

1978

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Recommended Citation

Ronald K. Olson, *Coalbed Methane: Legal Considerations Affecting Its Development as an Energy Resource*, 13 *Tulsa L. J.* 377 (1978).

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TULSA LAW JOURNAL

Volume 13

1978

Number 3

COALBED METHANE: LEGAL CONSIDERATIONS AFFECTING ITS DEVELOPMENT AS AN ENERGY RESOURCE

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I. INTRODUCTION

In 1977 President Jimmy Carter asked the Nation to “rediscover the ingenuity and efficiency which made our nation prosper, rather than deepening our dependence on insecure imports and increasingly expensive conventional energy supplies. We can rediscover small-scale, more creative ways of satisfying our needs.”¹ This general statement applies directly to coalbed methane gas production because its value in the present energy crisis has dramatically increased. Back in 1941, one commentator noted, “The abundant presence of gas in various coal strata is a matter of common knowledge, but the intrinsic worth of these deposits seldom gets attention.”² The study of both the technical

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1. EXECUTIVE OFFICE OF THE PRESIDENT ENERGY POLICY AND PLANNING, THE NATIONAL ENERGY PLAN (1977).

2. Williams, *On Leasing Gas from Coal Seams*, W. VA. L.Q. 211, 212 (1941).

and legal considerations behind methane gas production has laid dormant until very recently.

One of the major factors retarding production from coal seams is the growing concern of over who owns and who may develop this resource. The uncertainty over who owns this gas has prompted one producer to escrow receipts from methane sales.³ Technical authorities who appreciate the ready availability and economic feasibility of methane recovery point to unsettled legal questions as major constraints on development.⁴

Pennsylvania, the third largest coalproducing state,⁵ is considering legislation to resolve all doubt about the ownership of methane, "particularly in, around, and near coal fields."⁶ This proposal was prompted by a report that suggested the development of methane from coalbeds would supplement the nations dwindling gas supply and provide the Appalachian region with an economic stimulus if the uncertainty over ownership question could be resolved.⁷

Even though such an effort is well intended, it is unlikely that resolution of methane law related issues will come initially from legislative bodies. The safer bet is that the judiciary will first confront these questions, some of which are of first impression. Decisional law followed by statute is the basic pattern which attended the growth of oil and gas law.⁸ It seems only appropriate to note this pattern because it is from this area of the law that the applicable concepts will be found when the methane questions are presented to the courts. That methane related questions will be litigated is as certain as is the continuing rise in the cost of energy. As if describing the growing interest in methane, one observer has noted that

3. Getfchow, *Untapped Resource Gas Found in Nation's Coalbeds Attract Interest as New Source of Heating Fuel*, Wall St. J., Aug. 31, 1977, at 28, cols. 1, 2, 3.

4. Deul & Kim, *Methane In Coal: From Asset to Liability*, MINING CONG. J., Nov. 1974, at 28 [hereinafter cited as *Duel & Kim Methane*].

5. This ranking was based on production. For the ranking of all states and their production figures for 1976, see *KEYSTONE COAL INDUSTRY MANUAL* at 784-1113 (1977).

6. General Assembly of Pennsylvania, H.R. 181, 1977 Sess. This bill proposed to create a state Methane Gas Commission which would license and regulate the commercial recovery of coalbed methane. The key to the proposal was the sweeping declaration that "[a]ll methane under the surface of land in this Commonwealth is hereby declared to be and is property of the Commonwealth." *Id.* at § 4. This proposed legislative solution evidences the growing concern in coal producing states about the ownership of methane.

7. Pennsylvania Methane Plan, Office of State Planning and Development 1 (1975).

8. See W. SUMMERS, *THE LAW OF OIL AND GAS* § 63, at 173-74 (1954) [hereinafter cited as *SUMMERS*]. The best example of judicial decisions preceding legislative action in oil and gas law is the classification of mineral interests. See generally H. WILLIAMS & C. MEYERS, *1 OIL AND GAS LAW* §§ 201-216 (1977) [hereinafter cited as *WILLIAMS & MEYERS*].

[w]henever a substance suddenly comes to have a value which it hithertofore did not have or when an already valuable substance is found at a place previously not thought to contain it, there is a likelihood of conflict between grantors and grantees, lessors and lessees as to whether earlier, broadly-phrased grants, leases, or reservations had actually included the newly desirable substance within their provisions.⁹

The purpose of this paper, then, is to identify those concepts in the broad area of mineral or oil and gas law which seem to have applicability to the question of methane ownership. Also, a discussion of the suitability of these laws will be presented. An additional purpose is to point out some of the additional legal issues which must be addressed as methane is developed as an energy resource. As a first step we will turn to the presentation of necessary background information on the present state of coalbed methane technology.

II. COALBED METHANE PRODUCTION

Although the presence of coalbed methane has been known since men began going underground for coal, the "discovery" of coalbed methane as a significant energy resource is of recent vintage. One company has been recovering coalbed methane since 1949,¹⁰ but awareness of its potential as a large scale energy source dates back only approximately ten years. It will be ironic if our new knowledge about coalbed methane transforms what has always been considered a nuisance and hindrance to underground mining operations into a lucrative business.

A. *Technology of Methane Production*

Methane in coal seams is a result of

biochemical and bacterial transformation [that occurs] during the peat state of coal deposition and subsequently by metamorphic processes as buried peat increases in rank to become coal. Because of the fine pore structure of coal and degraded peat, sorptive capacities of such substance is very large so that much of the methane evolved during coalification is held in the peat and in the coal.¹¹

9. Annot., 61 A.L.R.3d 1109, 1111 (1975) (dealing with lease grant, exception or reservation of oil or gas rights as including oil shale).

10. Maugh, *Natural Gas: United States has it if Price is Right*, 191 SCI. 549 (1976) [hereinafter cited as *Natural Gas*].

11. Irani, Thimons, Bobick, Deul & Zabetakis, *Methane Emissions from U.S. Coal Mines, A Survey*, United States Department of Interior: Bureau of Mines 2 [hereinafter cited as *Coal Mines Survey*].

As a coal seam is mined, the methane migrates to the face of the mining operation and is released into the air. It is at this point where it tends to accumulate and present a threat to the miners and the mining operation. The ignition of accumulated methane causes most mine explosions.¹²

The extent and severity of the hazard is evidenced by the fact that the Bureau of Mines has been conducting studies of the problem since the creation of the Bureau in 1910. Congress recognized the danger and enacted the Federal Coal Mine Health and Safety Act of 1969¹³ containing detailed standards for the regulation and control of methane in underground mines¹⁴ and providing that concentrations above the statutory level constitutes cause for a finding of "imminent danger." Such a finding requires a shutdown of mining operations and can subject the operator to a civil penalty of up to ten thousand dollars.¹⁵

The realization that the troublesome methane might have commercial potential grew for the most part from research conducted by the Bureau of Mines. The Bureau felt that degasifying the coalbeds would be an alternative to venting the methane from them as the mining progressed.¹⁶ At first the thinking was centered on simply draining the methane by drilling into coal and allowing the gas to escape. However, as research progressed, it became apparent that the methane could be gathered and marketed. Not only could the methane be collected, it was pipeline quality gas. Studies have shown that it "generally contains in excess of 80% methane . . . contains no sulphur compounds or carbon monoxide. The heating value of coal-bed gas is generally between 900 and 1,050 BTU/Pscf."¹⁷

Quantity is another inhibiting factor. The volume of methane found depends primarily on the type of coal in which it is located, and although present data is somewhat incomplete, analysis has conservatively estimated the average gas content of coal in the United States to be 200 cubic feet per ton.¹⁸

Extrapolation of this information into known coal reserves has yielded the remarkable conclusion that there may be as much as 300 trillion cubic feet of methane in coalbeds which lie beneath less than

12. *Natural Gas*, *supra* note 10, at 549.

13. 30 U.S.C. §§ 801-960 (1976).

14. *Id.* at § 863(h).

15. *Id.* § 819.

16. Deul & Kim, *Degasification of Coal Beds*, 58 AM. GAS A. MONTHLY 7 (1976).

17. Deul & Kim, *Coal Beds: A Source of Natural Gas*, OIL & GAS J., June 16, 1975, at 48 [hereinafter cited as Deul & Kim, *Coal Beds*].

18. *Id.* However, gas content ranges from 0.1 to 500 cubic feet per ton of coal.

