South Dakota Groundwater Protection Law

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SOUTH DAKOTA GROUNDWATER PROTECTION LAW

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I. INTRODUCTION

The United States has a bountiful supply of groundwater,[1] roughly equivalent to the Great Lakes multiplied by four. The volume of groundwater in the United States is estimated at fifty times the total amount of water that flows annually in our rivers, streams, and lakes.[2] Nearly one-quarter of all freshwater supplies in the United States come from groundwater.[3] Seventy-five percent of the cities in the United States depend upon groundwater for most of their water supply. Consequently, groundwater is a source of drinking water for more than half the nation's population.[4] In addition, groundwater use is increasing sharply, with most of the growth occurring in the municipal and industrial sectors.[5]

Not only is groundwater available in great quantity and subject to increased use, it also enjoys certain built-in economic advantages over surface water. For example, to use surface water, a city, farm, or industry must construct a storage dam. Regardless of whether a reservoir is as small as a farm stock pond or as large as Lake Mead behind Hoover Dam, there are significant disadvantages which are prevalent. First of all, dams are incredibly expensive to construct. In addition, most acceptable dam sites in the United States have already been used. Also, surface water reservoirs frequently flood productive valley land.

Underground aquifers, in contrast, are already in place and allow for the continuing use of overlying land. Whereas, surface reservoirs are temporary, they will eventually fill with silt or deteriorate, and are expensive to maintain. When the Teton Dam in Idaho collapsed, the nation was reminded safety is always a factor in the use of surface reservoirs. Groundwater reservoirs, if managed correctly, rarely present this type of safety problem. Furthermore, when a large surface reservoir is used for a water supply, millions of gallons per day are lost to evaporation, particularly in the arid West.

Most importantly, groundwater is located where it is needed. Most cities wishing to expand their municipal water supply can drill wells at the

1. Groundwater is defined as all "water under the surface, whatever the geologic reservoir in which it is standing or moving;" S.D.C.L. § 46-1-6(12) (Supp. 1994).

2. A. DAN TARLOCK ET AL., WATER RESOURCE MANAGEMENT 13 (4th ed. 1993). For general background information on the large utilization of groundwater in this nation, see DAVID K. TODD, GROUNDWATER HYDROLOGY 7-13 (2d ed. 1980).

3. TARLOCK, *supra* note 2, at 480.

4. A. DAN TARLOCK, LAW OF WATER RIGHTS AND RESOURCES § 4.02, at 4-3 (1989).

5. TARLOCK, *supra* note 2, at 480.

place of need. When farmers want to irrigate, they can usually drill a well and begin irrigation immediately. When a rural home or business is built beyond the reach of municipal pipelines, a domestic well can be drilled at a modest expense. When a large skyscraper requires inexpensive water supplies for its air conditioning units, wells can be drilled on the site. Groundwater, both adaptable and available, is highly desirable in an age when a significant share of our surface water is already claimed for existing uses. It is also subject to increasing claims by the public for transportation, recreation, wildlife protection, and other uses which limit intense economic development.

South Dakota is probably more dependent on groundwater for drinking water than any other state in the United States.[6] Eighty percent of the state's population uses groundwater everyday. Reputable predictions estimate South Dakota's water needs will double within several decades.[7] Ninety-five percent of South Dakota's public water supply is dependent on groundwater.[8] Most South Dakotans who do not have access to public water systems rely upon water from individual domestic wells.[9]

Depletion and contamination of groundwater is an important environmental issue in South Dakota.[10] Contamination of groundwater is a fingerprint of human activity on the land. Once in the groundwater, contaminants are difficult, if not impossible to remove. Clean-up, through containment or treatment,[11] is so difficult and expensive that the economically sensible approach is through the protection of groundwater supplies. Moreover, because the pace and location of groundwater flows are not always predictable, the effects of contamination are not easily identified.[12]

Contamination of groundwater results from sources as diverse as human activity itself; thus, there can be no perfectly defined body of law which specifically protects groundwater from contamination. The legal structures applicable to mining, residential subdivision, forestry, farming, economic development, tourism, highway maintenance, or electric power generation may be as relevant to the protection of groundwater as the laws designed exclusively for their own purpose. Ultimately, however, "[m]eaningful protection for groundwater will require making difficult land use decisions that depart from traditional notions of private property."[13] Unless alterations are made in human land uses, groundwater contamina-

6. HIDDEN TREASURE (South Dakota Groundwater Research and Public Education Program and the University of South Dakota) (Charles Cranston Productions 1993).

7. *Id.*

8. *Id.*

9. *Id.*

10. *Id.*

11. *Id.* (citing T. HENDERSON ET AL., GROUNDWATER STRATEGIES FOR STATE ACTION 2 (1984)).

12. Linda A. Malone, *The Necessary Interrelationship Between Land Use and Preservation of Groundwater Resources,* 9 UCLA J. ENV'L L. & POL'Y 1, 3 (1990).

13. *Id.* at 1.

tion will continue.[14]

Prior to the 1970's, environmental protection was primarily the responsibility of each state. However, most states failed in this duty, forcing Congress to increase the federal government's involvement in environmental protection. This process, beginning with the Clean Air Act in 1970 and the Federal Water Pollution Control Act of 1972, is now carried forward through a long list of federal regulatory statutes.[15]

The federal government has extensive power to legislate in the area of environmental protection.[16] Although the federal government has exer-

14. ZACHARY A. SMITH, GROUNDWATER IN THE WEST 217-18 (1989). With regard to the problem of contamination of South Dakota groundwater, Smith wrote:

> The two most serious groundwater pollution problems in South Dakota are the contamination of public supply wells from leaks and spills (primarily from petroleum and agricultural chemicals) and nitrate and bacteria contamination from feedlots and septic systems (as well as other sources). For example, every town in Gregory county was found to have at least one municipal well with nitrate levels in excess of EPA standards. In the Big Sioux basin at least 11 wells were found to have nitrate levels in excess of EPA standards, and in Hamlin and Brookings counties in the Big Sioux basin 27% of the wells tested exceeded the EPA limit for nitrates. Nitrate pollutants also have been found in Aurora and Brule counties. Of over 122 shallow wells tested in these counties, 46% had nitrate levels in excess of EPA standards. . . .
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> Surface impoundments are, in South Dakota, as in many western states, a serious existing and potential pollution problem. A survey conducted in 1980 identified at least 631 impoundment sites of which 50% were used for handling domestic and municipal sewage, 43% for impounding animal wastes, 4% for the disposal of oil brine, and 3.5% in power production, mining, and industry. (The majority—98%—of fluids impounded by volume were cooling waters from power plants. These waters generally have little groundwater pollution potential) . . . .
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> In several parts of the state there are existing or potential groundwater pollution problems due to septic tanks. There are an estimated 60,000 septic-tank systems in South Dakota. The Black Hills area is a potential septic-tank pollution problem area. In 1984 the Department of Water and Natural Resources noted "rapid development of the Black Hills is presently occurring in many areas . . . unsuitable for the placement of large numbers of closely spaced homes with individual sewage disposal systems."
>
> Mineralization is a serious groundwater quality problem in many parts of South Dakota. More than 67% of the public community water systems in the state have been found to have TDS levels in excess of the EPA limit of 500 mg/L, with 41% exceeding 1,000 mg/L and 13% exceeding 2,000 mg/L. In addition, 6% of the public community drinking water systems exceed EPA limits for sulfate, iron, and manganese, and 2% of the public systems exceed EPA limits for nitrates. A study prepared for the U.S. Army Corps of Engineers in 1984 examining groundwater quality in the eastern part of the state concluded, among other things:
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> Although adequate in terms of health, the water quality of many of the aquifers is often considered poor for aesthetic reasons (taste, staining, hardness, etc.). Most of the ground waters in eastern South Dakota are very hard and many of the aquifers appeared to have high iron and manganese levels. Many of these aquifers also have fairly high levels of parameters such as dissolved solids and sulfates.

Id. (citations omitted).

15. *See generally* John H. Davidson & Orlando E. Delogu, FEDERAL ENVIRONMENTAL REGULATION (1989).

16. *Id.* The Commerce Clause is the principle basis of this authority because pollution affects interstate commerce. Fed. Energy Regulatory Comm'n v. Mississippi, 456 U.S. 742, 759 (1982); Hodel v. Virginia Surface-Mining and Reclamation Ass'n, 452 U.S. 264, 282 (1981). The Commerce Clause also limits the ability of states to legislate in a way that unduly burdens or discriminates against the free movement of interstate commerce. Margaret Rosso Grossman, *Agriculture and the Environment in the United States,* 42 THE AMER. J. COMP. L. 291, 294 (Supp. 1994). The Supremacy Clause of the Constitution, U.S. CONST., art. VI, cl. 2., also serves to limit state regulation. *Id.* When state laws conflict directly with federal law or obstruct the federal purpose behind such laws, the state laws are invalid to the extent of the conflict. *Id.*

cised this authority, it has also reserved important roles for the states.[17] Most federal pollution control statutes require federal agencies to establish basic nationwide standards. These statutes allow states to establish their own programs for the implementation and enforcement of those standards.[18] States are regularly allowed to implement more demanding standards than the federal minimums. In addition, state laws which do not directly interfere with the operation of federal programs are valid. Thus, in any area of environmental protection, there are layers of law which much be considered. The layers of the law include: (1) federal statutes, (2) federal agency regulations implementing federal statutes, (3) state statutes authorizing state implementation of federal standards, (4) state statutes surpassing the limits of the federal program by creating additional substantive rules for environmental protection, and (5) state regulations and administrative law.

This article will not restate the requirements of the various federal statutes. Rather, this article assumes the availability of such information and proceeds directly into South Dakota state law. It is not possible to separate the law of water rights from the law of water quality protection; they are parts of one whole. This article begins, therefore, with an overview of state water rights law and leads into the related water quality laws.

II. SOUTH DAKOTA LAW OF WATER RIGHTS ALLOCATION

A. THE BASICS

South Dakota, like most western states, directly regulates groundwater through the allocation of water rights to economic uses.[19] All uses of groundwater and surface water are subject to direct state controls over allocation and use. This is relevant because groundwater and surface water are usually connected hydrologically. Allocation ("water rights") rules govern the withdrawal and consumption of groundwater and are an integral part of the law protecting groundwater quality.

The allocation of water rights is complicated by a number of factors. First, for largely historical reasons, the law of water rights treats groundwater and surface water as separate bodies. This distinction is scientifically erroneous, resulting in the development of artificial rules. Second, prudent management of groundwater requires an understanding of the rate of periodic aquifer recharge. In contrast to groundwater, it is easier to develop predictions for the availability of surface water supplies. Third, contamination of groundwater has the same effect as depletion of the supply.

17. *Id.*

18. If the state programs meet minimum federal requirements, the federal agency approves the program and the states have "primacy" in the area. However, the federal agency often retains a veto power over state programs.

19. More than 100 irrigation wells are drilled each year, and a much larger collection of wells are drilled to support industrial, municipal, livestock, and domestic activities. HIDDEN TREASURE, *supra* note 6.

Whereas faster-flowing surface water has the capacity to assimilate waste and purge pollution, groundwater does not respond to corrective measures. Fourth, it is difficult to identify those responsible for excessive depletion or contamination of groundwater. Finally, in most states, the legal system for allocating water rights has developed separately from the regulatory system for protecting water quality. Because the water rights systems are typically senior to the regulatory systems, water rights are often viewed as property rights.

South Dakota's system of water rights is complicated, and will only be highlighted here. South Dakota is among a middle tier which spans the hundredth meridian and contains, on the east, lands sufficiently humid to support dryland agriculture and, on the west, semi-arid and arid land. Because settlement moved from east to west, the settlers' first experience with water law was in a region of apparently adequate moisture. As a result, riparian law, which assumes humid conditions, was adopted. The adoption of riparian law was followed by the adoption of appropriation law, which assumes conditions of scarcity, as the western part of the state was settled. Consequently, South Dakota's early water law was the result of a combination of these legal concepts.

Riparian law, codified in 1866 by the territorial legislature, vested rights upon settlement of the land where the entryman had the intention of claiming the land.[20] Riparian rights were classified as real property rights and treated accordingly.[21] The law of prior appropriation also dates back to the early history of Dakota Territory. An 1881 enactment of the territorial legislature provided that controversies were to be determined on the basis of the date of appropriation.[22]

In 1907, the South Dakota Legislature declared that the riparian and appropriation systems existed simultaneously.[23] This declaration created much confusion and the South Dakota Legislature reacted by enacting a comprehensive water law which declared all state waters were public property, subject to appropriation by individuals.[24] In 1913, the South Dakota Supreme Court declared the 1907 law unconstitutional in that it deprived landowners of rights under the riparian doctrine.[25] However, the 1907 law remained in effect for water rights initiated by non-riparian appropriators. Due to these developments, it was possible to establish water rights under both the riparian and appropriation doctrine until 1955.[26]

The 1955 water law was a comprehensive revision of South Dakota's

20. 1866 Dakota Laws ch. 1, § 256; DAK. CIVIL CODE § 255 (1877).
21. St. Germain Ditch Irrigating Co. v. Hawthorn Ditch Co., 143 N.W. 124, 127 (1913).
22. 1881 Dakota Laws ch. 142, § 4.
23. 1907 S.D. Laws ch. 180, § 1.
24. *Id.* For the first time, this law also required application to a governmental entity for a permit to appropriate waters for beneficial use. *Id.* at § 19.
25. *St. Germain,* 143 N.W. at 127.
26. Platt v. Rapid City, 291 N.W. 600 (1940) (recognizing the co-existence of riparian and prior appropriation law).

water law and continues to provide a framework for the acquisition and administration of water rights in the state.[27] Through its enactment, the legislature sought to gain control over all state water resources so new uses could be initiated only as provided by statute.[28] The 1955 law provided for the recognition of riparian and groundwater rights based upon the actual use of water prior to 1955.[29]

The current process for initiating water rights is straightforward and the Division of Water Rights provides an application form with instructions.[30] Once the application is complete, the Water Management Board (WMB) holds a hearing at which all interested parties have an opportunity to be heard. Based upon its findings, the WMB may issue a permit specifying a construction completion date and a date for actual use of the water.[31] The priority date for the appropriation is the date of the filing, unless the applicant has failed to complete construction or apply the water to beneficial use within the period stipulated by the WMB. The application procedure for appropriating groundwater is identical to surface water appropriation, except for differences in the presentation of facts.[32] Domestic wells and domestic surface water uses do not require a permit. Such users may register with the Board in order to document the location and output of their domestic use.[33]

South Dakota is a "true preference" state, declaring by statute domestic uses take precedence over all other appropriative rights.[34] Thus, in times of shortage, domestic uses are entitled to water before other uses—regardless of priority dates. Consequently, the WMB has statutory author-

27. 1955 S.D. LAWS ch. 430, § 1. The 1955 law declares:

> [T]he people of the state have a paramount interest in the use of all the water in the state . . . [and] all water within the state is the property of the people of the state, but the right to the use of water may be acquired by appropriation as provided by law.

S.D.C.L. § 46-1-6(3) (Supp. 1994). Use of water is limited by "[b]eneficial use, any use of water within or outside the state that is reasonable and useful and beneficial to the appropriator," as well as consistent with the interests of the public and the best use of water supplies. *Id.*

28. S.D.C.L. § 46-1-3 (1987).

29. In 1964, the South Dakota Supreme Court rejected a challenge to the constitutionality of this legislation, holding the statute was a permissible exercise of the police power of the state. Knight v. Grimes, 127 N.W.2d 708, 714 (1964).

30. The application must declare the amount of water, the period(s) of annual use, whether there is unappropriated water available, and that the proposed appropriation is in the public interest. Publication is required. By statute, applicants have a right to appeal the denial of a permit. Permitting and administering water rights is the responsibility of the Water Management Board (WMB), which operates within the Department of Environment and Natural Resources (DENR). The WMB consists of seven members appointed by the governor for staggered four-year terms. S.D.C.L. § 1-40-15 (1992). No more than four members may be of the same political party and the Board must have members experienced in municipal government, irrigation, domestic water use, industrial use, and fish and wildlife. S.D.C.L. § 1-40-16 (1992).

31. If the construction is satisfactory, the WMB issues a certificate of construction and a new inspection occurs to determine the final appropriation quantity.

32. A similar process is used for transfers of water rights to new purposes or places of use. For the application procedure for appropriation, see S.D.C.L. § 46-2A-9, *infra* note 36 and accompanying text.

33. For purposes of the application process, the law does not distinguish between surface and groundwater. It is the practice of the WMB to consider groundwater as a tributary to surface water.

34. S.D.C.L. § 46-1-5 (1987).

ity to adopt rules controlling large capacity wells to ensure water for reasonable domestic use.[35]

B. THE PUBLIC INTEREST

South Dakota's appropriation permit statute declares:

> A permit to appropriate water may be issued only if there is reasonable probability that there is unappropriated water available for the applicant's proposed use, that the proposed diversion can be developed without unlawful impairment of existing rights and that the proposed use is a beneficial use *and in the public interest.*[36]

An applicant for a water right has the burden of establishing: (1) there is water available, (2) the proposed use will not interfere with existing uses, (3) the proposed use is "beneficial," and (4) the proposed use is in the public interest. The first three requirements reflect the classical elements of prior appropriation law. The fourth requirement raises issues pertinent to the preservation of groundwater quality. It could be construed as a restatement of the state's general police power to regulate property in the interest of the "health, safety, and public welfare." Conversely, the phrase could represent an independent requirement for a water right permit. Similar to the "beneficial use" requirement, it is subject to redefinition to reflect changes in relevant social factors.

Due to the public interest requirement, the State of South Dakota may deny a permit even though unappropriated water is available and existing vested rights will be unimpaired. The public interest requirement qualifies the right to appropriate water, and gives the WMB the power to determine whether a proposed water use meets the needs of a broader public interest. Thus, where a proposed water development may have a negative impact on the quality of ground or surface water, the public interest may require the balance of rights be struck in favor of water quality and the permit be denied.[37]

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35. For a discussion of the state regulations for large capacity wells, see *infra* notes 83-86 and accompanying text. Domestic use is defined as: (1) a use that does not "exceed[ ] eighteen gallons per minute on an average daily basis;" (2) used by an individual or household for "drinking, washing, sanitary and culinary purposes and other ordinary household purposes;" or (3) noncommercial irrigation of an area up to one acre; or (4) stock watering. S.D.C.L. § 46-1-6(7) (Supp. 1994). Confined animal feedlots are not domestic uses if they pump in the excess of the 18 gallons per minute. Use of groundwater by municipal systems is also a domestic use. *Id.* The state and its institutions are given a preference under state law. They are allowed to acquire and hold future uses in which their priority dates are retroactive to the time of initial filing. This operates as a preference because these institutions need not put the water to actual use in order to establish and hold a priority.

36. S.D.C.L. § 46-2A-9 (emphasis added).

37. *See generally* 1 WELLS A. HUTCHINS, WATER RIGHTS LAWS IN THE NINETEEN WESTERN STATES 403 (1971); Ronald B. Robie, *The Public Interest in Water Rights Administration,* 23 ROCKY MTN. MIN. L. INST. 917 (1977). At a minimum, it is appropriate for the WMB to consider evidence of possible pollution. In Fraser v. Water Rights Commission, the Supreme Court of South Dakota affirmed denial of a water permit on the ground the permit would be detrimental to the public interest. *Fraser v. Water Rights Comm'n of the Dep't of Natural Resource Dev.,* 294 N.W.2d 784, 789 (S.D. 1980). The fact that "public interest" is a consideration in a water right permit application, raises the issue of standing to represent "the public interest" before the WMB

C. Administrative Integration of Water Quality and Water Rights

In most states, administrative jurisdiction over water *rights* is separated from that of water *quality*. South Dakota, in contrast, has integrated environmental regulation with water rights regulation. Thus, the WMB considers both water quality and water rights permits. The federal Environmental Protection Agency (EPA) has delegated to South Dakota, the administration of the Clean Water Act's (CWA) National Pollution Discharge Elimination System (NPDES), or water pollution discharge permit system.[38]

III. STATE REGULATION OF GROUNDWATER CONTAMINATION

A. Potential Water Pollution Sources

Contamination of groundwater is the result of a variety of sources; therefore, the applicable law is diverse and uneven in its selection of targets. Some major sources of pollution, such as roadway deicers, are not regulated at all, while other less destructive sources are more closely regulated. Few rules exist that sufficiently cover the diverse factual situations which may occur. This section will describe the rules applicable to specific sources of potential contamination. Before those rules are described, some general information about these sources is offered.

