease for a given zone or formation, except for the Elkton Formation within the area covered by the storage agreement.

[30] The panel finds that Approval No. 7607 and the storage agreement with the Crown do not restrict exploration and production of hydrocarbons outside the boundaries of the approved gas storage unit, even if the Elkton Formation or the Crossfield East Elkton reservoir extend outside those same boundaries. Therefore, the panel has no reason to conclude that section 16 of the *OGCA* has not been satisfied.

[31] The panel notes CrossAlta's argument that the AER does not have the jurisdiction to issue the well licence if Kallisto expects to produce any amount of storage gas as storage gas is the personal property of CrossAlta and its customers. The panel notes that CrossAlta relied on the common law torts of trespass and conversion and the decision by the Alberta Court of Queen's Bench on the 7-25 well to support its position.

[32] On the other hand, the panel notes Kallisto's reliance on *Alberta Energy v. Goodwell*, which, in paragraph 83, states the following:

Mineral extraction is an invasive business, likely to interfere with someone's property rights. Nevertheless, courts grant generous rights to exploit resources, even if the operations inevitably divert percolating waters, cause mines in higher strata to collapse and produce initial gas-cap gas. In fact, the only prohibition seems to be against operations that completely destroy the surface of the land, a right that is said to be fundamental to property ownership, and even that prohibition is not absolute. The production of initial gas-cap gas incidental to bitumen recovery is inevitable, but does not result in the destruction of anything. The gas can be measured and compensation can be paid.

[33] The panel notes CrossAlta's submission that the interim injunction issued by the Alberta Court of Queen's Bench supports the position that Kallisto is not permitted to harm CrossAlta's or its customers' property rights and that *Alberta Energy v. Goodwell* only applies to the production of native hydrocarbons. However, the panel finds that *Alberta Energy v. Goodwell*, as stated in paragraph 83 of that decision, does not support this limitation and, therefore, it may be permissible for Kallisto to interfere with property rights while exercising its mineral rights. The scope and extent of Kallisto's rights under its mineral lease, including any permissible interference with another person's property as contemplated in *Alberta Energy v. Goodwell*, is for the courts to decide. The panel further notes that *Alberta Energy v. Goodwell* refers to potential compensation for damage to property, which is outside the AER's jurisdiction and may be appropriate if Kallisto goes beyond the rights of its mineral lease. Further, it is unclear

whether the proposed well will affect CrossAlta's rights as it is possible that the 16-26 well will be unsuccessful, as argued by CrossAlta's own expert witnesses.

[34] Regarding the potential for trespass and conversion, the panel notes that a well licence does not permit such activity and that any remedy for tortious action would be within the jurisdiction of the courts.

[35] The AER must ensure that the requirements under the relevant legislation are met. In this case, the panel must be satisfied that Kallisto has rights as required under section 16 of the *OGCA*. The panel notes that a well licence does not grant Kallisto rights to substances other than what it currently holds under its mineral lease. The panel recognizes that a licence does not transfer ownership over a third party's private property. The well licence simply permits Kallisto to exercise its rights in accordance with Alberta's oil and gas regulatory scheme.

[36] The panel notes that in 2012, the parties participated in a hearing, which considered an application by Kallisto to drill a well at a location in LSD 11-26-27-1W5M (11-26). The purpose of the well was to produce crude oil from the Basal Quartz Formation. In *Decision 2012 ABERCB 005*, the ERCB approved the application and granted Licence No. 0444471 with conditions. Kallisto then drilled the 11-26 well and received confirmation from the ERCB that it complied with the conditions placed on the licence. The ERCB confirmed that the pressure test data provided by Kallisto showed that the 11-26 well was not communicating with CrossAlta's gas storage unit.

[37] The panel notes that if the 16-26 well were a gas well, there would not be common ownership throughout the drilling spacing unit as required. The panel notes it would be similar to the situation in *Decision 2012 ABERCB 005* in which the ERCB found that if the 11-26 well were a gas well, as opposed to an oil well, the well would be shut in until the required drill spacing unit was acquired.<sup>5</sup> In the same decision, the ERCB also found that, if the 11-26 well were to communicate with the Elkton gas storage unit, the well would be shut in.<sup>6</sup> However, such a situation is different from the 16-26 well in that Kallisto applied for a well licence in the Basal Quartz Formation in the 11-26 proceeding and not the Elkton Formation, as in the 16-26 proceeding.

[38] Regarding settled expectations that the AER would not approve a well targeting a formation in which gas is stored, the panel is of the view that approving an exploration well in the same formation as a nearby gas storage unit but outside the approved storage area is reasonable based on section 4.3.3 of *Directive 065: Resources Applications for Oil and Gas Reservoirs*, which states that

Equity is an important issue for gas storage pools, since competitive gas production would be detrimental to storage scheme operations. Therefore, it is advisable that you own all of the mineral right leases in the pool and adjoining sections or at least have a production-sharing agreement and written consent from the other owners that could be impacted.

It is also strongly advised that if some land is still available for sale, you purchase this land before considering the pool for storage.

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<sup>5</sup> See paragraphs 52 and 53 of *Decision 2012 ABERCB 005*.

<sup>6</sup> See paragraph 81 of *Decision 2012 ABERCB 005*.

The lessors must also provide consent for storage, since a special royalty agreement covering the remaining producible gas reserves may be required.

If all potential equity concerns are addressed before the scheme is approved, a costly and complicated hearing process may be avoided in the future.

You must notify all lessees and lessors within the area of the storage pool and adjoining offsetting sections. Notification must cover all zones, including those that either underlie or overlie the storage pool. You must also notify all well licensees in the pool.

[39] Also, the Alberta Department of Energy's frequently asked questions (FAQs) on unit and gas storage<sup>7</sup> states the following:

Does the department have any regulated buffer zone protection or specific rules around migration of gas?

No, the department does not have any regulated buffer zone protection or specific rules around migration of gas. It is important for the operator to identify the limits of the gas reservoir prior to using it for storage. However, only lands the Crown considers as part of the gas storage operation will be included in the Gas Storage Unit Agreement.

[40] The panel notes that CrossAlta was concerned with the lack of protection given to storage operations in the hearing of the 11-26 well and continued to press that point in this hearing. However, the panel finds that it is clear, given what is stated in section 4.3.3 of *Directive 065* and in the Alberta Department of Energy FAQ, that the storage operator should secure the rights for areas that are next to its gas storage unit and show that the lands are part of the storage reservoir to have the Crown include those lands in the storage unit agreement. This would ensure that the lands would not be drilled.