3000 feet of cover, not counting strippable coal.¹⁹ To further illustrate the magnitude of this reserve, the Bureau of Mines has listed 199 coal mines in this country that currently emit a total of 227 million cubic feet of methane per day.²⁰ When this is translated into consumption of natural gas in the United States, it is enough to heat 800,000 homes each day.²¹

Techniques developed by the Bureau of Mines for removing the methane from coalbeds are both simple and inexpensive. Probably the cheapest removal system is a series of vertical, small diameter holes drilled into the coal. The methane migrates to the shaft and then to the surface where it is collected for transportation and whatever processing is required. Another technique is the excavation of a large diameter borehole or shaft and the drilling of horizontal holes at the bottom of the shaft.²² Here again the methane naturally migrates to the borehole where it is collected and pumped into storage systems.

B. *Economics of Methane Production*

The economics of methane drainage involve numerous kinds of costs including such things as drilling costs and collection systems, but estimates based on Bureau of Mines' experience reveal that expenses are quite low for the volume of methane recovered. For example, using the Bureau of Mines' figure of \$0.75 per thousand cubic feet, the value of gas drained from an experimental large diameter borehole in a two year period was worth over \$350,000.²³ "In a situation in which a mine shaft can be sunk several years in advance, its use for degasification costs about \$100,000. This includes the cost of horizontal degasification holes, gas collection apparatus, water traps, pipes, compressor and metering equipment but not the cost of sinking the shaft."²⁴

Given such promising economic indicators, it is surprising that large scale commercial recovery operations have not already been undertaken. That they have not is due in part to the fact that until 1970 demand could be fully met by conventional natural gas from high vol-

19. *Id.*

20. *Coal Mines Survey*, *supra* note 11, at 9. Some mines release only 0.1 million cubic feet while others release up to twelve million cubic feet per day.

21. DEP'T OF ENERGY, COAL SEAM METHANE TO BE USED TO PROVIDE ELECTRICITY FOR PENNSYLVANIA MINE (1977) [hereinafter cited as *DOE-Release*].

22. Deul & Kim, *Coal Beds*, *supra* note 17, at 48.

23. Deul & Kim, *Methane*, *supra* note 4, at 31. This rate is low considering that the rate for new natural gas is \$1.42 per thousand cubic feet from wells commenced and gas dedicated to interstate commerce on and after January 1, 1975. FPC Opinion 770-A, 41 Fed. Reg. 50, 199 (1976).

24. Deul & Kim, *Methane*, *supra* note 4, at 31.

ume wells in known gas fields.²⁵ In addition to that, it should be pointed out that the Bureau of Mines' research data on this topic has only recently become available; most of the tracts date from 1970 to the present. Yet another negative factor has been the long downward trend in coal mining throughout the country that has only just begun to be reversed. With reduced mining activity there was less demand for development of degasification technology and actual draining work. A further constraint on the development of coalbed methane has been uncertainty over ownership questions, and one observer has gone so far as to contend that "[t]he one significant problem in drainage and conservation of methane in advance of mining is neither economic nor technical, but legal."²⁶

III. APPLICATION OF OIL & GAS OWNERSHIP THEORIES TO METHANE

Considering the history of coal mining and the experience with methane, it is not surprising that the question of ownership has not been addressed by the courts, the legislatures, or by grantors and grantees of mineral rights. The gas has always been considered a hazard, and the questions about it have centered around safety and disposal. Accordingly, those jurisdictions which have given any attention at all to methane accumulations in underground mines have placed the burden of control on the mine operator, and as we shall see, it may be that the operator will find no reason in the law to change his views about what to him has always been a nuisance.

Because methane is a gaseous substance both as it occurs in coal beds and as it is extracted, and because it is the major component of conventional natural gas, a good point of entry into the ownership question would be to consider some of the basic legal propositions

25. The emergence of a natural gas shortage during the past two years marks a historic turning point—the end of natural gas industry growth uninhibited to supply considerations. Not only has the Nation's proven gas reserve inventory for the lower 48 states been shrinking for the past three years, but major pipeline companies and distributors in most parts of the country have been forced to refuse requests for additional gas service from large industrial customers and from many new customers. For practical short-term purposes, we are confronted with the fact that current proven reserves in the lower 48 states, as reported by the American Gas Association, have dropped from 289.3 trillion cubic feet in 1967, to 259.6 in 1970, a 10.3 percent drop within a three-year period. Furthermore, approximately 95 percent of this proven reserve inventory is already committed to gas sales contracts and is therefore unavailable for sales to new customers or for increased volumes to old customers.

FPC STAFF REPORT NO. 2, NATIONAL GAS SUPPLY AND DEMAND 1971-1990, at ix (1972). For a review of the events leading up to the shortage, see Comment, *Natural Gas Rate Regulation: The Conflict in the Application of the Just and Reasonable Standard*, 12 TULSA L.J. 293, 300-17 (1976).

26. Deul & Kim, *Methane*, *supra* note 4, at 32.

which have been established in the law of natural gas. This is also appropriate because it was the vaporous nature of gas which gave this area of the law its primary direction.

A. *Non-ownership Theory*

The early case of *Westmoreland & Cambria Natural Gas Co. v. DeWitt*²⁷ determined that natural gas should be considered—for ownership purposes—the same as *ferae naturae*.²⁸ To a Pennsylvania court sitting before the turn of the century, when the science of oil and gas was rudimentary at best,²⁹ the analogy would be quite logical and suitable.

Water and oil, and still more strongly gas, may be classed by themselves, if the analogy be not too fanciful, as minerals *ferae naturae*. In common with animals, and unlike other minerals, they have the power and the tendency to escape without the volition of the owner. Their "fugitive and wandering existence within the limits of a particular tract is uncertain."³⁰

One difficulty with this concept of ownership, or more precisely, contingent ownership, is that it fails to fully accord the landowner any commercial right that is cognizable at law. This was corrected when, in *Ohio Oil Company v. Indiana*,³¹ The United States Supreme Court upheld the constitutionality of a state statute which was designed to prevent the waste of natural gas. The oil company argued that the statutory requirement of capping gas wells constituted a taking of property without compensation because it was searching only for oil, and production could not be carried out economically under the required gas conservation procedures. Part of the difficulty was that the oil and gas were commingled and the oil was raised by gas pressure. In light of this, the Court posed for itself the query: "Does the peculiar character of the substances, oil and gas, . . . cause them to be exceptions to the

27. 130 Pa. 235, 18 A. 724 (1889).

28. "Of a wild nature;—applied esp. to animals, as foxes, wild ducks, etc. in which at the common law, no one can claim absolute property, though a qualified property may be obtained, as by owning the land which they may be on, or by having a special privilege of hunting them." WEBSTER'S NEW INTERNATIONAL DICTIONARY (2d ed. 1950).

29. "[A] popular impression to the effect oil exists in underground lakes or rock cavities, or flows in underground streams, an impression which may have to some extent influenced the courts in the earlier cases, is denied by all petroleum geologists." SUMMERS, *supra* note 8, at § 4.

30. 130 Pa. 235, 249, 18 A. 724, 725 (1889) (quoting from *Brown v. Vandergrift*, 80 Pa. 142, 148 (1875)). For a discussion of the nature of a landowner's interest in minerals and the different theories behind ownership, see WILLIAMS & MEYERS, *supra* note 8, at §§ 203.1-203.4.

31. 177 U.S. 190 (1900).

general principles applicable to other mineral deposits, and hence subject them to different rules?"³² In the course of concluding that different rules did apply, the Court said that the *ferae naturae* analogy breaks down in the face of a need for state regulation or control. Under the doctrine of *ferae naturae*, all citizens may seek to reduce game to possession because they are "public things subject to the absolute control of the State, which, although it allows them to be reduced to possession, may at its will not only regulate but wholly forbid their future taking."³³

On the other hand, oil and gas are subject to being reduced to possession only by landowners and a regulatory statute is a necessary exercise of power by the state to protect that right from abuse by a single owner. This formulation of protection for the right of the landowner gives the right commercial value as the owner may develop the oil and gas himself or sever the mineral estate for an agreed upon consideration. His interest, while protected, is still regarded as a right only to reduce to possession; the *ferae naturae* characterization of the substances still is part of the law.