It is best to start with the familiar and simple water well, a hole or shaft excavated in the earth. Wells are frequently drilled to bring groundwater to the surface and dispose of waste material underground.[39] Wells

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and the courts. Under traditional prior appropriation law, in the absence of a public interest standard, opponents of a proposed permit had to establish standing on the basis of direct economic harm. Normally, this means opponents hold existing water rights which would be affected by the proposed permit. Under the public interest standard, non-water right holders may also contest an application. Hardy v. Higginson, 849 P.2d 946, 950 (Idaho 1993) (citing Shokal v. Dunn, 707 P.2d 441 (1985)).

38. Similarly, the WMB has been delegated authority by the federal EPA under the Safe Drinking Water Act (SDWA) and several other federal regulatory laws.

39. Todd, *supra* note 2, at 164. The oil and gas industry provides a typical model of the use of drilled wells for waste disposal.

> The production of oil and gas is usually accompanied by substantial discharges of wastewater in the form of brine. Constituents of brine include sodium, calcium, ammonia, boron, chloride, sulfate, trace metals, and high total dissolved solids. In the past oil-field brine disposal was handled by discharge to streams or "evaporation ponds." In both instances brine-polluted aquifers became commonplace in oil production areas as the infiltrating water reached the underlying groundwater. Today, such disposal methods are prohibited by most regulatory agencies; however, regulation is often ineffective so that many brine-affected areas remain and will persist for years into the future. . . .
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> Oil and gas producers now inject most brines through wells into deep formations that are geologically isolated from overlying freshwater aquifers. Properly designed injection wells contain an injection tubing inside the casing to prevent ruptures and to facilitate the detection of leaks. Even so, brine disposal can cause pollution because surrounding abandoned and unplugged oil and gas wells and test holes provide vertical pathways for injected brines to rise into overlying aquifers.

Id. at 331 (citations omitted).

are also drilled for subsurface exploration, observation, and artificial recharge. Many existing wells are simply "dug" wells—holes worked in the ground until the water table is met. From these simple structures of ancient origin, sophisticated modern technologies capable of reaching deep into the earth and operating at high capacities have been developed.[40]

Poorly constructed or maintained wells can be sources of contamination. If not adequately sealed to prevent contamination from surface runoff, wells serve as a conduit by which pollutants reach the groundwater. This is especially true of wells located close to concentrated pollution, such as feedlots and septic systems.[41] In addition, as wells age, they deteriorate or are abandoned. Wells then represent a threat to groundwater as surface runoff and material from the soil travels down the old well holes. Although wells could be sealed to prevent this process, thousands of unsealed, abandoned wells exist across South Dakota.[42]

A related source of groundwater contamination is inter-aquifer leakage.

> When wells or testholes are drilled into deep aquifers, the confined waters within these aquifers can often seep into overlying aquifers. In many instances, the underlying deeper aquifers are often more mineralized (poorer water quality) and hence can degrade the water quality of the more shallow aquifers into which they may leak.[43]

Thus, a deteriorating deep well may be drawing both contaminants down from the surface and drawing up poorer quality water from deep sources. This double pollution threat is particularly likely when the deep aquifer is under artesian pressure which drives water up the abandoned well shaft.

Any time potential pollutants are concentrated on the land, there is a threat of groundwater contamination.[44] Concentrated disposal sites, such as those for hazardous or municipal waste, are objects of concern. In addition, mining activities, seepage from tailing ponds, runoff from waste piles, discharge of mine drainage into soil, surface waste, and injection wells may contaminate groundwater with acids, dissolved solids, radioactive materials, and metals.[45]

Any substance customarily broadcast upon the land represents a potential threat to groundwater supplies.[46] Due to agriculture being a primary industry of South Dakota, particular attention must be paid to the relationship between farming and groundwater quality.[47] There was a time

40. *Id.*

41. MICHAEL MEYER, A SUMMARY OF GROUNDWATER POLLUTION PROBLEMS IN SOUTH DAKOTA 4 (Office of Water Quality, S.D. Dep't of Water and Nat. Res. April 1986).

42. *Id.*

43. *Id.* at 11. *See also* TODD, *supra* note 2, at 337.

44. Specific examples include a septic field, which concentrates the waste from a household or small business; municipal sewage collection systems; and tanks and pipelines, holding or transporting oil, gas, chemicals, or wastes.

45. MEYER, *supra* note 41, at 12-13.

46. Liquid waste, farm chemicals, and road salt are representative threats of pollution.

47. MEYER, *supra* note 41, at 10.

when agriculture was thought of as a victim of pollution rather than as the causation. Unfortunately, this is no longer the case. Since agriculture began, farmers have taken advantage of technological and managerial progress to enhance production.[48] These advances have increased groundwater pollution.[49] With intensified cropping practices, soil fertility declined. As a response, synthetic nitrogen fertilizers, usually in the form of inorganic anhydrous ammonia, nitrogen solutions, or organic urea, were developed. Nitrogen, in the form of nitrate (NO_3), is currently the most common contaminant found in groundwater.[50] Nitrates attributable to commercial fertilizers have been found in groundwater in every agricultural region of the United States as well as in most other agriculturally-developed nations.[51]

Pesticides are another type of agricultural chemical associated with groundwater pollution. Of the hundreds of pesticide ingredients in active use, the majority are synthetic organic compounds. During the last thirty years, there has been a dramatic increase in the agricultural use of pesticides,[52] most of it attributable to the increased use of herbicides.[53]

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48. Irrigation, for example, allows the farmer to avoid crop losses which occur when rainfall is scarce. Where topsoil was depleted by the regular planting of fertility-demanding crops, such as corn or cotton, the farmer learned to rotate crops and to include nitrogen-producing crops such as soybeans and alfalfa in the farm cycle. Farmers also learned to plant rows of trees to protect soils from erosion caused by harsh seasonal winds.

Technological developments of the twentieth century offered farmers the opportunity for even more intensive management and greater production. The tractor displaced the horse as a source of farm power. This allowed a single farmer to till larger acreages and freed for production the pasture and hay lands previously required to maintain draft animals. In spite of the advances in mechanical tillage equipment, weeds continued to compete with crops for moisture and sunlight. The chemical industry responded with a range of herbicide products that killed unwanted weeds while leaving the valuable crops unharmed. Insects came under chemical control with the introduction of synthetic insecticides.

49. A large section of this farming and groundwater discussion is reprinted from AGR'L L. & POLICY INSTITUTE, FARMING AND GROUNDWATER 23 (1988). This information is reprinted with permission of the copyright holder.

50. Typically, more than half the nitrogen fertilizer applied to fields does not reach plants. Instead, it dissolves and runs into surface streams or groundwater. Nitrates move easily with water and are usually not removed by soil filtration. Although nitrates are also generated by livestock feedlots, septic systems, and municipal waste water treatment plants, it is the annual synthetic fertilizer application which has the most profound affect on groundwater. For further discussion of the problem presented by nitrates, see *infra* note 51 and accompanying text.

51. FARMING & GROUNDWATER, *supra* note 49, at 22-23. California, which uses more groundwater than any other state has reported significant increases. Iowa, the second largest consumer of nitrogen fertilizer, has concluded that nitrates in groundwater is a "pervasive problem." In southeastern Minnesota, 20-25% of the people reportedly use water that does not meet the relevant drinking water standards for nitrates. There is an inescapable correlation between the occurrence of nitrates in groundwater and the increased use of nitrogen fertilizers. Over one million tons of commercial nitrogen fertilizers are applied annually to fields in both Illinois and Iowa. In 1956, only 11% of corn acreage and 5% of cotton acreage were treated with herbicides. In 1982, the percentages were reported at 95% and 97% respectively. Approximately 1.08 billion pounds of pesticides were used in the United States in 1984. Virtually every economically significant crop utilizes pesticides during its growth cycle. Seventy-seven percent of all the pesticides used in the United States today are used in agriculture. *Id.* at 18.

52. Single crop farming requires a more intensified application of commercial fertilizers and pesticides. Farmers once grew a variety of crops in addition to keeping livestock. This helped reduce soil erosion, conserve water in the fields, and maintain high nitrogen levels in the soil. On a typical grain farm, fields would be planted with oats, alfalfa, corn, and soybeans as part of an annual rotation. Corn, which consumes large amounts of nitrogen and rapidly depletes soils, was

Generalizations about how pesticides and other chemicals reach groundwater are difficult to make. The difficulty arises not only due to sparse research in the field, but also because of the vast number of chemicals used and the great variety of geological formations in which groundwater is located.[54] Not only do chemical characteristics influence the movement of pesticides in groundwater, but so do the great range of soil and geologic characteristics.[55] The distance of groundwater from the surface is also an important factor. Many active rural water wells are only a few feet from the surface and are maintained as open holes in the ground. Chemicals will reach these shallow groundwater sources long before adsorption, vaporization, or biological breakdown occur. Openings in the earth which carry surface water directly into deep water formations present particularly troublesome opportunities for groundwater contamination. Changes in agricultural practices have facilitated the movement of agricultural chemicals into groundwater.[56]

Irrigation is another significant pollution source. When crops are irri-

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planted after alfalfa or soybeans, which increase the amount of soil nitrogen during their life cycle. The oats, straw, and alfalfa, although not particularly valuable in the cash market place, provided feed and bedding for livestock, and manure was returned to the fields as a natural source of nitrogen. The problem of weeds was reduced during years when oats and alfalfa were grown. Insect populations were discouraged when their host crops were regularly moved. Thus, crop rotation, combined with a livestock operation, tended to naturally lessen the demand for commercial fertilizer and pesticides. FARMING & GROUNDWATER, *supra* note 49, at 20-21.

53. *Id.* at 22-23.

54. Some organic substances have very low solubility in water, which retards movement of the chemical to groundwater. Others are quite soluble and migrate easily with water into underground formations. Chemicals with low solubility can be toxic at very low concentrations and thus remain a threat. Organic substances can be lost from soils by vaporization and diffusion into the air. When this occurs, the concentrations of the chemical available for movement into the groundwater are greatly reduced, but vaporization does not occur after the chemical reaches the water table. Thus, the more rapid the water movement, the less the chemical is vaporized. When most chemicals are spread on the land they undergo some degree of biochemical degradation. Some chemicals break down quickly, and others take a long time to break down. The more "resistant" (slow to break down in the environment) the chemical, the more likely it is to reach the groundwater. Adsorption, or surface adhesion, is the main mechanism that prevents many chemicals from migrating directly from the land into the groundwater. Some chemicals become tightly attached to soil particles and do not move easily in the soil. Less strongly adsorbed chemicals will move rapidly through the soil and into the groundwater. FARMING & GROUNDWATER, *supra* note 49, at 18, 20.

55. Porosity and permeability of the soil will determine the rates at which water moves through the soil. Sandy soils allow chemicals to move quickly and discourage adsorption, whereas finer textured soils such as clay hold water to a much slower rate of movement. Many insecticides are more likely to be adsorbed to clay and organic matter; hence, the presence of these materials in the soil will determine the rate of movement.

56. Several factors encouraged abandonment of the diverse, crop rotation farm. First, the type of farm operation just described is labor intensive, whereas specialized grain farming requires only seasonal mechanized planting and harvesting. Second, in recent years the market price for livestock, especially beef, has been a somewhat unreliable source of profit. Third, as with other professions there is a tendency to specialize; a farmer is increasingly either a crop farmer or a livestock grower. Whatever the reason, when a farmer quits raising livestock, the rotation usually becomes corn and soybeans only. This requires regular increases in the amount of chemical fertilizer and pesticides in order to control pests. The more extreme effect is the agricultural practice known as "continuous corn," which as the name suggests, is the planting of corn in the same field year-upon-year, resulting in an even larger demand for chemical fertilizer and heavy applications of herbicides and insecticides. FARMING & GROUNDWATER, *supra* note 49, at 21.

gated, only about one-third of the water reaches the plants and soils; the other two-thirds either evaporates or flows into surface or groundwater. Return flows, waters which return to the stream of irrigation, are from three to ten times more saline than the water applied.[57] Because irrigation saturates soils, irrigation return flows are accelerated in their downward movement.[58] Rapid increases in the use of chemigation, irrigation systems which distribute agricultural chemicals to crops through the irrigation water, pose additional threats to groundwater.

Animal wastes containing high concentrations of nitrogen also reach the groundwater.[59] Today it is a common agricultural practice to confine many thousands of cattle, hogs, or poultry in a single facility. This practice frequently overtakes the natural assimilative capacities of the surrounding land and water. Precipitation on these lots releases great concentrations of salts, organic compounds, bacteria, and nitrates into groundwater.[60]

Although pesticides are not currently as prevalent as nitrogen in groundwater monitoring reports, there is evidence pesticides are reaching groundwater in increasing amounts. The occurrence of pesticides from routine agricultural use has been noted in at least twenty-three states including New York, Wisconsin, Florida, Nebraska, Pennsylvania, South Dakota, Maryland, Ohio, and California.[61]

B. Regulating the Basic Domestic Well

When we think of the State's imposition of legal restrictions to protect groundwater, reference is typically to large activities such as municipal dumps, spills from bulk storage, or mismanaged industrial sites. The problem begins, however, with the small well. Thousands of small wells are drilled annually to meet the domestic and business needs of South

57. A large part of this increase in salts is due to "evapotranspiration": as water evaporates, the salts contained therein remain behind to concentrate in the return flows. The water also picks up the pesticides and fertilizers added to the land by the farmer.

58. *See generally* COMMITTEE ON IRRIGATION-INDUCED WATER QUALITY PROBLEMS, ET AL., IRRIGATION-INDUCED WATER QUALITY PROBLEMS (passim) (1989).

59. FARMING & GROUNDWATER, *supra* note 49, at 22. For example, one beef cow kept in a feed yard for the usual 120 to 150 days will generate one-half ton of dry-weight manure. Livestock in the United States generate about two billion tons of wet manure per year, which includes 7.7 million tons of nitrogen and 1.9 million tons of phosphates. Only about 20% of all this is used in crop production. *See generally* Martha L. Noble & J.W. Looney, *The Emerging Legal Framework for Animal Agricultural Waste Management in Arkansas,* 47 ARK. L. REV. 159, 164 (1994).

60. MEYER, *supra* note 41, at 7. This threat to groundwater is further aggravated by the recently developed practice of "lagooning," in which feedlot manures are channeled in liquid form to large holding and evaporation lagoons. *Id.* The purpose of this practice is to protect surface water, yet by placing concentrated nitrogen on the land, migration downward into the groundwater is facilitated.

61. FARMING & GROUNDWATER, *supra* note 49, at 23. A recent Minnesota study sampled over 500 wells in an agricultural region where groundwater was known to be susceptible to contamination. One or more pesticides were detected in 38% of the wells sampled. Fourteen compounds, including 11 herbicides and three insecticides were found. Geologists in Iowa reported similar findings of pesticides in susceptible aquifers "state wide." Although concentrations were low, the report concluded the frequency of positive findings and the number of compounds detected were "higher than anticipated." *Id.*

Dakotans.[62] Thousands more are abandoned each year, sometimes replaced by more modern wells or rural water systems which pipe treated municipal water to rural homes, farms, and businesses. In addition, thousands of wells are deteriorating and in need of maintenance. Some are simply primitive, as is the case with the "dug" well. The manner in which the state addresses the small well is basic to this article, as poorly constructed, poorly maintained, and abandoned wells are sources of groundwater contamination.

Three South Dakota statutes lay down the basic principles of water rights law. These statutes proclaim:

> It is hereby declared that the people of the state have a paramount interest in the use of all the water of the state and that the state shall determine what water of the state, surface and underground, can be converted to public use or controlled for public protection.[63]
>
> It is hereby declared that the protection of the public interest in the development of the water resources of the state is of vital concern to the people of the state and that the state shall determine in what way the water of the state, both surface and underground, should be developed for the greatest public benefit.[64]
>
> It is hereby declared that all water within the state is the property of the people of the state, but the right to the use of water may be acquired by appropriation as provided by law.[65]

All of these principles apply to groundwater.[66] Although the waters are owned[67] by the public, private entities may obtain permission to use the water. Permission to use public waters is guided by the principles of appropriation, including: (1) first come, first served;[68] (2) loss by nonuse; (3) adherence to the public interest; and (4) necessary application to a beneficial use.[69] The state determines how much water may be converted to public use and the way water will be developed for the greatest public benefit. With the exception of domestic uses, all proposed water appropriations require permits from the WMB.[70]

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62. HIDDEN TREASURE, *supra* note 6.
63. S.D.C.L. § 46-1-1 (1987).
64. S.D.C.L. § 46-1-2 (1987).
65. S.D.C.L. § 46-1-3 (1987).
66. S.D.C.L. § 46-6-3 (1987).
67. The "ownership" of water by a permitted water user is not similar to "ownership" of property as the word is commonly used and understood. The statutory language is clear: "[A] water right does not constitute absolute ownership of the water, but shall remain subject to the principle of beneficial use." S.D.C.L. § 46-5-5 (1987). The state holds the water in trust for the use and benefit of the public. Therefore, any person may apply the water for beneficial use. Such use, however, is subject to state regulation. Because changing societal preferences for water use are expressed in revised definitions of beneficial use, the water user's rights will be subject to such preferences.
68. S.D.C.L. § 46-6-3. Quantitative priorities between groundwater appropriators are determined on a first come, first served basis. S.D.C.L. § 46-5-7 (1987). For a discussion of the procedure for appropriating groundwater, see *infra* notes 71-82 and accompanying text.
69. Beneficial use is declared to be the "[b]asis, the measure and the limit of the right," to the use of South Dakota waters, and must be "[i]n the interest of the people and for the public welfare." S.D.C.L. § 46-1-4 (1987); S.D.C.L. § 46-1-8 (1987).
70. South Dakota law states: "[N]o person may appropriate the waters of this state for any

The significance of the domestic use characterization is two-fold. First, a domestic well need not apply for a permit to enjoy a valid appropriation. Second, a domestic use has the highest priority, taking precedence over all appropriative rights.[71] In a period of shortage there may be competition among appropriators for a limited supply of water. Normally, principles of appropriation law resolve such a dispute on a first come, first served basis. The statutory preference, however, assures domestic users will take first, provided the well is otherwise in accordance with technical legal requirements. However, it does not follow that domestic wells are unregulated. Domestic wells are subject to a comprehensive regulatory scheme.[72]

Although not required to have permits from the WMB, domestic users may register a domestic well with the WMB "[t]o document the location and output of their water supply and the quality of its water."[73] This voluntary registration must be: (1) on a form provided by the WMB, (2) accompanied by a water quality analysis,[74] and (3) accompanied by a well driller's[75] well construction report.[76] Only those domestic wells which sat-

purpose without first obtaining a permit to do so." S.D.C.L. § 46-1-15 (1987). When groundwater is used by a public water system solely to meet domestic needs, it is considered a domestic use. S.D.C.L. § 46-1-6(7).

71. S.D.C.L. § 46-1-5(1) (1987).

72. Although the water statute appears to protect smaller domestic wells from regulation by the WMB, closer examination discloses the WMB has extensive authority with which to respond to threats to groundwater quality presented by small or domestic wells. How this authority might be exercised will be a function of the underlying facts. For example, if a particular aquifer is being contaminated as a result of abandoned small wells, the WMB might establish a regulatory program addressing all wells overlying the particular aquifer.

73. S.D.C.L. § 46-5-8 (1987). Registration of domestic wells is recommended. Registration makes a record of the necessary information for the WMB to respond to any future assertions that larger, non-domestic wells are interfering with the domestic well's flow and therefore depriving it of its statutory preference. At the same time, by complying with well construction standards, the registrant satisfies most WMB requirements for non-domestic wells. Voluntary registration has the effect of placing the burden of proving non-interference upon well owners accused of interfering with a registered domestic well. If a well owner is accused of depriving a registered domestic well of its supply, the record establishes where the domestic well was constructed, the hydrologic and geologic formations in which it was drilled, the specifics of well construction, the nature of the supply produced, and other pertinent data. If the domestic well owner is asserting a deprivation of water quality, the registration documents will establish the quality of the supply produced at the time of registration.

