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Coal Slurry Pipelines: A Transportation Alternative for North Dakota Coal

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COAL SLURRY PIPELINES: A TRANSPORTATION ALTERNATIVE FOR NORTH DAKOTA COAL?

I. INTRODUCTION

The energy crisis is here to stay. With this fact comes the realization that the United States must immediately take steps to make itself as self-sufficient as possible in the production of energy. Coal is widely regarded as an important factor in the drive to achieve this self-sufficiency.

It is estimated that United States coal production must at least double by 1985 if this country hopes to achieve energy independence.[1] Fortunately, the United States has a great, untapped supply of coal. Coal reserves constitute approximately eighty-five per cent of this nation's total energy resources, while coal presently provides only eighteen per cent of the nation's energy.[2]

The environmental emphasis of the 1960's has focused interest on western coal which has low sulphur content and thus complies with stringent pollution control standards.[3] Montana, North Dakota and Wyoming have the greatest known deposits of coal in the nation.[4] The crucial issue is how to get this western coal to the industrial centers.

Presently, there are two basic ways in which the coal energy used by utilities can be transferred from the sparsely populated western states to the energy consumption centers. First, a power plant can be built at the mining site and the electricity or gas produced by this plant can be sent to urban centers via electric trans-

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1. *See* ENERGY TRANSPORTATION SYSTEMS, INC., SLURRY PIPELINES—INNOVATION IN ENERGY TRANSPORTATION 13 (1975) [hereinafter cited as ETSI REPORT]. ETSI is the leading proponent of coal slurry pipelines and is the developer of the Wyoming-Arkansas coal slurry pipeline. ETSI is a partnership composed of Bechtel, a large California engineering firm, Lehman Bros., a New York investment banking house, and Kansas-Nebraska Natural Gas Co.

In 1974 Bechtel received $413,000 from the Department of the Interior to prepare a study comparing coal slurry pipeline transportation with transportation of coal by railroad.

There have been allegations that ETSI has been heavily involved in politics. About the time ETSI was formed, two former Cabinet-level officials joined Bechtel and another joined Lehman Bros. Strabala, *Controversy Clouds Slurry vs. Railroads*, The Denver Post, Nov. 23, 1975. It has also been alleged that the coal slurry pipeline issue was directly responsible for the appointment of Thomas Kleppe as Secretary of the Interior. This allegation was supported by the fact that after his appointment Kleppe announced that he was in favor of coal slurry pipelines. Wichita Eagle, Mar. 31, 1976, at 1.

2. *See* Leisenring, *Western Coal—The Sleeping Giant*, 19 ROCKY MTN. MIN. L. INST. 1, 5 (1974). *See also* ETSI REPORT, *supra* note 1, at 12.

3. ETSI REPORT, *supra* note 1, at 5. Sulphur content in western coal averages about .5%, while sulphur content in midwestern and eastern coal averages about 3%. *Id.*

4. Leisenring, *supra* note 2, at 1. Montana has nearly 222 billion tons of mostly sub-bituminous coal, North Dakota has over 350 billion tons of known reserves of lignite coal, and Wyoming has over 120 billion tons of sub-bituminous coal. *Id.* at 5.

mission lines or pipelines.[5] This form of energy transmission is often criticized by those living near the coal deposits for a variety of environmental reasons.[6]

The alternative is to transport the coal to the urban centers to be used by power plants located near the urban centers.[7] Today, the only feasible mode of transportation available for transporting coal to these more distant power plants is by rail.[8] Motor carrier transportation is not economical and barge carriage by water is unavailable in those western states with large coal deposits.[9] Because of the lack of substitute modes of transportation, several energy companies have shown an extensive interest in reviving an old transportation device—the coal slurry pipeline.

North Dakota is one of the western states with large deposits of coal.[10] Although there are currently no plans to develop coal slurry pipelines in North Dakota, proposals for utilizing this mode of transporting North Dakota coal may arise in the near future. The purpose of this note is to discuss whether coal slurry pipelines offer North Dakota a viable alternative for transporting its coal to the energy consumption centers. Before this question can be answered, it is necessary to explain the operation of a coal slurry pipeline and some of its benefits and problems.

II. THE DEVELOPMENT OF COAL SLURRY PIPELINES

The operation of a coal slurry pipeline is not complex. A slurry is formed by pulverizing the coal until the largest particle is about the size of a grain of sugar, and then mixing the pulverized coal with water. This mixture is then pumped through a pipeline to its destination, with booster pumps placed along the line to maintain the flow over long distances. Then, after a centrifuge at the electric power plant site is used to extract the water from the slurry, the coal is ready to use.[11] The extracted water can be reused by the electric power plant in its production process.

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5. *See generally* THE PEOPLE'S CONFERENCE ON NORTH DAKOTA COAL DEVELOPMENT 1-5 (May 1975) (statement of Robert L. Kessler, Regional Rep. of the Sec. of Transp., Denver, Colo.) and at 19-24 (statement of Howard Easton, Manager of System Planning & Marketing, Basin Electric Power Coop., Bismarck, N. D.) [hereinafter cited as N.D. CONFERENCE]. The Conference was held at Bismarck, N.D., in May 1975. A copy of the report on the Conference can be obtained from the Upper Great Plains Trans. Inst., North Dakota State Univ., Fargo, N.D.

6. Coal-fired electric power plants are the worst environmental offenders of all the energy generating operations. *See* Smith, *Electricity and the Environment: A Season of Discontent*, 33 FED. B.J. 271, 274 (1974).

7. *See generally* N.D. CONFERENCE, *supra* note 5, at 1-5 (statement of Robert L. Kessler).

8. HUDSON INSTITUTE, RESEARCH ANALYSIS OF FACTORS AFFECTING TRANSPORTATION OF COAL BY RAIL AND SLURRY PIPELINE 1 (1976) [hereinafter cited as HUDSON REPORT] (prepared under a grant from the Burlington Northern Railroad).

