LEGAL CONSIDERATIONS IN THE DEVELOPMENT OF COALBED METHANE

MICHAEL J. LAFFIN*

This article is premised on the fact that the development of coalbed methane has only recently become commercially viable. The author defines coalbed methane and then considers various legal issues pertaining to its development. He explores its ownership and remedies available in cases of ownership conflict. The author then considers leases of coalbed methane and issues arising due to the effects of coalbed methane development on the environment.

Cet article est fondé sur le fait que la production de méthane à partir la couche de houille n'est devenue rentable que dernièrement. L'auteur donne la définition de méthane provenant de la couche de houille puis soulève différentes questions juridiques relatives à sa production. Il en explore les droits de propriété et les solutions possibles en cas de conflit des droits de propriété. L'auteur examine ensuite les baux relatifs au méthane provenant de la couche de houille et les questions soulevées suite aux effets que sa production a sur l'environnement.

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* Partner, Drummond Phillips & Sevalrud, Calgary, Alberta.

I. INTRODUCTION

Coalbed methane was traditionally recognized by the coal mining industry as a dangerous waste product requiring ventilation from coal mines. However, despite its hazardous nature and the difficulties inherent in the production of coalbed methane, there is interest in the development and production of coalbed gas in Canada. Aside from questions of commercial feasibility, major roadblocks to the full development of coalbed gas include legal questions regarding the ownership of the rights to coalbed gas, how the drilling for and the taking of coalbed gas should be regulated, how coalbed gas rights should be leased, and environmental concerns related to its development.

This article is divided into six parts. Part II explains what coalbed methane is, where it is found, and how it is produced. Part III of this article deals with conflicting interests in coalbed methane ownership. Determining the ownership of coalbed methane is not a problem when the titles or leases to coal and gas are held by one party. However, where there are separate owners or lessees of gas and coal rights, determining who owns the coalbed gas is difficult and poses a significant deterrent to its development. This part also examines how the Alberta, British Columbia, and Nova Scotia governments view the ownership issue when it is Crown lands that are involved. In addition, this part canvasses certain American court decisions regarding the ownership issue and briefly reviews several Canadian court decisions that may provide insight into how the issue will be decided in Canada. Part IV considers various claims that may arise because title is violated in cases where title to coalbed methane is at issue. Part V briefly reviews what a court may consider in deciding the ownership issue. Part VI of the article examines whether some typical oil and gas clauses apply to the leasing of coalbed methane. This part also details some of the issues that arise when leasing from the Crown in Alberta, British Columbia, and Nova Scotia. The final part of the article reviews the major environmental impacts that may be associated with coalbed methane production and how these are addressed.

II. COALBED METHANE

A. WHAT IS COALBED METHANE?

Coalbed methane is created as a by-product of coal formation. The formation of coal, otherwise known as "coalification," occurs when plant material is transformed from peat into lignite, sub-bituminous coal, bituminous coal, and anthracite coal.[1] During coalification, methane gas is trapped within the coal because the deposits that overlay the plant material are relatively impenetrable, and the gas by-products of coalification are trapped in the coal seams as the coal is formed. Therefore, it is generally believed that

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[1] E.A. Craig III & M.S. Myers, "Ownership of Methane Gas in Coalbeds" [1987] Rocky Mtn. Min. L. Inst. 767.

coalbed methane is generated *in situ* rather than having migrated from adjacent strata.[2] Although a number of different types of gas make up coalbed gas, methane is typically the principle constituent, constituting in excess of 80 percent of the coalbed gas,[3] (thus the reference to coalbed methane). The high percentage of methane found in coalbed gas makes it attractive for use as a fuel.

Since methane is the principle component of natural gas, coalbed gas can often be placed directly into natural gas pipelines and used as a feedstock. The principle impurities of coalbed gas are carbon dioxide and water; sulphur dioxide and hydrogen sulphide are not present in coalbed gases.[4]

In a leading American case dealing with the ownership of coalbed methane, *United States Steel Corp.* v. *Hoge*[5] (discussed below), the trial court judge described coalbed gas as follows:

> It is a gas ... which ... has a close affinity for and association with coal seams. In its original state it permeates and penetrates the coalbed, is its alter ego, its constant companion, its geological handmaiden, and is sometimes viewed as its contumacious free-spirited bride, but more generally regarded as its ill-chosen bridesmaid. It is found with the coal when they come to mine it, stays with the coal as it leaves, and remains in the space after the mining has been done. Its past has been filled with peril and tragedy, its present is seen as having a modest commercial attractiveness, and its future as a fuel potential has become increasingly brighter.[6]

Coalbed methane found in coal seams is similar to natural gas in terms of its physical and chemical properties.[7] This similarity in molecular structure to natural gas supports the position that a gas lessee has a right to develop the coalbed methane. Coal owners who claim ownership of coalbed methane are supported by the fact that the methane located in the coal seam is itself absorbed into the coal.

It is generally accepted that coalbed methane is stored in the coal in two ways: (a) either it is adsorbed on the surface of the micropore system of the coal, or (b) it is present in the macropore system of the coal. The amount of gas found in coal seams varies depending on the temperature, pressure, permeability and depth of the coal, and on the coal rank. Lower rank coal contains little or no gas.[8]

Water is prevalent in most coal seams. Removing the water allows the methane to desorb from the coal and travel to the wellbore. Typical coalbed methane wells first

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2 J.C. Schumaker & A.W. Baldwin, "An Introduction To Coalbed Gas Development on Indian Lands" (1992) 3 Rocky Mtn. Min. L. Found. Min. L. Ser. 3-9.

3 M. Deul & A. Kim, "Coal Beds: A Source of Natural Gas" (1975) 73 Oil & Gas J. at 76.

4 Schumaker & Baldwin, *supra* note 2 at 3-9.

5 450 A.2d 162 (1983 Penn. S.C.) [hereinafter *U.S. Steel*].

6 *Ibid.* at 169.

7 J.M. Morgan & E.A. McClanahan, "Competing Ownership Claims to Coalbed Methane in The Appalachian Basin" (July/August 1990) *The Landman* 19.

8 Craig & Myers, *supra* note 1 at 768.

produce large amounts of water which gradually decline as production continues. Gas production tends to increase over time with an inverse decline curve.

B. HOW IS COALBED METHANE EXTRACTED?

There are essentially four methods used to extract coalbed methane: vertical wells, horizontal boreholes, ventilation fans, and gob gas.

The method most similar to oil and gas operations is the drilling of vertical wells. These wells are drilled from the surface into a coal seam prior to the commencement of mining operations. The effect of such wells is to remove methane from the coal before it is mined.

A second method used to extract coalbed methane is the drilling of horizontal boreholes. These holes are normally drilled by the coal operator into the coal seam from within the mine. In both methods (vertical and horizontal drilling) the methane migrates to the borehole (*i.e.*, the point of least pressure) and then to the surface where it is collected for transportation and processing. The volume of methane emitted from these methods is limited unless hydraulic stimulation techniques (*i.e.*, hydrofracturing) are used. While hydrofracturing has been shown to increase production, it has also sparked controversy over whether it causes damage to the coal seam and to the roof strata overlying the coal. Consequently, the use of these methods is often discouraged; they are seen as a danger to mining safety and productivity.[9]

Ventilation fans are a third method used to extract methane. This method has the effect of expelling methane found in the coal seam by drawing surface air into the mine and flushing the coal seam. Presently, this method is not used to commercially produce coalbed methane as there is no way of economically separating methane from the air.