74. S.D.C.L. § 34A-3A-18 states:

> Following completion of any new well for domestic use, a water quality sample shall be collected and submitted to the department of health laboratory or another laboratory approved by the department. If the well flows or if the well driller installs the pump, the well driller shall collect and submit the water quality sample. If the pump is not installed by the well driller, the owner shall collect and submit the water sample. The completed analysis shall be submitted to the department by the well driller or owner within thirty days after the submittal of the well completion report which is filed with the department pursuant to § 46-6-11. At a minimum, the water sample shall be analyzed for nitrate, coliform bacteria, sodium, conductivity and sulfate. Other contaminants may be analyzed for at the option of the well owner or driller. The owner or well driller shall pay for the cost of all analyses.

S.D.C.L. § 34A-3A-18 (1994).

75. Well drillers must be licensed by the WMB and meet all rule qualifications. S.D.C.L. § 46-6-9 (Supp. 1994). Among other requirements, well drillers must keep accurate records and deposit all driller's log and all well construction reports in a permanent public file. S.D. ADMIN. R. 74:02:01:42.02-.03 (1993).

isfy the WMB's well construction standards are allowed to register.[77]

In addition to its authority to receive voluntary registrations of domestic wells, the WMB has powers which are comprehensive in scope. The WMB regulations extend to cessation of use.[78] The WMB is also required to adopt rules addressing the rehabilitation and construction of wells, the prevention of underground leakage, and the control of abandoned artesian wells.[79]

Enforcement of the foregoing rules is by order of the WMB. The Chief Engineer or a citizen may institute an enforcement action before the WMB which then issues orders following an administrative hearing.[80] Although the statute is most frequently used to resolve controversies involving diminished water quantity, the Chief Engineer's authority extends to protection of groundwater quality as well. The Chief Engineer also has the authority to order users of wells, or surface water, to limit their use to protect existing uses from contamination.[81] The Chief Engineer may seek judicial enforcement of the WMB orders through temporary restraining orders or injunctions.[82]

C. Regulating the Large Capacity Well

State statute defines a large capacity well as a well capable of producing more than eighteen gallons per minute.[83] Simply put, the definition means the well is larger than those defined by statute as domestic.[84] All large capacity wells must have permits from the WMB.[85] In addition, such wells are subject to the full catalog of regulations described in the preceding section.[86]

The WMB is required to adopt rules controlling the location and capacity of large wells. These extensive rules focus on the spacing of large

76. S.D. Admin. R. 74:02:01:05.02 (1993). The WMB is required to adopt "minimum construction standards for all wells." *Id.*

77. *Id.* The applicable regulations for well construction standards fill 29 pages and cover many technical aspects of well construction. S.D. Admin. R. 74:02:04 (1993).

78. Any abandoned well "shall be plugged by its owner so that no leaking of its waters occurs underground or over the surface." S.D.C.L. § 46-6-18 (1987). Pursuant to this section, plugging is an obligation of all landowners. An abandoned well is defined to include any existing well replaced by a newer well when the owner has no plan to use the existing well. S.D.C.L. § 46-6-27 (Supp. 1994).

79. S.D.C.L. § 46-6-20 (Supp. 1994).

80. S.D.C.L. § 46-2-18; 34A-10-1 (Supp. 1994). The Chief Engineer may issue a direct order "[t]o shut off or limit . . . use of surface or groundwater, or to plug or otherwise control a well" when necessary to protect another user who has a higher right. S.D.C.L. § 46-2-18.

81. S.D.C.L. § 46-2-18.

82. S.D.C.L. § 46-2-17 (1987). Any violation of water rights rules are Class 2 misdemeanors and punishable by up to 30 days imprisonment and a $200 fine. S.D.C.L. § 22-6-2 (Supp. 1994). In addition, violations may be sanctioned with civil penalties of $500 per day of violation. S.D.C.L. § 46-1-11 (1987).

83. S.D.C.L. § 46-1-6(13). South Dakota water rights law defines this category of water well to assure the WMB takes all reasonable steps to protect domestic wells and prior appropriators from interference by larger wells.

84. S.D.C.L. § 46-1-6(7).

85. S.D.C.L. § 46-1-15.

86. *See supra* notes 62-82 and accompanying text.

capacity wells to protect domestic wells.[87] Specified protective measures limit aquifer drawdown, daily operating periods, and reduce withdrawal rates in accord with existing priorities of appropriation.

D. Regulating Irrigation Wells

Most large wells in South Dakota, used for the irrigation of crops, are subject to unique treatment under the state system of water rights. While the regulations applicable to domestic and large capacity wells also apply to irrigation wells, there are some special rules for irrigation wells which may be of significance when groundwater quality is a concern.

First, a maximum appropriation ("water duty") for irrigation is established by statute.[88] Second, if an applicant for an irrigation water permit intends to engage in chemigation,[89] he is subject to specific regulatory requirements.[90] Third, there are limits on the extent to which irrigation water rights may be transferred from one user to another. Although changes in water use are generally permissible, irrigation water in South Dakota becomes appurtenant to the land, and the rights to its use may not be transferred apart from the land.[91] Fourth, irrigation, as the term is used in South Dakota water law, refers to the application of water to growing crops and does not include the disposal of contaminated water on the land.[92] Such activities are regulated under other authority.[93]

Until 1994, a prerequisite to appropriation for irrigation was a soil-

87. S.D. Admin. R. 74:02:05:02-:03 (1993).

88. S.D.C.L. § 46-5-6 (1987). For each 70 acre block of land under irrigation, the water appropriation may not exceed a rate of "one cubic foot of water per second" or a total of "two acre-feet per acre." *Id.* The WMB has the discretion to increase the water duty in unique circumstances, and there is no water duty applicable to Missouri River waters. S.D.C.L. § 46-5-6.1 (1987).

89. Chemigation is defined at S.D.C.L. § 34A-2A-1(3) (1992).

90. S.D. Admin. R. 74:02:09:01-:16 (1993). The Chief Engineer must be notified prior to using chemigation. S.D. Admin. R. 74:02:09:02(1) (1993). Check valves or some other device, to ensure groundwater will not be contaminated, must also be installed. S.D. Admin. R. 74:02:09:02(2) (1993). The principal concern is that chemicals will be drawn down the well and contaminate the groundwater. Consequently, chemigators must keep records of dates of application and chemicals used. S.D. Admin. R. 74:02:09:02(3) (1993).

91. S.D.C.L. § 46-5-34 (1987). The general rule has one exception: if it becomes impractical to use all or part of the water beneficially or economically for irrigation, the right may be severed from the land without loss of priority. *Id.* "[I]rrigation rights may be transferred apart from the land to which they are appurtenant if they are transferred for domestic . . ." or municipal purposes. S.D.C.L. § 46-5-34.1 (Supp. 1994). The 1994 South Dakota Legislature added a requirement to the water statute that "[n]o land which has had an irrigation right transferred from it . . . may qualify for another irrigation right from any water source." 1994 S.D. Laws ch. 345 (amending S.D.C.L. § 46-5-34.1). This amendment is contrary to general principles of prior appropriation, which treat water as separate from land, allowing an appropriator to profit from an appreciation in the value of a water right. For example, an irrigator's water right might carry a very early date of appropriation and therefore be of great value to a municipal or rural water district in need of the protection derived from the early date. The irrigator, in contrast, may be in a position to accept the uncertainty associated with periodic drought and a recent appropriation date. There is no apparent reason why the irrigator should not be allowed to capture the difference.

92. S.D. Admin. R. 74:02:01:01(4) (1993).

93. *Id.* The regulation states: "Disposal of contaminated water is not considered to be irrigation unless other water is used along with the contaminated water." *Id.*

water compatibility permit issued by the South Dakota Department of Agriculture.[94] However, the Legislature, for undisclosed reasons, eliminated this statutory requirement.[95] All groundwater contains some natural minerals and chemicals. Left alone, these minerals and chemicals are normally benign. There is a possibility, however, that when water and soil are mixed, the resulting synergism will render the soils less productive. The soil-water compatibility requirement was an attempt to anticipate these unintended negative results.[96]

Fraser v. Water Rights Commission[97] was the only South Dakota Supreme Court decision to address the soil-water compatibility requirement. In *Fraser,* the soil-water laboratory report stated the water was "totally unfit" for irrigation as it would quickly degrade the soil quality "within ten years . . . to the point of little value as crop land."[98] Despite this, an irrigation permit was issued by the WMB.[99] The Supreme Court of South Dakota affirmed the circuit court's reversal of the WMB's action.[100] The court stated that the soil-water compatibility test was an essential step in the process of water right qualification and that a negative test was strong evidence the permit would be contrary to the public interest.[101]

94. S.D.C.L. § 46-5-6.2 (repealed by 1994 S.D. LAWS ch. 313, § 6).

95. 1994 S.D. LAWS ch. 313, § 6. Because the requirement may be reinstated by WMB rule and is of academic interest, it is discussed here. This permit requirement, the only one of its kind in the United States, protects soils and waters receiving run-off from crops and fields from the unintended effects of mixing soils and groundwater.

96. The administrative procedural context for soil-water compatibility applications was unusual. A person appropriating water for irrigation first submitted a water sample analyzed by a certified water quality laboratory, S.D. ADMIN. R. 12:08:01:05 (1989), and a soil sample analyzed by an approved soil laboratory. S.D. ADMIN. R. 12:08:01:05-:06 (1989). These were not necessarily the same laboratories. Water quality laboratories are certified by the EPA; soil laboratories are certified by the Department of Agriculture. Upon receipt of the analyses, the applicant sent a completed application to the Water Resources Institute at South Dakota State University in Brookings, South Dakota. The Institute made the initial recommendation, applying technical rules adopted by the Conservation Commission, a board located in the state Department of Agriculture. The Department of Agriculture then made a formal determination on whether the permit should be granted. S.D.C.L. § 46-5-6.5 (repealed by 1994 S.D. Laws ch. 313, § 6). A permit was denied if the project called for inadequate drainage. S.D. ADMIN. R. 12:08:04:04 (1989). If the applicant was dissatisfied, appeal lay to the Conservation Commission. Thus, the rules required one branch of an executive agency to review a decision made by another branch of the same agency—all as part of the process of preparing an application that was later considered by a different executive agency. Although a soil-water compatibility permit was a prerequisite to an application to appropriate water, the WMB had no authority to review the grant or denial of a soil-water compatibility permit. The Conservation Commission's decision was final and therefore subject to judicial review. S.D.C.L. § 1-26-30 and S.D.C.L. § 46-5-6.6 (repealed by 1994 S.D. Laws ch. 313, § 6). The soil-water compatibility permit accompanied an application for an irrigation water permit.

The Department of Agriculture, in determining whether to grant a permit, considered whether the land and water together would have long-term adverse effects on the soil or water. S.D.C.L. § 46-5-6.5 (repealed by 1994 S.D. LAWS ch. 313, § 6). Technical standards, expressed largely in terms of soil and water chemistry, were set forth in administrative regulations. Their focus was on electrical conductivity, sodium adsorption ratio, surface texture, and subsurface material. S.D. ADMIN. R. 12:08:04:01 (1989).

97. 294 N.W.2d 784 (S.D. 1980).

98. *Id.* at 785.

99. *Id.*

100. *Id.* at 789.

101. *Id.* at 788-89.

E. The Artesian Well under South Dakota Law

Artesian wells are known to hydrologists as wells dug into confined aquifers. Artesian wells "occur where groundwater is confined under pressure greater than atmospheric by overlying relatively impermeable strata."[102]

> In a well penetrating such an aquifer, the water level will rise above the bottom of the confining bed . . . . Water enters a confined aquifer in an area where the confining bed rises to the surface; where the confining bed ends underground, the aquifer becomes unconfined. A region supplying water to a confined aquifer is known as a *recharge area*. . . . Rises and falls of water in wells penetrating confined aquifers result primarily from changes in pressure rather than changes in storage volumes.[103]

One commentator describes artesian wells as follows:

> Artesian wells are flowing wells because the artesian water is contained under pressure between impervious strata or rock layers.
>
> An artesian aquifer is analogous to a city water system. It consists of a closed system in which one end is higher than the other. The raised end of the aquifer, or the water tower, creates pressure throughout the system. As long as there is no escape at the lower end, the water there will be under pressure. When a means of escape is provided, as when a well pierces the artesian aquifer or when a water tap is turned on, the pressure in the system forces the water out.[104]

Although artesian aquifers underlie most of South Dakota, artesian well-drilling has been most common in the artesian basin between the James and Missouri Rivers. The principal source of artesian flows is the Dakota sandstone, which comes to the surface in the Black Hills of western South Dakota and along the foothills of the Rocky Mountains, several hundred miles from most of the artesian wells and hundreds of feet higher up.[105]

Development of artesian wells in South Dakota is closely connected with Peter Norbeck, a former South Dakota governor. Norbeck accumulated fame and fortune after his development of a low-cost drilling system which made free-flowing artesian water available to the average farmer. Beginning his work in 1894, Norbeck had twenty-five well drilling rigs in operation in South Dakota by 1905, with extensive operations in surrounding states as well.[106] Development of the cheap artesian well hastened settlement in parts of South Dakota where lack of water had been a

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102. Todd, *supra* note 2, at 43.

103. *Id.* at 43-44.

104. Arthur L. Rusch, *South Dakota's Artesian Pressure—Should It Be A Protected Means of Diversion?*, 16 S.D. L. Rev. 481, 483-84 (1971).

105. Ellwood C. Perisho & S.S. Visher, The Geography of South Dakota 12 (1912).

106. Gilbert C. Fite, Peter Norbeck: Prairie Statesman 14, 18-23 (1948). In 1912, a geography of South Dakota described the town of Redfield as the home of the "greatest artesian well-drilling concern in the United States." Perisho & Visher, *supra* note 105, at 30.

hinderance to its development.[107]

The presence in the state of thousands of artesian wells, nearly a century after Norbeck began his drilling, presents a series of practical and legal issues. First, there is the legal issue of whether artesian pressure, or "head", is entitled to protection from the effects of subsequent groundwater appropriations. Artesian wells are not only a source of water, but also a means of delivery. Artesian pressure forces water to the surface.[108] Second, if allowed to flow freely, artesian wells present the potential for wasted water. Third, artesian wells present the threat of contamination by inter-aquifer leakage.[109] Fourth, the large number of abandoned artesian wells, arising from changes in land ownership patterns and availability of rural water systems, increases the chances of contaminants flowing downward into aquifers.

According to the early rule, the junior appropriator had a duty to protect existing artesian pressure, to maintain the same amount of water flowing as when the appropriation was first made.[110] This rule required some remaining unappropriated water to "maintain sufficient artesian pressure for existing wells."[111] In 1972, the legislature changed this rule.[112] First, it required the WMB to adopt rules controlling the location and capacity of irrigation, industrial, municipal, and other large capacity wells to protect reasonable domestic uses.[113] The WMB also established "minimum construction standards for all wells based upon the ability of a well to produce water independent of artesian pressure . . . ."[114] Thus, regulation of irrigation is no longer required to protect artesian pressure for domestic uses.[115]

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107. Gilbert C. Fite describes the effect of Norbeck's work thus:

> The cheap durable well developed by Norbeck had considerable influence on South Dakota's agricultural development. Many farmers, as well as townspeople, had begun to doubt the wisdom of expending large sums on artesian wells. Even though they were expensive, it was common for them to fail after a short period of operation. The situation was entirely changed, however, with the development of the small bore well, adequately cased, which would continue to flow over a long period of years. The smaller well was also more desirable because less water was wasted. Water now could be obtained in areas which otherwise could hardly have been inhabited because of an inadequate water supply.

FITE, *supra* note 106, at 19-20 (citation omitted).

108. This fact is of considerable economic importance since the well-owner is not then required to install and operate the deep, submersible pumps which would otherwise be required to lift the water to the surface. The problem is presented when a junior (in time) appropriator drills a well which reduces the amount of available pressure. In other words, the junior appropriator has not interfered with the *quantity* of water available, but has interfered with the *means of delivery.*

109. Artesian wells are often drilled through more shallow, purer glacial aquifers. As the artesian wells deteriorate over time, the pressure from the confined aquifer forces the lower quality artesian water out of the well casing and into the surrounding glacial aquifer.

110. William A. Garton, *South Dakota's System of Water Management and Its Relation To Land Use and Economic Development,* 21 S.D. L. REV. 1, 14 (1976).

111. *Id.*

112. *Id.*

113. S.D.C.L. § 46-6-6.1 (1987). The same required maintenance of artesian head pressure is not required for domestic wells.

114. S.D.C.L. § 46-6-6.1(2).

115. *Fraser,* 294 N.W.2d at 789.

However, the WMB's duties in this regard have not ceased. The South Dakota Supreme Court has stated the WMB does not have "unbridled power to approve irrigation projects without giving consideration to the maintenance of artesian head pressure as a method of delivery."[116] A permit cannot be granted if the board fails to consider the impact of the pumping on existing domestic artesian wells. The amended statute, according to the court, "requires a balancing of interests between irrigation and delivery of water by artesian pressure for domestic use."[117]

As a practical matter, domestic wells, artesian or otherwise, need to register if they want the WMB to protect them from large-capacity appropriators.[118] This applies to all new wells and by inference, also to wells being rehabilitated. The question remains whether existing unregistered artesian wells will be protected when their owners are faced with a loss of pressure due to new large-capacity wells in the area. These owners will have the right to appear before the WMB to oppose new permits or to ask the WMB for relief from a loss of pressure. Clearly, the WMB is required to consider the impact of the new wells on existing artesian pressure during the initial permit process. Beyond that, however, the WMB's discretion will likely be upheld.[119]

Lastly, artesian wells are subject to regulation to avoid waste and control abandoned wells. All abandoned wells must be plugged by their owners "so that no leaking of [their] waters occurs underground or over the surface."[120] The WMB has the authority to order the owner of a flowing large-capacity artesian well to cap the well to avoid waste.[121]

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116. *Id.*

117. *Id.* The court does not, however, provide any guidance as to how this balancing of interests is to be carried on, what factors should be considered, or what weight given each. It tells us only that reasonable domestic use must be assured, and "consideration" must be given to the continuance of artesian pressure as a means of delivery. *Id.* Beyond this, we know only that the result must be consistent with the public interest. The court has imposed a procedural duty on the WMB to consider artesian pressure but recognizes no substantive duty to protect such pressure.

The practical solution to conflicts between irrigation and domestic wells is found in well construction standards and well spacing. State statutes now require the WMB to adopt "[s]tandard[s] which will provide for lowering of a water lift mechanism to a depth near the bottom of the groundwater supply or, in artesian water to a substantial depth below the geological formation confining the groundwater . . . ." S.D.C.L. § 46-6-6.1(4) (Supp. 1994). The standard artesian well merely drives a pipe into the confined aquifer thus allowing pressure in the aquifer to drive water up the well to ground level. S.D. ADMIN. R. 74:02:04:20(12) (1993). A regulatory standard which requires a pump to be placed in the aquifer will not, in effect, protect new or newly rehabilitated artesian wells. S.D.C.L. § 46-6-6.1(4).

118. In order to register, the applicant must demonstrate the well has "been constructed in compliance with the adequate well requirements" of agency regulation. S.D. ADMIN. R. 74:02:01:05.02 (1993). An "adequate well" is defined at S.D. ADMIN. R. 74:02:04:20(6) (1993).

119. The better strategy for the existing well-owner is to ask the WMB to space any new wells so the existing wells and the new wells are accommodated. This middle position is advised because it is otherwise possible for the WMB to argue its minimum well construction standards are intended by the legislature to apply to all wells.

120. S.D.C.L. § 46-6-18.

121. S.D.C.L. § 46-6-14 (1987).

F. THE RULE OF NO-MINING

Typically, groundwater is pumped at a greater rate during the summer and fall, especially in areas practicing agricultural irrigation. During such periods, aquifer levels fall below normal. Ideally, aquifers will naturally recharge during the annual hydrologic cycle and return to their normal level before the next pumping season. However, aquifers are often times exploited at rates which exceed recharge capacity. Such pumping has the potential to lead to adverse conditions including: "(1) progressive reduction of the water resource; (2) development of uneconomic pumping conditions; (3) degradation of groundwater quality; (4) interference with prior water rights; or (5) land subsidence caused by lower groundwater levels."[122]

Groundwater managers refer to two concepts for calculating the potential yield of an aquifer.[123] The first concept is the mining yield, which occurs when "groundwater is withdrawn at a rate exceeding the recharge."[124] The second concept is perennial yield, which is "the rate at which water can be withdrawn perennially under specified operating conditions" without leading to adverse conditions.[125] The determination of perennial yield requires accurate predictions of future pumping costs and discount rates as well as detailed knowledge of the underground (and invisible) aquifer. The obvious complexity of calculating a safe perennial yield makes it a daunting task.[126]

South Dakota's approach is both bold and conservative; bold because it sets the State apart from its western cousins, and conservative because it places preservation of groundwater ahead of short-term exploitation. The statute reads:

> No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source. . . .[127]

The statute does not allow the WMB to grant a permit which will result in

122. TODD, *supra* note 2, at 363-64.

123. *Id.* at 363.