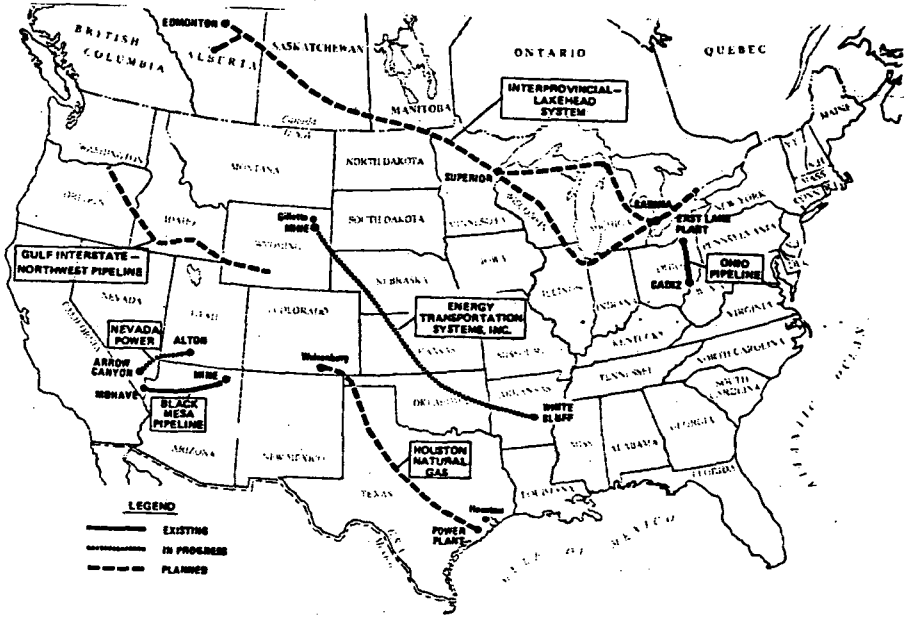
9. *Id.*

10. *See* note 4 *supra*.

11. The pulverizing process and the mixing of the pulverized coal with water also improves the quality of the coal. When the coal is washed its sulphur and ash content is

The first patent for pumping coal and water was issued in 1891.[12] But the new form of transportation was never really tested until 1957, when a 108-mile coal slurry pipeline was opened in Ohio.[13] From a technological standpoint the Ohio pipeline proved successful, but it was forced to stop operation after six years due to competition caused by reduced railroad rates.[14] Today there is only one coal slurry pipeline actually operating in the United States. This pipeline, which is 273 miles long, runs from Black Mesa, on the Navajo Indian Reservation in Arizona, to the Mohave Power Plant on the Colorado River in southern Nevada.[15] The Black Mesa pipeline was built in 1970 over terrain too rough for railroad construction. Ironically, the pipeline is owned by a railroad, the Southern Pacific.[16]

In addition to the above mentioned pipelines, there are now five other coal slurry pipelines in various planning stages. The present situation is represented by the following map.[17]



reduced by 15-20%. HUDSON REPORT, *supra* note 8, at 18.

12. ETSI REPORT, *supra* note 1, at 1.
13. *Id.* at 1-2.
14. *Id.* at 12.
15. *Id.* at 9.
16. HUDSON REPORT, *supra* note 8, at 9.
17. Reprinted with the permission of Energy Trnsportation Systems, Inc., San Francisco, Cal.

The Wyoming-Arkansas pipeline is in the most advanced stage of development of all the proposed pipelines.[18] This pipeline will be discussed in various sections of this note.

Although there are no coal slurry pipelines presently planned for North Dakota, this situation could certainly change in the future. The possibility of using coal slurry pipelines in Montana is, in fact, currently under discussion.[19]

III. COAL SLURRY PIPELINES V. RAILROADS: BENEFITS AND PROBLEMS

There are several benefits that will allegedly accrue through the use of coal slurry pipelines rather than railroads for the transportation of coal from the coal fields to the industrial centers.

A. TIMELINESS

One important advantage offered by a coal slurry pipeline is that it can be built and put into operation in only three years.[20] This is approximately the same amount of time required for a new coal mine to become operational.[21] Typical implementation schedules of other new energy sources are as follows:[22]

Low-sulfur western coal:	
Via slurry pipeline or rail	3 years
Mine-mouth power plants	5 years
Coal conversion	5-10 years
Oil Shale	8 years
Nuclear	
Light water and gas-cooled reactors	10 years
Breed reactors	20+ years
Fusion	25+ years
Solar Energy	25+ years

B. RELIABILITY

Maintaining a constant supply of coal is extremely important for the proper operation of a power plant. Moving coal by slurry pipeline has thus far proved to be a very reliable mode of transportation.[23] The reliability of the pipeline is based on two factors. First, only a small number of workers are needed to operate a pipe-

18. ETSI REPORT, *supra* note 1, at 2.
19. HUDSON REPORT, *supra* note 8, at 9.
20. ETSI REPORT, *supra* note 1, at 4.
21. *Id.*
22. *Id.* at 5.
23. *Id.* at 4. The Ohio coal slurry pipeline achieved an availability record of 98% during the six years it operated and the Black Mesa pipeline maintained over a 99% availability record during its first two years of operation. *Id.*

line. Therefore, a pipeline operation is less susceptible to strikes. Second, the pipeline itself runs underground and is therefore virtually immune to the effects of weather.[24]

Opponents of coal slurry pipelines argue that the pipelines are potentially very unreliable because a blocked pipeline is always a possibility, and considerable difficulty and delay would be involved in making the line operational again.[25] However, railroads, which are extremely vulnerable to labor strikes and slowdowns or derailments, are probably less reliable than pipelines.[26]

C. ENERGY CONSUMPTION

The debate over whether a railroad or a pipeline consumes more energy in the transportation of coal is inconclusive. Both pipeline advocates and opponents admit that there is very little difference between the amounts of energy consumed by the two modes of transportation.[27] Both systems would use about 300 BTU's per ton-mile of coal delivered.[28] This figure demonstrates that both modes represent highly efficient methods of transporting raw materials.[29]

D. ENVIRONMENTAL ISSUES

Since the coal slurry pipelines are buried underground, they are not plagued by many of the environmental problems facing the railroads. Pipelines do not create grade crossing hazards, scatter coal dust along the countryside,[30] interfere with surface activities,[31] cause a noise problem, or set prairie fires.