The final method is the use of gob wells. These wells are drilled in conjunction with longwall mining operations. Once coal has been removed, the roof above the resulting cavity collapses, leaving behind a mass of rubble referred to as a "gob." Methane from the coal being mined and from the surrounding coal seams tends to accumulate in and around the gob. Wells are then drilled into the gob to collect the methane before it spreads to other parts of the strata.[10]

Whatever method is chosen, it is important to note that, as the coal seam is mined, the methane migrates to the face of the mining operation. The methane naturally accumulates at this point and presents a great danger to miners in the mining operation; it can cause asphyxiation and is highly explosive. Methane in the air is extremely explosive at concentrations of 5 to 15 percent.[11]

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9 *Ibid.* at 770.

10 C.P. Armbrecht, "Multimineral Development Conflicts — Coalbed Methane In The Balance" (1992) 3 Rocky Mtn. Min. L. Found. Min. L. Ser. 4B-1(33).

11 J.H. Kemp & K.M. Peterson, "Coal-Bed Gas Development in the San Juan Basin: A Primer for the Lawyer and Landman" (Rocky Mountain Association of Geologists, 1988) [unpublished].

III. WHO OWNS COALBED METHANE?

Although the technology for coalbed methane recovery is in place, barriers to its full development as a resource arise from the conflicting ownership claims to it where the coal and gas rights are held by different parties. In both Alberta and British Columbia, the government agencies responsible for the exploration and development of energy resources view coalbed methane as natural gas.

A. ALBERTA'S POSITION

Information Letter 91-11[12] issued by the Alberta Energy and Utilities Board ("EUB") (successor to the Energy Resources Conservation Board) states that *"[t]he Energy Resources Conservation Board and the Department of Energy consider coalbed methane to be a form of natural gas."*[13]

The Alberta government's position that coalbed methane belongs to the natural gas owner dictates that most provincial statutes, regulations, and policies related to the drilling and production of conventional gas reservoirs can be applied directly to coalbed methane.[14] In this regard, normal gas well spacing of one well per section is in effect and production facilities require EUB approval in accordance with s. 7.001 of the *Oil and Gas Conservation Regulations*[15] (as is true for natural gas developments).

B. BRITISH COLUMBIA'S POSITION

British Columbia's Ministry of Energy and Mines (the "Ministry") position on the ownership of coalbed methane is set out in Information Letter EMD 99-05[16] which was revised December 15, 1999 and replaced Information Letter E91-18.[17] EMD 99-05 states that coalbed methane is natural gas, and where the rights to the resource are held by the Crown, such rights are conveyed through provincial petroleum and natural gas tenures under the *Petroleum and Natural Gas Act*.[18] Attached to EMD 99-05 is a Memorandum of Record ("Memorandum") which outlines the basis under which the Ministry will make the right to methane gas available. The Memorandum indicates that the Ministry's position is supported by the "scientific, common and statutory meaning of natural gas ... and that methane is recovered by techniques that resemble those which pertain to natural gas extraction." The approach adopted by British Columbia is based on a study conducted by the Canadian Institute of Resources Law.[19]

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12 Alberta Energy Resources Conservation Board, "Informational Letter IL 91-11," August 1991.

13 *Ibid.* at 1 [emphasis added].

14 *Ibid.*

15 Alta. Reg. 151/71.

16 British Columbia, Ministry of Energy and Mines, "Information Letter EMD 99-05," 15 December 1999.

17 British Columbia, Ministry of Energy and Mines, "Information Letter E91-18," August 1991.

18 R.S.B.C. 1996, c. 361.

19 Canadian Institute of Resource Law, *Surface and Subsurface Rights For Minerals In British Columbia* (Background Paper) by S.L. Martin, B. Barton & H. Samoil (15 June 1983).

C. NOVA SCOTIA'S POSITION

The ownership of mines and minerals in Nova Scotia is not as complex as it is in Western Canada because s. 109 of the *Constitution Act, 1867* provided that all mines and minerals belonging to Nova Scotia, Ontario, Quebec, and New Brunswick at the time of Confederation belonged to these provinces, subject to any trusts, or to any interest other than that of the relevant province.[20] Nova Scotia has developed a Coal Gas (Coalbed Methane) Policy that was finalized in March 1994. It provides that the *Petroleum Resources Act*[21] defines "petroleum" to include coal gas and that all petroleum, including coal gas, is deemed always to have been vested in the provincial Crown.

The policies of the Alberta, British Columbia, and Nova Scotia governments are helpful in determining ownership of coalbed methane between lessees of the Crown (*i.e.*, one person holding a Crown natural gas lease and another person holding a Crown coal lease), subsequent to those policies being formulated.

D. FREEHOLD OWNERSHIP

The rulings of the provincial departments do not and cannot provide a clear understanding of the ownership issue when the Crown leases one substance (*i.e.*, natural gas) and the coal is leased by a freehold owner, or when both substances are leased by a freehold owner. This lack of clarity is highlighted in British Columbia's EMD 99-05[22] which requires that where freehold coal rights exist, the Ministry may grant petroleum and natural gas rights. However, if petroleum and natural gas rights are also granted over the same lands and the two or more lessees cannot reach agreement on how the resources are to be developed, the holder of the petroleum and natural gas rights must indemnify the Crown if a legal suit follows. This is included because Information Letter 91-19 (the predecessor to EMD 99-05) concluded that "*[t]his is advised by Ministry legal counsel due to the uncertainty of the law and the possible ambiguities in ownership in this special situation.*"[23] EMD 99-05 goes on to state that "*petroleum and natural gas rights cannot be granted over areas where all subsurface rights are freehold.*"[24]

British Columbia's Information Letter EMD 99-05 and the inference drawn from it highlight that while the provincial rulings are conclusive in determining the ownership issue in cases where the Crown owns both the natural gas and the coal, the rulings are only guidelines in determining the respective rights of the coal and natural gas owner where those substances are not owned entirely by the Crown.

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20 Pursuant to the *Constitution Act, 1867*, (U.K), 30 & 31 Vict., c. 3, reprinted in R.S.C. 1985, App. II, No. 5, ownership of Crown lands, mines, minerals and royalties was retained by the provinces entering Confederation. For a more extensive discussion on Nova Scotia's ownership of mines and minerals, please refer to G.V. La Forest, *Natural Resources and Public Property Under the Canadian Constitution* (Toronto: University of Toronto Press, 1969).

21 R.S.N.S., 1989, c. 342, s. 1.

22 *Supra* note 16.

23 British Columbia, Ministry of Energy and Mines, "Information Letter E91-19," August 1991. [emphasis added].

24 *Supra* note 16 at 3 [emphasis added].

E. AMERICAN JUDICIAL DECISIONS

In its simplest form, the ownership question is whether coalbed methane is owned by the coal owner or by the oil and gas owner. This issue, as mentioned above, is academic when the title to the coal and gas are held by one party or the lease covering these substances specifically addresses coalbed methane. However, when the coal and gas are owned by different parties, or coalbed methane is not specifically addressed in coal and oil and gas leases, the ownership issue presents an obstacle to the successful development of the coalbed methane.