124. *Id.* Mining yield is limited in time and is likely to result in some of the adverse conditions just mentioned.

125. *Id.* Perennial yield is sometimes also referred to as "safe yield." In fact, the rate and extent to which underground supplies can be economically depleted, depends on accurate responses to questions as broad as the field of economics and the science of hydrology. Questions inevitably arise regarding the overall size of the aquifer, the physical effects withdrawal will have on the flow, the expense of securing the flow, and whether intrusion of mineralized water will occur. If the water which formerly recharged the aquifer is precluded from entering the aquifer on account of compaction, it must add to surface supplies which may be useful or harmful somewhere else.

126. *See* Jeff Masten, Current Issues in South Dakota Water Rights Litigation, *in* SOUTH DAKOTA WATER LAW 3-11, 3-13 (State Bar of S.D. Comm. on Continuing Legal Educ. eds., 1980). The apparent unreliability of the undertaking suggests it is not worthwhile. The implicit economic policy judgments required by the concept demands a conclusion which is not scientific.

127. S.D.C.L. § 46-6-3.1 (1987).

mining of groundwater aquifers. Recognizing the scientific uncertainty in every case to which the no-mining statute applies, the standard is that when it is "probable" mining will occur, no permit may be issued. This standard mandates the WMB err on the side of the no-mining rule.

G. "What the Heck Is the Greenhorn Formation?"

Two South Dakota statutes refer to groundwater formations "older than or stratigraphically lower than the greenhorn formation . . . ."[128] The first section carves an exception to the no-mining provision just described.[129] The second section holds that when two competing wells are pumping below the Greenhorn Formation, one a domestic or municipal well and the other a well for mine dewatering, the latter may not raise as a defense the fact the well of the former does not meet well construction standards.[130] This exception exists because of the established pattern of water use in the Dakota Formation. Until the recent development of rural water systems, the Dakota Formation was the only source of water for a significant area in rural South Dakota.[131] Thus, the no-mining rule applies mainly to the more shallow glacial aquifers of eastern South Dakota.

H. The Regulatory Devices for Protecting Groundwater: Some Available Approaches

There is no single regulatory approach to protecting groundwater. One approach is to declare groundwater generally off-limits to discharges of any type. Theoretically, this would assure the resource is not degraded, however, it would be difficult to implement. There are many ways around the rigid and close regulation this approach demands. A related approach would prohibit discharges in selected areas where particularly valuable groundwater resources are threatened. Such an approach would avoid the problems of over-regulation associated with a general prohibition by providing for areas in which some level of discharges can be tolerated.[132]

A modification of the total prohibition approach is taken by the federal CWA with regard to surface waters. The CWA places a total prohibi-

128. S.D.C.L. §§ 46-6-3.1; 46-6-24 (1987). The Greenhorn Formation underlies the larger part of South Dakota, exceptions being at the core of the Black Hills and in an area around Sioux Falls. It is a thin layer, perhaps averaging about 30 feet and is readily recognized by well drillers and scientists. It serves as a handy indicator because the principal aquifer below the Greenhorn is the Dakota Formation which has been widely developed for domestic and municipal use across the state. The Dakota Formation recharges very slowly and most wells drilled into it will result in a violation of the no-mining rule.

129. S.D.C.L. § 46-6-3.1.

130. S.D.C.L. § 46-6-24.

131. Senate Committee on Interior and Insular Affairs, 94th Cong., 1st Sess., Minerals and Water Resources of South Dakota 193-96 (Comm. Print 1975).

132. Implicit in any decision to provide special protection to one aquifer is a decision to tolerate pollution of other aquifers. By what measure is the decision made to protect one against the other? Is it a decision to protect immediate users over those who may make some presently unknowable future use elsewhere? How much contamination will be accepted in those aquifers not favored with special protection? Shall some aquifers be sacrificed to pollution?

tion on all discharges *unless* the discharger first acquires a five-year discharge permit.[133] The permit approach forces all potential dischargers to record their intent. It allows the state to maximize the removal of pollutants and to prohibit particularly hazardous chemicals. It also allows the discharger to phase-in pollution removal technologies over a period of time. Enforcement is feasible and efficient, as the terms of the permit are the only rules which must be observed in a given case.

Another possible regulatory approach is the exercise of control over especially threatening pollutants. When regulators decide a specific chemical is excessively hazardous, they may prohibit marketing and use altogether. In the alternative, they may elect to prohibit use of the particular chemical over vulnerable aquifers. Yet another approach is to generally tolerate discharges into the groundwater but restrict discharges which contaminate groundwater aquifers. This approach has historically not been very effective. It first requires the word "contamination" be defined in terms of level, or degree, and then attempts to determine the point at which a water resource has become so contaminated that regulatory intercession is justified. The last approach is to do nothing—inexpensive in the short-run but costly beyond measure in the long-run.

I. MEASURING GROUNDWATER CONTAMINATION: WATER QUALITY STANDARDS IN SOUTH DAKOTA

The federal CWA establishes three primary regulatory devices for controlling point sources of surface water pollution: (1) effluent limitations, (2) water quality standards (WQS), and (3) discharge permits. Effluent limitations are industry-specific standards which specify the maximum amount of pollutants allowed to enter water from point sources in a particular industrial category.[134] WQS are regulatory standards which address the level of pollution in the receiving body of water. WQS are established largely on the basis of the uses to be made of the particular body of water.[135] WQS establish minimum ambient standards for particular

133. This discharge permit may specifically authorize discharges but incorporates national technology-based effluent limitations and new source performance standards. Assimilative capacity of the receiving stream is not a feature of control. Instead, the technological feasibility of reducing pollutants in wastewater discharges becomes the norm, with questions of economic efficiency playing only a small role in decision making.

134. 33 U.S.C. § 1362(11) (1988). Effluent limitations are national uniform minima established to avoid competition among states and regions for location of industrial plants. 40 C.F.R. § 400 et seq. (1993) [hereinafter reference to 40 C.F.R. refers to the 1993 date, unless specifically noted otherwise]. Effluent limitations are enforced through discharge permits issued to individual polluters.

135. Niagara of Wisconsin Paper v. Wisconsin Dep't of Natural Resources, 268 N.W.2d 153, 163 (Wis. 1978). The Wisconsin Supreme Court addressed the definition this way:

> Effluent limitations and water quality standards are related, however significant differences exist between them. An effluent limitation is a measurement of pollutant discharge. It is measured at the source. A water quality standard is a measurement of the water itself and it does not focus on any single polluter but necessarily comprehends all discharges into a given body of water.

Id. The history of WQS was described by the Supreme Court of the United States as follows:

streams, rivers, and lakes.[136] Discharge permits are devices authorizing the discharge of pollutants within the limits established by effluent limitations and WQS.

Until 1972, federal water pollution control efforts focused on assisting states in developing and attaining WQS.[137] Although WQS were developed for most major surface water bodies, enforcement was difficult because individual sources of pollution could rarely be shown to be the "cause" of a WQS violation. Violations were the norm. Consequently, Congress adopted the Federal Water Pollution Control Act Amendments of 1972,[138] which gave primacy to the role of effluent limitations for point sources while preserving WQS as both a guide to the Act's water quality planning process, and also a tool for regulating point source discharges.

Neither effluent limitations nor WQS are enforceable against individual surface water point sources. They are implemented through the NPDES, a program which requires polluters of waters from a point source to obtain a permit.[139] The effluent limitations provide the key conditions for individual permits. The NPDES permit program is operated by either state or EPA offices.

WQS are carried forward into the CWA. Each state is required to divide water bodies into segments for CWA planning and implementation purposes. States must submit plans to the EPA and define target WQS for

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> Before it was amended in 1972, the Federal Water Pollution Control Act employed ambient water quality standards specifying the acceptable levels of pollution in a State's interstate navigable waters as the primary mechanism in its program for the control of water pollution. This program based on water quality standards, which were to serve both to guide performance by polluters and to trigger legal action to abate pollution, proved ineffective. The problems stemmed from the character of the standards themselves, which focused on the tolerable effects rather than the preventable causes of water pollution, from the awkwardly shared federal and state responsibility for promulgating such standards, and from the cumbrous enforcement procedures. These combined to make it very difficult to develop and enforce standards to govern the conduct of individual polluters.
>
> Some States developed water quality standards and plans to implement and enforce them, and some relied on discharge permit systems for enforcement. Others did not, and to strengthen the abatement system federal officials revived the Refuse Act of 1899, . . . which prohibits the discharge of any matter into the Nation's navigable waters except with a federal permit. Although this direct approach to water pollution abatement proved helpful, it also was deficient in several respects: The goal of the discharge permit conditions was to achieve water quality standards rather than to require individual polluters to minimize effluent discharge, the permit program was applied only to industrial polluters, some dischargers were required to obtain both federal and state permits, and federal permit authority was shared by two federal agencies.
>
> In 1972, prompted by the conclusion of the Senate Committee on Public Works that "the Federal water pollution control program . . . has been inadequate in every vital aspect," Congress enacted the Amendments, declaring "the national goal that the discharge of pollutants into the navigable waters be *eliminated* by 1985."

Envtl. Protection Agency v. California ex. rel. State Water Resources Control Bd., 426 U.S. 200, 202-05 (1976).

136. 33 U.S.C. § 1313(b) (1988).

137. Water Quality Act of 1965, Pub. L. No. 89-234, 79 Stat. 903, 905-07 (1965).

138. Pub. L. No. 92-500, 86 Stat. 816 (codified as amended at 33 U.S.C. §§ 1251-1376 (1988)).

139. 33 U.S.C. § 1342(1) (1988).

each identified segment.[140] States are required to designate uses for all water body segments. Typical uses include public water supplies, "warmwater permanent fish life propagation," wildlife propagation, stock watering, "coldwater marginal fish life propagation," commerce and industry, and immersion recreation.[141] States establish criteria necessary to protect water for its designated uses.[142] WQS developed for particular stream or lake segments vary with each designated use. Each state must identify areas failing to meet WQS, and establish total maximum daily pollutant loads that will comply with the applicable standards.[143] State WQS setting does not occur without supervision, nor do the states have unfettered discretion. The EPA is required to develop "criteria for water quality accurately reflecting the latest scientific knowledge."[144] States must submit their WQS to the EPA for determination of whether the WQS are "consistent with the applicable requirements" of the CWA.[145] The EPA can promulgate standards for a state if the state does not comply with the CWA or if it determines another standard is necessary to meet the requirements of the CWA.[146] States must review their surface WQS at least once every three years.[147]

South Dakota law mandates ambient WQS be established for groundwater. The WMB is required to establish rules for the "classification of all waters in accordance with their present and future beneficial uses."[148] The statute identifies factors to be considered in the development of WQS.[149] The factors, the result of political judgments made by an administrative board, help ensure certain goals will be attained by the WQS.[150] The selec-

140. 33 U.S.C. § 1313(a)(2) (1988).

141. S.D. ADMIN. R. 74:03:03:03 (1992).

142. 33 U.S.C. § 1312(a) (Supp. 1994).

143. 33 U.S.C. § 1313(d) (1988). For a discussion of WQS, see generally Natural Resources Defense Council v. United States Envtl. Protection Agency, 915 F.2d 1314, 1315 (9th Cir. 1990).

144. 33 U.S.C. § 1314(a)(1) (1988). The EPA's compilation of water quality is usually referred to as the "Red Book."

145. 33 U.S.C. § 1313(a)(3)(A)-(B) (1988).

146. 33 U.S.C. § 1313 (1988). According to EPA regulations, WQS "serve the purposes of the Act" if they meet the following definition:

> [WQS] should, wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water and take into consideration their use and value of public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, and agricultural, industrial, and other purposes, including navigation.

33 U.S.C. § 1313.

147. 33 U.S.C. § 1313(c)(1) (1988).

148. S.D.C.L. § 34A-2-10 (Supp. 1994). Beneficial use is defined at S.D.C.L. § 46-1-6(3). For a discussion of beneficial use and its similarity to public interest, see *supra* notes 67-69 and accompanying text.

149. S.D.C.L. § 34A-2-11 (Supp. 1994). Those factors include, environmental, social, economic, and existing use, along with existing degradation. This is not an exclusive list. These factors make clear that water quality standards are not intended to represent the exclusive views of science, nor do they contemplate groundwater quality will be maintained at the highest possible level. *Id.*

150. S.D.C.L. § 34A-2-11. The statute lists some goals of WQS including the protection of (1) public health and welfare; (2) public water supplies; (3) fish and wildlife; (4) recreation; and (5) "agricultural, industrial and other legitimate uses." *Id.*

tion of ambient standards is a political act simply phrased in the technical language of scientific measurement.

WQS appear in the state regulations as stable rules—inviolate lines in the sand.[151] Furthermore, the statutes appear to impose severe penalties for violating a standard.[152] Although the casual reader of state laws and regulations might conclude water quality standards are powerful enforcement tools, such a view is unrealistic. Water quality standards are merely planning tools, subject to changing circumstances, knowledge, and political change.[153] Nationwide, they are widely violated. Locally, they are readily adjusted to meet the needs of economic forces.[154] WQS serve only as a measuring rod by which regulators establish goals and measure setbacks.[155]

Other factors contribute to the definition of WQS as the weakling in the pollution prevention arsenal or, as it is often said, "the license to pollute."[156] For example, under WQS, mixing zones, areas of receiving water near the point of discharge to which the standards do not apply, are frequently allowed.[157] The rationale behind mixing zones is to give the pollutant a fair opportunity to be assimilated into the surrounding water. Variances from standards can also be had on a case-by-case basis, although the WMB must first conclude the violating discharge is "justifiable as a result of necessary economic or social development."[158]

Add to all of this the very substantial amount of prosecutorial discretion which the attorney general possesses, and the conclusion must be that WQS are not a strong enforcement tool. However, they do hold a place in the spotlight of South Dakota groundwater protection. The effectiveness of the WQS will be determined when the standards are written and adopted. If standards are set sufficiently high, there is a greater likelihood a higher norm will be sustained. If standards are set low, below the current ambient level of the receiving groundwater, the standards serve simply as a license to pollute. Thus, groundwater quality standards in South Dakota, in fact, postpone regulation to some unknown future date, providing little present protection.

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151. 2 WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW § 4.16, at 250-51 (1986).

152. A violation of a WQS is a Class 1 misdemeanor punishable by up to one year imprisonment or a $1,000 fine. S.D.C.L. § 22-6-2. Alternatively, a civil fine of $10,000 per day per violation may be imposed and the violator may be sued "for damages to the environment of this state." S.D.C.L. § 34A-2-75 (1992).

153. 2 RODGERS, *supra* note 151, § 4.16, at 250-51.

154. 2 *Id.*

155. WQS were never developed as enforcement tools; they are too vague to support reliable enforcement efforts. The standards merely established minimum ambient and use levels. When the ambient level drops below the minimum technical standard, it is extremely difficult to link individual pollution sources to the moment of violation. An alleged violator usually only needs a poker face and a convincing denial.

156. FARMING & GROUNDWATER, *supra* note 49, at 49.

157. S.D. ADMIN. R. 74:03:02:07 (1992).

158. S.D.C.L. § 34A-2-24 (1992).

J. Measuring Groundwater Quality: Drinking Water Standards

Drinking water standards are ambient regulatory standards which apply at the water tap rather than at the water source. They indirectly benefit groundwater resources because municipal water suppliers often find it more economical to protect an aquifer from contamination than to remove contaminants during the water treatment and purification in developing alternative supplies. The standards, expressed in terms of federal maximum contaminant levels,[159] identify a list of contaminants. These listed contaminants, if found in the drinking water, may have an adverse effect on the health of people. Health alone, however, does not govern the setting of these standards, for the amount of removal required during treatment is limited by feasibility.[160] South Dakota law forbids state drinking water standards to be more stringent than the federal standards[161] and authorizes a procedure for granting variances.[162]

K. Sole Source Aquifers

There are no designated sole source aquifers in South Dakota, although the applicable federal program provides an interesting vehicle for aquifer protection. The basic federal statutory provision is known as the Gonzalez Amendment to the Safe Drinking Water Act (SDWA).[163] Pursuant to the Act, petitions requesting an aquifer be designated as a sole source aquifer need not come from the state. Any individual, municipality, special district, non-profit organization, or other entity may initiate the application process.[164]

The effect of designation as a sole source aquifer may not be as beneficial as it first appears. As Professor Rodgers describes:

> With a designation in place, the obvious aim of the provision is to lay down a nondegradation regime to prevent "contamination" and a

159. 42 U.S.C. § 300g-1 (1988).

160. 42 U.S.C. § 300g-1(b)(4) (1988).

161. S.D.C.L. § 34A-3A-3 (1992).

162. S.D.C.L. § 34A-3A-5 (1992). South Dakota had assumed primary enforcement responsibility for the regulations established under SDWA prior to Congressional amendment of that Act. After amendment of the SDWA, South Dakota revised its approved primacy program relating to volatile organic chemicals and applied for primary enforcement authority. 48 Fed. Reg. 55173 (1983). Such authority was approved in 1990. 55 Fed. Reg. 40434 (1990). Further revisions in South Dakota's primacy program were approved by the EPA in 1992. 57 Fed. Reg. 48380, 48381 (1992).

163. 42 U.S.C. 300h-3(e) (1988). The Amendment states:

> If the Administrator [of the EPA] determines, on his own initiative *or upon petition,* that an area has an aquifer which is the sole or principal drinking water source for the area and which, *if contaminated, would create a significant hazard to public health,* he shall publish notice of that determination in the Federal Register. After the publication of any such notice, *no commitment for Federal financial assistance* (through a grant, contract, loan guarantee, or otherwise) may be entered into for any project which the Administrator determines may contaminate such aquifer through a recharge zone so as to create a significant hazard to public health . . . .

Id. (emphasis added).

164. 40 C.F.R. § 149.104.

> "significant hazard to public health." The means is to place the [EPA] Administrator in the role of a pre-clearance officer adjudging compatibility of a proposed project with drinking water objectives. The one glaring limitation . . . is that project leverage is expressed in terms of control over the purse strings alone . . . and not over direct federal action threatening the integrity of the aquifer. On the other hand, the federal government does nothing without somebody being paid, so there is at least an arguable case for interdicting any unsavory federal action creating the requisite "significant hazard."[165]

The designation prevents new injection wells in the aquifer unless a permit has first been issued.[166] Beyond that, there are no binding restrictions. It has been suggested that designation as a sole-source aquifer is not unlike the designation of an endangered species under the Endangered Species Act.[167] It is an acceptable designation until it interferes with some lucrative economic activity.

L. Outstanding Resource Waters and South Dakota's Nondegradation Policy

Nondegradation policy developed pursuant to the CWA regulation of surface waters.[168] The rule of antidegradation, promulgated in 1983, contains several qualified commands.[169] Included in these is a command that states "shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy . . . ."[170] The policy adopted by each state is to meet several minimum requirements.[171]

First, existing uses must be "maintained and protected."[172] Second, the regulation authorizes downgrading of high quality waters subject only to procedural protections.[173] There must also be findings the degradation is "necessary to accommodate important economic or social development

165. 2 Rodgers, *supra* note 151, § 4.8, at 116 (citations omitted).

166. 42 U.S.C. § 300h-3(a)(1).

167. 2 Rodgers, *supra* note 151, § 4.8, at 117.

168. The origin of the nondegradation policy is in a regulatory agency rather than Congress. However, Congress did make passing reference to the policy when revising the CWA in 1987. For the current embodiment of the nondegradation policy, see 33 U.S.C. 1313(d)(4)(B).

169. 40 C.F.R. § 131.12.

170. 40 C.F.R. § 131.12(a).