However, one serious environmental issue facing coal slurry pipelines involves the question of where the pipelines will obtain the large amounts of water necessary to operate. This problem will be discussed in detail later in this note.

A related problem is the use to be made of the water at the end of the pipeline. Pipeline advocates contend this water could be used by the electric utility plant for its cooling towers, causing the

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24. *Id.*
25. HUDSON REPORT, *supra* note 8, at 59.
26. Comment, *An Anaylsis of Technical and Legal Issues Raised by the Development of Coal Slurry Pipelines*, 13 HOUS. L. REV. 528, 531 (1976).
27. *See* ETSI REPORT, *supra* note 1, at 4. Coal slurry pipelines are about 96% efficient. This means that only 4% of the energy value of the coal being transported is absorbed in the transportation process. Rail transport, on the other hand, is 95% efficient. *Id. Compare with* HUDSON REPORT, *supra* note 8, at 114. In comparing a slurry system with a rail system it would appear that the energy expended would be about equal to or favor slightly the rail system. *Id.*
28. HUDSON REPORT, *supra* note 8, at 114.
29. *See* ETSI REPORT, *supra* note 1, at 4. Extra high voltage transmission of electricity is only about 90% fuel efficient, compared with the 95% efficiency of coal slurry pipelines and railroads. *Id.*
30. Coal dust which is blown off the tops of railroad cars or which sifts through hopper cars is an environmental problem not faced by underground coal slurry pipelines.
31. Pumping stations, spaced approximately 100 miles apart along the coal slurry pipeline, will be visible but they should cause no undue environmental concern.

water to be evaporated through the cooling process.[32] If, however, the water is merely discharged, the pipeline company or the utility company will have to satisfy federal and state regulations promulgated under the Federal Water Pollution Control Act Amendments of 1972.[33]

Another concern involves coal spills which might result if the pipeline becomes plugged and a rupture occurs.[34] Pipeline advocates discount the possibility of such ruptures.[35]

Due to the above mentioned potential environmental problems, it would seem likely that coal slurry pipeline companies will be required to file a federal environmental impact statement, particularly if the pipeline crosses federal or Indian lands.[36]

E. SAFETY

Movement of coal by slurry pipelines is much safer than shipment by rail. For example, in 1973, there were 1,916 people killed in railroad related accidents,[37] while the number of deaths due to the operation and maintenance of natural gas and oil pipelines was negligible.[38]

F. COMMUNITY IMPACT

Coal slurry pipelines will have only a minimal population impact in the areas where they operate. The construction of the pipelines will cause an initial spurt in labor activity in a community for a brief period of time.[39] However, once the pipeline begins to operate it will require only a skeleton crew. For example, it is estimated that only 335 people will be needed to operate the 1,036-mile Wyoming-Arkansas pipeline.[40] Because of the small number of workers necessary to operate a pipeline, pipeline advocates emphasize that pipelines will cause very little industrial interference with a rural community's style of life.[41]

On the other side, the railroads argue that reduced community impact is not a benefit at all because very few new jobs will be created. If a new 1,100 mile railroad line were developed to move new coal traffic, it would create 1,800 to 2,570 new jobs.[42]

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32. ETSI REPORT, *supra* note 1, at 18.
33. 33 U.S.C. §§ 1251-1376 (Supp. II 1972), *as amended.*
34. HUDSON REPORT, *supra* note 8, at 3-4.
35. ETSI REPORT, *supra* note 1, at 12.
36. *See generally*, 42 U.S.C. §§ 4321-4347 (1970), *as amended*, (Supp. V 1975).
37. HUDSON REPORT, *supra* note 8, at 136. This number includes people killed by freight and passenger trains, including those in automobiles hit at crossings, trespassers on rights-of-way, and railroad employees killed by non-train accidents.
38. *Id.* at 137. Coal slurry pipelines would be even safer than gas and oil pipelines because the contents of the slurry pipeline are not flammable. *Id.*
39. *Id.* at 117.
40. ETSI REPORT, *supra* note 1, at 19.
41. *Id.*
42. HUDSON REPORT, *supra* note 8, at 117.

G. FINANCIAL COSTS

Coal slurry pipeline advocates contend that tremendous cost savings will result from pipeline operations. The Wyoming-Arkansas pipeline promotors argue that slurry transportation will save the Arkansas utility company fourteen billion dollars in transportation costs over a thirty-year period.[43] It is expected that the utility company will pass this saving on to its consumers.[44]

Pipelines demand a large initial capital investment. For example, the Wyoming-Arkansas line will cost approximately $750 million.[45] Once the pipes are in the ground and the pumps are set up, however, about seventy percent of the unit cost will have been met.[46] The remaining thirty percent of the unit cost is variable costs related to electricity, labor and supplies.[47]

Railroads, on the other hand, have far greater variable costs than pipelines. For example, labor alone amounts to over fifty percent of railroad costs.[48]

Inflation plays an important role in a pipeline's predicted cost savings. Variable costs are extremely sensitive to inflationary pressure, while inflation has little effect on fixed costs. Therefore, if the present inflationary trend continues, it is likely that the railroads' coal rates, which are largely based on variable costs, will rise much more quickly than the pipeline charges which are more dependent on fixed costs.[49] In other words, the more inflation, the more economical pipelines become.