The underlying concept which has been alluded to above is generally referred to as the "non-ownership" theory.³⁴ It is a minority view in terms of the number of states which can be identified as having clearly taken a position on what to call a proprietary interest in in-ground oil and gas. One review and summary of the perceptions of seven authorities found that there was some disagreement among them as to how many states had adopted the non-ownership theory, but the majority put the number at nine.³⁵

The exact nature of the right or interest which obtains in the holder or possessor does not seem to be a subject of general agreement. One authority has described this mixed assortment of views by saying: "When the right to search for oil and gas is owned apart from the land, it is usually classified as a profit a prendre, an incorporeal interest in the land, although it has also been classified as a license, a servitude, or

32. *Id.* at 202.

33. *Id.* at 208-09.

34. "In essence, under this theory no person owns oil and gas until it is produced and any person may 'capture' the oil and gas if able to do so. Of course one may not go upon the land of another to effect the capture . . ." WILLIAMS & MEYERS, *supra* note 8, at § 203.1.

35. Alabama, California, Illinois, Indiana, Kentucky, Louisiana, New York, Ohio and Wyoming. For a complete chart noting the ownership theories of all jurisdictions, see WILLIAMS & MEYERS, *supra* note 8, at § 203.

a chattel real."³⁶

The non-ownership concept as it has been variously described by the courts contains at least these essential elements: (1) an "exclusive right" in the landowner to search for oil and gas;³⁷ (2) the right to make a grant of those rights to another under the condition that such a grant is limited to such oil and gas as the grantee may find, and no title to it vests in the grantee until it is actually found;³⁸ (3) that the right is an "incorporeal interest, the owner not being entitled to possessory actions";³⁹ and (4) recognition of the "migratory character" of oil and gas.⁴⁰

B. *Non-ownership Theory Applied to Methane*

All of these attributes of the oil and gas non-ownership theory as developed in various jurisdictions are entirely compatible with coalbed methane if one is willing to accept the threshold classification of methane as natural gas or at least a gas in terms of oil and gas law. Setting the latter characterization question aside for the moment, we can note these parallels. It is the tendency of coalbed methane to migrate through coal and porous rock to areas of reduced pressure or to exposed surfaces which make the *ferae naturae* analogy particularly appropriate. That it may be captured and removed from the ground and held apart as personal property is a feature fully coincidental with natural gas, and of course, the search for it requires that an accommodation be reached with the landowner.

Pennsylvania, which apparently adheres to the non-ownership concept, is the only jurisdiction which to date has authoritatively applied the doctrine to coalbed methane. The question arose in 1974 when E. Edward Simon, Director of State Planning and Development, wrote to the Attorney General of Pennsylvania and requested a ruling on the question: "Who has the right to assert title to methane gas produced, as between the owner or grantee of existing coal rights and the owner or grantee of existing gas rights?"⁴¹

36. R. HEMINGWAY, *THE LAW OF OIL AND GAS* 11 (1971). [hereinafter cited as HEMINGWAY].

37. Callahan v. Martin, 3 Cal. 2d 110, 43 P.2d 788 (1935). For further discussion, see Colby, *The Law of Oil and Gas*, 31 CALIF. L. REV. 357, 397 (1943).

38. Trigger v. Carter Oil Co., 372 Ill. 182, 23 N.E.2d 55 (1939).

39. See Burnside, *Nature of Interest Created by Oil Leases in Illinois*, 24 WASH. U.L.Q. 91 (1938).

40. Back v. Ohio Fuel Gas Co., 160 Ohio St. 129, 113 N.E.2d 865 (1953). For a brief background on the physical qualities of oil and gas, see SUMMERS, *supra* note 8, at §§ 1-10.

41. 53 OP. ATT'Y GEN. OF PA. 211 (1974) [hereinafter cited as OP. OF ATT'Y GEN.].

The Attorney General ruled that the methane gas contained in coal seams is subject only to the claims of the landowner or the grantee of gas rights. The opinion rests its conclusion in part upon the proposition that Pennsylvania law considers oil and gas to be *ferae naturae* and, as such, not subject to being owned until reduced to possession. It is the landowner who has the exclusive right to control access or more precisely to allow developers to reduce these minerals to possession, and because methane is a gas, the right to search for gas once granted apart from the coal interest is vested in the gas right owner. Central to this logic is the finding that coalbed methane is natural gas.⁴²

As for the coal owner who, in practical fact, encounters the methane as he removes coal, the Attorney General disposed of any claim which such an owner might make to the methane by citing dictum from an early Pennsylvania case: "[T]he grantee of coal owns the coal but nothing else, save the right of access to it and the right to take it away."⁴³

The opinion of the Pennsylvania Attorney General has to date not been cited in any reported decision, but assuming that it will be, the observation should be made that exactly the same result could have been reached in states which do not follow the non-ownership doctrine. It is also unlikely that a court would find that methane rights belong to the gas owner simply because of the particular theory of ownership followed in that state; instead, there are other and better lines of reasoning to reach the same conclusion. Although not necessarily a superior theory, ownership in place is such an alternate approach.

C. *Ownership in Place Theory*

According to a number of authorities, ownership in place is the majority view.⁴⁴ A good statement of the rule is contained in the following comment made in a Texas case:

42. There is ample support for this finding. Natural gas has been defined as "[h]ydrocarbons which at atmospheric conditions of temperature and pressure are in a gaseous phase." H. WILLIAMS & L. MEYERS, *MANUAL OF TERMS, OIL AND GAS LAW* 358 (1977). Whereas methane has been defined as "[a] simple hydrocarbon associated with petroleum. It is gaseous at ordinary atmospheric pressure. *Of the many hydrocarbons that make up natural gas, methane is the lightest and most abundant.*" *Id.* at 261 (emphasis added). For further discussion, see Pruit, *Mineral Terms—Some Problems in Their Use and Definition*, 11 ROCKY MT. MIN. L. INST. 1, 16 (1966).

43. OP. OF ATT'Y GEN., *supra* note 41, at 212 (citing *Chartiers Block Coal Co. v. Mellon*, 152 Pa. 286, 296, 25 A. 597, 599 (1893)).

44. This theory is followed in Arkansas, Colorado, Kansas, Maryland, Michigan, Mississippi, Montana, New Mexico, North Dakota, Tennessee, Texas, Washington and West Virginia. WILLIAMS & MEYERS, *supra* note 8, at § 203. *But see* HEMINGWAY, *supra* note 35, at 15.

We do not regard it as an open question in this state that gas and oil in place are mineral and realty, subject to ownership, severance, and sale while embedded in the sands or rocks beneath the earth's surface, in like manner and to the same extent as is coal or any other solid mineral.⁴⁵

This statement by the court captures the essential feature of the ownership in place view, and promises us that ownership of oil and gas will be defined by the same standards that are applied to "coal or any other solid," but this is not without its difficulties.

The physical attributes of oil and gas which allow those substances to wander or migrate through the earth and across property lines has been the greatest obstacle to application of the ownership in place doctrine. For example, a West Virginia court⁴⁶ was presented with a landowner's claim that he had an equitable interest in oil produced from an adjoining tract even though he had no title or other interest in the neighboring land. In order to resolve the issue, the court relied in part on the line of decisions⁴⁷ holding that the owner of a tract of land is considered to have the fee only in oil and gas underlying the boundaries of his property even though they "may not remain in place and are not the subject of actual possession until brought to the surface, because until that occurs there is no way to determine positively that oil and gas does, in fact, lie under a designated boundary."⁴⁸

Thus the court recognized the transient nature of the minerals and the need to reduce them to possession to prove ownership. This was reconciled with ownership in place by a declaration that possession only verified ownership and did not, as in a non-ownership state, establish ownership.

Carried to its logical extreme, the ownership in place theory can lead to an assertion that not just a mineral is owned, but, in fact, the strata itself is the interest that is held. One suggestion of this is found in the frequently cited case, *Chartiers Block Coal Co. v. Mellon*,⁴⁹ wherein the owner of a coal right sought to enjoin the surface owner's lessee from erecting a derrick and drilling for oil, thereby boring through the

45. *Stephens County v. Mid-Kansas Oil & Gas Co.*, 113 Tex. 160, —, 254 S.W. 290, 292 (1923). See also Walker, *The Nature of the Property Interest Created by an Oil and Gas Lease in Texas*, 7 TEXAS L. REV. 1 (1928).

46. *Bogges v. Milam*, 127 W. Va. 654, 34 S.E.2d 267 (1945).