171. *Id.*

172. 40 C.F.R. § 131.12(a)(1). Recall the WQS breakdown of two components—use and technical criteria (specific physical parameters). By limiting the nondegradation policy to use categories, the EPA regulation authorizes some degradation of previously pure surface water, so long as waters are not degraded into a lower use category.

173. 40 C.F.R. § 131.12(a)(2). So long as the "fishable-swimmable" goal is maintained, degradation within the use category will be tolerated, subject to additional restrictions. The "fishable-swimmable" goal is described as follows:

> Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, . . . that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. . . .

Id.

in the area . . . ."[174] Third, a special protection category is established for what are described as "outstanding national resource" waters.[175] Even for outstanding national resource waters, some degradation is tolerated if the overall water quality is "maintained and protected."[176]

South Dakota, by WMB rule, has established an "outstanding resource waters" designation, as required by federal regulations.[177] Although this provision is published in the chapter of administrative rules entitled "Surface Water Quality Standards," the regulation refers specifically to "waters of the state" which expressly includes groundwater.[178] Assuming the specific language of the regulation supersedes the chapter title, it follows that the WMB has determined to extend its nondegradation policy to encompass both ground and surface waters. By so doing, the WMB also allows designation of groundwater aquifers as "outstanding resource waters," a sensible move considering the economic and social importance of groundwater to the state.

The state's nondegradation policy requires the maintenance of existing superior water quality levels above the prescribed minimum levels.[179] Once again, the critical distinction in WQS is between use categories and criteria categories which establish specific physical parameters. In many cases, considerable contamination occurs before a particular water is no longer able to support its designated use. Nonetheless, the rule clearly establishes no water may be allowed to drop below its current use category.

M. Wellhead Area Protection Programs

The federal SDWA mandates that the governor of each state "shall" adopt and submit to the EPA a state program to protect wellhead areas from "contaminants which may have any adverse effect on the health of persons."[180] The required elements focus on the delineation of wellhead areas in need of protection and the development of a methodology for implementing some level of voluntary control.[181] The federal statute does not

174. 40 C.F.R. § 131.12(a)(2). All new and existing point sources must achieve "the highest statutory and regulatory requirements." *Id.*

175. Outstanding national resource waters have been described in the following way: "Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected." 40 C.F.R. § 131.12(a)(3).

176. *Id.*

177. S.D. Admin. R. 74:03:02:54 (1992). The regulation states:

> [W]aters of the state in which the existing water quality is better than the minimum levels prescribed by the designated beneficial use shall be maintained and protected at that higher quality level. Waters of the state that are of high quality or are of exceptional recreational or ecological significance may be designated by the [WMB] as outstanding resource waters. The existing high quality of waters so designated shall be protected and maintained.

Id.

178. S.D.C.L. § 34A-2-2(12) (Supp. 1994).

179. S.D. Admin. R. 74:03:02:54 (1992).

180. 42 U.S.C. § 300h-7(a). The Act also lists the essential elements to be included in a state's program.

181. 42 U.S.C. § 300h-7(a)(1)-(4). A wellhead protection area is defined as: "[t]he surface

give the EPA a veto power over state programs, nor has the EPA issued regulations governing the program. However, the EPA may insist upon the statutory minima. South Dakota statutes require the Department of Environment and Natural Resources (DENR) to develop a "voluntary wellhead protection program which will specify" six categories of guidelines.[182]

Nearly every municipality in the state has invested heavily in municipal well fields and drinking water treatment technologies. These same municipalities are now required to satisfy "at the tap" drinking water standards. Prudence rather than regulatory threat dictates they take steps to protect their well fields from contamination. The cost of abandoning existing fields, and of developing alternative sources, presents an economic threat no responsible municipal government can ignore. The state's wellhead protection program is simply a nudge down a path most municipalities should have been traveling since investing money in wells and treatment facilities.

The most effective tools for protecting well fields from contamination, zoning and related land use controls, were delegated to towns and cities during the 1920's. Zoning of land overlying an aquifer recharge area limits harmful activity without requiring land acquisition by towns and cities. Because the federal statute leaves enforcement to the states, enforcement efforts are elusive at best. South Dakota has passed the task on to the local governments sponsoring wellhead protection programs.[183]

N. General Groundwater Discharge Permit Program (GDP)

1. Introduction

A quick examination of the South Dakota environmental statutes, which will be looked at in greater detail later in this article, establishes legislative authority for the allowance of diverse permits to discharge pollutants into the environment. Permits are required for discharges into surface waters, some wastewater treatment plants, and construction of domestic, agricultural, industrial, and waste disposal wells. Bulk storage[184] of most chemicals is subject to regulatory approval, as are new outlets of

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and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield." 42 U.S.C. § 300h-7(e).

182. S.D.C.L. § 34A-3A-17 (1992). Although the word "guideline" is not defined, it is certainly not an administrative rule or binding instruction. The DENR has published a document entitled "South Dakota Wellhead Protection Program" which touts in a subheading that it has "EPA Approval: September 1992." Dep't of Env't and Natural Resources, Div. of Envtl. Regulation, Ground-Water Quality Program, South Dakota Wellhead Protection Program (1992). In essence, the program encourages municipalities to develop a wellhead program. The DENR document describes the establishment of priorities among the municipal wells to aid in the selection of six to eight systems it will "assist" annually in the development of a protection program.

183. The DENR states: "The local WHP plan must clearly designate enforcement responsibility through techniques such as permits, licenses, fines, management plans, inspections, compliance reports, and groundwater monitoring." *Id.* at 25.

184. S.D.C.L. § 34A-2-2.

any kind into waters of the state. Feedlots, hazardous waste disposal sites and sewage sludge are also subject to permit requirements. Some legislative authorization of permit programs use the mandatory "shall" and others the discretionary "may." When an activity is proposed that may cause a pollutant to reach groundwater, it is not a simple task to identify which permits are required.[185]

Although other permits may be required for a project, a developer must always consider whether it is necessary to apply for a GDP, the "catch-all" groundwater protection permit created by rule of the WMB. The GDP program draws its authority from two statutory provisions. One authorizes the DENR to operate a permit program for the discharge of wastes into the groundwater "upon condition that" all state WQS "and all other requirements of this chapter" are satisfied.[186] A second requires a permit from the WMB before construction may begin on any project disposing of wastes into groundwater.[187] The general statutory prohibition supporting the GDP program states: "No person may cause pollution of any waters of the state, or place or cause to be placed any wastes in a location where they are likely to cause pollution of any waters of the state."[188]

2. *What Is Being Permitted?*

A permit is required for any project that discharges waste or pollutants[189] "that may move directly *or indirectly* into groundwater."[190] This definition nearly states that any activity placing any material on the ground, which upon entry into the groundwater might cause a violation of groundwater quality standards, must apply for a permit. The regulation potentially applies to activities such as "land application of wastes, waste storage pits, waste storage piles, landfills and dumps, feedlots, and mining and mill-

185. Unfortunately, this writing cannot clarify the matter entirely because the South Dakota Administrative Rules themselves offer scant guidance.

186. S.D.C.L. § 34A-2-36.1 (1992).

187. S.D.C.L. § 34A-2-27 (1992).

188. S.D.C.L. § 34A-2-21 (1992). S.D.C.L. § 34A-2-22 states: "No person may discharge any wastes into any waters of the state which reduce the quality of such waters below the water quality level existing on March 27, 1973." S.D.C.L. § 34A-2-22 (1992).

189. A "Pollutant" is defined as:

> [D]redged spoil, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal, or agricultural waste discharged into *waters of the state.*

S.D. ADMIN. R. 74:03:16:01(18) (1992) (emphasis added). "Waters of the state" are defined as:

> [A]ll waters within the jurisdiction of this state, including all streams, lakes, ponds, impounding reservoirs, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, situated wholly or partly within or bordering upon the state . . . .

S.D.C.L. § 34A-2-2(12). "Wastes" are defined as: "sewage, industrial wastes, pollutants and all other liquid, gaseous, solid, radioactive, or other substances which may pollute or tend to pollute any waters of the state . . . ." S.D.C.L. § 34A-2-2(11).

190. S.D. ADMIN. R. 74:03:16:02 (1992) (emphasis added).

ing operations."[191] This list of inclusions is pared-down considerably, however, by the impressive list of exemptions from the permit requirement.[192]

A particular problem with the GDP program is that the rules fail to disclose whether this permit will satisfy all DENR permit requirements for a specific project.[193] Similarly, South Dakota's Regulated Substances Discharges Act[194] requires all discharges of regulated substances[195] to have a permit.[196] Will the GDP permit suffice, or will several permits be required? Although only raised here, this question is of considerable practical significance because application requirements vary considerably from one permit to another, as do the tactical advantages and disadvantages of obtaining a permit.

3. *What Is Not Being Permitted—The Roster of Exemptions*

The authors of the GDP created many exemptions from the list of regulated parties. In fact, they were bold to the point of stretching their legislative authority. A first exemption is "[e]ffluent or leachate[197] which has been demonstrated to conform to" groundwater quality standards.[198] If the groundwater quality standards are established at a level below current ambient levels, this exemption becomes a sweeping license to contaminate the groundwater free of regulatory oversight.[199] Irrigation for revegetation of surface mines is also exempted unless the water comes from a waste disposal system.[200] The reason for this qualification may be because the mined earth will contain pollutants which can move downward with the irrigation water.

Another exemption is "[l]eachate which results from the direct natural infiltration of precipitation through any area of land affected by mining or milling operations, unless the secretary determines that the leachate may result in pollution of" groundwater.[201] Leachate which conforms to groundwater quality standards has already been exempted from regulation.[202] Now, leachate resulting from rain or snow at a mine or mill is also

191. *Id.*

192. S.D. ADMIN. R. 74:03:16:05. The specific exemptions include underground injection wells, septics, and wastewater treatment and disposal facilities. The existence of this list suggests any activity not specifically exempted is subject to other permit requirements.

193. Take, for example, landfills, where solid wastes are buried. State law requires landfills first have a permit from the Board of Minerals and the Environment (BME), a separate board housed in the DENR, and that protection of water quality shall be a principal concern of the permitting process. S.D.C.L. § 34A-6-1.4 (1992). The GDP program specifies it applies to landfills and dumps.

194. S.D.C.L. § 34A-12.

195. "Regulated Substance" is defined at S.D.C.L. § 34A-12-1(8) (Supp. 1994).

196. S.D.C.L. § 34A-12-8 (1992).

197. Leachate is defined as "water that has percolated through solid waste or soils containing dissolved soluble substances and certain amounts of these substances in solution . . . ." S.D. ADMIN. R. 74:03:16:01(11) (1992).

198. S.D. ADMIN. R. 74:03:16:04(1) (1992).

199. For further discussion of water quality standards, see *supra* notes 134-58.

200. S.D. ADMIN. R. 74:03:16:04(2) (1992).

201. *Id.* at :04(6).

202. *Id.* at :04(1).

exempted. The rule appears to say that when leachate moves into the groundwater, because of rain or snow, it is not a discharge of a pollutant for purposes of the permit requirement. Because rain and snow drive most mine and mill materials toward the groundwater, this exemption is very broad.

Leachate, resulting entirely from the "direct natural infiltration of precipitation through undisturbed materials," is also exempted.[203] Here again, the key is the definition of leachate.[204] Most often, leachate is defined as polluted water. Interpreted this way, this exemption seems to apply to waters polluted as a result of percolation through solid waste or soluble substances now moving toward the groundwater with rain or snow.[205] Given its plain meaning, this appears to be a very broad exemption as well.

4. The Substantive Standard for Issuance

The substantive standard, applied at the point of decision, is expressly defined in most permitting statutes. The GDP rule takes a modified approach and establishes separate standards for issue for conditional permits, final permits, disapproval of permits, and termination of existing permits. The WMB may issue a conditional permit if the "ambient groundwater quality will not be degraded or a water quality variance permit can be issued . . . ."[206] The first part of this standard, which contributes to its misunderstanding, is not based on compliance with WQS as required of final permits. Instead, the standard is that "ambient groundwater quality will not be degraded."[207] Since the activity for which a permit is sought is the discharge of pollutants, it is obvious ambient groundwater *will* be degraded. Consequently, this condition cannot be met. Disapproval of a permit application occurs when the WMB concludes a breach of groundwater quality standards is inevitable, in the absence of a variance.[208] Approval of the WMB may occur if it is determined "the discharge meets or will meet all applicable state water quality standards."[209]

The WMB may terminate a permit or deny a renewal if "the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by plan modification or termination."[210] Noncompliance with any condition of the approved plan is also grounds for termination.[211] The rule, however, does not expressly state that non-com-

203. S.D. ADMIN. R. 74:03:16:04(8) (1992).
204. *Id.* at :01(11).
205. Read this way, the exemption is in conflict with S.D.C.L. § 34A-2-21 which directly prohibits the placement of wastes in a location where they are likely to cause pollution of any waters of the state.
206. S.D. ADMIN. R. 74:03:16:09(2) (1992). Ambient groundwater is defined at S.D. ADMIN. R. 74:03:16:01(2) (1992).
207. S.D. ADMIN. R. 74:03:16:09(2).
208. *Id.* at :10(2) (1992).
209. *Id.* at :13 (1992).
210. S.D. ADMIN. R. 74:03:16:15(3) (1992).
211. S.D. ADMIN. R. 74:03:16:15(1) (1992).

pliance with all WQS is grounds for termination. Consequently, WQS conformance must be made an express condition of the permit itself. If it is not, the standard for denial then becomes an endangerment of human health, and therefore an elusive enforcement standard.

5. The POP Variance—A Mixing Zone By Any Other Name . . .

The perimeter of operational pollution (POP),[212] or mixing zone, is central to the GDP program. The idea is that for each GDP application, the WMB will decide upon the appropriate POP and issue a water quality variance for waters within the POP.[213] This should be where the "natural attenuation of contaminants to environmentally acceptable levels"[214] will hopefully occur.[215] A "compliance monitoring point,"[216] the point at which groundwater must be in compliance with WQS, is located somewhere on an outer edge of the POP.

The POP approach is essential if reliance on WQS is the measure in a pollution containment system. However, the POP program demonstrates the shortcomings of WQS as applied to groundwater. In surface water, flowing water has an assimilative capacity. Because flowing water is visible, it can be measured and observed in detail. In contrast, groundwater is deep in the ground and its rate and direction of flow are often matters of conjecture. Groundwaters usually flow very slowly and, because they are isolated from the atmosphere, have very limited assimilative capacities. In addition, observers require many observation points (and a great deal of money) to understand particular groundwater flows.[217]

POP mixing zones are capable of swallowing-up WQS by covering a large share of a stream or aquifer.[218] If a number of POPs exist in an aquifer, then they, rather than WQS, establish the norm. As GDP rules place an affirmative obligation on the applicant to describe its POP, it is in the applicant's best interest to describe the largest possible POP when compliance with WQS will not be expected. If there are other operators in the area, each shielded by their own POPs, widespread degradation can occur with enforcement becoming impossible as a practical matter. In this way,

212. S.D. ADMIN. R. 74:03:16:01(16) (1992). The POP is defined as a "three-dimensional section of geologic materials surrounding the point of application of discharge within which groundwater quality degradation is permitted to occur . . . ." *Id.*

213. S.D. ADMIN. R. 74:03:16:16 (1992).

214. *Id.*

215. 2 RODGERS, *supra* note 151, § 4.16, at 257. Rodgers wrote:

> Another popular way to tame the water quality standards is with the concept of a "mixing zone." The key here is to acknowledge that any pollution standard is inseparable from the means of measurement; the reputation for beauty is enhanced by never showing the bad side. A mixing zone is a water segment in the vicinity of a discharge where standards are suspended to allow the effluent to become assimilated by the watercourse.

Id.

216. S.D. ADMIN. R. 74:03:16:01(4) (1992).

217. Imagine requiring all knowledge about a discharge into a surface stream to be based upon one or two samples; basically that is how we monitor groundwater and determine assimilative capacity.

218. 2 RODGERS, *supra* note 151, § 4.16, at 257.

the contamination of an entire formation is feasible—even though all dischargers are in compliance with the GDP rules.

A good understanding of the POP requires acknowledgement that the POP is as much a political judgment as it is a conclusion based on science or technology. These rules place an affirmative obligation on the applicant to include in the application "justification of necessary economic or social development for the POP . . . ."[219] This, and the language in the POP definition which tells us a POP is an area in which "degradation" is permitted, is the language of political compromise, not of aquifer protection.[220] The justification for considering economic factors in POP variance applications is questionable because the WMB is already required to consider economic factors while adopting groundwater quality standards.[221] This becomes a double variance opportunity which strongly favors economic development over water quality protection.

6. GDP Enforcement

Enforcement is not directly addressed in the GDP rules. However, the statute states "[a] violation of a condition of a permit . . . is subject to § 34A-2-75,"[222] which imposes criminal penalties and civil fines of up to $10,000 per day per violation. The violator is also liable for "damages to the environment of this state."[223] Since groundwater is owned by the people of the State, unlicensed degradation is "damage[ ] to the environment of this State," allowing a court to order site remediation.[224]

O. Septics, Cesspools, and Other "On Site Wastewater Systems"

Environmental control over the last two decades has focused on large pollution sources such as industrial plants and municipal wastewater treatment plants. This focus is justified as the necessary selection of a priority. However, significant water pollution will continue so long as the millions of smaller pollution sources, each contributing their relatively modest increment to the larger problem, remain uncontrolled. An example of big pollution by small increments is that of septic tanks and cesspools (known to the regulatory community as "on-site wastewater systems") which are generally thought to represent the "[m]ost numerous and widely distributed po-

219. S.D. Admin. R. 74:03:16:06(8) (1992).

220. Perhaps the real question in a GDP application is the size of the variance to be awarded. One possible source for the origin of the "economic or social development" language is S.D.C.L. § 34A-2-24. That statute authorizes the WMB to allow discharges which reduce the quality of water below that existing in 1973, if it is affirmatively demonstrated that the discharge is "justifiable as a result of necessary economic or social development." *Id.* The same provision specifies, however, that the allowed discharge may not violate existing standards. *Id.*

221. S.D.C.L. § 34A-2-11.

222. S.D.C.L. § 34A-2-36.1.

223. S.D.C.L. § 34A-2-75.

224. *Id.*

tential sources of groundwater pollution."[225] Three principal problems presented by septic systems are: (1) liquid waste that is filtered through the septic field and returned to the groundwater, lakes, or rivers; (2) disposal of the septic sludge pumped from individual tanks;[226] and (3) placement of septic systems near wells, lakes, sloughs, and other water sources presenting other run-off problems.[227]

No direct discharge of domestic waste into surface or groundwaters is permitted in South Dakota. However, it is not uncommon for rural homeowners to pipe their domestic sewage directly into ditches, sloughs, creeks, or other surface waters.[228] Others either pipe directly into roads and ditches leading to another water body, or discharge into a field tile system which surfaces some distance away. Such methods of disposal violate both federal and state law.[229] Under state law, all wastewater must pass through a treatment system before being released.[230]

All septic systems installed after 1975 are required to comply with detailed construction and performance standards.[231] The standards apply to all systems, for no system is allowed to contribute to groundwater pollution, allow wastewater to surface, cause a violation of water quality standards, or present a threat to the public health.[232] All systems are subject to inspection.[233] Those in the business of installing and repairing septics must be certified by the DENR,[234] and housing developers are subject to a minimum lot size rule when septics are used.[235] The rules also impose on developers an absolute preference for municipal wastewater systems. Septics may not be used if a municipal system is available.[236] In addition, wells

225. TODD, *supra* note 2, at 335. In 1980, there were an estimated 22 million septic systems serving one-third of the nation's population, contributing the single largest source of wastewater discharged directly into the groundwater. RUTH PATRICK ET AL., GROUNDWATER CONTAMINATION IN THE UNITED STATES 61 (2d ed. 1987). In 1980, there were an estimated 77,000 septic systems, cesspools, and outhouses in South Dakota. MYERS, *supra* note 41, at 8. Such systems are most common in rural areas but are also found in housing developments at the fringe of towns and at recreation areas.