In order for a coal slurry pipeline to maximize its economic advantages it must move a large volume of coal over a long distance to a single market.[50] The sole existing operational pipeline, the Black Mesa pipeline, is only 273 miles long and can move only up to five million tons of coal a year.[51] This is a small operation. The prediction of a fourteen billion dollar saving as a result of the Wyoming-Arkansas pipeline was based on the movement of twenty-five million tons of coal per year over a 1,036-mile pipeline to a spe-

43. ETSI REPORT, *supra* note 1, at 17.
44. *Id.*
45. *Id.* at 15.
46. *Id.* at 4.
47. *Id.*
48. *Id.* at 17.
49. *Id. But see* HUDSON REPORT, *supra* note 8, at 17, which points out that inflation also affects construction costs and therefore pipelines which are built in the future will have a much higher capital investment cost than is predicted in any current study.
50. *See Hearings on H.R.* 1863, 2220, 2553 & 2896 *Before the House Comm. on Interior and Insular Affairs*, 94th Cong., 1st sess. 19-26 (1975) (reprinted version of statement of Louis W. Menck, Chairman & Chief Exec. Officer, Burlington Northern, Inc.) [hereinafter cited as *Hearings*] (on file with the Upper Great Plains Transp. Inst., North Dakota State Univ., Fargo, N.D.).
51. ETSI REPORT, *supra* note 1, at 9-10.

cific destination for thirty years.[52] Forecasts of such a large movement of coal over such a long period are quite speculative.[53]

Despite the uncertainty as to future inflationary trends and the ability of pipelines to move large volumes of coal to one market, it appears that pipeline transportation will result in some cost savings to a utility company.[54]

IV. WATER

Coal slurry pipelines need large amounts of water to operate since the slurry mixture is comprised of approximately equal amounts of coal and water.[55] It is estimated that the Wyoming-Arkansas pipeline will transport twenty-five million tons of coal per year.[56] The movement of such an amount of coal means that an equivalent amount of water by weight, or 6.25 billion gallons, will be required each year for one pipeline.[57] It is obvious that if a number of similar coal slurry pipelines are built throughout the western coal region, tremendous demands will be placed on existing water reserves.

A. WATER UTILIZATION BY OTHER ENERGY SYSTEMS

If the western states expect to develop their coal resources, some water will have to be used. All energy systems require the use of water. In fact, coal slurry pipelines utilize less water than most energy systems.

Water Requirements[58]
(gallons of water/million BTU delivered)

Mine-mouth Power Plant	100
Coal Gasification	10-30
Coal Slurry	12
Railroad	Minimal

Public policy considerations in the western states may require that the largest water consumers, the power plants themselves, be located close to the energy consumption centers so the scarce water

52. *Id.* at 17.
53. *Hearings, supra* note 50, at 19-26. Menck stated that the Wyoming-Arkansas pipeline, by far the largest of the proposed pipelines, would not deliver coal to a single market which needs 25 million tons of coal annually. In fact, no such need was foreseen for the forseeable future. If the pipeline followed the more realistic course of distributing 5 million tons of coal to one power plant, 6 million to another, etc. the added costs would greatly change the predicted cost savings. *Id.*
54. HUDSON REPORT, *supra* note 8, at 67.
55. ETSI REPORT, *supra* note 1, at 19.
56. *Id.* at 3.
57. One ton of water equals 250 gallons of water.
58. ETSI REPORT, *supra* note 1, at 7.

supply will not be depleted.[59] As a result, coal may have to be transported to these industrial centers either by coal slurry pipelines or by railroads. As noted above, coal slurry pipelines require much more water to operate than railroads, and this fact raises problems for pipeline advocates.

B. SOURCES OF WATER

For the pipelines, the least costly source of water is from the state in which the coal formations are located.[60] Unfortunately, much of the nation's coal is located in arid western states where water is a very valuable and scarce resource.

The concern of the western states has been voiced by a number of congressmen from the Upper Great Plains. Senator Quentin Burdick and Representative Mark Andrews from North Dakota,[61] South Dakota Senators George McGovern and James Abourezk, Senator Lee Metcalf of Montana, and Wyoming Senator Clifford Hansen[62] have all expressed concern that there may not be sufficient water in the West for both agriculture and coal slurry pipelines.

Alternative suggestions for water conservation are available to the coal slurry pipelines. One such alternative would be to build a parallel water pipeline and to require the ultimate users of the coal to supply the water.[63] A second alternative would be to pump the water in from some distant abundant water source.[64] A final alternative would be for the coal pipeline to recycle the water by building a parallel pipeline. Then, after the water is separated from the coal at the plant site, the water can be returned to the coal gathering site and reused.[65] The problem with all of these alternatives is that they substantially increase the capital and operating expenses of the pipeline.[66] Some pipeline advocates state that these increased costs would not allow coal slurry pipelines to be economically competitive with railroads.[67]

C. WATER LAW

How would coal slurry pipelines legally obtain the water they need to operate? The answer to this question lies in the exceedingly

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59. Additional benefits of locating power plants near urban centers are that the work force and electric power for processing are probably already in existence there. *Id.* at 8.
60. *See generally* HUDSON REPORT, *supra* note 8, at 127-28.
61. Marking, *Coal Slurry Pipelines v. Railroads*, THE FARMER, June 19, 1976, at 16.
62. Wichita Eagle, March 31, 1976, at 2A, col. 3.
63. Comment, *supra* note 26, at 547.
64. N.D. CONFERENCE, *supra* note 5, at 36 (statement of T. C. Aude, Manager of Slurry Systems, Bechtel, Inc., San Francisco, Cal.).
65. HUDSON REPORT, *supra* note 8, at 134.
66. For example, a water recycling system has been reported to add about 38 to 40% to the costs of moving coal by slurry pipeline. *Id.*
67. *Id.*

complex area of water law.[68] Since water law does not lend itself to a cursory examination, suffice it to say that anyone seeking to appropriate a substantial amount of water from a given area will be faced with a number of complex and interwoven problems dealing with the ownership or control of the given water supply.[69] There are no easy solutions to this problem. The situation in North Dakota is a good example of how unclear this area of the law is today.

> The people of North Dakota own the water within the state of North Dakota; subject to existing riparian and prescriptive rights; subject to existing usufructuary rights obtained pursuant to the state's prior appropriation law, some through permits, others through physical appropriation, and subject to the issuance of further such permits and further physical appropriation; subject to whatever ownership rights may exist in the federal government and Indian Tribes, and subject certainly to a great degree of control by the federal government over the use of water from federal structures and navigable waters; subject to whatever claims Canada may have to international streams; and subject to whatever claims other states may have to the interstate bodies of water. It will probably be a long time before some of the larger claims are settled.[70]

Coal slurry pipeline companies that need water to operate their pipelines will have to do their homework to obtain that water. If a pipeline company is interested in North Dakota water, the best place to begin the search to determine who controls certain water in the state would be with an inquiry to the North Dakota State Water Conservation Commission.[71]

V. ECONOMIC CONSIDERATIONS BETWEEN RAILROADS AND PIPELINES

When comparing railroad coal service to proposed slurry pipeline service, it must be remembered that the comparison is between an existing system which is already operating and a duplicate system which does not yet exist. Even more important, however, is the fact that a specialized carrier will be competing with a true common carrier.