47. *Manufacturer Light & Heat Co. v. Knapp*, 102 W. Va. 308, 135 S.E. 1 (1926); *Preston v. White*, 57 W. Va. 278, 50 S.E. 236 (1905); *South Penn Oil Company v. McIntyre*, 44 W. Va. 296, 28 S.E. 922 (1898); *Wilson v. Youst*, 43 W. Va. 826, 28 S.E. 781 (1897).

48. *Bogges v. Milam*, 127 W. Va. 654, —, 34 S.E.2d 267, 270 (1945).

49. 152 Pa. 286, 25 A. 597 (1893).

coal seam. A bill for an injunction was denied, but in reaching that conclusion the court observed: "Formerly a man who owned the surface owned it to the center of the earth. Now the surface of the land may be separated from the different strata underneath it, and there may be as many different owners as there are strata."⁵⁰

Further support for the strata idea⁵¹ is available in an early Ohio case⁵² where the question was whether the separate interest created by a grant of rights to coal was a fee simple or a license to remove the coal. It was determined that a fee simple determinable had been created because it would terminate when the coal was removed. However, apparently following a conception that the strata had been conveyed, the court permitted the grantee to continue to occupy and use the subterranean passageways for transportation of coal from mining operations on adjoining lands. In accord with this, Pennsylvania has held that a grant of "all the merchantable coal" had the effect of creating an absolute fee to the coal and title to the underground passages.⁵³

D. *Ownership in Place Applied to Methane*

This aspect of the ownership in place theory has some interesting implications for coalbed methane. The most obvious thought is that if the coalbed owner does indeed own not just coal but a strata, his claim to the methane which is incidental to the coal is greatly enhanced.

On the other hand, if we assume *arguendo* that the owner of a gas interest has title to the methane in the coalbed, competing interests arise concerning different substances located in the same strata. The question then arises as to what duty each owner owes to the other.

It is suggested that if the methane belongs to the owner of the gas right, then the gas owner has a duty to remove it so that mining can proceed without causing a loss of the gas. As we have already seen in *Ohio Oil Co. v. Indiana*,⁵⁴ one owner may, in the name of conservation, be restrained by statute from extracting oil at the expense of another's gas. Thus there can be a statutory duty to avoid waste. Should the gas owner press his right to extract the methane, the coal operator would

50. *Id.* at 295; 25 A. at 598.

51. Under the ownership of strata theory, the "landowner owns the sedimentary layer containing the oil and gas within the limits of the vertical planes representing the boundaries of his tract." WILLIAMS & MEYERS, *supra* note 8, at § 203.4. See also *Gray-Mellon Oil Co. v. Fairchild*, 219 Ky. 143, 292 S.W. 743 (1927); *Jilek v. Chicago, Wilmington & Franklin Coal Co.*, 382 Ill. 241, 47 N.E.2d 96 (1943).

52. *Moore v. Indian Camp Coal Co.*, 75 Ohio St. 493, 80 N.E. 6 (1907).

53. *Lillibridge v. Lackawana Coal Co.*, 143 Pa. 293, 22 A. 1035, 1036 (1891).

54. 177 U.S. 190 (1900).

have to defer his mining, but would probably expect compensation for losses which result from such delay. If the mine operator goes forward with coal removal, does he have a duty to collect and store the gas, presumably with the right to compensation by the gas owner?

At least one state has attempted to resolve these ownership questions by statute. Addressing only natural gas, and not oil, Oklahoma law provides that "[a]ll natural gas under the surface of any land in this state is hereby declared to be and is the property of the owner, or gas lessees, of the surface under which gas is located in its natural state."⁵⁵

Oklahoma has also attempted to anticipate the strata arguments which could arise from underground storage of gas⁵⁶ by enacting a statute which permits gas producers to condemn depleted strata.⁵⁷ This same statute provides that title to gas stored in such strata shall remain in the one who places it there.⁵⁸

The Oklahoma "ownership" provision could easily be amended to respond to the methane ownership question. One such amendment would specifically define natural gas as including methane. For example, this was the tack taken with casinghead gas. As a result of protracted litigation over the meaning of the term, the legislature simply decreed that "[t]he word 'gas' shall mean all natural gas, including casinghead gas."⁵⁹

An amendment which would accomplish the same end would be to amend the ownership provision to read "All natural gas under the surface of any land, *in all strata including coal seams*, in this state is hereby declared to be and is the property of the owner or gas lessees, of the surface. . . ."⁶⁰ Although this would not completely resolve the issues pertaining to the duty of the coal owner and the corresponding

55. OKLA. STAT. tit. 52, § 231 (1971).

56. The Oklahoma legislature was not considering the problem of methane production when enacting this statute.

57. OKLA. STAT. tit. 52 § 36.6 (1971).

Ownership of gas.—

All natural gas which has previously been reduced to possession, and which is subsequently injected into underground storage fields, sands, reservoirs and facilities, shall at all times be deemed the property of the injector, his heirs, successors or assigns; and in no event shall such gas be subject to the right of the owner of the surface of said lands or of any mineral interest therein, under which said gas storage fields, sands, reservoirs and facilities lie, or of any person other than the injector, his heirs, successors, and assigns, to produce, take, reduce to possession, waste, or otherwise interfere with or exercise any control thereover, provided that the injector, his heirs, successors and assigns shall have no right to gas in any stratum, or portion thereof, which has not been condemned under the provisions of this Act, or otherwise purchased.

58. *Id.*

59. OKLA. STAT. tit. 52, § 86.1(f) (1971).

60. Based on OKLA. STAT. tit. 52, § 231 (1971) (italicized words represent the proposed addition).

duty of the gas owner, it would be a long step toward encouraging further development of this resource.

Thus there are two basic theories which have been applied to questions of oil and gas ownership and which will arise in litigation over rights to coalbed methane. In addition to the decisional law of ownership in place and the non-ownership doctrines, there seems to be a third view represented by Oklahoma's statutory treatment of the matter. Having identified the basic form of these concepts, it is now appropriate to turn our attention to some of the important qualifications on their application which are generally recognized.

E. *The Rule of Capture*

One such modifying rule which arguably would be applicable to coalbed methane is generally referred to as the "rule of capture."

The rule of capture states basically that "the owner of a tract of land acquires full title to the oil and gas that he produces from all wells drilled on and bottomed under it, regardless of whether that oil and gas migrates from adjoining lands."⁶¹ Here again the law has developed around the idea that these substances are or can be migratory and virtually impossible to locate with the same precision as surface property lines. The harshness of the rule is mitigated somewhat by the fact that every landowner has the same right and one who feels that oil and gas is being drained out from under his property has a right to drill an offset well.

The rule of capture has been recognized in one form or another in all jurisdictions but would seem decidedly more compatible with the non-ownership theory. Ownership in place states would by definition seem to be recognizing a right of one landowner to summon away the realty of a neighbor. Texas, an ownership in place state, has noted the seeming contradiction, but answered it by falling back on the fact that adjacent owners have correlative rights of drainage.⁶²

The rule of capture has led to numerous abuses in the production of oil and gas including such things as excessive production and wasteful and disorderly drilling practices. Not only would a landowner be compelled to drill when he saw his neighbor drilling, but he would be motivated to pump his well to exhaustion of the resource. In recent

61. Eckman, *Statutory Fieldwide Oil and Gas Units: A Review for Future Agreements*, 6 NAT. RES. LAW. 339 (1973). For a discussion on the limitations of the rule of capture, see HEMINGWAY, *supra* note 36, at 153.

62. *Stephens County v. Mid-Kansas Oil & Gas Co.*, 113 Tex. 160, 254 S.W. 290 (1923).

years state laws and regulations requiring unitization and proration,⁶³ usually enforced by a state commission,⁶⁴ have done much to mitigate these problems and at the same time have sharply reduced reliance on and use of the rule.

One observer noted that the term "rule of capture" has been over-used until "it is now considered a sort of inherent disease, peculiar to the industry, and which is most difficult, if not impossible to cure."⁶⁵ The term has fallen from popular use and recent works on oil and gas mention it only incidentally.⁶⁶

The rule of capture would be of little interest to a coal rights owner who might desire to claim that the methane right is his along with the coal. Even though the operator must exert control over the methane and must physically capture it in order to vent it from the mine, the right to the methane would not vest in the coal owner under the rule of capture. This is because the rule of capture was derived from the need to adjudicate the rights of adjoining landowners. Its essential feature is that one landowner acquires title to the oil and gas which is pumped from a well on his land even if it can be shown that it migrated from adjoining property. It has not been applied to commingled substances on the same tract, and is therefore of doubtful relevance to methane unless, of course, there are situations where migration across property lines has occurred.