Any question regarding the ownership of coalbed methane coming before the courts will raise essentially two issues: first, whether coalbed methane is a gas or an intrinsic part of the coal, and second, whether the parties to a particular mineral conveyance (*i.e.*, a transfer, lease, *etc.*) intended to transfer ownership of the coalbed methane. To date, Canadian courts have not faced these issues. However, the issues have been raised in the United States. The four leading decisions in the United States to date, discussed below, are *Amoco Production* v. *Southern Ute Indian Tribe*,[25] *Carbon County* v. *Union Reserve Coal Co.*,[26] *U.S. Steel*,[27] and *Rayburn* v. *USX Corporation*.[28]

1. *AMOCO PRODUCTION CO.* V. *SOUTHERN UTE INDIAN TRIBE*

In a decision rendered June 7, 1999, the United States Supreme Court in *Amoco Production* held that the term "coal," as used in the federal *Coal Lands Acts* of 1909 and 1910, did not encompass coalbed methane. In this case land patents issued to settlers in 1909 and 1910 conveyed the land and everything in it to the settlers, but the "coal" was reserved to the United States. The Southern Ute Indian Tribe was later granted the rights to the coal reserved by the United States. In its decision the court found that the determining issue was whether the United States Congress regarded coalbed methane as a constituent of coal in 1909. In its analysis the court reviewed the process that generated coalbed methane and the dictionary meanings of "coal" and "coalbed methane." It then found that the "common understanding of coal in 1909 and 1910 would not have encompassed" coalbed methane gas, both because it is a gas rather than a solid mineral and because it was understood "as a distinct substance that escaped from coal during mining, rather than as a part of the coal itself."[29] Because the Court concluded that the most natural interpretation of "coal" did not encompass coalbed methane, it did not consider the applicability of the canon that ambiguities in land grants are construed in favour of the sovereign. This recent decision of the United States Supreme Court appears to resolve once and for all in that country the ownership issue regarding any reservations made by the federal government pursuant to the aforementioned legislation and any similar legislation. Consequently, any state legislation would probably be viewed in a similar manner. However, the decision is not determinative in addressing the issue as it

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25 526 U.S. 865 (1999) [hereinafter *Amoco Production*].

26 898 P.2d 680 (Mont. 1995) [hereinafter *Carbon*].

27 *Supra* note 5.

28 844 F.2d 796 (11th Cir. 1988) [hereinafter *Rayburn*].

29 *Supra* note 25, para. 4.

relates to private conveyances. A criticism of this decision is that it does not give effect to the intent and custom of the industry at the time and assumes that, had liability been suffered because of the presence of coalbed methane, liability would accrue to the non-coal owner.

2. *CARBON COUNTY* v. *UNION RESERVE COAL CO.*

In this case the Supreme Court of Montana was asked to determine whether coal seam methane gas was a constituent part of the coal estate. In its decision rendered in June 1995, the Court reviewed the findings in *U.S. Steel* (discussed below) and distinguished it on the basis that while coal seam methane was considered a waste product in 1920, its value was certainly established by 1984, the time of the conveyance in question in this decision. Further, the Court indicated that while in *U.S. Steel* the Court considered the characteristics of coal seam methane gas *in situ*, Montana law currently and historically has provided that the determination of whether or not a substance is considered to be gas is made at the wellhead.[30] The Court also reviewed the *Rayburn* decision (discussed below) and distinguished it on the basis that at the time the conveyance deed in *Rayburn* was executed (1960), coalbed methane was not considered commercially recoverable. Furthermore, unlike the deed considered in *Rayburn*, there was no ambiguous language in this deed. In its decision the Court looked at the plain meaning of the language of the deed to determine the intent of the parties, and in doing so found that "coal" and "gas" are mutually exclusive terms by reference to various dictionary meanings as well as statutory meanings given to "minable coal" and "gas." Using these definitions, the Court concluded that coal seam methane is not a constituent part of coal and, as a result, it may be severed from the coal estate.

3. *UNITED STATES STEEL CORP.* v. *HOGE*

The facts of this case are as follows: In 1920, a predecessor to U.S. Steel Corp. had purchased all the coal underlying two tracts of land. Along with the title to the coal, U.S. Steel Corp. acquired the mining rights and privileges which included the right of mine ventilation. The owners at the time retained the right to drill through the coal for oil and gas extraction. The oil and gas were then leased to Mary Cunningham in 1976. U.S. Steel Corp. opened a coal mine in 1977 which included the two tracts of land in question and began production. In 1978 the lessee of the oil and gas rights began drilling a well on one tract of the subject land for the express purpose of recovering the coalbed gas contained in the subjacent Pittsburgh coal seam. U.S. Steel Corp. then sought an injunction to prevent the oil and gas lessee from drilling into and producing from the coal seam and also sought a finding that U.S. Steel Corp. held title to the coalbed methane.

At trial and at the lower appeal court, the gas owner was determined to have title to the coalbed gas. In finding in favour of the lessee of the gas, the courts reasoned that the coal conveyance deed reserved the coalbed gas in and around the coal to the grantor of the lease. The courts also found that, at the time of the conveyance of the coal, there was no common understanding that coalbed gas was part of the coal itself. U.S. Steel Corp.

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[30] *Supra* note 26 at 684.

appealed to the Supreme Court of Pennsylvania which, in a three to two decision, reversed the lower court's findings. It determined that title to coalbed gas should be given to the coal owner.

In its decision the Supreme Court of Pennsylvania reviewed the characteristics, origins, history of development, and the legal principles related to the ownership of gas. To determine the issue, the Court looked to the language of the conveyance in its entirety, and in light of the conditions existing at the time of execution, to give effect to the intention of the parties. The court found that

> subterranean gas is owned by whoever has title to the property in which the gas is resting ... such gas as is present in coal must necessarily belong to the owner of the coal, so long as it remains within his property and subject to his exclusive dominion and control.[31]

The Court also found it inconceivable that the parties intended that all gas be reserved to the grantor of the gas rights despite the use of the unrestricted term "gas." It then submitted that it would strain credulity to believe that the grantor of coal rights would retain the right to valueless gas with the attendant responsibility for its dangerous nature.[32] Thus the key factual finding coming out of *U.S. Steel* was that the parties did not intend for coalbed gas to be transferred to the natural gas owner at the time that the mineral conveyance was executed.

4. *RAYBURN* V. *USX CORPORATION*

In *Rayburn* the surface owner reserved oil and gas in a deed that conveyed other minerals, including coal, to USX Corporation ("USX"). The surface owners maintained that coalbed methane was within their reservation of gas while USX argued that the methane was an intrinsic part of the coal and therefore passed to USX. In reaching its decision that the coalbed methane passed to the coal owner, the Federal District Court in Alabama followed an analysis similar to that in *U.S. Steel*. First, it examined the status of the oil and gas industry at the time that the mineral conveyance was executed. In this regard, the Court found that at the time that the conveyance was entered into, "coalbed methane was not considered to be commercially recoverable."[33] Subsequent knowledge was deemed irrelevant in interpreting the document.[34] Next, the Court examined the wording of the conveyance using well-established contract principles and held that the granting clause reflected an "intention that the methane in the coal bed not be available to any well drilled by the grantors."[35] This intention arose primarily out of the ambiguous language requiring the oil and gas developer to encase all coal seams that were penetrated.

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31 *Supra* note 5 at 147.

32 *Ibid.* at 172-73.

33 M.A. Swartz, "Ownership Issues and Their Impact Upon Coalbed Methane Development" (1992) 3 Rocky Mtn. Min. L. Found. Min. L. Ser. 1 at 1-23.

34 Schumaker & Baldwin, *supra* note 2 at 3-22.

35 *Ibid.* at 3-5.