[41] The panel finds that there is no settled expectation that well licences would be denied in order to create a de facto buffer zone around a storage unit for protection purposes.

## **TECHNICAL CONSIDERATIONS**

### **Evidence**

[42] Kallisto stated that, based on its geological interpretation, it expects to encounter oil in the Elkton Formation at the 16-26 location, which is outside the approved boundaries of CrossAlta's gas storage unit. Kallisto believed that if the 16-26 well encounters oil, it would be in the same reservoir as the Crossfield East Elkton D pool. Kallisto noted that CrossAlta does not believe that there is any porous Elkton in Section 26 that would constitute a reservoir and that the Crossfield East Elkton D pool in which CrossAlta stores its customers' gas does not extend into Section 26.

[43] Kallisto relied on the geological interpretation of data from the nearest wells with reservoir quality Elkton and used the deepest known porosity from a well at LSD 10-36-27-1W5M (02/10-36 well) to define the base of the known gas.

[44] Kallisto maintained that there is potential for a significant accumulation of moveable oil downdip from the 02/10-36 well. Kallisto based its argument on evidence that showed the

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<sup>7</sup> Available on the Alberta Energy website: <http://www.energy.alberta.ca/Tenure/1093.asp>.

presence of C7 hydrocarbons within a recombined gas analysis from the 02/10-36 well and residual oil within the core of the same well. In addition, Kallisto submitted that there is an accumulation of oil in the Crossfield East Elkton D pool north of the proposed 16-26 location in Sections 13 to 15-28-1W5M and in Section 22-28-1W5M. It also noted that the Crossfield East Elkton A, D, and F pools all produced oil from beneath a gas cap. Kallisto maintained that gas composition data from available comparative wells support the possibility of an oil leg downdip of the 02/10-36 well; particularly when examined in conjunction with its geological and seismic interpretation. Kallisto maintained that CrossAlta's evidence does not disprove the potential existence of an oil leg downdip of the 02/10-36 well.

[45] Kallisto stated that significant hydrocarbon resources are to be developed in the area of the proposed well and estimated that there could be as much as 600 to 1400 million cubic metres (20 to 50 billion cubic feet) of gas and 0.6 to 1.6 million cubic metres (4 to 10 million barrels) of oil.

[46] CrossAlta referred to Application No. 6351 by Amoco Canada Petroleum Ltd. (Amoco) and subsequent *Decision 72-10: Application for Concurrent Production and Good Production Practice Crossfield East Elkton Pools*, which outlined the development of the Crossfield East Elkton A and D pool oil accumulations. CrossAlta noted that in *Decision 72-10*, the ERCB deemed the south end of the Crossfield East Elkton D pool, once known as the Crossfield East Elkton C pool, as a nonassociated gas pool based on pressure production tests and gas and liquid samples from the well at LSD 10-10-28-29W5M. CrossAlta further noted that Amoco maintained gas cycling operations to assist oil production in the Crossfield East Elkton D pool and that the 02/10-36 well production continued during storage conversion, draining the local area down to a pressure less than 4100 kilopascals (kPa). CrossAlta argued that the prolonged gas production at the 02/10-36 well, without any oil from an interval below the gas-oil contact identified in the Crossfield East Elkton D pool, reinforces the finding that the 02/10-36 well was a nonassociated gas well, and also supports CrossAlta's contention that the increase in reservoir energy in this area has come by way of injected storage gas.

[47] CrossAlta stated that its interpretation of the geological and geophysical data does not support Kallisto's finding of reservoir quality Elkton at the 16-26 location and further contended that the production pressure and fluid data did not show an oil leg downdip of the 02/10-36 well. CrossAlta believed that Kallisto's hypothesis of a large oil accumulation near the 02/10-36 well was too speculative and not supported by the pore volume, pressure, and fluid composition data of that well. In addition, CrossAlta did not agree that the core analysis of the 02/10-36 well indicated that there was downdip movable oil and maintained that Kallisto's assumption of a downdip oil leg was based entirely on indirect evidence.

[48] CrossAlta stated that the 16-26 well will likely encounter tight Elkton basal limestone. However, it acknowledged that the 16-26 well could encounter porous Elkton given the interpretive uncertainty from point-source data of well penetrations. If the Elkton Formation is porous, CrossAlta believed it would be directly connected to its gas storage unit and acknowledged that, in that case, storage gas would have already migrated into Section 26.

[49] CrossAlta submitted that if the 16-26 well encounters porous Elkton, Section 26 would be an extension of the former Crossfield East Elkton C pool, which was a dry gas pool. CrossAlta maintained that if any fluids were present, it would likely be gas, and not oil. CrossAlta

concluded that the 16-26 well would inevitably produce storage gas, regardless of whether it encounters gas or oil.

[50] Kallisto argued that CrossAlta's interpretation of the Elkton as nonporous in Section 26 implies that the Crossfield East Elkton D pool (interpreted as reservoir) does not extend into Section 26. Kallisto acknowledged that it may or may not encounter oil at the 16-26 location and recognized that other outcomes were possible, including encountering only storage gas. Kallisto noted that differing opinions on the seismic interpretation resulted from the parties relying on different processed versions of the raw data and on reasonable interpretive differences of professional opinion. Kallisto noted that different experts can hold different views, which supports its position that the outcome is uncertain until the 16-26 well is actually drilled.

[51] CrossAlta recognized that it used the same well control data, the same seismic data volume, and similar measurements as Kallisto, but that its interpretation of the data and measurements differed. CrossAlta stated that the chances of the 16-26 well being a success are low and that the only real benefit of the well was limited to providing a further evaluation of the Elkton Formation.

[52] Kallisto argued that the evidence on whether or not there is porous Elkton in the northeast quarter of Section 26 is irrelevant because it has the right to explore for oil in that section, regardless of whether or not CrossAlta agrees with its geological interpretation.

### **Analysis and Findings**

[53] The panel agrees with the parties that if the Elkton Formation is porous at the 16-26 location, it is likely that storage gas is already present and, therefore, is being stored on the northeast quarter of Section 26. The panel also agrees with Kallisto and CrossAlta that the 16-26 well could produce storage gas as well as oil, if the Elkton Formation is porous at the 16-26 location; in that case, storage gas would be produced shortly after the well is put on production. On the other hand, the panel agrees that if porous Elkton is not encountered at the 16-26 location, storage gas will not be present in the northeast quarter of Section 26.