Railroads move millions of commodities and products other than coal. The railroads argue that the operation of coal slurry pipelines

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68. For detailed and extensive information on water law, *see generally* WATERS AND WATER RIGHTS (R. E. Clark ed. 1967, 1972, 7 vols.).

69. *See, e.g.*, Beck & Hart, *The Nature and Extent of Rights in Water in North Dakota*, 51 N.D.L. REV. 249 (1975).

70. *Id.* at 311. *See also* Loble & Loble, *The Rocky Road to Water for Energy*, 52 N.D.L. REV. 529 (1976) for a comparison of Montana, North Dakota and Wyoming water law.

71. The powers and duties of the North Dakota State Water Conservation Comm'n are listed in N.D. CENT. CODE § 61-02-14 (1960), *as amended*, (Supp. 1975).

will weaken or perhaps even destroy some railroads.[72] It is argued that because of this harmful effect on railroads, coal slurry pipelines, which transport only coal, must be substantially more efficient than the existing railroads in moving coal to be considered beneficial to the public interest.[73] The effect of moving coal more efficiently by pipeline must be balanced against the possible reduction of total railroad service caused by a loss of profitable coal traffic.

The railroads emphasize that the amount of coal which is diverted to a coal slurry pipeline will be lost to the railroads. For example, if twenty-five million tons of coal per year is moved by pipeline from Wyoming to Arkansas,[74] the railroads, as a result, will not be moving this coal. Under average rail coal rates, the movement of this twenty-five million tons of coal would produce approximately 150 million dollars in revenue for a railroad.[75]

Coal has long been the railroads' most important commodity both in tonnage and revenue. The industry also looks to coal revenues as an important source of future growth.[76]

If the railroads lose the coal traffic, some railroads may be forced into bankruptcy.[77] Even if these railroads do not become bankrupt, they argue that they will be forced to provide poorer service or raise their rates for the transportation of other commodities.[78]

Advocates of coal slurry pipelines contend that the railroads will not be able to handle the increased coal traffic expected during the next few years.[79] Railroads argue that this contention is without merit because of the new economies surrounding the long distance operation of unit trains.[80] The railroads also argue that they will be able to rapidly increase the number of coal cars as the need arises.[81]

Coal slurry pipeline advocates also contend that present coal rates charged by railroads are too high.[82] These rates are sometimes

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72. *Hearings*, *supra* note 50, at 39-42.
73. HUDSON REPORT, *supra* note 8, at 89.
74. ETSI predicts that the Wyoming-Arkansas pipeline will move 25 million tons of coal per year. ETSI REPORT, *supra* note 1, at 18.
75. *Hearings*, *supra* note 50, at 39.
76. ASSOCIATION OF AMERICAN RAILROADS, THE CASE AGAINST COAL SLURRY PIPELINES 4 (1975) [hereinafter cited as AAR REPORT]. In 1974 coal accounted for 10% of all rail revenue and 16% of all rail ton-miles. *Id.*
77. *Hearings*, *supra* note 50, at 39.
78. AAR REPORT, *supra* note 76, at 11.
79. *Hearings*, *supra* note 50, at 39.
80. *Id.* at 4-11.
81. For example, because of the introduction of 100-car unit trains into their system, the Burlington Northern Railroad doubled its coal transport capacity between 1971 and 1975. N.D. CONFERENCE, *supra* note 5, at 43 (statement of James Walker, Associate General Counsel, Burlington Northern Railroad, St. Paul, Minn.). An efficient unit train runs constantly and is loaded and unloaded in four hours or less. One unit train of 118 cars can deliver 600,000 tons of coal annually over an 800-mile route. *Id.* at 45. It would thus take over 40 new 100-car unit trains to move the 25 million tons of coal which the Wyoming-Arkansas pipeline proposed to move per year. ETSI REPORT, *supra* note 1, at 3.
82. N.D. CONFERENCE, *supra* note 5, at 10 (statement of Robert Hines, Sr., Pres. of R. L. Hines Assoc's, Inc., Washington, D.C.).

as high as 140% above variable costs.[83] High coal rates are one of the main reasons that electric utilities are looking for an alternative mode of transportation for coal.[84] Unless the railroads eventually agree to lower their coal rates to a more reasonable level, they may find the lucrative coal traffic "literally up for grabs."[85]

VI. EMINENT DOMAIN

In their drive to link the coal fields of the West with the energy consuming market, coal slurry pipeline builders face one major obstacle as a result of railroad opposition: the railroads will not allow the pipelines to cross their rights of way.[86] As a result, coal slurry pipeline companies are requesting that they be given the federal power of eminent domain.[87] Eminent domain is the power of a sovereign to take private property for public use without the owner's consent upon payment of just compensation.[88]

The coal slurry pipeline advocate proposals for granting pipeline companies the federal power of eminent domain so far have been defeated by the strange combination of environmentalists and railroad companies. As stated above, the railroads strongly oppose the pipelines on economic grounds.[89] The environmentalists, on the other hand, oppose the granting of eminent domain powers to coal slurry pipeline companies on the ground that the pipelines will seriously damage the natural water balance of the arid states in which they operate.[90]

A. NORTH DAKOTA LAW

In 1963, North Dakota law was amended to provide for the regulation of coal pipelines as common carriers. The 1963 legislation merely added the words "coal pipelines" to the major provisions of the Code which had formerly applied only to crude petroleum and gas pipelines.[91]

The Public Service Commission (PSC) has regulatory jurisdiction over the construction and operation of coal slurry pipelines within North Dakota.[92] The regulatory powers of the PSC are extensive. The PSC must give its approval before a coal pipeline may operate in the state;[93] it must establish and enforce the rates a pipeline