226. *Id.*

227. *Id.*

228. Sharon Schmickle, *Despite Laws, Wastes Foul the Minnesota,* MINNEAPOLIS STAR TRIBUNE, June 6, 1993, at 01A.

229. Direct releases are point sources under the CWA and require a NPDES permit. 40 C.F.R. § 122.2. *See also* S.D. ADMIN. R. 74:03:01:39 (1992) stating: "No person may install, construct, or operate a wastewater treatment or disposal system or any other system for the treatment or disposal of human excreta which does not meet the requirements of this chapter." S.D. ADMIN. R. 74:03:01:45 ("Wastewater shall pass through a septic tank, sedimentation tank, or aerobic system prior to discharge to an absorption system.").

230. *Id.*

231. S.D. ADMIN. R. 74:03:01:40 (1992). Septic systems which satisfy the technical construction standards are exempted from the State's groundwater discharge permit program, but a septic system that is failing due to noncompliance with construction standards will come within the enforcement jurisdiction of the GDP. S.D. ADMIN. R. 74:03:16:05 (1992).

232. S.D. ADMIN. R. 74:03:01:39 (1992).

233. S.D.C.L. § 34A-2-46; S.D. ADMIN. R. 73:03:01:79 (1992).

234. S.D.C.L. § 34A-2-108 (1992).

235. S.D. ADMIN. R. 74:03:01:53 (1992).

236. S.D. ADMIN. R. 74:03:01:44 (1992).

must be a specified distance from septic systems.[237]

Both the WMB and the Secretary of the DENR have enforcement powers. The Secretary can issue administrative orders requiring clean-up or seek judicial injunction.[238] Any person or entity can report violations to the WMB. The WMB then requires the Secretary to investigate and make a report, based upon which it may take action.[239] Monitoring of septics usually occurs at the point of certifying installers. The potential for pollution of groundwater from these sources remains great.

A far more intriguing set of legal questions arise with the disposal of sludge gathered from the thousands of individual tanks. Most owners of septic systems periodically employ an independent contractor to pump out the accumulated sludge. The load, however, cannot be dumped into a surface water, or into any draw, road ditch, or other conveyance which leads to "waters of the United States."[240] The CWA further prohibits the discharge of "pollutants," including sewage sludge, without a NPDES permit.[241] The load also cannot be injected into underground formations as it is "fluid" under the well injection program.[242] The load similarly represents a "contaminant" for purposes of the emergency provisions of the SDWA.[243] It can be turned over to a publicly-owned treatment work for treatment, if the driver can find a plant willing to accept it.[244] In every case, this is the preferred solution.[245]

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237. S.D. ADMIN. R. 74:02:04:24 (1992).

238. S.D.C.L. §§ 34A-2-48 (Supp. 1994), -68, -73.

239. S.D.C.L. § 34A-2-47 (1992). Violations are Class 1 misdemeanors and can be punished by jail and a criminal or a civil fine up to $10,000. S.D.C.L. § 34A-2-75.

240. 40 C.F.R. § 122.2. This definition also includes "wetlands." *See also* 33 U.S.C. § 1362(7).

241. 33 U.S.C. § 1362(6); 40 C.F.R. § 122.2.

242. 40 C.F.R. § 144.3. However, according to S.D.C.L. § 34A-2-36.1, the Secretary may issue a permit allowing for such discharge.

243. The emergency provisions are found at 42 U.S.C. § 300(i).

244. 33 U.S.C. § 1317(b) (1988); S.D. ADMIN. R. 74:03:01:78(3) (1992).

245. If the load will not enter any United States waters, an outcome that can almost never be assured, then the CWA does not seem to apply. *But see* Concerned Area Residents for the Environment v. Southview Farm, 34 F.3d 114 (2d Cir. 1994). Consequently, the WMB is required to issue rules "to establish requirements for proper disposal of sewage sludge." S.D.C.L. § 34A-2-123 (1992). A load of septage can possibly be buried. If it is a "solid waste," it must be buried in a sanitary landfill. The Resource, Conservation and Recovery Act's (RCRA) definition of solid waste excludes "solid or dissolved material in domestic sewage," and disposal by burial is an option. 42 U.S.C. § 6903(27) (1988). The administrative rule authorizing burial requires "all possibility of pollution from entering any well, water-bearing strata, or surface water supply" be eliminated. S.D. ADMIN. R. 74:03:01:78(1) (1992). S.D.C.L. § 34A-6-1.4 states:

> No provision of §§ 34A-6-1.1 to 34A-6-1.38, inclusive, may be construed so as to prohibit a farmer or rancher from disposing of solid waste from normal farming operations or ordinary domestic activities upon his own land provided such disposal does not create a nuisance or a hazard to public health, does not violate a local ordinance, will not unlawfully pollute ground or surface waters or does not violate chapter 34A-1 or 34A-2 or the water or air pollution control laws of the United States.

It is important to note that S.D. ADMIN. R. 74:03:01:78 cites 34A-2 as its authority, and thus preempts the language just quoted.

P. UNDERGROUND INJECTION WELLS: CLASSIFICATION AND REGULATION

The federal SDWA imposes controls over specific categories of underground waste injection. The EPA is required to issue regulations for state underground injection control (UIC) programs.[246] Each state must demonstrate to the EPA it has adopted and will implement a satisfactory UIC program and will comply with EPA recordkeeping and reporting requirements.[247] If there is EPA approval, a state achieves primacy for permitting and enforcement.

The UIC program is not comprehensive in scope. It is limited to the prohibition of underground injection[248] which "endangers drinking water sources."[249] The regulations only aim at public water system supplies and then only if contaminants may lead to the system's lack of compliance with national primary drinking water regulation. Contamination of groundwater by injection is tolerated if, in the judgment of regulators, the contaminated supply cannot reasonably be expected to serve a public water system.[250] Rural aquifers servicing individual ranches and farms are, therefore, not within the regulatory framework.[251] The standards adopted as groundwater quality criteria for the UIC programs are primary drinking water regulations[252] based upon health considerations, cost factors, and technological feasibility.[253] As a result, some aquifers may be exempted

246. 42 U.S.C. § 300h(a)(1), (b)(1).

247. 42 U.S.C. § 300h-1(b)(1)(A) requires states to adopt UIC programs. If state programs are not approved by the EPA, the federal agency will adopt UIC regulations for the state. 40 C.F.R. § 145.21(d).

248. Underground injection entails "the subsurface emplacement of fluids by well injection." 42 U.S.C. § 300h(d)(1).

249. Such endangerment exists, in the words of the statute:

> If such injection may result in the presence in underground water which supplies or can reasonably be expected to supply any public water system of any contaminant, and if the presence of such contaminant may result in such system's not complying with any national primary drinking water regulation or may otherwise adversely affect the health of persons.

42 U.S.C. § 300h(d)(2). Contaminant is defined as "any physical, chemical, biological, or radiological substance or matter in water." 40 C.F.R. § 144.3.

250. A "public water system" is defined as one piping water for human use, if it has either 15 or more service connections or serves at least 25 individuals on a regular basis. 42 U.S.C. § 300f(4).

251. Even where the contamination will reach an aquifer servicing a public water system, the injection may be allowed if the system can achieve ambient drinking water regulations. Recall that such regulations apply *at the tap* rather than at the source. It follows that if a contaminant can be removed at a system's treatment facility, it will meet the statutory requirements.

252. 40 C.F.R. § 144.12.

253. *Id.* In addition to these judgment-laden criteria the UIC program allows for the full exemption of an aquifer if:

> (a) It does not currently serve as a source of drinking water; and
>
> (b) It cannot now and will not in the future serve as a source of drinking water because:
>
> (1) . . .
>
> (2) It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical;
>
> (3) It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption . . . .

40 C.F.R. § 146.4.

from protection or used as waste repositories.

Even where states have primary responsibility for UIC programs, the EPA retains authority to enforce program requirements by civil, criminal, or direct administrative action.[254] In addition, the EPA may initiate "imminent and substantial endangerment" actions in appropriate cases.[255]

The federal EPA has elected to regulate underground injection wells based upon the type of fluid injected and the aquifer into which it is injected. Five classes of wells exist, with each class having different requirements for construction, operation, and monitoring.[256] If a proposed well meets the regulatory description of one of these classes, a permit is required. Predictably, the greater degree of regulation applies to hazardous wastes. The EPA delegates UIC program authority to states on a class-by-class basis. As a result, it is typical to find the EPA enforcing the UIC program as to certain well classes, with the states enforcing the remainder. This is the situation in South Dakota.

In South Dakota, the general problem of parallel operation of state GDP and UIC programs exists.[257] Because state administrative rules specifically exempt only certain classes of underground injection wells from the GDP program, it must be assumed the intent of the rule-makers was to include those not specified. Because the GDP program claims authority to impose standards higher than those in the UIC program, an exemption from the one does not suggest an automatic exclusion from the other.

1. *Class I Wells.* A Class I well is a well used to inject hazardous waste or other industrial and municipal fluids beneath "the lowermost formation containing, within one-quarter mile of the well bore, an underground source of drinking water."[258] There is a close connection between the Resource, Conservation and Recovery Act's (RCRA) hazardous waste disposal program and the Class I UIC program. An underground injection well injecting hazardous waste constitutes a land disposal facility requiring a RCRA permit.[259] However, by regulation, a Class I well has a RCRA permit if the owner or operator has an underground injection well permit and is in compliance with UIC Class I standards.[260]

2. *Class II Wells.* Wastewater ("produced water") in the oil and gas industries include waters that percolate through the rock formation with

254. 42 U.S.C. § 300h-2.

255. *See supra* notes 211-12.

256. 40 C.F.R. § 144.1(g). The five classes of wells are found at 40 C.F.R. § 144.6.

257. Although the GDP program exempts Class I, IV, and V wells if they have a UIC permit, several questions remain. S.D. ADMIN. R. 74:03:16:05 (1992). First, do Class II and III wells also require GDP permits? Second, do wells which escape regulation under SDWA, such as those which pump into an exempt ("throw-away") aquifer, or those that are found not to endanger public water supply systems, nonetheless require a GDP permit? The tentative answer to both questions is affirmative.

258. 40 C.F.R. § 144.6(a); S.D. ADMIN. R. 74:03:12:01 (1992).

259. 42 U.S.C. § 6924(r) (1988).

260. 40 C.F.R. § 270.60(b). Substantive standards for Class I wells are detailed in federal regulation. 40 C.F.R. §§ 144.60-144.70, 146.11-146.15, and 146.61-146.73. The Class I well program is administered by the federal EPA. 40 C.F.R. § 147.2101.

the oil and are extracted through the well. The most common method of dealing with this byproduct is reinjection into the ground, a process which provides the definition of Class II underground injection wells.[261] Such wells are exempt from RCRA until the EPA determines that hazardous waste rules should apply and Congress authorizes rule-making on the subject.[262] It is somewhat easier for states to achieve primacy over Class II programs,[263] and South Dakota administers its own program.[264] The permit-granting authority is the Board of Minerals and the Environment (BME).[265]

3. *Class III Wells.* This designation applies to solution or in situ mining, a process by which a solution is injected into an ore body, usually uranium.[266] The solution dissolves the uranium, and the uranium-bearing solution is brought to the surface through a separate pipe.[267] UIC permits are required for this class of wells.[268] Although the WMB has promulgated rules for a Class III program, it has not yet been approved by the federal EPA.[269]

4. *Class IV Wells.* This designation applies to underground injection wells which dispose of hazardous waste into a groundwater formation which contains an underground source of drinking water within or above one-quarter mile of the well.[270] As the result of a 1984 amendment to RCRA, Class IV wells are further restricted.[271]

5. *Class V Wells.* These wells are distinguished from Classes I, II, and III because they are not directly regulated under the SDWA and are not subject to technical design and operation requirements.[272] This is despite the fact the category includes some serious sources of groundwater pollution. Regulations define Class V wells, by exclusion, as any well that does not fall into the first four categories, and includes a long list of examples.[273] Federal regulations require an owner or operator of any Class V well to

261. 40 C.F.R. § 144.6(b). The definition also includes injection wells used for recovery of oil and gas.

262. 42 U.S.C. § 6921(a)-(b)(1) (1988).

263. 42 U.S.C. § 300h-4.

264. 40 C.F.R. § 147.2100; S.D. ADMIN. R. 74:10:09 (1987).

265. S.D.C.L. § 45-9-13 (Supp. 1994).

266. 40 C.F.R. § 146.5(c).

267. ROCKY MOUNTAIN MINERAL LAW FOUNDATION, 5 AMER. L. MINING § 177.01[2] (2d ed.) (1992).

268. The substantive permit requirements are at 40 C.F.R. § 146.31 et seq..

269. 40 C.F.R. § 147.2101. As of 1980, 15% of all domestic uranium mining was by the insite mining process. ROCKY MOUNTAIN MINERAL LAW FOUNDATION, *supra* note 267, at § 177.01[2].

270. 40 C.F.R. §§ 144.6(d); 146.5(d).

271. 42 U.S.C. § 6939b(a) (Supp. 1993). For a discussion of the RCRA land-ban, see *infra* notes 314-26.

272. 2 RODGERS, *supra* note 151, § 4.20A at 84-85.

273. 40 C.F.R. § 146.5(e) states:

> *Class V.* Injection wells not included in Class I, II, III, or IV. Class V wells include:
>
> (1) Air conditioning return flow wells used to return to the supply aquifer the water used for heating or cooling in a heat pump;
>
> (2) Cesspools including multiple dwelling, community or regional cesspools, or other devices that receive wastes which have an open bottom and sometimes have perforated sides. The UIC requirements do not apply to single family residential cesspools nor

notify the director of the DENR of the well's existence, location, nature, type, and operating status.[274] The state must then assess the resulting pool of information and develop specific recommendations for the most appropriate "regulatory" approaches and remedial actions.[275] Under South Dakota law because Class V wells are groundwater discharges, they are required to have a GDP permit.[276] Hence, the reporting required by federal regulation parallels the first stage in the application for a GDP permit.[277] South Dakota's GDP regulations exempt underground injection Class II and III wells.[278] Class I and IV wells are the province of federal law. This leaves Class V wells subject to the GDP requirement that any discharge "that may move directly or indirectly into groundwater" must apply for a permit.[279]

Q. Underground Storage Tanks (USTs)

The federal RCRA requires regulation of underground storage tanks to protect against loss of their contents to surface and groundwater. Using RCRA as its statutory authority for the program, the federal EPA has promulgated extensive regulations which detail its minimum requirements.[280] South Dakota's program for regulating USTs has been approved

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to non-residential cesspools which receive solely sanitary wastes and have the capacity to serve fewer than 20 persons a day.

(3) Cooling water return flow wells used to inject water previously used for cooling;

(4) Drainage wells used to drain surface fluid, primarily storm runoff, into a subsurface formation;

(5) Dry wells used for the injection of wastes into a subsurface formation;

(6) Recharge wells used to replenish the water in an aquifer;

(7) Salt water intrusion barrier wells used to inject water into a fresh water aquifer to prevent the intrusion of salt water into the fresh water;

(8) Sand backfill and other backfill wells used to inject a mixture of water and sand, mill tailings or other solids into mined out portions of subsurface mines whether what is injected is a radioactive waste or not.

(9) Septic system wells used to inject the waste or effluent from a multiple dwelling, business establishment, community or regional business establishment septic tank. The UIC requirements do not apply to single family residential septic system wells, nor to non-residential septic system wells which are used solely for the disposal of sanitary waste and have the capacity to serve fewer than 20 persons a day.

(10) Subsidence control wells (not used for the purpose of oil or natural gas production) used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with the overdraft of fresh water;

(11) Radioactive waste disposal well other than Class IV;

(12) Injection wells associated with the recovery of geothermal energy for heating, aquaculture and production of electric power.

(13) Wells used for solution mining of conventional mines such as stopes leaching;

(14) Wells used to inject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts;

(15) Injection wells used in experimental technologies.

(16) Injection wells used for in situ recovery of lignite, coal, tar sands, and oil shale.

40 C.F.R. § 146.5(e).

274. 40 C.F.R. §§ 146.52(a); 144.26(a).

275. 40 C.F.R. § 146.52(a)(4).

276. S.D. Admin. R. 74:03:16:04(9) (1992).

277. There are some exceptions, such as septic tanks, recognized by the GDP rules.

278. S.D. Admin. R. 74:03:16:04(9) (1992).

279. *Id.* at :02. For a list of Class V examples, see *supra* note 273.

280. 40 C.F.R. § 280.

by the EPA.[281]

The federal definition of a UST[282] is fully incorporated into South Dakota statutory law.[283] The key elements are that ten percent or more of the tank resides beneath the surface of the ground,[284] and the tank contain "regulated substances." Ten specific exclusions are described in the statute,[285] most of which are facilities regulated under other programs or the servicing of individual residences. Tanks serving farms are excluded from regulation if their capacity is less than 1100 gallons and they contain motor fuel not held for resale.[286]

A "regulated substance" includes petroleum in all of its forms.[287] South Dakota's statute also lists hazardous substances specified by the federal "Superfund" law.[288] But it does not include hazardous wastes regulated under Subtitle C of RCRA,[289] which are addressed under the hazardous waste program.[290] The practical assumption is that a non-waste chemical substance held in a UST is subject to reporting and regulation requirements. This assumption is recommended because South Dakota has enacted a Regulated Substances Discharges Act[291] which supplements UST, hazardous waste, and other related regulation. Although the definition of a "regulated substance" is broader[292] under that act than under the

281. Although the state has primacy for regulation and enforcement, both federal and state law continue to apply.

282. 40 C.F.R. § 280.12.

283. S.D.C.L. § 34A-2-98 (1992).

284. The 10% figure is a designation of "hidden-leaking potential." 4 RODGERS, *supra* note 151, § 7.17 at 183.

285. S.D.C.L. § 34A-2-98(5). The exclusions from the definition are:

(a) A farm or residential tank with a capacity of one thousand one hundred gallons or less used for storing motor fuel for noncommercial purposes;

(b) A tank used for storing heating oil for consumptive use on the premises where stored;

(c) A septic tank;

(d) A pipeline facility, including gathering lines, regulated under the Natural Gas Pipeline Safety Act of 1968, the Hazardous Liquid Pipeline Safety Act of 1979 or a pipeline which is an intrastate pipeline facility regulated under state laws comparable to the provisions of law referred to above;

(e) A surface impoundment, pit, pond or lagoon;

(f) A storm water or wastewater collection system;

(g) A flow-through process tank;

(h) A liquid trap or associated gathering lines directly related to oil or gas production and gathering operations;

(i) A storage tank situated in an underground area such as a basement, cellar, mineworking, drift, shaft or tunnel if the storage tank is situated upon or above the surface of the floor; and

(j) Any pipes connected to any tank which is described in subsections (a) to (i), inclusive, of this subdivision.

S.D.C.L. § 34A-2-98(5).

286. 40 C.F.R. § 280.12.

287. S.D. ADMIN. R. 74:03:28:01(36), (41) (1992).

288. The federal Superfund law is the common name for the Comprehensive Environmental Response, Compensation, and Liability Act, (CERCLA). 42 U.S.C. §§ 9601-9675.

289. S.D. ADMIN. R. 74:03:28:01(41) (1992).

290. A complete list of all hazardous substances is found at 40 C.F.R. § 302.4 (1994).

291. S.D.C.L. ch. 34A-12 (1992).

292. S.D.C.L. § 34A-12-1(8) (1992).

UST statute, the reporting requirements are similar.

Knowledge of a spill or possible spill imposes a duty to act on an owner or operator.[293] Stoppage of the release, cleanup, and remediation are required, as is an investigation to determine whether the regulated substance is still being discharged. If additional material is located, that situation must also be corrected. All subsequent corrective actions are subject to review and prior approval by the DENR.[294]

The UST regulations are comprehensive. The regulations include general operating requirements, design, and construction standards for new USTs. The regulations detail standards for release detection systems for all USTs, including existing tanks.[295] Extensive recordkeeping is also required.[296] Permanent closure of a UST must be preceded by notice to the DENR. The site must be assessed for pollution and the tank either removed from the ground or filled with an inert material.[297]

Where there has been a discharge from a UST, the DENR is under a duty to investigate and identify the party responsible for the cleanup.[298] With discharges of regulated substances (other than oil) from a UST, the person who caused the discharge is strictly liable for the cost of clean-up.[299] In the case of petroleum spills, responsible parties who comply with clean-up plans may be eligible for reimbursement from the Petroleum Release Compensation Fund.[300] As with other state statutes which prohibit discharges into waters of the state, there exists an array of enforcement tools.[301] The DENR has authority to make inspections,[302] issue emergency[303] and administrative orders,[304] and seek injunctive relief.[305]

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293. Spills, overfills, or any suspected loss of a regulated substance from a UST must be reported to the DENR along with all specific testing, monitoring, and related information. Additionally, reporting is required if any evidence suggests the possibility of a spill or tank leak. S.D. ADMIN. R. 74:03:28:15-:15.01 (1992). For example, state regulations require reporting of "[e]rratic behavior of product dispensing equipment, the sudden loss of product from the UST system, an unexplained presence of water in the tank . . ." or the presence of the substance or even unusual vapors of unknown origin. S.D. ADMIN. R. 74:03:28:15(2) (1992). Any evidence that the substance may be outside the tank must be reported. If the substance is a hazardous substance, a report must also be submitted to the federal National Response Center.