The additional reason that the rule of capture would be of questionable value to one claiming an ownership right in coalbed methane derives from the amounts of methane to which it could be applied.

63. See, e.g., OKLA. STAT. tit. 52, §§ 287.1-287.15 (1971) (unitization); 1977 TEX. SESS. LAW SERV. ch. 871, §§ 101.001-.052 (1977) (unitization); OKLA. STAT. tit. 52, § 87.1 (1971) (proration); 1977 TEX. SESS. LAW SERV. ch. 871, §§ 85.001-.207 (1977) (proration).

These terms are defined as follows:

Unitization—A term frequently used interchangeable with pooling but more properly used to denominate the joint operation of all or some portion of a producing reservoir as distinguished from POOLING, which term is used to describe the bringing together of small tracts sufficient for the granting of a well permit under applicable rules.

H. WILLIAMS & C. MEYERS, OIL & GAS LAW—MANUAL OF TERMS 625 (1976).

Prorationing—Restriction of production by a state regulatory commission, usually on the basis of market demand. The commission determines what amount shall be produced in a state during a given period of time and then allocates this total amount among the producing fields in the state (field allowables) and then allocates the field allowable to the various leaseholds and wells within the field (lease and well allowables).

Id. at 464.

64. See, e.g., OKLA. STAT. tit. 17, §§ 51-53 (1971) (Oklahoma Corporation Commission); TEX. SESS. LAW SERV. ch. 871, §§ 81.001-.156 (1977) (Texas Railroad Commission).

65. Hardwicke, *The Rule of Capture and Its Implications as Applied to Oil and Gas*, 13 TEX. L. REV. 391, 391 (1935).

66. Most texts discuss limitations to the rule, such as slander of title and conduct of operator injurious to others. See generally HEMINGWAY, *supra* note 36, at 153; WILLIAMS & MEYERS, *supra* note 8, at §§ 217-218.14.

With certain exceptions, the amount of methane which is controlled and expelled from individual mines is probably not commercially significant. Exceptions would, in all likelihood, be those mines with methane emission rates in excess of a million cubic feet per day, such as a mine in Monongalia County, West Virginia which emits 39 million cubic feet per day or one in Marion County, West Virginia which emits 30.4 million cubic feet per day.⁶⁷

The fact that the coal mine owner has exerted a considerable degree of control over the methane does raise the question of whether or not he has reduced it to possession, so that in terms of the non-ownership doctrine he owns what he controls. In anticipation of such an argument, the Attorney General of Pennsylvania has opined that the doctrine would not be available to such a coal mine operator in the face of contradictory claims by a gas right owner.

As authority for that conclusion, the Attorney General cited the *Chartiers* case⁶⁸ and that court's gratuitous observation that the grantee of coal has only a right of access and asportation.⁶⁹ This is a misapplication of *Chartiers* which should properly be used as authority only in access situations because it simply has no precedential value in ownership questions. The holding of *Chartiers* was that "the right to drill oil or gas wells through a stratum of coal belonging to another person to reach oil or gas in a lower stratum belonging to the surface is a right which exists at all times."⁷⁰ Even though the authoritative basis for his conclusion is subject to question, the essential finding of the Attorney General is not changed. Methane, he says, is without any question gas; therefore the right to reduce it to possession—under Pennsylvania's non ownership doctrine—is exclusive to the landowner or his assignees.

IV. LEGAL INSTRUMENTS AND GRANTS OF METHANE

Another area of consideration which arises in all states when a question of ownership of minerals is raised is that of the interpretation of the instruments creating the interest. Each case will present unique factual circumstances which will have a strong bearing on the judicial process of construction, but always central to the consideration will be the wording by which the interest was created. The task facing the deci-

67. *Coal Mines Survey*, *supra* note 11, at 15.

68. 152 Pa. 286, 25 A. 597 (1893).

69. In this context, the right of asportation merely gives the coal mine operator a right to carry the coal away from the property.

70. 152 Pa. at —, 25 A. at 599. See *Pyramid Coal Corp. v. Pratt*, 229 Ind. 648, —, 99 N.E.2d 427, 429 (1951).

sion maker will be to determine as nearly as possible what the parties intended to convey, or, as the case may be, what they intended to reserve.

A. *The Term "Minerals"*

One preliminary line of inquiry which might have interest for a methane claimant would be consideration of what is meant by a grant or a reservation of "minerals." The general rule provides that the term "minerals," if not qualified or restricted in some way, does include oil and gas.⁷¹ Although, as we have already indicated, there is little doubt that methane would be considered by the courts to be a gas, because that is its natural form and for the further reason that it is the main component of natural gas, some coal owners might be unpersuaded.

All this is simply to say that an imaginative attempt to lay claim to coalbed methane could perhaps raise the issue of the proper classification of that substance. In *Deep South Oil Co. of Texas v. Federal Power Commission*,⁷² the company sought to avoid the government's characterization of its activities as being those of a gas producer and as such subject to regulation. One of its principal arguments was that the casinghead gas it sold was not natural gas.

The argument seems doomed from the outset, especially in view of the authoritative definition of casinghead gas as "[n]atural gas rich in oil vapors. So named as it is usually collected, or separated from the oil, at the casing head. Frequently called combination gas or wet gas."⁷³ The court, in holding that casinghead gas *is* natural gas, arrived at its conclusion by noting that "the principal constituents of natural gas which is used as a domestic or industrial fuel are methane and ethane; that casinghead gas contains methane and ethane"⁷⁴ and is therefore natural gas.

The same question was raised in Oklahoma in a series of cases. In one case it was held that casinghead gas was not oil upon which a royalty had to be paid.⁷⁵ In another case in which the same issue was

71. *Warner v. Patton*, 19 S.W.2d 1111, 1112 (Tex. Ct. App. 1929). *See also Sellors v. Ohio Valley Trust Co.*, 248 S.W.2d 897 (Ky. 1952); *Luse v. Boatman*, 217 S.W. 1096 (Tex. Ct. App. 1919).

72. 247 F.2d 882 (2d Cir. 1957).

73. THRUSH, A DICTIONARY OF MINING, MINERAL AND RELATED TERMS 180 (1968). In other words, the gas is in a near liquid form.

74. 247 F.2d at 888.

75. *Hammett Oil Co. v. Gypsy Oil Co.*, 95 Okla. 235, 218 P. 501 (1921). In *Hammett*, an oil and gas lease was held not to include a percentage of gasoline manufactured from casinghead gas. The court emphasized that such gasoline was neither oil nor gas within the contemplation of the

before a federal district court, it was held that casinghead gas was oil.⁷⁶ In yet another Oklahoma case, it was held that casinghead gas was neither oil nor gas.⁷⁷ As we have already seen, the ambiguity has now been resolved by statute, but the point remains that however clearly it may appear that methane is natural gas, it is not a closed question.

B. *Ejusdem Generis Analysis*

While placing methane outside the ambit of natural gas may be beyond the pale of law and logic, the same may not be true of the broader term "mineral." One possible exception to the general rule that the grant of "minerals" includes oil and gas might occur where the granting instrument contains some other reference to oil and gas. This situation is an invitation to the invocation of the maxim of *ejusdem generis*.⁷⁸ The results of such attempts have produced a somewhat unsettled area of law. For our purposes, it is sufficient to note that "the doctrine of *ejusdem generis* has repeatedly been urged upon the courts and requires the construction that the specific enumeration of various "hard" minerals manifests an intention to exclude oil and gas."⁷⁹ Thus a grant of "mineral, including coal" or some variant form could give rise to the argument that the grantor did not thereby convey oil and gas with the term "minerals." In order to be heard with that contention, the

parties to the oil and gas lease, which made no reference to casing-head gas or the manufacture of gasoline therefrom.

76. *Twin Hills Gasoline Co. v. Bradford Oil Co.*, 264 F. 440, 441 (E.D. Okla. 1919). The court considered the evidence surrounding the construction of this lease and concluded that casinghead gas is a component part of oil; that casinghead gas is not made from dry gas, and that it is not a product of dry gas; but that it is a product of wet gas, and wet gas exists only with oil. Therefore, casinghead gas was construed a component of oil.