[54] The panel notes that Kallisto relied on a combination of data from geologic mapping, seismic interpretation, gas analyses recombination, core analysis, and data from offset Elkton pools that have produced oil from beneath gas caps, leading it to conclude that there may be oil at the 16-26 location.

[55] The panel also notes that CrossAlta relied on *Decision 72-10* to support its position that the former Crossfield East Elkton C pool is a nonassociated gas pool. However, the panel is of the view that this simply indicates that no oil has been produced, and is not proof that oil is absent. The panel finds Kallisto's interpretation of oil being present in the Elkton Formation at the 16-26 location to be possible.

[56] The panel notes the various potential reservoir outcomes at the 16-26 location presented by the parties and the evidence provided in support of their interpretations. However, the parties acknowledged that, given uncertainties in the data, multiple scenarios are possible, including the Elkton Formation being porous and oil bearing, porous and gas bearing, porous and water saturated, or nonporous. The panel attributes this to differing interpretations of the same data and does not find any reason to prefer one interpretation over another. The panel also finds that the

drilling, logging, and testing of the 16-26 well could help determine the reservoir's characteristics.

[57] The panel finds that it is unnecessary to determine which scenario would be more likely at the 16-26 location and whether the well will produce storage gas. The panel finds that Kallisto, subject to regulatory approval, has the right to explore for and produce the oil under its mineral lease, regardless of whether porous Elkton is present at the 16-26 location.

## **RISK OF HARM TO CROSSALTA'S GAS STORAGE UNIT AND PROPOSED MEASURES TO MITIGATE THE RISK**

### **Evidence**

[58] For ease of reading and comprehension, the panel has chosen to discuss the issues of risk of harm and measures to mitigate risk in this section under the following three broad headings, recognizing that these are not mutually exclusive: Physical and Operational Risk, Economic and Commercial Risk, and Compensation and Return of Storage Gas.

#### *Physical and Operational Risk*

[59] Kallisto argued that very little concrete evidence from CrossAlta supports an actual adverse effect on its gas storage unit and its storage operation from the 16-26 well. In fact, it noted that CrossAlta presented evidence that coproduction of oil with gas storage operations is already done in other jurisdictions in North America.

[60] Kallisto argued that the existing wells drilled in the Crossfield East Elkton reservoir may threaten the integrity of CrossAlta's gas storage unit more than a new well drilled to current standards would. Kallisto stated that it will abide by the strict regulations for drilling wells that the AER has in place, particularly those in *Directive 051: Injection and Disposal Wells – Well Classifications, Completions, Logging, and Testing Requirements*.

[61] Regarding abandonment options for the 16-26 well, Kallisto provided two scenarios, depending on whether the abandonment happened before or after casing the well. If the well were abandoned before casing, Kallisto would perform an open-hole abandonment with a cement plug placed from total depth to some distance above the Elkton Formation so that the entire section could be cemented off. If casing had been installed, Kallisto committed to squeezing the perforated interval with cement and filling that entire section to somewhere well above the Elkton Formation with cement inside the casing. Kallisto noted that its abandonment plans exceed the minimum AER requirements that apply.

[62] CrossAlta submitted that the integrity of the Crossfield East Elkton reservoir should be protected and that the 16-26 well, if drilled, should meet the more stringent requirements for the monitoring and integrity of storage wells, such as those in *Directive 051*, instead of those for conventional wells. CrossAlta argued that its own monitoring and integrity programs would be frustrated and that other risks would arise if the 16-26 well produced storage gas and was not operated by CrossAlta.

[63] CrossAlta acknowledged, however, that it does not have a program to monitor abandoned wells or detect gas leaks to other zones through wells in the gas storage unit. CrossAlta admitted that its primary inventory analysis is through material balance, which it believes works well in a stratigraphic trap like the Crossfield East Elkton reservoir.

[64] Regarding issues of caprock integrity, CrossAlta acknowledged that the wells already in the reservoir had been drilled through the caprock and recognized that drilling the 16-26 well would not affect it in a different or more adverse way than those wells had. CrossAlta also acknowledged that many, if not all, of the original production wells within its gas storage unit do not meet current *Directive 051* requirements, particularly for cementing, given that they were drilled in compliance with their original production well purposes and before current requirements were in place.

[65] CrossAlta referred to *Re Dominion Transmission (2011)*,<sup>8</sup> a decision by the U.S. Federal Energy Regulatory Commission (FERC), in which the FERC expanded the buffer of a storage reservoir to protect its integrity from potential breaches caused by hydraulic fracturing of the Marcellus Shale. CrossAlta referred to several other decisions by the FERC, such as *Re Dominion Transmission (2001)*,<sup>9</sup> which found a need to protect the functional integrity of storage reservoirs and, where oil production causes gas to migrate from the storage unit, the boundary of the storage unit should be expanded based on this new evidence of storage gas migration.

[66] CrossAlta further noted that its deliverability of storage gas would be affected by a reduction in storage pressure caused by gas production at the 16-26 well, creating a pressure sink that would promote pathways for continuous migration of storage gas towards the well.

#### *Economic and Commercial Risk*

[67] CrossAlta stated that significant harm would be caused if the AER allows a well to be drilled into a reservoir approved for gas storage. CrossAlta explained that if the 16-26 well is licensed, it would signal to other storage owners, the gas industry, the public, other regulators, and other jurisdictions that, in Alberta, the gas storage component of the overall system is of little commercial or public value.

[68] CrossAlta noted that, other than *Decision 2012 ABERCB 005*, there are no reported cases in Canada of a well licence being issued when it could affect the integrity of a gas storage reservoir. CrossAlta argued that such a decision would raise public interest issues beyond those in *Decision 2012 ABERCB 005*, including those related to the development of natural gas infrastructure. CrossAlta also submitted that, in its view, both storage and production operations should be on equal footing with respect to the AER's public interest mandate. CrossAlta referred to FERC orders that shut in nearby wells to prevent "gas poaching" by third parties.

[69] Kallisto argued that any adverse effect the drilling and operation of the 16-26 well would have on CrossAlta's gas storage operation, such as the coproduction of storage gas and oil, can be simply and effectively mitigated by returning or re-injecting any storage gas produced at the well. Kallisto noted that the FERC has permitted concurrent production of oil and natural gas

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<sup>8</sup> *Re Dominion Transmission Inc.*, 137 FERC P61, 132 (November 17, 2011).