83. *Id.* at 10.
84. *Id.* at 6.
85. *Id.*
86. ETSI REPORT, *supra* note 1, at 15.
87. *Id.* at 15.
88. 1 NICHOLS ON EMINENT DOMAIN § 1.11 (3rd ed. 1976) [hereinafter cited as NICHOLS].
89. *See* text accompanying notes 72-81 *supra.*
90. *See* text accompanying notes 55-62 *supra.*
91. Ch. 325 [1963] N.D. Sess. Laws 600 (codified in N.D. CENT. CODE ch. 49-19 (Supp. 1975)).
92. N.D. CENT. CODE § 49-02-01(3) (Supp. 1975).
93. *Id.* § 49-19-08 (Supp. 1975).

will charge for transporting coal;[94] it is empowered to hear and decide complaints made by the public against a coal slurry pipeline company;[95] and it can require pipelines to submit monthly or annual reports regarding pipeline operations.[96] Finally, the PSC has the power to require coal slurry pipeline companies to provide adequate service, without discrimination, to any customer who requests such service.[97]

Presently, the PSC also has the power to enter into joint action with other states and thus allow coal slurry pipeline companies to engage in interstate commerce.[98] In addition, once a coal slurry pipeline company complies with certain prerequisites, the state delegates its power of eminent domain to the company.[99] With the power of eminent domain, the pipeline builders can force unwilling private property owners in North Dakota to allow the construction of a pipeline and a transmission plant on their land.[100] Of course, the pipeline owners must give just compensation to the landowners for the use of their land.[101]

A coal slurry pipeline developer must take three procedural steps before he can fully exercise the state power of eminent domain. First, before a coal slurry pipeline developer can operate in North Dakota, he is required to obtain a certificate of public convenience and necessity from the PSC.[102] In order to get such a certificate, a public notice and hearing is required.[103] The hearing is necessary to determine whether the construction and operation of the pipeline will be in the public interest.[104] Factors which the PSC can properly consider before granting a certificate of public convenience and necessity include the following:

> (1) whether the proposed service is reasonably necessary or would be wasteful and a useless burden on the public; (2) whether it would cause economic waste or public disadvantage; (3) whether it would cause unnecessary duplication of facilities . . . of the same type in the area where the proposed facility is to be located and which could ultimately result in inadequate services and higher rates; and (4) whether or not an applicant has the ability to finance its proposed service

94. *Id.* § 49-19-13 (Supp 1975).
95. *Id.* § 49-19-03 (1960).
96. *Id.* § 49-19-02 (1960).
97. *Id.* §§ 49-19-19 to 20 (Supp. 1975).
98. *Id.* § 49-19-18 (Supp. 1975).
99. *Id.* § 49-19-12 (1960).
100. *See* N.D. CENT. CODE §§ 32-15-01 to 02 (1976).
101. N.D. CENT. CODE § 32-15-01 (1976).
102. *Id.* § 49-03-01 (Supp. 1975).
103. *Id.* § 49-03-02 (1960), *as amended*, (Supp. 1975).
104. Eckre v. Public Serv. Comm'n, 247 N.W.2d 656, 664 (1976). Although this case involved an oil pipeline, all of the legal concepts discussed would also apply to a coal slurry pipeline, since both are considered common pipeline carriers under North Dakota law. N.D. CENT. CODE § 49-19-01 (Supp. 1975).

and is a fit, willing, and able party to perform the services proposed in conformance with the laws of the State and the rules and regulations of the PSC.[105]

Second, a coal slurry pipeline must comply with the Energy Conversion and Transmission Facility Siting Act.[106] The basic requirements of the Siting Act as summarized by the North Dakota Supreme Court in *Eckre v. Public Service Commission*[107] are as follows:

> [A] system of public hearings[108] and PSC study and evaluation by which a suitable corridor for the project is proposed and approved; and then, after additional public hearings and PSC study and evaluation, a specific transmission facility route within such corridor is proposed and approved.

Before approving a certain corridor or site, the PSC is required to consider the following factors:

> 1. Evaluation of research and investigations relating to the effects of energy conversion facilities and transmission facilities on land, water, and air resources and the effects of water and air discharges from such facilities on public health and welfare, vegetation, animals, materials, and aesthetic values. . . .
>
> 2. Environmental evaluation of energy conversion facility sites and transmission facility corridors and routes proposed for future development and expansion. . . .
>
> 3. Evaluation of the effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.
>
> 4. Evaluation of the potential for beneficial uses of waste energy from proposed energy conversion facilities.
>
> 5. Evaluation of adverse direct and indirect environmental effects which cannot be avoided should the proposed site, corridor, or route be accepted.
>
> 6. Evaluation of alternatives to the proposed site, corridor or route.

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105. Eckre v. Public Serv. Comm'n, 247 N.W.2d 656, 665 (1976).
106. N.D. CENT. CODE ch. 49-22 (Supp. 1975).
107. 247 N.W.2d 656, 665 n.1 (1976).
108. N.D. CENT. CODE § 49-22-13 (Supp. 1975) states in part as follows:
> The commission shall hold at least one public hearing in each county where a site or corridor is being considered for designation pursuant to section 49-22-10 as suitable for construction of an energy conversion facility or transmission facility. . . . Notice of public hearing shall be given by the commission at least 10 days in advance but no earlier than 45 days prior to such hearings. Notice shall be by publication in the official county newspaper of the county in which the public hearing is to be held and by mailed notice to the persons designated in subsection 2 of section 49-22-08.

Section 49-22-08(2) requires that the commission mail personal notice to the chairman of the board of county commissioners and to the chief executive officer of each city in the affected county, and to the head of each government agency concerned with the environment or land use planning in the affected area. (editor's footnote).

7. Evaluation of irreversible and irretrievable commitments or resources should the proposed site, corridor, or route be approved.

8. Analysis of the direct and indirect economic impact of proposed energy conversion facilities and transmission facilities.

9. Analysis of existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.

10. Evaluation of the effect on existing scenic areas, historic sites and structures, or archeological sites at or in the vicinity of the proposed site, corridor, or route.

11. Evaluation of the effect on areas unique because of biological wealth or because they are habitats for rare and endangered species at or in the vicinity of the proposed site, corridor, or route.