F. CANADIAN JUDICIAL DECISIONS

The Canadian practice of resorting to American case law and legal writing for guidance where the subject matter has not been dealt with in Canada is well established; however, Canadian courts will not subjugate themselves to American judicial opinion.[36]

Although no Canadian courts have dealt with ownership disputes involving coalbed methane, several decisions have addressed ownership of mines and minerals and may be helpful in determining the issue.

The seminal oil and gas case in Canada is *Borys* v. *Canadian Pacific Railway Co.*,[37] in which the Privy Council found that natural gas in solution belonged to the holder of petroleum rights. There, the Court reasoned that the ordinary vernacular meaning of "petroleum" included gas intermingled with oil and that the parties never intended that the gas in solution belonged to the gas owner given that at the time the grant was made, the solution gas was regarded as a "danger and a nuisance rather than a help."[38]

In *Mastermet Cobalt Mines* v. *Canadaka Mines*,[39] the Ontario Court of Appeal concluded that a conveyance of "mines, minerals and mining rights in, upon or under certain lands" includes tailings that were left on the surface of the land after the extraction and refining of ore, and that such tailings belong to the owner of the mineral rights as opposed to the landowner by virtue of the fact that "a mineral retains its character as such regardless of size or economic value."[40]

In a decision contrary to *Mastermet*, the British Columbia Supreme Court in *Seymour Management* v. *Kendrick*[41] concluded that a reservation in a Crown grant that empowered a lessee "to raise and get thereout any minerals, precious or base" did not include tailings and the minerals therein. The Court reasoned that the Crown could not have intended to reserve to itself the title to the minerals in tailings since at the time they had no economic value and only later became commercially viable.

IV. REMEDIES — DECLARATORY, TORT, AND INJUNCTIVE RELIEF

Given the potential uncertainty regarding ownership of coalbed methane, it is worth noting the various remedies available where rights are being, have been, or will be impaired.

Actions with respect to possession and ownership of coalbed methane in the United States are usually of three different varieties: actions for declaratory judgments of

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36 D.E. Lewis & A.R. Thompson, *Canadian Oil and Gas*, vol. 1 (Toronto: Butterworths, 1954) at para. 22.

37 [1953] 7 W.W.R. 546 (P.C) [hereinafter *Borys*].

38 *Ibid.* at 560.

39 (1978), 21 O.R. (2d) 494 (C.A.), aff'd [1980] 2 S.C.R. 119 [hereinafter *Mastermet*].

40 *Ibid.* at 494.

41 [1978] 3 W.W.R. 202.

ownership; actions in tort for trespass or conversion; and injunctive relief.[42] Although Canadian jurisprudence on the availability of these remedies in the oil and gas context is scarce, the machinery is in place in Canada to provide for similar relief.

A. DECLARATORY JUDGMENTS

In the United States, declaratory judgments are often sought as a precautionary measure before the exploration, development, and production of oil and gas reserves. The *Uniform Declaratory Judgments Act*[43] and the corresponding statutory provisions enacted by many individual states to provide for declaratory relief, are well suited to these types of actions.[44] In Alberta the *Judicature Act* provides for declaratory relief. Section 11 of the *Act* states as follows:

> No proceeding is open to objection on the ground that a judgment or order sought is declaratory only, and the Court may make binding declarations of right whether or not any consequential relief is or could be claimed.[45]

Other Canadian provinces have similarly worded statutes.[46] The courts will also consider certain criteria in assessing whether to grant a declaratory judgment,[47] such as whether the issue will likely arise and the judgment will be of some use. Pursuant to the Alberta *Rules of Court*,[48] one need not commence an action for declaratory relief by way of statement of claim. Rather, an action may be commenced by way of originating notice, if that action is within the parameters provided by the *Rules*.

B. TRESPASS AND CONVERSION

Increasingly, actions have been advanced in the United States where disputes regarding ownership or possession of oil and gas have arisen after exploration, development, and production have begun. These actions usually take the form of either a claim of trespass or of conversion. Again the Canadian experience in this regard is much more limited, especially in regard to freehold mines and minerals.

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42 Swartz, *supra* note 33 at 1-16.

43 *Uniform Declaratory Judgments Act*, 12 U.L.A. 109 (1922).

44 Swartz, *supra* note 33 at 1-17.

45 R.S.A. 1980, c. J-1, s. 11.

46 L. Sarna, *The Law of Declaratory Judgments*, 2d ed. (Toronto: Carswell, 1988) at 5-6.

47 W.A. Stevenson & J.E. Côté, *Alberta Civil Procedure Handbook* (Edmonton: Juribiler, 2001) at 319-20.

48 Alta. Reg. 338/83, r. 410 [hereinafter *Rules*].

While there is a scarcity of Canadian case law dealing with trespass to freehold mines and minerals,[49] Crown interests are protected by a statutory "trespass" action in Alberta. Section 53 of the *Mines and Minerals Act* of Alberta provides, in part, that

> No person shall win, work, or recover a mineral that is the property of the Crown in right of Alberta unless he is authorized to do so under this Act or by an Agreement.[50]

The *Mines and Minerals Act* goes on to provide for compensation to be paid to the Crown when such a trespass occurs. The wrongdoer must indemnify the Crown for the value of the mineral captured less the costs incurred by the wrongdoer for drilling and production.[51] The *Mines and Minerals Act* further provides that the wrongdoer is guilty of an offence and liable to pay a penalty of up to $100,000 per offence. It appears that recourse to these provisions by the Crown has met with little success,[52] and the Department of Resource Development is currently considering adjusting the penalties so as to give the *Mines and Minerals Act* more "teeth" in this regard.

Suing in conversion for expropriation of coalbed methane also appears to be a possible remedy in some American states.[53] As conversion is a remedy exercised against chattels as opposed to real property,[54] this relief may not be suitable in some states, depending on whether the state takes the view that oil and gas is realty or personal property. This analysis may, accordingly, apply to the Canadian experience.[55]

C. INJUNCTIVE RELIEF

Injunctions may be useful in situations where one party holds an interest in the coalbed methane, and another holds the title to the coal. In an effort to enhance production of the coalbed methane, the party with the interest in the gas may want to hydrofracture or stimulate the coal seam. This may have an adverse impact on the coal owner's interest. In order to prevent this, the coal owner may seek injunctive relief, which is expressly provided for in Alberta by the *Judicature Act*.[56] Successful trespass actions may also result in injunctive relief.

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49 In the oil and gas context, see *e.g.*, *Hill Estate* v. *Chevron Standard Ltd.*, [1993] 2 W.W.R. 545 (Man. C.A.), in which the Manitoba Court of Appeal found that an oil company which obtained its interest in oil by way of an invalid power of attorney had trespassed in extracting the oil, without offering much by way of explanation for this finding. The lack of trespass actions may be the result of regulations enacted in the western provinces that provide off-target penalties prior to a formal trespass complaint occurring. It will be interesting to see if horizontal drilling leads to more trespass disputes.

50 R.S.A. 1980, c. M-15, s. 53(1).

51 *Ibid.*, s. 45.

52 B. Skorenki, "Trespass" (2000) February, *The Negotiator* 2.

53 Swartz, *supra* note 33 at 1-20.

54 L.N. Klar, *Tort Law*, 2d ed. (Scarborough, Ont.: Carswell, 1996) at 76.

55 Conversion of minerals was at issue in the Ontario Supreme Court, Appellate Division decision of *McLeod* v. *Sault Ste. Marie Public School Board* (1916), 29 D.L.R. 661. The Court found a conversion of shale where a contractor had removed the mineral excavated from the owner's land without authorization or abandonment on the part of the owner.