<sup>9</sup> *Re Dominion Transmission Inc.*, 97 FERC P61, 334 (December 21, 2001).



where gas is re-injected, with the consent of the storage operator. Kallisto noted that it had proposed something similar to CrossAlta, but that no meaningful discussion occurred.

### *Compensation and Return of Storage Gas*

[70] Kallisto argued that there are two important aspects to the FERC decisions: that the storage operator 1) applies to expand the storage boundaries and 2) acquires the mineral rights it needs by *eminent domain* (expropriation) where the mineral rights owner is compensated accordingly. Kallisto submitted that neither the principle of *eminent domain* with respect to mineral rights nor such a compensation scheme exists in Canada. Kallisto further noted that this proceeding is different than the FERC decisions because CrossAlta is neither proactively seeking to expand the boundary of its storage area nor is it offering to compensate adjacent mineral rights owners for creating a de facto buffer around the gas storage unit.

[71] CrossAlta suggested that compensating mineral rights holders affected by AER decisions that deny the approval of adjacent wells to protect a storage reservoir is provided for in Alberta. It cited section 99 of the *OGCA*, which states the Lieutenant Governor in Council can direct the development of a scheme for compensation. CrossAlta also referred to section 8 of the *Mines and Minerals Act*, which also allows for compensation from the Crown if a mineral lease is cancelled.

[72] Kallisto hoped that the AER, in its decision, would provide a fair structure under which Kallisto could recover the minerals under its lease and, at the same time, return any produced storage gas. Kallisto argued that section 38(b) of the *OGCA* authorizes the AER to require that gas be injected into the storage reservoir for storage purposes and that, therefore, the AER has the jurisdiction to order that storage gas be returned to CrossAlta.

[73] Kallisto maintained that it can and will implement measures to address how drilling and producing the well may affect CrossAlta's storage operations. Kallisto proposed measures that involved gas measurement, gas re-injection or delivery, payment for gas produced, and the predelivery of gas into the gas storage unit to replace any storage gas produced and gas storage unit energy used. Kallisto maintained that any of these measures would reasonably allow both parties to preserve and exercise their rights.

[74] To deal with CrossAlta's concerns regarding storage gas production, Kallisto proposed that it could

- re-inject an equivalent heat value of storage gas produced from the 16-26 well into the gas storage operation, at Kallisto's expense, into an existing scheme well or a new well;
- return the storage gas to CrossAlta after processing the gas, place it into the Nova market pipeline system, and attribute a volume of the processed gas to CrossAlta on an equivalent heat value basis. Kallisto viewed this as the simplest solution as it would not require additional facilities or commercial contracts; or
- become a regular storage customer whereby Kallisto can commit to maintaining a volume of gas in the storage operation sufficient to offset any volume of storage gas produced in the 16-26 well. (Kallisto stated that it would expect to be treated like any other customer of

CrossAlta, except for issues related to the management of a common reservoir, if the geology and the results from the 16-26 well are proven to be as expected by Kallisto.)

[75] CrossAlta submitted that the proposed mitigation measures involve complex commercial arrangements between the parties, and possibly others, and that the AER does not have jurisdiction to approve the interference with private property rights or compel private persons to enter into contracts. CrossAlta argued that the AER does not have the statutory authority to approve Kallisto's proposals, which would permit a storage gas cycling scheme under the guise of an oil well, as section 38(b) of the *OGCA* is not intended to apply to storage gas owned by a third party. CrossAlta contended that what Kallisto is seeking is similar to compulsory unitization and is something that the AER does not have the authority to impose.

[76] CrossAlta requested a number of conditions if the AER were to approve the well licence, depending on what the well encounters. In any event, CrossAlta requested that the well be vertical and not fracture stimulated. As the application is for an oil well, CrossAlta requested that the well should only be allowed to produce oil, not storage gas. CrossAlta also submitted that Kallisto must measure initial and ongoing bottomhole pressures and hydrocarbon characteristics.

[77] CrossAlta requested that the AER adopt a two-stage approach, similar to the one it used to condition the 11-26 well in *Decision 2012 ABERCB 005*, whereby the well would be evaluated before permitting its completion. CrossAlta suggested that the well should be immediately abandoned without completion if it did not encounter porous Elkton and if there was not any uphole potential. As the well would most likely produce storage gas, CrossAlta maintained that it should be immediately shut in and the zone abandoned if it encountered only gas in porous Elkton. If the well encountered oil in porous Elkton, it must be monitored to ensure that it produces only oil; once it starts producing storage gas, the well should be shut in. If the well encountered a separate pool, CrossAlta suggested that it should be allowed to produce without fracture stimulation, with constant pressure monitoring, to ensure that there is not any communication with the gas storage unit.

[78] CrossAlta argued for a shut-in trigger when the gas-oil ratio (GOR) exceeds twice the current solution GOR for three consecutive months or the GOR spikes to five times the current solution GOR. CrossAlta also submitted that the *Mines and Minerals Act* sets a ratio of 1800 cubic metres of gas per cubic metre of oil (equal to 10 000 standard cubic feet of gas per barrel of oil) as the accepted benchmark for when a well actually becomes a gas well, at which time the well should be shut in.

[79] CrossAlta submitted that it would need to agree to the terms for the presupply period before the well became a full gas well and that, if terms cannot be reached before that, the trigger point for shutting in the 16-26 well should be a GOR that exceeds the solution GOR. CrossAlta submitted that, using a bottomhole oil sample, Kallisto should determine the gas in solution at current reservoir pressure and at 4200 kPa (600 pounds per square inch [psi]), which was the pressure when the unit was converted to gas storage.

[80] Kallisto agreed that the AER has standard procedures for dealing with excessive gas production through the setting of a GOR, and regularly applies penalties when the GOR is exceeded. However, Kallisto argued that the GOR should not be used as a trigger for shutting in the well because it would be arbitrary; instead, the actual origin of the gas should be used to determine if the well produced storage gas that should be returned to CrossAlta. Kallisto argued

that by proposing to re-inject the produced gas into the gas cap, it would be maintaining reservoir energy.

[81] CrossAlta submitted that a gas composition analysis of methane and carbon dioxide markers could not determine if the well was producing storage gas. Such an analysis depends on a trend that could take years to establish, during which time storage gas would be produced. CrossAlta submitted that, given the complicated nature of the fluid composition of the storage reservoir, it would be difficult to define, measure, and redeliver the storage gas produced by the 16-26 well.