294. S.D. ADMIN. R. 74:03:28:18 (1992).

295. S.D. ADMIN. R. 74:03:28:10 (1992). The owner or operator is obliged to inspect the tank for release at least once every 30 days. S.D. ADMIN. R. 74:03:28:10(1)(d) (1992). In addition, the regulations detail what each inspection must encompass.

296. S.D. ADMIN. R. 74:03:28:09, :13 (1992).

297. S.D. ADMIN. R. 74:03:28:32(2) (1992).

298. S.D.C.L. §§ 34A-2-71.1 (1992); 34A-12-16 (1992).

299. S.D.C.L. § 34A-12-12 (1992).

300. S.D.C.L. § 34A-13-8.1 (1992).

301. Violations of the UST regulations are subject to criminal penalties and civil penalties up to $10,000 per day. Damages equal to the amount of damages to the environment may also be awarded. S.D.C.L. § 34A-2-75.

302. S.D.C.L. § 34A-2-45 (1992).

303. S.D.C.L. § 34A-2-68 (1992).

304. S.D.C.L. § 34A-2-48 (Supp. 1994).

305. S.D.C.L. §§ 34A-2-72 (1992); 34A-2-73 (1992).

R. Above-Ground Stationary Storage Tanks (ASTs)

The state operates a regulatory program for above-ground storage tanks which largely mirrors the UST program. An AST is "[a]ny stationary tank or combination of stationary tanks above ground, including connected pipes, which stores an accumulation of regulated substances . . . ."[306] A list of exclusions also mirrors what is found in the UST statute, except any farm tank is excluded from AST coverage.[307]

New AST tanks must meet specifications to assure prevention of releases "[f]or the operational life of the tank."[308] All new and existing tanks must register with the DENR,[309] and all new or upgraded tanks must meet design and construction standards, which include mechanisms for secondary containment of releases.[310] Regular inspections are required, as are detailed monitoring and recordkeeping.[311] As with USTs, all suspected releases must be reported and cleanup must proceed in accordance with a pre-approved plan.[312]

Where there has been a discharge from an AST, the DENR is under a duty to investigate and identify the responsible party. If the substance discharged is petroleum, the owner or operator of the facility is strictly liable but may be eligible for reimbursement from the state's Petroleum Release Compensation Fund.[313] For discharges of hazardous waste (other than oil), the person who caused the discharge is strictly liable.

S. Hazardous Waste Storage and Disposal

1. Groundwater Protection

Groundwater protection is the principal objective of RCRA's regulation of sanitary landfills and hazardous waste disposal sites. Until 1984, Congress hoped it could protect groundwater through local land use requirements.[314] This approach was politically necessary because the primary hurdle to explicit regulation of groundwater was the perception that such regulation would constitute federal land use planning.[315] It became clear, however, that state and local governments were not adequately protecting surface and groundwater from nonpoint runoff, including that from waste disposal sites. It was also clear that RCRA, in its 1984 form, could not effectively protect groundwater from ongoing contamination caused by

306. S.D.C.L. § 34A-2-100 (1992).
307. For a discussion of these exclusions, see *supra* note 285 and accompanying text.
308. S.D.C.L. § 34A-2-102 (1992).
309. S.D. Admin. R. 74:03:30:02 (1992).
310. S.D. Admin. R. 74:03:30:04, :05 (1992).
311. S.D. Admin. R. 74:03:30:17-:19 (1992).
312. S.D. Admin. R. 74:03:30:20 (1992).
313. S.D.C.L. § 34A-13-8.1.
314. Such requirements were developed pursuant to "Section 208" planning for nonpoint controls.
315. 3 Sheldon M. Novick, Law of Environmental Protection § 13.01[3], at 13-8, 13-9 (1991).

waste disposal. Thus, the overriding purpose of the 1984 RCRA amendments was groundwater protection.[316]

Subpart F[317] of RCRA's hazardous waste regulations for permitted disposal facilities imposes strict groundwater monitoring requirements. RCRA requires that surface impoundments, landfills, land treatment units, and waste-pile units which receive hazardous waste meet groundwater monitoring requirements. A groundwater monitoring system[318] must be maintained during the active life of the facility.[319] "Detection" monitoring must continue during a post-closure period of approximately thirty years. Facilities compelled to do "compliance" monitoring must do so for a specified number of years or until the groundwater protection standard has been met for three consecutive years.[320]

2. *South Dakota State Laws*

South Dakota's hazardous waste disposal law closely tracks the federal law both statutorily[321] and administratively.[322] The Hazardous Waste Management Act of 1983 instructs the DENR to administer a program[323] and the BME to promulgate rules governing hazardous wastes in the state.[324] The federal RCRA hazardous waste management program has not yet been delegated to the state, so a dual obligation remains.[325] South Dakota is, however, proceeding toward delegation.[326]

316. *Id.* at 13-11.

317. 40 C.F.R. § 264.90 et seq..

318. 40 C.F.R. § 264.97. Groundwater monitoring sampling requirements will be specified in the facility's permit. At a minimum, these will include the locations at which samples must be taken, the performance standard applicable to the samples, and the hazardous constituents the facility must monitor. If the samples show violations of the permitted standards, corrective action must be taken.

319. 40 C.F.R. § 264.96(a).

320. *Id.* at § 264.96(b).

321. S.D.C.L. ch. 34A-11. The statutes follow the federal categories of generators, transporters, and disposal facility operators created in the federal RCRA and focuses regulation on a system of permits and manifests. Any person causing a discharge or spill must immediately report to the DENR and will be held strictly liable for the costs of corrective action. S.D.C.L. §§ 34A-12-9 & 12 (1992). The DENR is authorized to use funds from the state Emergency Response Fund in the case of an emergency remedial effort. After the DENR determines a discharge has occurred, it must further determine whether immediate corrective action is necessary to protect against an "imminent threat to the public health or safety" or to the environment if action is not immediately taken. S.D.C.L. § 34A-12-4(2) (1992). All corrective action costs expended pursuant to a cleanup will constitute a lien on all property owned by the violator. S.D.C.L. § 34A-12-13 (1992).

322. S.D. ADMIN. R. ch. 74:28 (1993).

323. S.D.C.L. § 34A-11-3.

324. S.D.C.L. §§ 34A-11-8 & 9 (1992).

325. 40 C.F.R. § 272.2050 (reserved).

326. *See* 57 Fed. Reg. 19807 (1992).

T. The Rest: Regulated Substances, Bulk Storage, Fertilizers, Pesticides, and the Regulated Substance Response Fund

1. *Overview*

Among South Dakota's groundwater protection laws are a great many regulatory categories (GDPs, septics, underground injection wells, USTs, ASTs, solid waste, hazardous waste) separated by borders and worsened by the substantial overlap among regulatory programs.[327] The programs are a confusing balkanization, rather than comprehensive and coordinated. They have been enacted one at a time, in varying political contexts, and usually with only casual regard for the laws already in place.[328]

The Regulated Substances Discharges Act[329] applies to discharges of regulated substances, a category which is broader than that applicable to USTs, ASTs, and RCRA hazardous waste. The discharge of a regulated substance is prohibited unless pursuant to a federal or state permit.[330] If an unauthorized regulated substance discharge occurs, or is suspected to have occurred, the DENR must be notified.[331] The DENR has authority to order the responsible person to take immediate corrective action.[332]

2. *Regulated Substances*

Regulated substances are also subject to regulation when stored in bulk. The object of such regulations is the prevention of "potential contamination of public water supplies."[333] The bulk storage statute purports to exempt from DENR jurisdiction "the storage of those chemicals regulated by the department of agriculture,"[334] which are agricultural fertilizers and pesticides.[335] Consequently, the legislature delegated the regulation of chemicals in bulk storage to the Department of Agriculture. It then included farm chemicals within the definition of a regulated substance.[336] As a result, bulk storage of farm chemicals and fertilizer is subject to DENR regulation under the Regulated Substances Discharges Act[337] and bulk storage rules.[338] As parallel regulations are issued by the Department of

327. A Class V well, for example, is theoretically not regulated under the UIC statute, but is clearly subject to direct regulatory control under both the GDP and the regulated substance program.

328. This problem is exhibited in South Dakota's apparently distinct program for controlling discharges of "regulated substances," bulk chemicals, fertilizers, and pesticides.

329. S.D.C.L. ch. 34A-12.

330. S.D.C.L. § 34A-12-8.

331. S.D. Admin. R. 74:34:01:04-:05 (1990).

332. S.D.C.L. § 34A-12-10 (1992).

333. S.D.C.L. § 34A-2-12.1 (1992). Rules for bulk storage are found at S.D. Admin. R. 74:03:31 (1992).

334. *Id.*

335. S.D.C.L. chs. 38-19 (fertilizers), 38-21 (pesticides).

336. The statutory definition of regulated substances is found at S.D.C.L. § 34A-12-1(8) (Supp. 1994). It does not include sewage or sewage sludge. *Id.*

337. S.D. Admin. R. 74:34:01:03 (1990).

338. S.D. Admin. R. 74:03:31 (1992).

Agriculture, regulated parties are presumably bound to comply with both sets of regulation.[339] The definition of regulated substances encompasses most of the exclusions and exemptions from the UST, AST, GDP, and other programs. The reason for the broad definition of regulated substances is that all such substances are thus brought within the purview of the Regulated Substance Response Fund (RSRF), a state version of the federal superfund.

3. *The Definition of a Discharge*

As previously stated, the discharge of a regulated substance is prohibited unless pursuant to a federal or state permit.[340] The risk of noncompliance with the permit requirement is strict liability for all cleanup costs. In this statute, a discharge is defined as "an intentional or unintentional act or omission which results in the release, spill, leak, emission, escape, or disposal of a regulated substance into the environment *and which harms or threatens harm to public health or safety or the environment.*"[341] In turn, "environment" is defined as "land, including public and private property, surface and underground waters, fish, wildlife, biota, air and other such resources within the state . . . ."[342]

4. *The Fund*

South Dakota's RSRF was created to finance the cleanup of regulated substances.[343] Modeled after the federal superfund, it is intended as a reserve account available to the DENR to finance emergency cleanups. The DENR is authorized to use money from the fund in three situations: (1) to

339. S.D. ADMIN. R. 12:56:02 (1993). S.D. ADMIN. R. 74:34:01:03 provides:
(1) Substances listed in the "Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act," U.S. environmental protection agency (January 1990);
(2) Fertilizers as defined in SDCL 38-19-1(1), (2), (3), (12), (13), and (14), including fertilizer derivatives;
(3) Pesticides as defined in SDCL 38-20A-1(1), (3), (4), (5), and (6), SDCL 38-20A-10; and those substances defined in SDCL 38-21-14(4), (5), (18), (19), (21), and (29), including metabolites and all active and inert ingredients of these substances;
(4) Petroleum and petroleum substances, including oil, gasoline, kerosene, fuel oil, oil sludge, oil refuse, oil mixed with other wastes, refined or blended crude petroleum stock, and any other oil or petroleum substance;
(5) Radiological, chemical, or biological warfare agents or radiological waste; and
(6) Hazardous wastes as described in 40 C.F.R. Part 261, Subparts C and D (July 1, 1988).
S.D. ADMIN. R. 74:34:01:03 (1990). From the statutory list laid out above, items one, three, four, and five are no longer referred to specifically. Clearly, the statute intends the DENR cover the mining industry, yet the regulations show a reluctance to do so. However, the two lists referred to in the administrative rules include most of the chemicals referred to in the statutory directive. The addition by the DENR of "radiological, chemical, or biological warfare agents or radiological waste" is curious. These warfare agents are subject to regulation, but were not mentioned in the specific statutory definition.

340. S.D.C.L. § 34A-12-8.

341. S.D.C.L. § 34A-12-1(4) (Supp. 1994) (emphasis added).

342. S.D.C.L. § 34A-12-1(6).

343. S.D.C.L. § 34A-12-3 (1992). The RSRF will look to responsible parties for reimbursement after cleanup. S.D.C.L. § 34A-12-6 (1992).

cover departmental investigations requiring funds beyond those in the current DENR budget; (2) to take emergency action with regard to pollution which may pose an "imminent threat to the public health or safety;" and (3) to finance cleanups which cannot otherwise be undertaken because of the lack of a capable, responsible party.[344]

5. *Liability*

The DENR must determine the person responsible for the discharge, possibly after taking corrective action with fund money or as part of an effort to compel a privately-financed cleanup.[345] The DENR may order the violator to take timely corrective action, which is enforceable by mandatory injunction.[346] In any event, strict liability for cleanup costs imposes a lien against the land.[347] If a responsible person is not identified, the property owner or operator is the liable party.[348]

U. INCINERATOR ASH

The definition of phrases such as "hazardous waste," "toxic substance," or "regulated substance" are oftentimes difficult to apply to specific materials. An example of this difficulty is incinerator ash, the byproduct of municipal solid waste incineration.[349] When incinerator ash is disposed of in an ordinary sanitary landfill, it is a relatively inexpensive part of the incineration process. If disposed of as hazardous waste in a licensed Transfer, Storage or Disposal (TSD) facility, disposal costs increase radically, perhaps preventing incineration as a viable option for cities and towns. RCRA states that a municipal solid waste incinerator, recovering energy from the mass burning of solid waste, does not qualify as one managing hazardous wastes.[350] However, in 1994, the Supreme Court of the United States held that incinerator ash from a municipal waste disposal facility was not exempt from RCRA regulation, and could be treated as hazardous waste.[351]

V. SANITARY LANDFILLS

Solid waste is regulated under Subtitle D of RCRA, as well as state

344. S.D.C.L. § 34A-12-4. After the remedial actions have been taken, the DENR seeks reimbursement from the "responsible person" who is strictly liable. S.D.C.L. §§ 34A-12-6 & 12. The person who has caused a discharge, be it intentional or unintentional, has an absolute duty to report the facts to the DENR "immediately." S.D.C.L. § 34A-12-9.

345. S.D.C.L. § 34A-12-16.

346. S.D.C.L. § 34A-12-10.

347. S.D.C.L. § 34A-12-13 (1992).

348. S.D.C.L. § 34A-12-16.

349. Such ash is likely to contain residual amounts of lead, cadmium, and other pollutants at levels high enough to make it a hazardous waste under Subtitle C of RCRA.

350. 42 U.S.C. § 6921(i) (Supp. 1994). RCRA states such a facility "shall not be deemed to be treating, storing, disposing of, or otherwise managing hazardous wastes" for purposes of RCRA if the facility burns only household waste, commercial and industrial waste "that does not contain hazardous waste" and the facility attempts to screen out hazardous wastes.

351. City of Chicago v. Envtl. Defense Fund, 114 S. Ct. 1588, 1592 (1994).

statutes and administrative rules. The heart of the federal program is the distinction between open dumps and sanitary landfills. Sanitary landfills are solid waste disposal sites which comply with the EPA's solid waste disposal facility criteria[352] and state requirements. Open dumps are landfills which do not comply. States and private citizens may enforce violations under RCRA's citizen suit provision.[353]

1. The State Permit Requirement

It is unlawful to operate any solid waste disposal facility without a permit from the DENR, or in violation of the terms of a permit, or other statutory or administrative rule.[354] Permits are issued by the Secretary of the DENR or the BME.[355] The Secretary's final recommendation of the permit's contents will stand unless the BME exercises its adjudicatory role in a contested hearing.[356] In the majority of cases, the permit application will be an individual process reflecting the unique factual circumstances of the situation.[357] Statutes authorize general permits for selected categories,[358] which enjoy more simple general permit procedures.[359] Essentially, the individual permit process includes facilities handling a mixture of wastes or located in a situation of varying conditions, such as various soil types at a site.

2. Required Permit Conditions

State solid waste legislation mandates several conditions for inclusion in all landfill permits. The first involves groundwater monitoring:

> The [BME] shall require that, unless it is demonstrated in a specific case that groundwater degradation will not occur, the holder of the

352. 40 C.F.R. § 258. The federal rules became effective in October of 1993 and therefore established the minimum performance standards for solid waste disposal facilities. Beginning in 1993, any facility not in compliance with the federal rules is an "open dump" and is prohibited. 42 U.S.C. § 6945(a) (Supp. 1994).

353. 42 U.S.C. § 6972.

354. S.D.C.L. § 34A-6-1.4; S.D. ADMIN. R. 74:27:08:01 (1994). A facility is defined at S.D.C.L. § 34A-6-1.3(5) (Supp. 1994).

355. S.D.C.L. § 34A-6-1.13 (1992).

356. *Id.*

357. Such permits are issued for a period of up to two years, and are renewable for terms up to five years. S.D.C.L. § 34A-6-1.16 (Supp. 1994).

358. S.D.C.L. § 34A-6-58 (1992); S.D. ADMIN. R. 74:27:10 (June 10, 1993).

359. Selected categories, found at S.D. ADMIN. R. 74:27:10:02, are:

(1) Land application of petroleum contaminated soils;
(2) Land application of whey or whey permeate from cheese manufacturing facilities;
(3) Rubble disposal;
(4) Construction or demolition debris disposal;
(5) Sludge disposal;
(6) Transfer stations accepting more than 500 tons of solid waste a year but less than 25,000 tons of solid waste a year;
(7) Waste tire handling facilities;
(8) Asbestos monofills; and
(9) Other categories that meet the criteria specified in § 74:27:10:01.

S.D. ADMIN. R. 74:27:10:02 (1994).

> permit . . . *shall* install and maintain a groundwater monitoring system to adequately determine the quality of the groundwater and the effects of the landfill upon it, if any. The rules and decisions of the [BME] and the department *shall* operate in conjunction with the groundwater rules promulgated by the [WMB] . . . and *shall* protect groundwater from degradation by solid waste to the greatest extent practicable.[360]

This unequivocal mandate applies to both individual and general permits and is not otherwise qualified by statute.[361] To avoid the groundwater monitoring requirement, the applicant must affirmatively demonstrate groundwater degradation will not occur. Such a demonstration is nearly impossible to make.

In contrast to this clear statutory mandate, DENR rules attempt to narrow the groundwater monitoring requirement. Rules of the DENR purport to apply only to "municipal solid waste landfills"(MSWLFs),[362] a regulatory category limited to facilities receiving "household waste for land disposal."[363] But the groundwater monitoring requirement is clearly meant to apply to *all* permitted facilities disposing of solid waste.[364] This attempted narrowing by the DENR is without statutory basis and, therefore, subject to challenge.

The DENR rule also narrows the statutory mandate of groundwater monitoring through its small-town exemption.[365] This exemption applies to municipal sites disposing of less than twenty tons of solid waste daily, and not presently exhibiting groundwater contamination, or sites existing because of limited solid waste disposal alternatives.[366] The purpose is to reduce the costs of operating landfills in remote areas. However, the exemption breaches the clear statutory language. In addition, the DENR regulations also fail to require groundwater monitoring during closure and post-closure periods. Because the possibility of groundwater contamination continues after closure of landfills, the legislature probably intended groundwater monitoring to apply to the post-closure period.

A second condition mandated by the legislature for inclusion in all solid waste permits is an agreement by the owner or operator "with the [BME] acknowledging such perpetual responsibility and liability for the solid waste."[367] This mandate clearly applies to every permitted facility, including general permit facilities and those exempted from the regula-

360. S.D.C.L. § 34A-6-1.7 (1992) (emphasis added).

361. S.D.C.L. § 34A-6-58 authorizes the issuance of general permits and does not qualify the specific language of § 34A-6-1.7.