56 *Supra* note 45, s. 13(2). See also *supra* note 48, r. 440.

In order to protect a coal owner's rights more immediately, an interlocutory permanent, or *quia timet* interlocutory application may be sought. *Quia timet* injunctions are sought to prevent threatened future harm which has not yet occurred.

The test for whether a Court will grant an interlocutory injunction is the well-known *tri-partite sequential test*. That is, the Court must determine:

(a) whether the applicant has raised a serious issue;
(b) that the applicant would suffer irreparable harm if no order was granted; and
(c) the balance of convenience considering the total situation of both parties favours the order.[57]

Quia timet injunctions have additional considerations unique to that remedy which must be addressed on application for that remedy,[58] such as whether the occurrence of the harm is imminent and whether a substantial risk that harm will occur exists.

V. DECIDING OWNERSHIP OF COALBED METHANE

A. ANALYZING THE CONVEYANCES

Any effort to determine title issues must begin with an analysis of the relevant grants, conveyances, or reservations. The initial question to be asked is whether coalbed methane is specifically included in such documentation. Invariably the answer is "no," since coalbed methane has not emerged as a commercially feasible source of energy in Canada. It is noteworthy that certain Canadian companies now include a specific reservation to coalbed methane when granting leases or farmouts to its fee simple lands. The wording in most grants will refer to "minerals," "gas," and "coal" and therefore the question becomes whether coalbed methane can be classified as any of these. Conversely, if the grant refers to coal, does this implicitly carry with it the right to coalbed methane?

In the United States the courts have ruled that the term "minerals" includes oil and gas unless the instrument creating the mineral interest reveals that the parties intended the term to have a more restricted meaning.[59] "Coal" is another important term; it may be argued that if only the term "coal" is used, the conveyance is less inclusive than if the term "minerals" was used, resulting in the owner of the coal having no claim to coalbed gas.

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[57] *Law Society of Alberta* v. *Black* (1983), 29 Alta. L.R. (2d) 326 (C.A.).

[58] See L.N. Klar *et al.*, *Remedies in Tort*, vol. 3 (Toronto: Carswell, 1987) at 17-57 for a good discussion of this remedy.

[59] P.C. McGinley, "Legal Problems Relating to Ownership of Gas Found In Coal Deposits" (1978) 80 W. Va. L. Rev. 369.

The term "minerals" has been held by several courts to include coal, oil, and gas, although other American courts have held that "minerals" does not include substances that are not commercially viable at the time of the grant.[60]

The strongest claim to ownership which a gas lessee may make is that coalbed methane is a "gas." There is no dispute that methane is the main component of natural gas and the natural form of methane is a gas. Furthermore, there are many chemical and physical similarities between natural gas and methane.

B. THEORIES OF OWNERSHIP

Owing primarily to the diversity of jurisdictions, several theories of ownership regarding oil and gas have been recognized in the United States. These theories are as follows:

(1) Theory of Absolute Ownership. This theory is based both on the maxim *cuius est solum, eius est usque ad coelum et ad inferos* ("He who possesses land possesses also that which is above it and below it")[61] and the fact that an owner can alienate his estate to other parties. It is noteworthy that even where this theory is followed, the rule of capture is also applied so that the absolute ownership ceases if the oil or gas migrates.[62]

(2) Theory of Qualified Ownership. This theory recognizes the right of the land owner or his lessee to acquire absolute title by production and is often classified as a *profit à prendre.*

(3) Theory of Non-ownership. This theory is based on the early case of *Westmoreland & Cambria Natural Gas Co.* v. *DeWitt*,[63] in which it was determined that natural gas should be considered for ownership purposes the same as *ferae naturae*.[64]

Despite the adoption in the United States of several theories of ownership, "Canadian courts have not clearly settled on a theory of oil and gas ownership."[65] In his article MacIntyre concluded, after reviewing several seminal Canadian oil and gas decisions, that the theory of private ownership of oil and gas interests in Canada is neither complete nor

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60 For a discussion regarding these findings, see R.K. Olson, "Coalbed Methane: Legal Considerations Affecting Its Development As An Energy Resource" (1978) 13 Tulsa L.J. 377 and Craig & Myers, *supra* note 1 at 767.

61 Bennett Jones & N. Bankes, eds., *Canadian Oil and Gas*, vol. 1 (Toronto: Butterworths, 1991) at para. 2.10.

62 J.M. MacIntyre, "The Development of Oil and Gas Ownership Theory in Canada" (1969) 4 U.B.C. L. Rev. 245 at 255.

63 130 P. 235 (1889).

64 The essence of the rule of capture is that oil and gas should be classified in a similar manner as animals, in that unlike other minerals, they travel uncontrollably from one piece of land to another.

65 A.R. Lucas & C.D. Hunt, *Oil and Gas Law In Canada* (Toronto: Carswell, 1990) at 5.

coherent.[66] The owner of the minerals would probably be said to own oil and gas *in situ* but his/her ownership is subject to the rule of capture. This finding is not dissimilar to the conclusion reached by Hunt and Lucas that the Canadian decisions to date indicate "uncertainty in and lack of development of Canadian oil and gas ownership theories," and that what may be inferred from the Canadian cases is a theory that resembles qualified ownership of oil and gas in place subject to the rule of capture.[67]

Simply stated, the rule of capture provides that the owners of mines and minerals underlying a tract of land acquire the title to all substances that are produced from wells drilled on such lands, regardless of whether oil and gas migrates from adjoining lands. If we assume that the most workable theory in Canada to date is the ownership in place or *in situ* theory (*i.e.*, the theory of absolute ownership) as qualified by the rule of capture, one encounters many interesting implications for coalbed methane. One of the most obvious of these is that, if the coalbed owner owns not just coal but a strata, his/her claim to the methane is greatly enhanced. However, if the owner of a gas has title to the methane in the coalbed and various competing interests arise regarding different substances located in the same reservoir or strata, the issue becomes what duty each resource owner owes to the other. Further, application to coalbed methane of the ownership in place theory suggests that the owner or lessee of the coal has rights to the methane it contains because the methane is imbedded in the coal and forms part of the coal. This reasoning is similar to that found in *Borys* where the word "petroleum" was viewed as including gas intermingled with oil. It is noteworthy that in the American decision *Chartiers Block Coal Co.* v. *Mellon*,[68] the coal owner had to exercise his right to extract the coal in a manner that would not infringe on the gas lessee.

If we apply the rule of capture to the ownership question, the rule may enable the coal lessee to capture the methane regardless of its possible classification as a gas. Conversely, it may be argued that the rule would not vest title to the methane in the coal owner since the rule derived from the need to adjudicate the rights of competing interest holders and not interfere with the exclusive right of the gas owner to reduce it to possession.

C. INTENT

Despite the many arguments put forth regarding the classification of coalbed methane as a gas or as an intrinsic part of the coal, and despite the various theories of ownership, the determining factor regarding ownership should be the intent of the parties.

Intent, in the absence of clear language, is best ascertained by the custom and usage in the industry. Historically, coal operators assumed all of the risks associated with the presence of coalbed methane; consequently, the coal owner should also reap the rewards associated with this substance. Conversely, it may be argued that the intent of a coal grant was to mine and remove coal and not to extract gas, except as this facilitates mining operations.

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[66] MacIntyre, *supra* note 62 at 265.

[67] Lucas & Hunt, *supra* note 65 at 7.

[68] 152 P. 286 (1893).