[82] CrossAlta argued that if Kallisto produces only a small amount of storage gas, as it stated in the hearing, applying a shut-in trigger based on GORs would be consistent with Kallisto's operation plans. If the AER were to approve the well without a trigger, CrossAlta requested that the AER delay the effective date of the approval to provide an opportunity to challenge the AER's jurisdiction through the courts. In addition, CrossAlta requested that the AER condition the approval to require Kallisto to pay to use the storage gas, to equalize a portion of capital costs incurred by CrossAlta in creating the storage operation, to compensate for any storage capacity lost, and for any other damages due to Kallisto's use of the reservoir.

[83] Finally, CrossAlta argued that if Kallisto's geological interpretation was correct, the AER would have grounds to simply expand the Crossfield East Elkton D pool into the northeast quarter of Section 26, which, under the terms of the storage approval, would expand the approved storage boundary and allow CrossAlta to obtain storage rights from the Crown. CrossAlta argued that determining the precise boundaries of a reservoir at the time of initial approval of a gas storage operation is an inexact science; the practice is for the boundaries to change after the storage operation is in place and as or when new information becomes available.

### **Analysis and Findings**

[84] The panel notes that Kallisto's proposal to explore for oil in a formation that, in nearby areas, has been approved for natural gas storage is a situation that has not been dealt with in previous regulatory decisions or by the Alberta courts. The panel reviewed the FERC decisions referred to by CrossAlta and agrees that the three principles that follow would apply to storage operations in Alberta.

[85] First, storage operations benefit the public and are an important part of the natural gas system in Alberta. The ERCB confirmed this in *Decision 2012 ABERCB 005*, in which it recognized the benefits gas storage brings to the province, the public, and industry. However, the panel finds that the risk to the integrity of the gas storage reservoir must be balanced with the right to explore for and develop hydrocarbon resources near the storage reservoir. Such development is in the public interest and should occur where the risk can be managed.

[86] Second, the boundaries of the storage unit may change based on evidence from new developments. The panel notes that its legislation allows CrossAlta, as the storage operator, to file applications to expand its approval area based on such new evidence.

[87] Third, the storage operator is responsible for monitoring development around its gas storage unit and for taking steps to expand the boundaries when new information confirms there

is a need to do so. The latter would be in accordance with the statements in *Directive 065* and the Alberta Department of Energy FAQ.

[88] The panel notes that, despite the obligation to monitor development around its gas storage unit, CrossAlta had been unable to detect the production of a significant amount of its storage gas through the 7-25 well. The panel understands that Bonavista Energy completed the Lower Mannville Basal Quartz sands and produced about 127 million cubic metres (4.49 billion cubic feet) of storage gas from February 2001 to January 2011. The panel notes CrossAlta's argument that if such quantities were produced at the 16-26 well, CrossAlta would be aware of the production. However, the panel notes it was Bonavista Energy that notified CrossAlta of this matter, which suggests to the panel that CrossAlta's monitoring is unable to detect leakage of this magnitude. The panel notes that during this time, CrossAlta was still able to meet its obligations to its customers and would likely continue to do so if the 16-26 produces storage gas.

[89] The panel recognizes that the 16-26 well is needed to explore the formations from which Kallisto has the right to produce in accordance with its mineral lease. Further, the panel believes that this well will likely provide information on whether porous Elkton is present in the northeast quarter of Section 26. The panel notes that the extent of the gas storage reservoir was previously raised in the hearing of the 11-26 well. The panel recognizes that not knowing the extent of the gas storage reservoir affects not only Kallisto and CrossAlta, but also Freehold mineral owners in the area. The panel is aware that any information that would help determine its extent would benefit all parties.

[90] To assess the risk to CrossAlta's gas storage unit by the proposed 16-26 well, the panel must consider the type of development and potential mitigation measures. The panel notes Kallisto's commitment to drill and complete the well in accordance with *Directive 051* and its intention not to fracture stimulate the well, but to simply use an acid squeeze to clean up the formation after drilling. The panel conditions the licence to reflect these commitments.

[91] The panel accepts CrossAlta and Kallisto's agreement that the well should meet the requirements of *Directive 051* for drilling and completion even though the 16-26 well is not an injection well, which recognizes that an oil production well is not necessarily tested in the same way an injection well would be. However, the panel notes that not all the requirements for a Class IIIb injection well would be appropriate for the 16-26 well. Accordingly, the panel conditions the well licence to include the following *Directive 051* requirements:

- run an initial full-length cement integrity log before completion
- conduct a hydraulic isolation log after completion and stimulation

[92] The panel finds that the above requirements, in addition to the panel's condition to complete the well with an acid squeeze and without fracture stimulations, sufficiently ensure that the functional integrity of CrossAlta's gas storage unit will not be adversely affected if porous Elkton is encountered. Accordingly, the panel finds that the risk to the integrity of CrossAlta's gas storage unit is insignificant, even if oil in porous Elkton is encountered.

[93] The panel notes CrossAlta's belief that the 16-26 well would not encounter porous Elkton. If that is the case, the panel is of the view that CrossAlta's gas storage unit would not be affected. The panel notes CrossAlta's own interpretation that the Crossfield East Elkton reservoir

does not extend into Section 26. This would imply that the 16-26 well would not interfere with CrossAlta's storage gas operations.

[94] The panel is of the view that the well should only be placed on production as long as it is a producing oil well. In this regard, the panel notes the requirements under *Directive 040: Pressure and Deliverability Testing Oil and Gas Wells* and *Directive 007: Volumetric and Infrastructure Requirements* that require Kallisto to submit initial fluid analyses and ongoing production volumes to satisfy the AER that the produced liquid is primarily oil and prove that the well is an oil well. The panel notes that *Directive 040* requires submission of an initial pressure test, however, *Directive 040* also provides for certain exemptions from this requirement. Given that pressure test information is important for pool delineation purposes, the panel conditions Kallisto to submit an initial pressure test.

[95] Regarding measurement to determine the type of fluid produced at the 16-26 well, the panel finds that it is more efficient to use the solution GOR at the abandonment pressure before the storage scheme commenced operations, rather than relying on methane or carbon dioxide markers or a compositional analysis.