77. *George v. Curtain*, 108 Okla. 281, —, 236 P. 876, 877 (1925). In *George*, the plaintiff brought suit to recover the value of certain casinghead gas, that the defendants had allegedly extracted from a well leased from the plaintiff. The lease contained provisions regarding oil and gas generally, but made no mention of casinghead gas. The court held that the disposition of casinghead gas was not within the contemplation of the parties to the contract; therefore, the terms of the lease did not apply to it.

78. *Ejusdem generis* is a rule of construction. Where general words follow an enumeration of words of particular or specific meaning, such general words are not construed to their widest extent; instead, they are held to apply to those things of the same general kind or class as those specifically mentioned. See *Wulf v. Shultz*, 211 Kan. 724, —, 508 P.2d 896, 901 (1973); *Wolf v. Blackwell Oil & Gas Co.*, 770 Okla. 81, —, 186 P. 484, 485 (1920); *Southland Royalty Co. v. Pan American Petroleum Corp.*, 378 S.W.2d 50, 55 (Tex. 1964).

79. *New York State Nat. Gas Corp. v. Swan-Finch Gas Dev. Corp.*, 278 F.2d 577, 579 (3d Cir. 1960); *Allen v. Farmers Co-op.*, 538 P.2d 204 (Okla. 1975); *Keller v. Ely*, 192 Kan. 698, —, 391 P.2d 132, 136 (1964); *Fleming Foundation v. Texaco*, 337 S.W.2d 846, 851-52 (Tex. Ct. App. 1960); *Vogel v. Cobb*, 193 Okla. 64, —, 141 P.2d 276, 280 (1943). *But see Shell Oil Co. v. Dye*, 135 F.2d 365, 368-69 (7th Cir. 1943); *Sellars v. Ohio Valley Trust Co.*, 248 S.W.2d 897, 899 (1952); *Anderson & Kerr Drilling Co. v. Bruhlmeier*, 134 Tex. 574, —, 136 S.W.2d 800, 804 (1940); *Luse v. Boatman*, 217 S.W. 1096, 1101 (Tex. Ct. App. 1919).

coal rights owner or grantor would first have to establish that there was an ambiguity sufficient to justify the application of the rule. Even then, evidence of intent might demonstrate to the court that the general rule of including oil and gas within "minerals" should be followed.

For example, *Federal Gas, Oil & Coal Co. v. Moore*⁸⁰ presented the question of whether a conveyance using the words "all the coal, saltwater and minerals in and upon and under" excluded oil and gas under the doctrine of *ejusdem generis*. It was held that the deed conveyed to the grantee both solid and liquids and no reservation was intended. The case is of interest here because it involved commingled substances, oil and saltwater. It was this particular condition which gave rise to the comment by the court that it was within the "common knowledge of man" that the two substances occur in proximity, and therefore were within the intent of the parties. This would lend some basis for arguing that where a deed conveys "coal and other minerals," methane would be included. As between the coal grantee and the grantor this might be sound, but conflict would arise if "coal and other minerals" were conveyed to one party and "oil and gas" to another. The "minerals" and "common knowledge of man" would auger well for the interest in methane being vested in the coal owner, but the gas grant alone would suggest a contrary holding.

The problem of what is intended or what is included when there has been a listing of specific substances has arisen in connection with almost every kind of substance imaginable.⁸¹ In this regard, an energy resource of interest is oil shale. Like methane, oil bearing shale has only recently been given serious attention as a significant and commercially attractive energy resource, and also, like methane, it is not found in association with oil and gas.

In *Bell Petroleum Co. v. Cross V. Cattle Co.*,⁸² which was a quiet title action involving private parties, the court was asked to determine if the reservation of "all oil and gas rights and all oil and gas in or under said lands, or any part thereof"⁸³ included oil shale. The holding

80. 290 Ky. 284, —, 161 S.W.2d 46, 48 (1942).

81. *See, e.g.*, *Sloan v. Peabody Coal Co.*, 547 F.2d 115, 116 (10th Cir. 1977) (coal); *Carson v. Missouri Pac. R.R.*, 212 Ark. 963, 209 S.W.2d 97,99 (1948) (Bauxite); *Panhandle Cooperative Royalty Co. v. Cunningham*, 495 P.2d 108, 113 (Okla. 1971) (copper, silver, gold, and other types of metallic ores and minerals); *Barker v. Campbell-Ratelif Land Co.*, 64 Okla. 249, —, 167 P. 468, 469 (1968) (oil and gas); *Cronkhite v. Falkenstein*, 352 P.2d 296, 399 (Okla. 1960) (gypsum); *Beck v. Harvey*, 196 Okla. 270, —, 164 P.2d 399, 401 (1944) (sand and gravel); *Vogel v. Cobb*, 193 Okla. 64, —, 141 P.2d 276, 279 (1943) (water). *See also Lange, Does the Phrase "Oil, Gas and other Minerals" in a Mineral Deed Include Uranium?*, 2 NAT. RES. LAW. 360 (1969).

82. 492 P.2d 80 (Colo. Ct. App. 1971).

83. *Id.* at 81.

by the trial court that oil shale was not included in the reservation and that the right to it therefore passed to the grantee was affirmed by the Colorado appellate court. The reviewing court looked not to the geological fact of oil commingled with rocks but to the intent of the parties. In the face of conflicting evidence on the question of what the grantor had intended, the court invoked the rules of construction that reservations are to be construed more strictly than grants and ambiguities are to be resolved against the grantor.

An opposite result was reached in *Brennan v. Udall*,⁸⁴ where there was a reservation of "oil and gas" in government patents issued pursuant to a 1914 statute⁸⁵ which authorized agricultural entry upon mineral lands, but required a reservation to the United States of the minerals. There is an added note of interest in the case because the petitioner made the argument, albeit unsuccessfully, that "oil" was used in the patent to mean "a liquid hydrocarbon mineral capable of migrating in its natural form."⁸⁶ Oil shale, the argument continued, was a solid substance which did not contain oil but instead a substance known as "kerogen" which through chemical processes could be converted into oil. The court of appeals was unpersuaded and held that the government had manifested a clear intent to reserve oil shale, and therefore oil shale was included in the reservation of oil.

These cases suggest that as to Western lands, a government reservation of oil and gas would almost certainly be read to include coalbed methane as the only difference between natural gas in the conventional sense and methane in coalbeds is the mode of its occurrence. This difference is especially unlikely to distinguish the two because in *Brennen* the Secretary of Interior was heard to explain that the only differences between "oil in liquid and oil shale were the mode of occurrence and the method of recovery."⁸⁷

On the other hand, a reservation by the government of "coal" only would certainly be open to question and arguably would not include the methane in the coal, but a reservation of "coal and other minerals" would deny methane rights to the grantee.

A further illustration of the wide coverage given the term "minerals" is seen in a case in the 9th Circuit involving geothermal steam.⁸⁸ In

84. 379 F.2d 803 (10th Cir.), cert. denied, 389 U.S. 975 (1967).

85. Act of July 17, 1914, Pub. L. No. 63-128, ch. 142, §§ 1-3, 38 Stat. 509 (codified at 30 U.S.C. §§ 121-123 (1976)).

86. 379 F.2d at 804.

87. *Id.* at 804-05.

88. *United States v. Union Oil Co.*, 549 F.2d 1271 (9th Cir. 1977).

reversing the district court, the court of appeals stated: "All the elements of a geothermal system—magma, porous rock strata, even water itself—may be classified as minerals."⁸⁹

The district court had looked to the legislative history of the Stock Raising Homestead Act⁹⁰ authorizing the patents at issue and in the course of that evaluation noted that "[t]he reservation contained in section 9 speaks of 'coal and other minerals;' Congress could have reserved 'the subsurface estate' if that is what it desired, but it did not so desire and therefore did not do so."⁹¹ Reversal of the district court's narrow interpretation of "minerals" is a further indication that coalbed methane would also be covered in a "mineral" reservation. This is perhaps strengthened by the fact that coalbed methane was known, although not sought after, at the time of the reservation, while geothermal steam was almost certainly not within the knowledge of the government at the time of the reservations.

Before leaving this area, it should be noted that there is an exception to the rule that "minerals" in a habendum clause will be read to include oil and gas. This exception is sometimes referred to as the "Dunham rule" and is apparently recognized only in Pennsylvania.

In *Dunham v. Kirkpatrick*⁹² there was a reservation of timber as well as all minerals. The court admitted that petroleum was a mineral scientifically, however, due to popular understanding, the court held it would not fall within the classification of minerals.⁹³ Thus in Pennsylvania, where the rule has been followed in a line of cases⁹⁴ since *Dunham*, a grant or reservation of "coal and all minerals" would not include oil and gas and hence not methane.