In *U.S. Steel* both the Supreme Court of Pennsylvania and the lower courts considered the intention of the parties to be the relevant consideration in determining what was conveyed in the deed. This approach is consistent with that taken by the Canadian judiciary. Although the Supreme Court in *U.S. Steel* concluded that the grantor could not have intended to reserve gas which was not known to be of value and was instead considered dangerous, the lower court came to the opposite conclusion, and one could just as effectively argue that neither of the parties to the agreements in question intended that the right to coalbed gas be included in the right to all of the "said coal," as the value of coalbed gas was virtually unknown when the agreements were entered into.

In *Barnard-Argue-Roth Stearns Oil & Gas Company* v. *Farquharson*,[69] Lord Atkinson took a similar view to that of the Supreme Court of Pennsylvania in the *U.S. Steel* case and held that it never occurred to the grantor to preserve ownership of a substance regarded as a dangerous and destructive element. However, the Privy Council in the *Borys* case acknowledged that

> [i]n reaching this conclusion their Lordships have not taken into consideration the view or belief of either Mr. Borys or the C.P.R. in 1906 or thereafter as to what was included in the term petroleum. Probably they had none, and, in any case, it has to be remembered that what has to be sought is the vernacular meaning of the word "petroleum" and not what opinion was held by the parties to the grant.[70]

Various writers have commented on the question of intent, and one of the earliest writers on the issue of coalbed gas ownership, C.C. Williams, Jr., "believed that 'any notions about the intended scope of the severance ... would have to be sheerest guesswork.'"[71] He doubted that there was ever a meeting of minds on the subject. Further, Patrick C. McGinley in his article states that "even if the parties to a conveyance intended for the coal owner to control and to dispose of the coalbed gas as he chose, the commercial use of such gas was not within the contemplation of the parties."[72]

It would seem that an analysis of the intent of the parties in the foregoing cases does not provide any clear-cut solution. Nevertheless, the intent of the parties is still of paramount importance and should be the ultimate criterion for determining ownership of coalbed gas in the present circumstances.

VI. LEASING COALBED METHANE

A. FREEHOLD OWNERSHIP

Another legal obstacle to the successful development of coalbed methane is the leasing of that resource. Therefore, the effectiveness and efficiency of the coalbed gas lease is an important element in the development of the coalbed methane.

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69 (1912), 5 D.L.R. 297 (P.C.).

70 *Supra* note 37 at 19.

71 C.C. Williams, "On Leasing Gas from Coal Seams" (1941) 47 W. Va. L.Q. 211.

72 *Supra* note 59 at 391.

Although many differences exist between the production of oil and gas and of hard minerals, generally the hard mineral industries have followed the oil and gas industry insofar as freehold lease forms are concerned. This trend has arisen primarily because the oil and gas lease has been in existence for many years and its meaning has been considered by the courts on numerous occasions. Compared to the hard minerals lease, the oil and gas lease has become standardized and, consequently, any development of a coalbed methane lease should focus on clauses contained within an oil and gas lease. Notwithstanding the legal development of the oil and gas leases, the economics and technology associated with the development of coalbed methane necessitate that such a lease be viewed critically prior to its adoption to coalbed methane exploration. Furthermore, the differences in developing oil and gas and hard minerals (*i.e.*, fugacious versus stationary; unknown versus known quantity) must also be considered when attempting to utilize an oil and gas lease for the development of coalbed methane when coal is also extracted.

The function of a lease authorizing development of coalbed methane is to allow the lessee to extract coalbed methane and the lessor of the coalbed methane to receive compensation for the resources that are extracted. Typical provisions found in an oil and gas lease and suggestions as to how they should be revised to incorporate the leasing of coalbed methane are discussed below.

As considered above, there are essentially three commercially viable types of coalbed methane production (ventilation fans are not economically feasible at this time) (1) conventional production using vertical bore holes; (2) horizontal bore holes; and (3) gob gas. As described earlier, gob gas production occurs when gas is taken from a mined out area after the roof rock has collapsed. Leases pertaining to gob gas production are significantly different from oil and gas leases and will not be addressed in this article. Vertical and horizontal recovery techniques may utilize oil and gas leases with the amendments suggested below, as a starting point in drafting a coalbed methane lease.

1. HABENDUM CLAUSE

The habendum, or duration, clause outlines how long the lessee has the right to take the leased minerals. The standard oil and gas lease provides for a primary term and a provision that the lease will continue as long thereafter as the lessee conducts operations or produces oil and gas in paying quantities from the leased lands. If a lessee intends to produce coalbed methane without regard to coal mining operations, the habendum clause used in oil and gas operations may be acceptable. However, if methane production is tied to coal production, a typical oil and gas habendum clause in a coalbed gas lease is not appropriate for a number of reasons, namely:

(1) coalbed gas production is not as consistent as natural gas, and coal production requires greater lead time before production occurs, therefore the habendum clause in a coalbed gas lease must be of a longer term;

(2) the production of coalbed methane may be of marginal economic value and therefore the criterion of "paying quantities" may be insufficient to extend the term of the lease; and

(3) often hard mineral mines such as coal mines must be closed because of the unavailability of markets for extended periods of time, therefore a coalbed gas lessee must ensure that any lease will allow for temporary shutdowns — such a provision is not provided for in the standard form of oil and gas leases.

2. GRANTING CLAUSE

A granting clause in an oil and gas lease is designed to transfer an interest and to describe the interest being transferred (*i.e.*, the land involved and the mineral rights that are to be leased). A typical granting clause in an oil and gas lease might read as follows:

> the lessor does hereby grant and lease exclusively unto the lessee all the petroleum, natural gas and other related hydrocarbons (except coal) and material and substances (whether, solid or gaseous and whether hydrocarbons or not) produced in association with the petroleum found in natural gas or other related hydrocarbons).

It is questionable whether, relying on this clause, coalbed methane is transferred to the lessee because: (a) it does not specifically mention coalbed methane; and (b) it does not address where coalbed methane may be found (*i.e.*, coalbed methane may migrate from the coal seam where it arises, and natural gas may migrate to the coal seam; as a result these substances may become indistinguishable). To be more precise in ensuring that coalbed methane is granted to a lessee, the granting clause must be modified. Suggested modifications, all of which are intended to incorporate into the lease the right to produce all gas (including coalbed methane) that can be produced from a specified subsurface area, are as follows:

> All petroleum, natural gas, and related hydrocarbons (except coal, but including all methane and other natural gas substances which may be found to be occupying the same strata as coal, but excluding all methane and other natural gas substances which are derived through the future conversion of coal into such substances), all other gases.
>
> or
>
> Any producing oil and gas (including, but not limited to, gas producible from coal-bearing formations).
>
> or
>
> All gas originating or produced from coal formations or seams and all zones in communication therewith and all associated natural gas and other hydrocarbons contained therein from the bottom of the coal seam to a height 300 feet above the said seam and which is released in preparation for and/or during the course of lessee's mining operations in the leased premises.

In any lease of coalbed methane, the granting clause should include not only the right to enter upon and develop the lands, but should also provide for the exploration, development, and production operations to address any water use and storage concerns and to address the potential for injury to the coal seams. In addition, if the oil and gas interests are held by different parties, the timing of the mining of the minerals may present problems, and difficulties will arise if surface coal mining and oil and gas operations are attempted at the same time. Ideally, negotiations should take place between conflicting interests to deal with the methods and the timing of coalbed gas production before operations begin.