[96] Kallisto must also ensure that the 16-26 well meets the measurement requirements set out in *Directive 017: Measurement Requirements for Oil and Gas Operations*. To ensure that any storage gas that could be produced at the 16-26 well is appropriately measured, the panel finds that Kallisto must meet the following conditions:

- install a three-phase separator to separate the gas, emulsion, and water before commingling with other well effluent;
- install appropriate measurement devices to measure the three phases according to the delivery point requirements in *Directive 017*, except for water measurement;
- prove, inspect, and calibrate the measurement devices according to the delivery-point requirements in *Directive 017*, except for water measurement;
- install continuous sampling devices for the gas phase after separation according to *Directive 017* requirements and analyze the gas sample once every two weeks, at a minimum;
- install proportional sampling devices to determine the water cut once per week, at a minimum, for the emulsion phase according to *Directive 017* requirements or install a continuous water-cut analyzer; and
- ensure the well head separator does not have an operating pressure greater than 4200 kPa (600 psi).

[97] The panel conditions Kallisto to report any production from the 16-26 well to PETRINEX as a single oil well battery. The panel finds that any gas measured at the gas leg of the separator that is over and above gas that would have been solution gas at an abandonment pressure of 4200 kPa (600 psi) would be storage gas and should be returned to CrossAlta. The panel is of the view that the additional measurement requirements conditioned on the licence will provide the information the parties need to differentiate native solution gas from storage gas and determine

how to handle that production, either through a voluntary agreement or through the courts. The panel finds that this condition addresses CrossAlta's concerns about the need for a trigger point for shut in as it gives the parties the information and flexibility they need to decide the best way of resolving the return of the storage gas. The panel notes that if the well encounters a separate pool, it will be confidential for one year. Therefore, the panel conditions Kallisto to provide all information held confidential during that one-year period to CrossAlta and the Freehold mineral owners (Jensen and Taks families).

[98] The panel acknowledges Kallisto's proposals to provide mitigation measures and return any produced storage gas to CrossAlta. It is clear that this is not a case of "gas poaching" as stated in some of the FERC decisions. Based on the Amoco application materials filed by CrossAlta in this proceeding, it appears that Amoco cycled gas through the reservoir to recover oil for stakeholders when it was preparing for gas storage operations. The panel finds that this approach would be appropriate in the current situation if there is oil at the 16-26 well, recognizing the need for parties to cooperate as suggested in Amoco's application materials.

[99] The panel finds that all the mitigation measures proposed by Kallisto are reasonable and notes that some are already used in other jurisdictions in North America. The panel acknowledges that if Kallisto presupplied gas to CrossAlta's gas storage unit in quantities greater than or equal to the heating value of the gas produced, the gas produced from the 16-26 well could be considered its own and not that of any other gas owner. This addresses CrossAlta's issue of Kallisto taking possession of gas that it does not own. However, as set out in *Decision 2012 ABERCB 005*, the panel understands and accepts that if the legislature had intended the AER to have the authority to force commercial arrangements on parties it would have provided explicit directions, such as those in the common carrier and common processor provisions. However, the panel believes that these types of commercial arrangements can be reached and encourages the parties to continue efforts to find such a solution.

[100] The panel notes that Kallisto refers to section 38(b) of the *OGCA* as the AER's authority for including a condition that imposes a commercial arrangement between the parties, which states the following:

In order to prevent waste, the Regulator, with the approval of the Lieutenant Governor in Council, may

- (a) require enhanced recovery operations in any pool or portion of a pool, and for or incidental to that purpose require the introduction or injection into the pool or portion of a pool of gas, air, water or other substance or a form of energy, and
- (b) require that any gas, on its production, be gathered, processed if necessary, and the gas or products from it marketed or injected into an underground reservoir for storage or for any other purpose.

[101] The panel notes that Kallisto did not provide examples of where section 38 has been used to impose conditions similar to those Kallisto is requesting. It appears to the panel that clauses (a) and (b) of section 38 are not alternatives, as Kallisto seemed to be arguing by only relying on section 38(b). The panel understands that Kallisto requested this condition not to require itself to undertake any action but to order CrossAlta to enter into certain agreements. The panel understands that this is clearly not the intended purpose of section 38, which is to authorize the AER to order an approval holder to commence enhanced recovery operations and re-inject its gas into a pool in order to prevent waste. The panel understands that since Kallisto's proposed

mitigation would be to return CrossAlta's property to "keep it whole" and would not primarily be to prevent waste, section 38 would not apply.

[102] The panel notes that the legislature has not proclaimed the legislation regarding compulsory unitization. The panel finds that it cannot order re-injection by CrossAlta that would create a gas cycling scheme that involves multiple units operating in conjunction since that would constitute a de facto unitization. Although it would be desirable from an orderly and efficient development perspective to have CrossAlta and Kallisto work together in such a manner that would allow the production of any oil at the 16-26 well, the AER does not have the jurisdiction to order the parties to do so.

[103] The panel notes that it does not have jurisdiction to determine and award the compensation requested by CrossAlta for storage gas and reservoir energy use or for damages arising from Kallisto's activities. Although section 99 of the *OGCA* was referred to by CrossAlta as a provision that could create a compensation scheme in Alberta, the panel notes that the creation of such a scheme requires direction from the Lieutenant Governor in Council. The AER has not been so ordered, and therefore no such scheme exists in Alberta.

[104] The panel further notes that section 8(1)(c) of the *Mines and Minerals Act* cited by CrossAlta refers to compensation for cancelled Crown agreements. However, at this time, neither Kallisto's mineral lease nor CrossAlta's storage agreement has been cancelled. While the panel acknowledges that the agreements of the parties may be affected by the outcome of the 16-26 well, such compensation would be administered by the Crown and is not under the AER's authority. Ultimately, the courts would consider damages for impacts on the personal property of CrossAlta and its customers.

[105] The panel finds that additional abandonment requirements for the 16-26 well will ensure appropriate abandonment of the Elkton zone and maintenance of the functional integrity of the storage reservoir if porous Elkton is encountered. The panel notes that the abandonment scenarios proposed by Kallisto were not challenged by CrossAlta. The panel conditions the well licence to exceed the current abandonment requirements outlined in *Directive 020: Well Abandonment* by requiring the following abandonment practices:

- For open-hole abandonment, run a continuous cement plug from total depth to a minimum of 30 m above the top of the Elkton Formation. The cement plug top must be confirmed by tagging, not logging.
- In the event that the well is cased, completed, and abandoned, conduct a cement squeeze of the perforated interval and fill the casing with cement to a minimum of 15 m above the top of the Elkton Formation. If future well abandonment requirements exceed these conditions the more stringent requirements will apply.