12. Where appropriate, consideration of problems raised by federal agencies, other state agencies, and local entities.[109]

Third, the individual landowners within the specific transmission facility route must be given personal notice of and be made parties to a judicial eminent domain proceeding.[110] At this proceeding, issues requiring judicial determination are resolved. These issues include assessment of damages, a determination that the use to which the property is to be applied is authorized by law, and a determination that the taking is necessary.[111]

Once a pipeline company successfully completes the three procedural steps discussed above, it will be able to exercise the power of eminent domain in North Dakota.

Suppose a landowner in North Dakota does not want a pipeline to run under his land. At what stage of the proceedings mentioned above should he raise his objections? In *Eckre v. Public Service Commission*[112] Justice Vogel of the North Dakota Supreme Court, in a partially dissenting opinion, discussed the effect of a landowner's waiting to raise his objections until the eminent domain proceeding as follows:

> In the case before us, the certificate of public convenience and necessity had been obtained, and presumably hundreds of easements had been obtained and possibly millions of dollars expended on the project before the landowners involved in this action ever heard of the project. Under these

109. *Id.* § 49-22-09 (Supp. 1975).
110. *Id.* § 32-15-18(2) (1976).
111. *Id.* §§ 32-15-06, 22 (1976). For a general discussion of North Dakota's eminent domain law procedures, *see* Guy, *Land Condemnation: A Comparative Survey of North Dakota Statutory Law*, 51 N.D.L. REV. 387 (1974).
112. 247 N.W.2d 656 (1976).

> circumstances, we believe it is a mockery of reality to say that these landowners have any meaningful opportunity to contest the necessity of the taking of an easement on their lands. That necessity had already been determined before they heard of the project.[113]

As Justice Vogel's opinion indicates, a landowner should not wait until the judicial condemnation proceeding begins to voice his objections to the taking of his land. By that time it is too late to stop construction of a pipeline. Rather, the landowner should actively oppose the issuance of a certificate of public convenience and necessity to the pipeline company from the beginning. Similarly, he should make sure his opinions are heard at the public hearings mandated by the Energy Conversion and Transmission Facility Siting Act.[114]

Justice Vogel's opinion also brings to light a problem which should be briefly mentioned here. Often, landowners may not know that a pipeline company is requesting a certificate of public convenience and necessity. The PSC does not require that personal notice be given to the landowners whose land ultimately may be taken for pipeline use.[115] Rather, the PSC will usually post a notice of a hearing in its office. It might also send notices of the hearing to competing public utilities and to the board of county commissioners in counties through which the pipeline may run. Finally, the PSC might send out a general news release to the newspapers of the affected counties. This procedure was upheld in *Eckre*[116] despite Justice Vogel's partially dissenting opinion, part of which is quoted above.[117]

If the PSC continues its present general notice procedures, county officials will be made aware of the problem. These county officials should then take the responsibility to notify all local landowners of pipeline certification hearings which might affect them.

B. FEDERAL EMINENT DOMAIN

As stated above, coal slurry pipeline companies that meet state requirements are delegated the power of eminent domain within North Dakota. The coal slurry pipeline battle is far from over at that point, however, since not all states handle eminent domain as North Dakota does. Although a number of states have granted the power of eminent domain to pipeline companies by statute, many

113. *Id.* at 667.
114. N.D. CENT. CODE ch. 49-22 (Supp. 1975).
115. *See* N.D. CENT. CODE § 49-22-13 (Supp. 1975).
116. 247 N.W.2d 656 (1976).
117. *See* text accompanying note 113 *supra*. Justice Vogel concurred in the result in *Eckre* only because the hearing process of the Energy Conversion and Facility Siting Act, N.D. CENT. CODE ch. 49-22 (Supp. 1975), would supply the due process which was otherwise lacking. Eckre v. Public Serv. Comm'n, 247 N.W.2d 656, 666 (1976).

of these statutes are limited to gas and oil pipelines.[118] In addition, the laws differ extensively even in those states which have granted coal slurry pipeline companies the power of eminent domain.[119] This lack of uniformity among state eminent domain laws causes many delays in the building of interstate pipelines. Delay causes a loss of money to the coal slurry pipeline developers. The developers, therefore, are seeking a federal power of eminent domain for their projects.

Certain private organizations were long ago given the federal power of eminent domain to further a public use.[120] Ironically, among the first private corporations to be granted the federal power of eminent domain were the railroads.[121] Coal slurry pipeline developers are also quick to point out that natural gas pipeline companies today have the federal power of eminent domain.[122]

If the coal slurry pipeline companies are granted a federal power of eminent domain, there will be no need for the pipeline companies to rely on state law because the federal power of eminent domain cannot be restricted in any manner by the state.[123]

C. RAILROAD OPPOSITION

The railroads oppose the granting of the power of eminent domain to coal slurry pipeline companies on a number of legal grounds. One argument is that the power of eminent domain should be granted only to companies that are true "common carriers" and thus serve the entire public.[124] The only coal slurry pipeline presently in operation delivers coal directly to a final destination point.[125] A similar delivery system is initially anticipated for the proposed pipelines. Thus the railroads argue that these coal slurry pipelines will not serve the general public, but rather will serve only a small number of consumers in a private or contract carrier capacity.[126] In response to this argument, pipeline advocates maintain that they can make coal available at any point along their line and will do so if requested by coal suppliers or electric utilities.[127]

Another argument advanced by the railroads is that it is not proper to compare natural gas pipeline companies, which have federal eminent domain power, with coal slurry pipeline companies.

118. *See, e.g.*, COLO. REV. STAT. ANN. § 38-4-102 (1974); S.D. COMPILED LAWS ANN. §§ 49-2-2, 12 (1969).
119. *See* 2A NICHOLS, *supra* note 88, at § 7.2.
120. 2A NICHOLS, *supra* note 88, at § 7.1.
121. *See generally* 2A NICHOLS, *supra* note 88, at § 7.521.
122. 15 U.S.C. § 717(f)(h) (1970).
123. Chappell v. United States, 160 U.S. 499 (1895).
124. AAR REPORT, *supra* note 76, at 9.
125. ETSI REPORT, *supra* note 1, at 9.
126. AAR REPORT, *supra* note 76, at 9-10.
127. ETSI REPORT, *supra* note 1, at 17.