3. DELAY RENTAL CLAUSE

The standard oil and gas lease provides that operations regarding renewal of the lease after the primary term is expired must occur no more than ninety days between the ceasing of operations and the renewal of operations. As indicated previously, coalbed gas production is sporadic and may be subject to stoppages at any time. While a coalbed gas lessee may not have any control over the stoppage in production, the lease should not penalize the lessor. Therefore, a coalbed gas lease should contain a clause requiring the lessee to pay the lessor a sum of money when operations have ceased for a certain period of time. This clause may take the form of a delay rental payment, similar in form to those found in oil and gas leases, or may include a minimum royalty clause. It is noteworthy that minimum royalty clauses are differentiated from delay rental clauses because minimum royalty clauses are often insufficient to maintain a lease and any minimum royalties paid are deducted from production royalties when production occurs. The lessor must be wary that the lessee, through the payment of a delay rental or minimum royalty, does not unduly delay the mining of the coal and the production of coalbed methane thereby depriving the lessor from receiving any payments.

4. ROYALTY CLAUSE

The standard lessor royalty provision found in gas leases will work in a coalbed gas lease. It is noteworthy, however, that royalties in gas leases are typically calculated at the wellhead. While there is no wellhead price for gas, this approach, by virtue of the wording of the lease and established Canadian case law,[73] enables the lessee to deduct the lessor's proportionate share of various costs (*i.e.*, processing or transportation) from the lessor's royalty. This concept is important in coalbed methane leases since this type of gas often has a low heat content or is contaminated with unwanted substances. Consequently, the methane must either be upgraded with other products, or impurities such as oil, grease, heavy metals, and selected additives removed prior to any sales of such gas. Therefore, the lessee of the methane should be entitled to deduct costs associated with upgrading the methane to a sales standard.

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[73] *Resman Holdings* v. *Huntex Ltd.*, [1984] 1 W.W.R. 693 (Alta. Q.B.).

5. SHUT-IN CLAUSE

Any coalbed gas lease must include an unrestricted shut-in clause because of the constant stoppage in production involved in the production of coal. This clause may include a fixed shut-in payment or a minimum royalty.

6. POOLING CLAUSE

A pooling or unitization clause is essential in any coal gas lease because: (a) a coal seam may cover a large area owned by different entities and many wells would have to be drilled to efficiently capture the methane; and (b) coalbed methane may migrate from the coal seam and thereby make it necessary to combine several tracts of land to successfully capture the methane.

7. SUBORDINATION OF INTERESTS

Although rarely found in an oil and gas lease, one should be aware that a coalbed methane lease should account for conflicting uses or a subordination of interests. These may arise where differing lessees have interests in varying substances (*i.e.*, coal versus coalbed methane). In this instance the lease should contain clear language identifying which lease has priority. This may be achieved by specific subordination language (*i.e.*, whereby either the rights of the coalbed methane lessee are subordinated to the rights of the coal lessee or vice versa), or provisions that provide for a "first in time first in right" concept such that a lessee of either coal or coalbed methane may have priority, given the expediency with which they intend to develop the resource, provided that the operations conducted do not impair the ability to develop the other resource.

B. ALBERTA CROWN LEASING

In Alberta the right to Crown natural gas is governed by the *Mines and Minerals Act*.[74] In this *Act* natural gas and coal are treated as different substances and are leased separately. The *Mines and Mineral Act* does not consider that a coal lessee has any right to natural gas except in those cases where s. 65(2) of the *Act* has been invoked. In Part 2 of the *Mines and Minerals Act*, which pertains to coal, s. 65(2) states:

> The Minister, on the recommendation of the Energy Resources Conservation Board that it is necessary to do so for safety or conservation reasons, may authorize a lessee of a coal lease to recover natural gas contained in a coal seam in the location of the coal lease.[75]

Presumably this section would be relied on in those instances where a coal mine operator had applied to the EUB for the safety reasons specified, or the EUB was of the opinion that it was necessary for conservation reasons, the EUB recommending to the minister that the legislation be applied.

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[74] *Supra* note 50.

[75] *Ibid.*

It is interesting to note that petroleum and natural gas agreements are continued pursuant to Part 5 of the *Mines and Minerals Act*. In order for an agreement to be continued, a lessee must demonstrate that the agreement is capable of producing petroleum or natural gas in paying quantities from a zone in the location of the agreement in which rights to that petroleum or natural gas are granted. Pursuant to EUB Information Letter 91-11,[76] petroleum and natural gas rights will not be continued based solely on the presence of coal.

A significant issue pertaining to coalbed methane development is confidentiality. Operators that decide to drill or test for methane deposits normally request additional periods of confidentiality in order to enable an operator willing to incur the risk of exploring for this substance time to realize a return. All basic coalbed methane well data including drilling, completion, and production data must be submitted and will be released as provided for in existing legislation for all natural gas wells. The release period is one year from the rig release date of a well. To obtain an extended period of confidentiality would represent a significant departure from EUB policy.[77] However, an application may be made to the EUB to have the coalbed methane operation classified as an experimental scheme, in which case the data may be held as confidential for up to three years. Data which merely indicates the presence of coalbed methane is not generally experimental, and experimental status cannot be granted retroactively.[78]

C. BRITISH COLUMBIA CROWN LEASING

In British Columbia normal gas spacing and target areas are defined in the *Petroleum and Natural Gas Act*[79] and the *Drilling and Production Regulations*[80] and apply to coalbed methane wells. In addition, data submission requirements for coalbed methane wells are the same as those for natural gas wells. Confidentiality concerns do not have the same sense of urgency as in Alberta because EMD 99-05[81] indicates that all information obtained from a test hole is released after three years, and that the designation of coalbed methane as an experimental scheme with confidentiality periods of three years may be approved by the British Columbia Oil and Gas Commission.

The British Columbia government recognizes that coal ownership must be protected. The Memorandum attached to EMD 99-05 outlines six situations in which methane may be encountered and how the ministry will respond to each for the purposes of leasing petroleum and natural gas rights. The situations identified are as follows:

Case 1 No Prospect for Coal Extraction — coalbeds identified but no present value for coal extraction and no coal tenure issued. In this situation, the coalbed methane will be administered by the Ministry without consideration for coal.

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76 *Supra* note 12.

77 T.L. Byrnes & K.F. Schuldhaus, "Coalbed Methane In Alberta" (1995) J. Can. Petr. Technol. 57 at 61.

78 *Ibid.* at 60.

79 *Supra* note 18.

80 B.C. Reg. 362/98.

81 *Supra* note 16.

Case 2 Prospect for Coal Extraction — no coal licences issued but the prospect of coal production exists. The Ministry has indicated that it will issue petroleum and natural gas rights, but will regulate the exploration and development of coalbed methane to protect coal located in the reservoir.

Case 3 Coal Tenure: Agreement— coal licences issued. Petroleum and natural gas rights may be granted by the Ministry but not until there is an agreement between coal and petroleum and natural gas licensees regarding acceptable terms to extract methane.

Case 4 Coal Tenure: No Agreement — coal and petroleum and natural gas tenure granted but no agreement reached between holders of the individual tenures. In this situation, the Ministry will resolve the issue on a case-by-case basis.

Case 5 Freehold Coal Rights — the Ministry maintains that it will grant petroleum and natural gas rights without regard to freehold coal rights. The Memorandum points out that the petroleum and natural gas rights holder should reach an agreement with the coal rights holder regarding acceptable terms for conducting operations for the production of methane. If an agreement is not entered into, the holder of the petroleum and natural gas rights tenure must indemnify the Crown prior to developing the resource.