[106] The panel notes CrossAlta's acknowledgement that one potential outcome of the 16-26 well if porous Elkton is encountered is that the gas storage unit could expand into Section 26. This seems to be a reasonable conclusion given such an outcome with the well. The panel finds that if the Crossfield East Elkton reservoir is shown to extend into Section 26 and is proven to contain storage gas, CrossAlta should engage the Crown to secure the required storage rights in that area and file an application with the AER to expand the boundaries of the gas storage unit. This scenario would be similar to the FERC decision in *Re Dominion Transmission (2001)* and

would result in the rights and approvals held by CrossAlta reflecting gas storage in Section 26. Further, any compensation paid in accordance with both the *Mines and Minerals Act* and the Crown's process on royalty payments for native hydrocarbons, including those for oil, could be assessed and paid to both the Crown and any Freehold mineral owners.

[107] The panel finds that the drilling, completion, and abandonment of the 16-26 well, in accordance with the conditions outlined above, would not affect the functional integrity of CrossAlta's gas storage unit. The panel also finds that measurement conditions placed on the licence will ensure that the parties have the information they need to identify the nature of fluid produced at the 16-26 well and reach an arrangement, either voluntarily or through the courts, that reflects the rights and interests of each party.

[108] With respect to interference with CrossAlta's business and commercial interests from the mere issuance of a well licence near CrossAlta's gas storage unit, the panel notes that CrossAlta raised this argument in the 11-26 proceeding. However, in this proceeding, CrossAlta was unable to provide evidence of any adverse effect to its commercial interests as a result of the approval of the 11-26 licence. As set out above, the panel is of the view that there are no settled expectations that well licences outside the approved boundaries of gas storage unit would not be approved. Further, the panel is of the view that the above conditions aimed at protecting the functional integrity of the gas storage unit highlight the importance the AER places on gas storage in Alberta. Accordingly, the panel expects there will be no adverse effect from the approval of the 16-26 well licence.

[109] Finally, the panel restates its view that if storage gas extends into Section 26, CrossAlta should take steps to include that area in its gas storage unit approval and that drilling the 16-26 well will provide information to help decide whether to include the area. The panel believes that risk to the gas storage unit can be appropriately managed and concludes that the proposed 16-26 well is in the public interest and should be drilled.

## **FUTURE DEVELOPMENT IN THE AREA**

### **Evidence**

[110] CrossAlta and Kallisto submitted that this decision would set a precedent for drilling wells near gas storage operations, not only for them, but for the entire industry. Kallisto submitted that it holds mineral rights and plans to explore more of the Crossfield area (see figure 1). Both parties requested that the AER guide them further on how to handle such situations in the future to avoid costly hearings and court actions.

### **Analysis and Findings**

[111] The panel notes that the 16-26 location is the closest of Kallisto's future proposed well locations to CrossAlta's gas storage unit that Kallisto identified. The panel is of the view that any risk to storage operations from future wells will likely be similar or lower at locations farther than the proposed 16-26 location. As set out above, the panel finds that CrossAlta is obligated to ensure its storage operations are protected and that areas where its gas is being stored are included in the approved gas storage unit. The 16-26 well will provide useful information to the parties on the extent of the gas storage reservoir. This will likely help determine future actions,



including whether to object to future applications. As set out above, the panel believes that there are ways to ensure that any storage gas that may be produced is returned, in some fashion, to CrossAlta.

[112] The panel believes its decision provides information and guidance that makes it possible for parties to avoid hearings and court actions. However, the panel notes that the AER must consider each and every application it receives on its own merits and consider whether a hearing should be held.

[113] The panel also notes the interest that Freehold mineral owners in the area expressed at the hearing of the 11-26 well and during this proceeding. The panel encourages all parties to find ways to obtain information that would help make informed decisions about whether to include additional lands within the boundaries of the gas storage unit, remove them from development, or permit development on them for production. This additional information and consequent decisions would likely address many of the concerns of the Freehold mineral owners. The panel believes that drilling wells, such as the 16-26 well, is one way to obtain such information.

[114] The panel confirms its expectation that, as outlined in *Directive 065*, storage operators are to ensure that they have secured adjacent lands on which development could affect their storage operations. The panel notes that storage operators do not have the option of securing a buffer area from the Crown. However, storage operators are expected to be proactive in protecting their operations where a risk from development activities exists, including securing lands where gas is being stored.

## **CONCLUSION**

[115] The AER approves the well application, subject to the conditions set out in Appendix 1.

Dated in Calgary, Alberta, on July 23, 2013.

## **ALBERTA ENERGY REGULATOR**

G. Eynon, P.Geo., FGC  
Presiding Panel Member

T. L. Watson, P.Eng.  
Panel Member

B. T. McManus, Q.C.  
Panel Member

## APPENDIX 1 SUMMARY OF CONDITIONS

Conditions are requirements in addition to or otherwise expanding upon existing regulations and guidelines. An applicant must comply with conditions or it is in breach of its approval and subject to enforcement action by the AER. Enforcement of an approval includes enforcement of the conditions attached to that licence. Sanctions imposed for the breach of such conditions may include the suspension of the approval, resulting in the shut-in of a well.

The conditions imposed on the licence are listed below.

### CONDITIONS

#### *Drilling and Completion*

- 1) Kallisto must not fracture stimulate the 16-26 well.
- 2) Kallisto must
  - a) run an initial full-length cement integrity log before completion.
  - b) conduct a hydraulic isolation log after completion and stimulation.

#### *Abandonment*

- 3) Kallisto must
  - a) for open hole abandonment, run a continuous cement plug from total depth to a minimum of 30 metres above the top of the Elkton Formation. The cement plug top must be confirmed by tagging, not logging.
  - b) in the event that the well is cased, completed, and abandoned, conduct a cement squeeze of the perforated interval and fill the casing with cement to a minimum of 15 metres above the top of the Elkton Formation. If future well abandonment requirements exceed these conditions, the more stringent requirements will apply.

#### *Measurement*

- 4) Kallisto must
  - a) submit an initial pressure test completed in accordance with *Directive 040: Pressure and Deliverability Testing Oil and Gas Wells*.
  - b) install a three phase separator to separate the gas, emulsion, and water before commingling with other well effluent.
  - c) install appropriate measurement devices to measure the three phases according to the delivery point requirements in *Directive 017: Measurement Requirements for Oil and Gas Operations*, except for water measurement.