V. CONFLICTS OVER METHANE PRODUCTION

This paper has already alluded to the fact that coalbed methane with its increasing attractiveness as an energy resource presents producers and governments with a difficult dilemma. Coal producers are under pressure to open new mines and to increase their efforts to make available large quantities of coal for industries which are being urged to convert from oil to coal. At the same time, the realization is growing

89. *Id.* at 1273-74.

90. 43 U.S.C. §§ 291-301 (1970) (repealed 1976).

91. 369 F. Supp. 1289, 1294 (N.D. Cal. 1973).

92. 101 Pa. 36 (1882).

93. *Id.* at 44.

94. *Bundy v. Myers*, 372 Pa. 583, 94 A.2d 724 (1953); *Preston v. South Penn. Oil Co.*, 238 Pa. 301, 86 A. 203 (1913); *Silver v. Bush*, 213 Pa. 195, 62 A. 832 (1906).

that there is within the coal a valuable resource that, if not removed before or during mining, is irretrievably lost, and, indeed, is *now* being lost.

The enormity of the waste which is now occurring through venting has been estimated to be "250 million cubic feet per day roughly enough to heat 800,000 homes."⁹⁵ Even this conservative estimate does not include the loss which is occasioned through strip mining, where there has been no effort to assess the amount of methane lost into the atmosphere.

A. *Federal and State Regulatory Policies*

Prevention of needless waste of natural resources has long been a concern of both the federal government and state legislatures. In *Walls v. Midland Carbon Co.*,⁹⁶ the United States Supreme Court upheld the validity of a Wyoming conservation statute which prohibited the use of natural gas for the production of carbon black. A similar statute was held to be valid in *Henderson Company v. Thompson*,⁹⁷ where in the name of conservation the Texas legislature forbade the use of sweet gas for manufacturing carbon black.

*Lindsley v. Natural Carbonic Gas Co.*⁹⁸ involved an attempt to enjoin the enforcement of a New York statute which declared it unlawful to pump mineral waters which contained natural mineral salts. The petitioner made due process and equal protection arguments, but the United States Supreme Court upheld the statute as a valid conservation measure. The case is of interest here because it involved the issue of commingled substances and a conservation statute which protected one at the expense of the other. That such a protective measure may be enacted and enforced is no longer open to question, and state legislatures have so acted.

This is illustrated by a statute codified in Pennsylvania where waste of oil and gas is defined in part as "migration [that] would result in the loss of recoverable oil or gas, or both."⁹⁹ Such examples could be multiplied, but the Pennsylvania statute is typical and is sufficient to illustrate the concern expressed by various states over the waste of resources. Yet in the face of this, coal mines in Pennsylvania and other

95. *DOE-Release*, *supra* note 21.

96. 254 U.S. 300 (1920).

97. 300 U.S. 258 (1937).

98. 220 U.S. 61 (1911).

99. Oil and Gas Conservation Law of Pennsylvania, PA. STAT. ANN. tit. 58, §§ 402, 404 (Purdon 1961).

coal producing states are wasting enormous quantities of methane by venting it into the atmosphere.

The difficulty of this situation is of course further compounded by the federal and state safety requirements¹⁰⁰ that methane gas be expelled from underground mines. Concern has also been expressed that methane draining activity, which may include drilling large numbers of small diameter bore holes into the coal seam, could inhibit mining operations by weakening or fragmenting overhead structures. Illustrative of this type of concern is Pennsylvania's statutory provision which requires oil and gas producers to follow special casing procedures when drilling through a coal seam.¹⁰¹

Given these conflicting considerations of conservation of energy resources on one side, and the statutory mandates of mine safety on the other, it is manifestly clear that an accommodation must be found which will satisfy both interests. As we shall see, there are still other factors which serve to intensify the need for attention to this matter, and one such element is the growing federal energy program.

B. *Federal Commitment to Develop Various Energy Sources*

Coalbed methane, as an energy resource, is slowly, but nevertheless inexorably, penetrating the federal consciousness. As noted at the outset, methane has been given close and careful statutory treatment as a hazard to coal mining, but only recently has it been looked at as a potential commodity. This is reflected in the fact that the newly created Department of Energy¹⁰² recently announced a cost sharing contract with Westinghouse Electric Corporation for the purpose of demonstrating the feasibility of capturing the methane which is now being vented and using it as an energy source for mining operations.¹⁰³ Bureau of Mines' research is still going forward in the area of coalbed degasification and the National Academy of Sciences recently published the text of a paper on coalbed methane prepared by Maurice Deul.¹⁰⁴

100. 30 U.S.C. §§ 801-960 (1976). For state examples, see Illinois Coal Mining Act of 1953, ILL. ANN. STAT. ch. 93, §§ 31.01-31.32 (Smith-Hurd 1953); Oil & Gas Conservation Commission Act, 57 NEB. REV. STAT. § 905 (1961).

101. Gas Operations Well-Drilling Petroleum and Coal Mining Act, PA. STAT. ANN. tit. 52, §§ 2101-2602 (Purdon 1966 & Supp. 1977-1978).

102. The new department went into operation on October 1, 1977, and was established by the Department of Energy Organization Act of 1977, Pub. L. No. 95-91, § 2, 91 Stat. 567 (to be codified in 42 U.S.C. §§ 7101-7352).

103. DOE-Release, *supra* note 21.

104. Deul, *Natural Gas from Unconventional Sources* 193 (1976) (unpublished paper on file with the National Academy of Science; Board on Mineral Resources—Commission on Natural Resources).

As an incentive to development, the Federal Power Commission on July 7, 1977, published a notice of proposed rulemaking:

The Commission proposes to amend its Regulations to provide for the exemption from certificate regulation of sale of natural gas produced by the flaring of methane from coal seams in accordance with various state regulations prior to resumption of coal mining operations. *We believe that this proposal would encourage those persons engaged in coal mining activities to make such short-term sales of the natural gas produced, and presently flared as a by-product of their operations, to interstate pipelines.*¹⁰⁵

The obvious difficulty with this well intentioned proposal is that the coal mine operators may very well not own the methane. If they do not, then there can be little incentive for them to do anything other than vent the gas into the atmosphere as they now do. Here again the Pennsylvania Attorney General's opinion is directly in point on the issue. "Any attempt by the owners or grantees of coal rights to convert methane to profitable use could be challenged by those individuals who have acquired the gas rights."¹⁰⁶ In the light of this disincentive, it is not likely that the Federal Energy Regulatory Commission's¹⁰⁷ effort will produce any pipeline coalbed methane until there is a further resolution of the ownership question.

Another area of federal involvement in the production of coalbed methane is related to the leasing of public and mineral lands. Under the Department of Energy Organization Act,¹⁰⁸ authority for promulgating regulations under the Mineral Lands Leasing Act¹⁰⁹ has been transferred from the Department of Interior to the new energy department.¹¹⁰

Assuming that the Department of Energy takes the position that rights to coalbed methane are included in federal oil and gas leases, the issue arises as to whether or not the leasing and/or mining of coal must be deferred until the gas lessee has exercised his right to drain off the methane. A similar problem has already arisen involving the mining of

105. 18 C.F.R. § 157 (1977) (emphasis added).

106. OP. OF ATT'Y GEN., *supra* note 41, at 213.

107. The Federal Power Commission was absorbed into the Department of Energy on October 1, 1977. The Commission has been renamed as the Federal Energy Regulatory Commission and has been given certain additional authority. *See* Department of Energy Organization Act of 1977, Pub. L. No. 95-91, §§ 401, 407, 91 Stat. 582-87 (to be codified in 42 U.S.C. §§ 7171-7177).

108. *Id.* at §§ 2-1002, 91 Stat. 567-612 (to be codified in 42 U.S.C. §§ 7101-7352).

109. 30 U.S.C. §§ 181-287 (1976).

110. *See* Department of Energy Organization Act of 1977, Pub. L. No. 95-91, § 302, 91 Stat. 578 (to be codified in 42 U.S.C. § 7152(b)).

potash under federal leases. The mining operations are not compatible with oil and gas drilling and a priority question is created when both rights have been granted to different parties for the same tract of land.