They point out that natural gas pipeline companies are heavily regulated while coal slurry pipelines are not.[128] The railroads contend that this extensive regulation was necessary to insure the only feasible mode of transporting natural gas and emphasize that gas, unlike coal, can be distributed efficiently only by pipeline.[129] Coal slurry pipeline advocates respond by noting that if they are given the power of eminent domain, that power will be accompanied by extensive regulation over their industry.[130]

D. PRESENT STATUS OF FEDERAL EMINENT DOMAIN LEGISLATION

The Ninety-fifth Congress had been in session for only a little over two weeks before it had already two bills before it relating to coal slurry pipelines.[131]

One of the bills would grant coal slurry pipeline companies the power of eminent domain.[132] However, before a coal slurry pipeline company would be delegated the power of eminent domain, the bill would require the company to obtain a certificate of public convenience and necessity from the Department of the Interior.[133] In addition, this proposed bill would place the operation of interstate coal slurry pipelines under the regulatory jurisdiction of the Interstate Commerce Commission.[134]

The second bill is an anti-coal slurry pipeline proposal. This bill would prohibit the use of the power of eminent domain to enable a coal pipeline to cross the right-of-way of another common carrier of coal.[135]

The debate in Congress over coal slurry pipelines is once again expected to be lively. The position of the Carter Administration on coal slurry pipelines has not yet been made known.

VII. NORTH DAKOTA AND COAL SLURRY PIPELINES

Western North Dakota has tremendous quantities of lignite coal beneath its surface. The total reserves are estimated to be approximately 351 billion tons.[136] Sixteen billion tons of this coal could be

128. AAR REPORT, *supra* note 76, at 9.
129. *Id.*
130. *See, e.g.*, the extensive coal slurry pipeline regulations that are embodied in the proposed Coal Pipeline Act of 1977, H.R. 1609, 95th Cong., 1st Sess. (1977).
131. H.R. 1325, 95th Cong., 1st Sess. (1977); H.R. 1609, 95th Cong., 1st Sess. (1977). *See also Familiar Pieces of Legislation Pop up as Ninety-Fifth Congress Starts Moving*, TRAFFIC WORLD, Jan. 24, 1977, at 24.
132. H.R. 1609, 95th Cong., 1st Sess. (1977).
133. *Id.* § 3. It should also be noted that section 7 of the bill states that no certificate shall be issued by the Department of the Interior until it has received advice from the Attorney General and the Federal Trade Comm'n that such action will not create a situation in contravention of the antitrust laws.
134. *Id.* § 12.
135. H.R. 1325, 95th Cong., 1st Sess. (1977).
136. N.D. CONFERENCE, *supra* note 5, at 65 (statement of Jack Parker, Design Eng. Synthetic Fuels Group, American Natural Gas Serv. Co. (Michigan Wisconsin Pipe Line Co.)).

easily reached through strip-mining.[137] The movement of this large quantity of coal to energy power plants will obviously provide the transporting carrier with a great deal of revenue. Although there are no coal slurry pipelines presently planned for North Dakota, it is likely there will be pipelines in the future if pipeline companies are granted the federal power of eminent domain.

T. C. Aude, a speaker at the recent "People's Conference on North Dakota Coal Development," stated that "it's clear that transportation is a key element in developing North Dakota coal."[138] He suggested that it would cost less to transport coal by pipeline than by rail. One result of this lower cost would be an enlargement of the marketing area of North Dakota's coal.[139] Aude concluded by stating: "The message here is that coal slurry pipelines provide a valuable option and a potential for extending markets that might not otherwise be available for North Dakota's resources."[140]

On the water issue, Aude said that water is not as serious a problem in North Dakota as it is in some other parts of the United States. He pointed out that the Missouri River system has a half million acre-feet (approximately 160 billion gallons) of water available for industrial use. And the Little Missouri River has about 60,000 acre-feet (approximately 20.5 billion gallons) of water available.[141] It should be remembered that the Arkansas-Wyoming pipeline will use about 6.25 billion gallons of water a year.[142]

In addition to the possibility of using North Dakota water for transporting North Dakota coal, pipeline advocates are also considering using Missouri River water for coal slurry pipelines in other states. It has been suggested, for example, that a feasible water source alternative for the planned Wyoming-Arkansas pipeline is Missouri River water from the Oahe Reservoir.[143]

Many farm organizations do not agree with the pipeline advocates' optimistic analysis regarding the amount of available water in North and South Dakota. The National Farmers Union and the American Farm Bureau Federation are among the groups opposing coal slurry pipeline development in the Midwest.[144] A typical statement from these farm organizations is: "Exporting water from this fragile region at a time when energy development already is expanding is not consistent with the nation's agricultural interests."[145]

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137. *Id.*
138. *Id.* at 25 (statement of T. C. Aude, Manager of Slurry Systems, Bechtel, Inc., San Francisco, Cal.).
139. *Id.* at 40.
140. *Id.*
141. *Id.* at 36.
142. *See* text accompanying note 57 *supra.*
143. ETSI REPORT, *supra* note 1, at 21.
144. Marking, *supra* note 61, at 16.
145. *Id.*

Farmers worry that if existing water supplies are used for coal slurry pipelines, there will not be enough water for future agricultural needs.

VIII. CONCLUSION

Do coal slurry pipelines offer North Dakota a viable alternative for the transportation of North Dakota coal?

The benefits of coal slurry pipelines, including almost certain savings in transportation charges, are real and sometimes substantial. On the other hand, the problems surrounding the utilization of coal slurry pipelines, including their possible adverse effect on rail service and the serious water issue, are not insignificant.

An extensive study relating directly to North Dakota should be conducted by an impartial group before North Dakota allows a single coal slurry pipeline to operate within its boundaries or before any of North Dakota's water is used for a coal slurry pipeline.

However, if a federal law is passed granting coal pipelines the power of eminent domain, North Dakota will no longer have a voice in determining whether or not coal slurry pipelines will be allowed to operate in this state. For this reason, North Dakota should at least be aware of the battle over coal slurry pipelines which is presently being fought in the United States Congress.

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