- d) prove, inspect, and calibrate the measurement devices according to the delivery point requirements in *Directive 017: Measurement Requirements for Oil and Gas Operations*, except for water measurement.
- e) install continuous sampling devices for the gas phase after separation according to requirements in *Directive 017: Measurement Requirements for Oil and Gas Operations* and analyze the gas sample once every two weeks, at a minimum.
- f) install proportional sampling devices to determine the water cut at least once per week for the emulsion phase according to requirements in *Directive 017: Measurement Requirements for Oil and Gas Operations* or install a continuous water-cut analyzer.
- g) ensure the well head separator does not have an operating pressure greater than 4200 kPa (600 psi).

*Disclosure of Confidential Information*

- 5) Kallisto must provide all confidential information related to the 16-26 well to CrossAlta and the Freehold mineral owners (Jensen and Taks families).

*Production Reporting*

- 6) Kallisto must report any production from the 16-26 well to PETRINEX as a single oil well battery.

## APPENDIX 2 HEARING PARTICIPANTS

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### Principals and Representatives (Abbreviations used in report)

### Witnesses

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#### Kallisto Energy Corp.

G. Fitch  
E. Dixon

R. H. Lore  
R. A. Clark  
C. Hartzler, P.Eng.  
J. Byers, P.Geoph.  
P. V. Pedersen, P.Eng.  
H. J. Visscher, P.Geol.

#### CrossAlta Gas & Storage Services Ltd.

R. W. Block, Q.C.  
L. Miller  
M. A. Marion

B. Anderson  
D. L. Foken  
B. M. Campbell  
S. F. Nowaczewski  
L. Herd, P. Geoph., P.Geo.  
L. Mattar, P.Eng.  
R. C. Yardley Jr.

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#### Freehold mineral owners

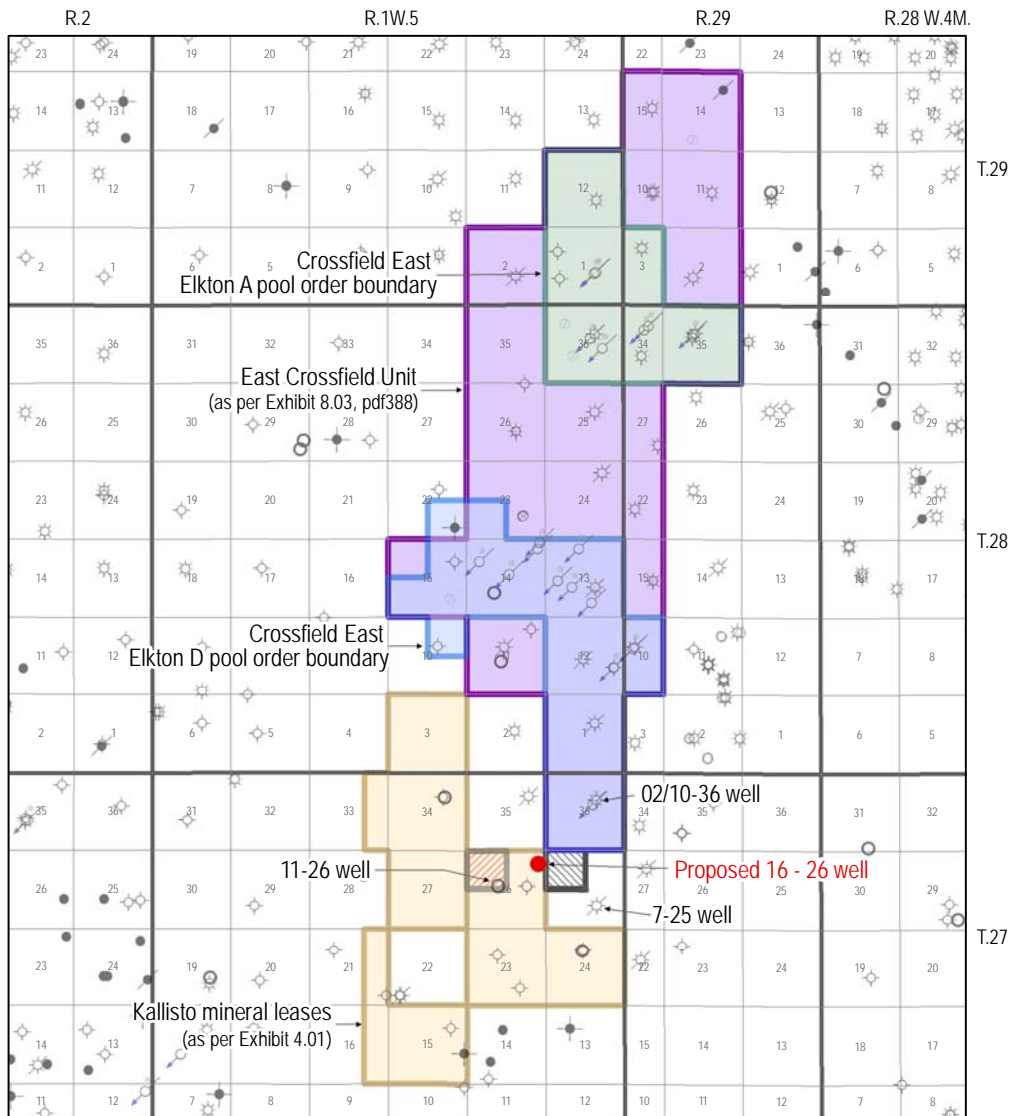
K. Verbeurgt  
M. Taks

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#### Alberta Energy Regulator staff

M. Alboiu, P.Ag.  
D. Burns, AER Counsel  
A. Darwiche, P.Eng.  
B. Fairgrieve, P.Geol.  
A. Holt  
A. Jones  
R. MacDonald, P.Eng.  
N. Rutherford, P.Eng., P.Geoph.  
Rutherford Consulting Group Inc.  
S. Walter, P.Geol.

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**Legend**

- |                                    |                                   |  |                   |  |                     |
|------------------------------------|-----------------------------------|--|-------------------|--|---------------------|
|                                    | Freehold minerals owned by Taks   |  | Disposal          |  | Surface casing only |
|                                    | Freehold minerals owned by Jensen |  | Drilled and cased |  | Suspended           |
| <b>Well status, Licence status</b> |                                   |  |                   |  |                     |
|                                    | Abandoned oil                     |  | Injection         |  | Suspended gas       |
|                                    | Abandoned gas                     |  | Observation       |  | Suspended oil       |
|                                    | Abandoned oil                     |  | Oil               |  | Undefined           |

Figure 1. Map of the project area