One approach of the government has been to withdraw from oil and gas leasing of the potash bearing lands.¹¹¹ Another attempt to resolve the conflict has been to include in oil and gas leases

stipulations [which] generally provide that the oil and gas lessees must agree not to drill until the regional oil and gas supervisor of the Geological Survey determines that such drilling will not result in undue waste of potash deposits or constitute a hazard to or unduly interfere with mining operations being conducted for the extraction of potash.¹¹²

Some conflicts have already developed between federal oil and gas lessees and coal lessees in Wyoming. No final solution has been forthcoming and it may be necessary for Congress to address the policy questions of priority of development and resolve them by statute. Some guidance has already been provided by the Classification and Multiple Use Act of 1964¹¹³ which provides in part: "Multiple use means the management of the various surface and subsurface resources so that they are utilized in the combination that will best meet the present and future needs of the American people."¹¹⁴

Regulations issued under that Act make it unmistakably clear that multiple development will be allowed. "The granting of a permit or lease for the prospecting, development, or production of deposits of any one mineral will not preclude the issuance of other permits or leases for the same land for deposits of other minerals"¹¹⁵

The Coal Mining Operating Regulations¹¹⁶ promulgated in 1976 contain a requirement that the coal lessee provide plans protecting other development operations. Specifically, mention is made that "[w]hen mining operations are conducted in areas of known wells or bore holes that may liberate oil, gas, water, or other fluid substances, the lessee shall include in his proposed plan all measures determined

111. Schissler, *Developmental Conflicts and Constraints Dealing with the Problem of Coexistent Estates*, 22 ROCKY MT. MIN. L. INST. 203, 235 (1976).

112. *Id.* at 246.

113. 43 U.S. C. §§ 1411-1481 (1976).

114. *Id.* at § 1415.

115. 43 C.F.R. § 3100.4 (1976). This pertains to oil and gas and is identical to the provision of other minerals at 43 C.F.R. § 3500.1 (1976).

116. 30 C.F.R. §§ 211.1-.75 (1976).

necessary"¹¹⁷ to protect such wells and bore holes while still allowing "maximum" coal development.

Implementation of both the spirit and letter of the Multiple Use Act and the regulations would require that the methane resources be conserved. While there is no explicit statement that development of one resource will be deferred to save another, the coincidence of coal and methane requires such an interpretation. It should be pointed out here that with respect to federal coal, deferral would not be an impossible approach because coal production from federal leases is not currently a significant percentage of total production levels.¹¹⁸

C. *Environmental Restraints*

Deferral of coal production may be required by federal environmental laws.¹¹⁹ As much of the strip mining in the West will be done on public lands or pursuant to federal leases, the leasing there must be preceded by an environmental impact statement pursuant to the National Environmental Policy Act.¹²⁰ One necessary component of that statement must be a discussion of alternatives to the proposed federal action.

The importance of presenting alternatives is emphasized not only in section 102(2)(C)(iii), but also in section 102(2)(D), which requires that agencies develop "appropriate alternatives when there are unresolved conflicts concerning alternative uses of available resources." These two sections of the statute tell agencies to present reviewers with options other than the one favored by the agency.¹²¹

Since methane is indeed an available resource and is one of substantial quantity, it would seem to be axiomatic that its development should be at least discussed in connection with any proposed coal leasing plan. At the very least, the federal government would seem to be under an obligation to evaluate the methane resources in the thick

117. 30 C.F.R. § 211.11 (1976). See also 30 C.F.R. § 221.5 (1976), which requires the mining supervisor to "prevent waste, damage to formations or deposits containing oil, gas or water."

118. U.S. DEPT OF INTERIOR, PROPOSED FEDERAL COAL LEASING PROGRAM: FINAL ENVIRONMENTAL IMPACT STATEMENT 1-41 (1975).

119. SURFACE MINING CONGROL AND RECLAMATION ACT OF 1977, Pub. No. 95-87, §§ 101-908, 91 Stat. 447-531 (to be codified in 30 U.S.C. §§ 1201-1328). See also *Kleppe v. Sierra Club*, 427 U.S. 390 (1976).

120. 42 U.S.C. §§ 4321-4361 (1976).

121. Anderson, *NEPA In the Courts*, in ENVIRONMENTAL LAW INSTITUTE, 216, 217 (1973). See also ABA Environmental Controls Committee, *Complying with NEPA: Practice Comment, Judicial Review of Federal Agency Actions Under NEPA* 28 OKLA. L. REV. 866 (1975); Note, *Judicial Review of a NEPA Negative Statement*, 53 B.U.L. REV. 879 (1973).

Western coal seams to determine the extent of the gas deposits and the amount of effort which would be required to remove the gas ahead of coal mining.

In a recent decision handed down by the United States District Court for the District of Columbia,¹²² the plaintiffs sought an injunction to restrain the government from implementing its new coal leasing program arguing that the final programmatic environmental impact statement was deficient. The court agreed that the statement was insufficient because it failed to include "mention or consideration of the first alternative of 'no action.'"¹²³ Then, following a brief recitation of facts indicating that coal mined under federal leases was making only a marginal contribution to the nation's coal production,¹²⁴ the court stated:

In light of these statistics, the threshold question as to *whether* the proposed policy is even *necessary* should have been addressed and considered in depth. The cursory treatment of the "no action" alternative provided in the Final EIS does not satisfy the statutory mandate of section 102(C) of NEPA.¹²⁵

One aspect of the inadequately considered "no action" alternative would certainly be the recovery of the methane in the coal. Its presence in the coal is in itself a compelling reason for at least no present action to mine the coal.

In *Daly v. Volpe*,¹²⁶ the court was confronted with a dispute over the construction of an interstate highway. In holding the environmental report to be insufficient, the court stated: "The fifth paragraph of the draft impact statement is totally unsatisfactory. It should list, among other things . . . the resources which may be irretrievably lost, and the nature of each such loss."¹²⁷

This is, of course, an explicit requirement of NEPA. Further, because strip mining is certain to liberate unknown quantities of methane and because the effect of the removal of surface coal on methane in deeper strata is not known, it seems obvious that the matter should be examined in the environmental impact statement which contemplates leasing of federal coal.

122. *Natural Resources Defense Council v. Hughes*, 437 F. Supp. 981 (D.D.C. 1977).

123. *Id.* at 990.

124. *See* note 118, *supra* and accompanying text.

125. 437 F.Supp. at 991.

126. 350 F.Supp. 252 (W.D. Wash. 1972).

127. *Id.* at 259.

Under the Department of Energy Organization Act, the Department of Interior is designated as the lead agency for the preparation of environmental impact statements pertaining to the leasing of mineral lands.¹²⁸ Thus, while the essential decisions concerning leasing will be in the Department of Energy,¹²⁹ the environmental statement on leasing will be in Interior. This is part of the division of responsibility which was conceived by Congress as a compromise when the Energy Department was created. The peacefulness of the envisioned coexistence is a chapter yet to be written, but on the basis of past performance by the Department of Interior alone, there is little to suggest that methane will be given any greater consideration than before, and it now remains to be seen if environmental aspects of coalbed methane will be faced squarely.

VI. CONCLUSION

Coalbed methane is an energy resource of significant magnitude that can contribute to the energy requirements of the United States. Knowledge of the amount of methane contained in coal and of methods and techniques for its removal are quite recent. What attention has been given to this subject in the past has proceeded from the fact that methane in coal is a nuisance and a hazard in mining operations.

There is little reason to doubt that when methane ownership questions are litigated, the substance will be categorized as a gas. It follows that the proprietorship issues will be treated in the context of oil and gas law.

The basic concepts of ownership in place and non-ownership will serve as starting points for treatment of the issues of the right to coalbed methane. There is little in either theory which promises to be dispositive of the ownership question, which will more than likely be determined on a case-by-case basis with the courts looking primarily to the controlling instruments, the words used, the intent of the parties, and local custom.

Conservation principles are presently at odds with forced waste of coalbed methane and some compromise of this dilemma seems inevitable. One aspect of any such compromise must take into account the facts that present waste is unconscionable and that if the methane is to be put to beneficial use, its removal should precede mining operations.

128. Department of Energy Organization Act of 1977, Pub. L. No. 95-91, § 303, 91 Stat. 579 (to be codified in 42 U.S.C. § 7153(d)).

129. *Id.*

Finally, we note that federal coal and gas leasing statutes and regulations have not yet been applied to the methane question, but that they should be cannot be denied. The environmental implications of coal leasing of mineral lands have not been explored, but here again, the unmistakable intent of the law is that they should be.