Case 6 Freehold Coal and Petroleum and Natural Gas Rights — the Crown holds no authority for granting rights but any operations will be regulated by the Oil and Gas Commission pursuant to the *Petroleum and Natural Gas Act*.

EMD 99-05, in particular Case 5 identified above, highlights that while provincial rulings may be conclusive in determining the ownership issue where the Crown owns both the natural gas and coal, such rulings are only guidelines in determining the respective rights of the coal and natural gas holder where those substances are not owned entirely by the Crown.

D. NOVA SCOTIA CROWN LEASING

In Nova Scotia, the development of coalbed methane has its own tenure system. The Nova Scotia *Petroleum Resource Act*[82] provides that only the holder of a "Coal Gas Exploration Agreement" or an exploration licence may explore for coal gas, and that it may only be developed or produced by the holder of a coal gas production agreement. An exploration licence is a non-exclusive right to explore for petroleum and is intended to enable the holder to conduct preliminary exploration of certain lands. The "Coal Gas Exploration Agreement" provides the agreement holder with the right to explore for coal gas and the exclusive right to apply for a "Coal Gas Production Agreement." The Coal Gas Production Agreement gives the holder the exclusive right to produce coal gas for commercial purposes. Coal gas agreements will be issued on the basis of work plan(s) submitted by the applicant(s).

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[82] *Supra* note 21.

In deciding whether to enter into agreements with prospective applicants regarding coal gas exploration and development, the Nova Scotia Petroleum Directorate has developed guidelines regarding concurrent resource development. These guidelines are based on three separate categories as outlined below:

(1) prospect for coal extraction but coal rights not issued — the recommendation will be that coal rights not be issued during the term of the coal gas agreement without the consent of the coal gas holder, unless the applicant for the coal rights can establish that its activities will not adversely impair the coal gas rights holder's ability to conduct its operations.

(2) coal rights issued — agreement between coal rights holder and coal gas applicant. If the coal rights holder has agreed to the issuance of coal gas rights, coal gas rights will normally be issued.

(3) coal rights issued — no agreement with coal gas applicant. Given this scenario, it is unlikely that coal gas rights will be issued unless the applicant for coal gas rights can establish that its activities will not adversely impact the coal rights holder's ability to conduct its operations.

Associated with each of the foregoing situations is the condition that the province will not be financially liable for the inability to produce any substance. Given Nova Scotia's lengthy history in coal mining, it is not surprising that each of the foregoing situations reflects the principle that operations to produce coal gas should protect the coal resource.

VII. ENVIRONMENTAL ISSUES

The development in the United States during the 1980s of coalbed methane as a valuable energy resource and the increased attention given to environmental concerns in North America, means that the environmental impact of coalbed methane operations and developments is receiving greater attention. Several provincial and federal statutes may apply to coalbed methane operations, including Alberta's *Environmental Protection and Enhancement Act*[83] and *Water Act*,[84] and the Federal government's new *Canadian Environmental Protection Act, 1999*.[85]

Presently, the most significant environmental impacts related to coalbed methane development are water disposal, impact on groundwater supplies, surface land impacts, and long production periods. Each of these impacts is discussed below.

A. WATER DISPOSAL

Most coal seams may contain a substantial amount of water (either naturally occurring or injected water) which is produced from a coal seam prior to economic levels of gas

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[83] S.A 1992. c. E-13.3.
[84] S.A. 1996, c. W-3.5.
[85] S.C. 1999, c. 33.

being produced. Typical coalbed methane wells initially produce large amounts of water that gradually decline as the production of gas continues. This water is produced because coal seams are also aquifers and through the drilling process water is injected into the coal seam. Furthermore, the water may contain a high salt content and constituents that result from production additives. Such water is often disposed of through reinjection, and it is allowed to evaporate from surface disposal pits or discharged into existing streams. Each method is regulated by federal and provincial laws.

The cost of treating and/or disposing of produced water represents a major factor pertaining to the commercial viability of coalbed methane production, and operators often argue that coalbed operations cannot tolerate the added expense of disposal. In Alberta production facilities require EUB approval in accordance with Section 7.001 of the *Oil and Gas Conservation Regulations*.[86] As with drilling natural gas wells, operators of coalbed gas wells will be required to address all related environmental and social impacts and to address objections of directly and adversely affected persons. In particular, the handling and disposal of the expected water production and possible coal fines need to be carefully planned and appropriate approvals for disposal schemes obtained. Options for water disposal include treatment and release to the watershed or subsurface disposal to a compatible formation.

B. IMPACT ON GROUNDWATER SUPPLIES

The depressuring of coal seams to allow for adsorption of methane usually involves lengthy periods of water production. Since most coalbed methane projects are shallow, groundwater may be affected, leading to the possible contamination of domestic water wells. A primary concern is that the dewatering and degassing of the coalbed may cause methane to migrate directly to fresh water aquifers. In addition, the production of methane sourced from mountainous river valley areas may temporarily reduce river flows in valleys. The British Columbia government, through Information Letter EMD 99-05, recognizes the foregoing issues and suggests that public input is needed to establish contingency plans, minimum acceptable river flows, and to address other groundwater sourcing concerns.

Alberta Information Letter 91-11 recognizes the impact that the coal seam dewatering may have on area groundwater aquifers by indicating that this concern must be addressed before large scale water withdrawals commence from any coal seam. The Information Letter further points out that if the water produced is potable, there is a possibility that groundwater removal permits may be required by Alberta Environment.[87]

C. SURFACE LAND IMPACTS

Since coal in coalbed methane target areas is under tremendous pressure, more wells in a smaller area more effectively decreases the pressure, thereby allowing the coalbed gas to flow more freely from the coal seams. Consequently, coalbed methane development

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[86] *Supra* note 15.

[87] *Supra* note 12 at 2.

tends to occur at higher than normal spacings in order to maximize production from any operation. Deviation from the conventional regulation of one gas well per 259 hectares may create several environmental concerns, including the impact that new roads, pipelines, and wells will have on environmentally sensitive areas, as well as the adverse effect that the development may have on the natural habitat of various wildlife. To date, the EUB has indicated that normal gas well spacing of one well per section will apply unless a change is approved under Section 4.030 of the *Oil and Gas Conservation Regulations*.[88] Any such change under the Regulations must consider the effects on gas recovery and the surface impacts of such reduced spacing.

British Columbia's Information Letter EMD 99-05 indicates that normal gas spacing in target areas will apply for coalbed methane wells. Provisions exist within the British Columbia *Drilling and Production Regulations* to relax spacing area requirements only if it can be demonstrated that provincial interests will not be harmed.

D. LONG PRODUCTION PERIODS

The life expectancy of most coalbed methane wells will be substantially higher than their conventional natural gas counterparts. Notwithstanding the tremendous pressure on the coal seams, methane trapped in coal is produced at a very low pressure thereby increasing the production life of such wells. The extended life expectancy of coalbed methane wells means that sensitive ecosystems may be adversely affected for a longer period than those normally sustained through conventional gas developments.

VIII. CONCLUSION

Technical advances appear to allow for the recovery and utilization of coalbed methane on a more economically viable basis, and as a result, recent years have seen increased interest in the development of this resource. Accompanying this heightened interest is a growing awareness of the legal and operational risks associated with coalbed gas development. These issues are beginning to be addressed by the legal community. Notwithstanding the prospect of coalbed methane as a valuable energy resource, the developers of this resource are advised to evaluate the legal risks along with the geological, environmental, and economic parameters involved in its development. Failure to do so may result in unnecessary complications for its successful development.

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[88] *Supra* note 15.