362. S.D. ADMIN. R. 74:27:19:01 (1994).

363. S.D. ADMIN. R. 74:27:07:01(43) (1994).

364. S.D.C.L. § 34A-6-1.7.

365. S.D. ADMIN. R. 74:27:07:01(62) (1994).

366. S.D. ADMIN. R. 74:27:12:25 (1994). This category is authorized by EPA rule. *See* 40 C.F.R. § 258.1(f).

367. S.D.C.L. § 34A-6-1.10 (1992). Perpetuity is defined as the "life of the solid waste facility plus an additional fifty years." S.D.C.L. § 34A-6-1.3(10A) (Supp. 1994).

tions.[368] The possibilities for liability are substantial and must be considered in the acquisition of hazard insurance. For the larger sites, liability exists without regard to the permit requirement. RCRA, Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and state pollution laws make owners, both former and present, financially responsible for waste streams they have created.

An ever-present mandate in state permits for municipal landfills is the federal regulations for municipal solid waste landfills. The municipality must be aware that these standards are enforceable by the state and private citizens and are a binding element of such permits.[369] In addition to permit provisions required by statute, the DENR has specified limitations which govern the siting and permitting of solid waste facilities. These limitations are comprised of more than 100 pages of detailed and carefully drawn regulations. Some siting criteria are mandatory, and the applicant carries the burden of proof.[370]

3. *Exemptions from Permit Requirements*

State statutes establish exemptions from the solid waste landfill permit system. Additionally, certain exclusions from the federal definition of solid waste facilities are carried forward into state law.[371] RCRA states:

> The term "solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under [the CWA] or source, special nuclear, or byproduct mate-

368. However, the legal character of this agreement is difficult to evaluate. For a municipality, the question is whether sovereign immunity has been waived. For a private owner, the question is whether the acceptance of financial responsibility for a period beyond a site's active period is feasible.

369. 40 C.F.R. § 258.3.

370. The applicant carries the burden of proof in the following areas:

(1) "The location shall not cause significant adverse effect to wildlife, recreation, aesthetic value of an area, or state or federal threatened or endangered species" S.D. ADMIN. R. 74:27:11:02 (1994);

(2) The facility may not be located within 1,000 feet of a lake, pond, slough, river, stream, or other wetland (74:27:11:06 (1994)) unless the operator of the disposal site submits evidence showing that pollution of such surface waters by solid waste or leachate is not likely. The secretary may require a greater distance if the secretary determines that 1,000 feet is not sufficient to provide adequate protection to the waters (74:27:11:09 (1994));

(3) The facility may not be located within a 100-year floodplain (74:27:11:03 (1994)) unless mitigating measures approved by the secretary are initiated (74:27:11:09 (1994));

(4) The facility may not be visible or within 1,000 feet of a public park, principal or minor arterial, major collector, or an area where the facility constitutes a potential safety hazard to the public. (74:27:11:05 (1994)).

371. S.D.C.L. § 34A-6-1.3(18) (Supp. 1994).

rial as defined by the Atomic Energy Act of 1954. . . .[372]

This definition excludes irrigation return flows, discharges into surface waters, and radioactive materials from the statutory parameter.

State law includes a statutory farmer exception, which states solid waste regulation shall not:

> prohibit a farmer or rancher from disposing of solid waste from normal farming operations or ordinary domestic activities upon his own land provided such disposal does not create a nuisance or a hazard to public health, does not violate a local ordinance, will not unlawfully pollute ground or surface waters.[373]

In addition, this exception also prohibits farmers from violating the CWA and its state equivalent.[374] This exception reflects the well-known fact that most farms and ranches contain private dumps which receive the solid waste generated by the agricultural operation and residents. Although much of the waste in these private dumps is domestic material, there is a risk some waste found there may pose a threat to groundwater.[375] Such farm dumps meet the criteria of open dumps and represent a large amount of uncontrolled waste disposal. As the cumulative effects of many small polluters threaten the well-being of surface waters, the cumulative effects of these private dumps similarly constitute a large threat to a particular aquifer.

4. The Mining Exemption

The federal RCRA definition of solid waste includes mining waste.[376] Although this definition is borrowed by South Dakota law, mining waste is excluded.[377] In addition, the state statute mandating permits for solid waste disposal facilities in South Dakota specifically excludes mine wastes.[378] However, the section on mined land reclamation states: "All refuse from the mining operation shall be disposed of in a manner so as to create the least amount of unsightliness and unproductive areas, and will not pollute surface or ground water."[379] This suggests, where groundwater pollution resulting from mining is concerned, the favored *state* remedy is through the land reclamation permit and enforcement process. Exclusion

372. 42 U.S.C. § 6903(27).

373. S.D.C.L. § 34A-6-1.4 (1992). As stated by the legislature, the farmer exception remains subject to common law remedies, local land-use controls, and the CWA. These small pollution sources will necessarily be encountered at some future time.

374. *Id.*

375. Examples might include pesticides and pesticide containers, machine fluids, veterinary supplies, and salt.

376. 42 U.S.C. § 6903(27). Mine waste includes the high volume of overburden and other non-ore bearing material that is moved and disposed of in a typical mining operation. Sometimes such waste is low in hazard, other times it may contain a heavy load of potential pollutants.

377. S.D.C.L. § 34A-6-1.3(17) (Supp. 1994).

378. S.D.C.L. § 34A-6-1.10.

379. S.D.C.L. § 45-6B-38 (1983). A violation is enforceable with a cease and desist order. S.D.C.L. § 45-6B-49 (1993). The order may be preceded by a temporary restraining order. S.D.C.L. § 45-6B-52 (1983).

at the state level, however, is not the end of this story. If the federal EPA determines mining waste is regulable as solid waste, the state's exemption will be preempted and mine operations will be subjected to solid waste disposal regulation. It will probably be drafted in an unique manner which reflects the circumstances of mine waste.

As to the other types of mine wastes, the regulatory history is intertwined with hazardous waste regulation. Although mining wastes are within RCRA's statutory definition of "solid waste,"[380] they are not currently being regulated as either solid waste (RCRA Subtitle D) or as hazardous waste (RCRA Subtitle C). Initially, the EPA defined mining wastes as a type of "special wastes" it perceived as high in volume, low in hazard,[381] and in need of special standards. Before the EPA developed standards, Congress amended RCRA with the Bevill Amendment[382] and exempted mining wastes from regulation as hazardous waste until after the EPA had completed further studies.[383]

According to the terms of the Bevill Amendment, the EPA could (six months after release of the required studies) elect to regulate mining wastes as hazardous waste. The EPA has made such an election only for a few specified categories.[384] Consequently, all wastes generated by removing overburden, by excavation of waste rock during extraction, and waste rock generated by grinding and crushing of the raw material, will be exempted from regulation as hazardous waste. This EPA decision has survived a judicial challenge.[385] Thus, with the exception of some processing wastes, most mining wastes are not currently subject to regulation as hazardous waste. The next question is whether mining wastes will be regulated as solid waste.

The EPA now recognizes the regulation of mining wastes under Subtitle D as solid waste. However, solid waste management criteria do not adequately cover environmental concerns related to the management of mining wastes.[386] Although the new program is not final, a draft regulation ("Strawman II") has been circulated.[387]

Under Strawman II, the EPA proposes to regulate wastes in active heap and dump heap operations and wastes in water or other liquid that accumulates in open pits or mine shafts with the potential to release hazardous constituents. The EPA also proposes to regulate wastes in stock-

380. 42 U.S.C. § 6903(27).

381. 53 Fed. Reg. 41288 (1988) sets out the history of the mining waste exclusion.

382. 42 U.S.C. § 6921(b)(3)(A)(ii).

383. 42 U.S.C. § 6921(b)(3)(A). Such studies, broad and detailed, were delayed but finally appeared. *See* Envtl. Defense Fund v. Envtl. Protection Agency, 852 F.2d 1316 (D.C. Cir. 1988).

384. For a list of these categories, see 53 Fed. Reg. 41288 (1988). The larger effect is that of 20 wastes from mineral processing, 18 will be regulated as solid waste rather than as hazardous waste. 56 Fed. Reg. 27300 (1991).

385. *Envtl. Defense Fund,* 852 F.2d at 1309.

386. 51 Fed. Reg. 24496 (1986).

387. Office of Solid Waste, EPA, Strawman II: Recommendations for a Regulatory Program for Mining Wastes and Materials Under Subtitle D of the Resource Conservation and Recovery Act (May 21, 1990).

piled ores and subgrade ores and other minerals associated with mining that may threaten human health. Strawman II would require criteria for design, monitoring, verification, corrective action, closure, and post-closure of mines.[388] The action is on hold within the agency.[389]

5. *Dealing with Hazardous Waste at the Landfill*

Small quantities of hazardous waste can be disposed of indirectly through a municipal solid waste landfill. First, to the extent household waste contains hazardous waste, hazardous waste will enter the landfill. Second, waste from conditionally exempt small quantity generators—less than 100 kilograms of hazardous waste per month—may also be allowed.[390] The decision as to how much hazardous waste enters a landfill is one for the local owner or operator. That decision will be guided by the fear of potential liability under RCRA, CERCLA, and state common law and statutory remedies.

6. *Enforcement*

A state statute explicitly authorizes local cities and counties to enact standards higher than those set by the DENR.[391] Many remedies are available to enforce landfill permit conditions and regulations. The Secretary of the DENR is required to "make periodic inspections at every permitted solid waste facility"[392] and has authority to enter sites pursuant to an investigation of violations and to inspect solid waste in transit.[393] There are procedures for suspension or revocation of operating permits.[394] Equitable relief is available to address emergencies,[395] and the usual civil and criminal penalties also remain available.[396]

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388. *Id.*

389. It is important to highlight that the federal Superfund law, CERCLA, may apply to mine wastes which pose a serious threat to the environment. *See generally* John R. Jacus & Thomas E. Root, *RCRA Regulation of Mining Waste: An Overview*, 5 NAT. RES. & ENV'T. 26 (No. 3, Winter) (1991). In some cases, state governments used CERCLA's liability provisions in an effort to force restoration of mine sites. Idaho v. Bunker Hill Co., 634 F. Supp. 800 (D. Idaho 1986); Colorado v. ASARCO, Inc., 608 F. Supp. 1484 (D. Colo. 1985).

390. 40 C.F.R. § 258.20(b). That section states:

> Owners or operators of all MSWLF units must implement a program at the facility for detecting and preventing the disposal of regulated hazardous wastes. . . . This program must include, at a minimum:
>
> (1) Random inspections of incoming loads unless the owner or operator takes other steps to ensure that incoming loads do not contain regulated hazardous wastes . . . .

Id. at (a)(1).

391. S.D.C.L. § 34A-6-41 (1992).

392. S.D.C.L. § 34A-6-1.20 (1992).

393. *Id.*

394. S.D.C.L. § 34A-6-1.21 (1992).

395. S.D.C.L. § 34A-6-1.29 (1992).

396. S.D.C.L. § 34A-6-1.31 (1992).

W. Animal Feedlots

1. The Clean Water Act (CWA) Background

The federal CWA defines "point source" to specifically include a "concentrated animal feeding operation."[397] In 1972, the EPA first initiated regulation of point sources. However, the EPA recognized the futility of requiring permits of so many sources, whether small, dispersed geographically, or difficult to monitor. Consequently, the EPA decided to avoid the situation altogether by issuing regulations which excluded from the permit requirement all smaller feedlot operations, without regard to the "point source" definition. This decision failed to survive judicial scrutiny,[398] making it clear point sources cannot be defined out of existence. Therefore, all "concentrated animal feeding operations" are point sources subject to the CWA permit requirement. The district court offered the EPA advice on the subject:

> [Plaintiff] points out that, while all sources which are eventually defined as point sources should be regulated under an appropriate permit program, the Administrator would have wide latitude to rank categories and sub-categories of point sources of different importance and treat them differently within a permit program. He would also have substantial discretion to use administrative devices, such as area permits, to make EPA's burden manageable. Admittedly, some sources, such as irrigation return flows and storm sewers, might pose special difficulties. Nevertheless, such difficulties must not stand in the way of Congress' mandate that a comprehensive permit program covering all point sources be established.[399]

The Court of Appeals agreed, observing clear Congressional intent that a discharger from a point source may only escape the total discharge prohibition by obtaining a NPDES permit.[400]

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397. 33 U.S.C. § 1362(14) (Supp. 1994); A similar definition is found in state law at S.D.C.L. § 34A-2-2(4) (1992).

398. Natural Resources Defense Council, Inc. v. Train, 396 F. Supp. 1393 (D.D.C. 1975), aff'd as Natural Resources Defense Council, Inc. v. Costle, 568 F.2d 1369 (D.C. Cir. 1977).

399. *Train*, 396 F. Supp. at 1401-02.

400. *Costle*, 568 F.2d at 1374. Although the EPA argued it was impossible to establish uniform national effluent limitations for runoff pollution, the court responded:

> When numerical effluent limitations are infeasible, EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels. This may well mean opting for a gross reduction in pollutant discharge rather than the fine-tuning suggested by numerical limitations. But this ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all.

Id. at 1380. The appellate court ratified the district court's suggestion the EPA consider use of an area or general permit:

> [CWA] does not explicitly describe the necessary scope of a NPDES permit. The most significant requirement is that the permit be in compliance with limitation sections of the Act .... As a result [Natural Resources Defense Council, Inc.] NRDC and the District Court have suggested the use of area or general permits. The Act allows such techniques. Area-wide regulation is one well-established means of coping with administrative exigency.

Id. at 1381.

2. *The Current Federal and State Regulation*

The EPA regulation divides feedlots into two regulatory categories: (1) animal feeding operations, and (2) concentrated animal feeding operations. An animal feeding operation is a facility where animals are confined and fed "for a total of 45 days or more in any 12-month period" and crops or groundcover are not sustained during the growing season.[401] The definition of an animal feeding operation necessarily includes all concentrated animal feeding operations, but the latter category is defined according to the specific number of animals maintained.[402] It is these concentrated operations which must apply for an individual NPDES permit.[403]

3. *The Big Feedlots*

Large feedlots, of which there are few in South Dakota, are directly regulated. A large feedlot[404] must apply for and receive an individual NPDES permit prior to operation unless the operation discharges water only in the event of a twenty-five year, twenty-four-hour storm event.[405] The federal regulations also establish minimum performance standards for large feedlots.[406] The federal performance standard is: "There shall be no discharge of process waste water pollutants to navigable waters."[407]

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401. 40 C.F.R. § 122.23(b).

402. *Id.* at § 122, app. B.

403. S.D. ADMIN. R. 74:03:17:03; 74:03:19-:32 (1992). The State of South Dakota administers the NPDES surface water discharge permit program as delegatee of the federal EPA and has adopted regulations which duplicate the federal rules.

404. A large feedlot is one where:

> (a) More than the numbers of animals specified in any of the following categories are confined:
>
> (1) 1,000 slaughter and feeder cattle,
> (2) 700 mature dairy cattle (whether milked or dry cows),
> (3) 2,500 swine each weighing over 25 kilograms (approximately 55 pounds),
> (4) 500 horses,
> (5) 10,000 sheep or lambs,
> (6) 55,000 turkeys,
> (7) 100,000 laying hens or broilers (if the facility has continuous overflow watering),
> (8) 30,000 laying hens or broilers (if the facility has a liquid manure handling system),
> (9) 5,000 ducks, or
> (10) 1,000 animal units . . . .

40 C.F.R. § 122, app. B. *See also* S.D. ADMIN. R. 74:03:18:27(1) (1992).

405. S.D. ADMIN. R. 74:03:18:28 (1992).

406. To comprehend the standard, it is necessary to define "process waste water" and "process generated waste water." Process waster water is defined as:

> [A]ny process generated waste water and any precipitation (rain or snow) which comes into contact with any manure, litter or bedding, or any other raw material or intermediate or final material or product used in or resulting from the production of animals or poultry or direct products (e.g. milk, eggs).

40 C.F.R. § 412.11(c). Process generated waste water is defined as:

> [W]ater directly or indirectly used in the operation of a feedlot for any or all of the following: Spillage or overflow from animal or poultry watering systems; washing, cleaning or flushing pens, barns, manure pits or other feedlot facilities; direct contact swimming, washing or spray cooling of animals; and dust control.

40 C.F.R. § 412.11(d).

407. 40 C.F.R. § 412.13(a). The single regulatory exception is:

> Process waste pollutants in the overflow may be discharged to navigable waters whenever

4. *The Mid-Sized Feedlots*

Federal regulations recognize a second regulatory category comprised of feedlot operations which either discharge pollutants "into navigable waters through a manmade ditch, flushing system, or other similar manmade device;" or directly into waters of the United States.[408] Mid-sized feedlots qualify as concentrated animal feeding operations[409] under federal law and must apply for and receive a surface water discharge permit prior to operating.[410] The standard of performance is precisely the same as for the large feedlots.[411]

5. *The Small Feeding Operations*

A great many small farm lots escape the first two categories. They escape the "concentrated animal feeding operation" categorization unless:

> (i) Pollutants are discharged into waters of the United States through a manmade ditch, flushing system, or other similar manmade device; or
>
> (ii) Pollutants are discharged directly into waters of the United States which originate outside of the facility and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation.[412]

Generally, it is thought these operations are agricultural in nature and not subject to the permit requirement unless shown to have an effect on water quality.[413] Nonetheless, the United States Supreme Court stated that all point sources under the CWA are to be regulated in *Natural Resources Defense Council, Inc. v. Costle.*[414] Therefore, these small lots cannot be entirely excluded from the permit system.

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rainfall events, either chronic or catastrophic, cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a 25-year, 24-hour rainfall event for the location of the point source.

40 C.F.R. § 412.13(b).

408. A mid-sized feedlot is one where:
(b) More than the following number and types of animals are confined:
(1) 300 slaughter or feeder cattle,
(2) 200 mature dairy cattle (whether milked or dry cows),
(3) 750 swine each weighing over 25 kilograms (approximately 55 pounds),
(4) 150 horses,
(5) 3,000 sheep or lambs,
(6) 16,500 turkeys,
(7) 30,000 laying hens or broilers (if the facility has continuous overflow watering),
(8) 9,000 laying hens or broilers (if the facility has a liquid manure handling system),
(9) 1,500 ducks, or
(10) 300 animal units . . . .

40 C.F.R. § 122, app. B.

409. 40 C.F.R. § 122.23.

410. 40 C.F.R. § 122.23(a); S.D. ADMIN. R. 74:03:18:01 (1993).

411. For a discussion of this performance standard, see *supra* note 406 and accompanying text.

412. 40 C.F.R. § 122.23(c)(v)(2).

413. *Id.*

414. 568 F.2d 1369 (D.C. Cir. 1977). *See infra* note 424.

6. *The South Dakota Regulatory Structure and the General Permit Issue*

The State of South Dakota administers the surface water pollution discharge permit program. Through the DENR, South Dakota has adopted regulations which reflect the federal mandate.[415] Several practical issues are presented. First, for the two larger categories of concentrated animal feeding operations, the state performance standard is: "[N]o discharge except in the event of a 25-year 24-hour storm event unless other limits are determined necessary by the secretary [of the DENR] to protect surface water quality standards."[416] This requirement is consistent with the federal standard.[417] Second, smaller agricultural lots are required to have a permit if they meet one of the following two standards:

> (1) Pollutants are discharged into waters of the state through a man-made ditch, flushing system, or other similar man-made device; or
>
> (2) Pollutants are discharged directly into surface waters of the state which originate outside of and over, across or through the facility or otherwise come into direct contact with the animals confined in the operations.[418]

This means any discharge into a wetland, river, stream, lake, gully, dry draw, intermittent stream, or road ditch will require a feedlot permit and are subject to the no discharge requirement. Similarly, any discharge into a man-made conveyance such as a terrace, field-tile, field ditch, road ditch, or the like will subject the operation to categorization as a concentrated operation and the no discharge standard.[419]

From the clear and unequivocal *no discharge* standard, South Dakota's system of regulating animal feedlots is not as visible as one might expect. The source of confusion is the general permit. In one paragraph, the administrative regulations designate feedlots as point sources subject to the permit requirement.[420] In the next paragraph, the regulations state that feedlots are covered by the "general permit program for concentrated animal feeding operations . . . ."[421]

The source of the general permit idea is the language in *Natural Resources Defense Council, Inc. v. Train,*[422] suggesting the EPA "would have wide latitude to rank categories and sub-categories of point sources of different importance and treat them differently within a permit program."[423]

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415. S.D. ADMIN. R. 74:03:17:03 (1992).
416. S.D. ADMIN. R. 74:03:18:28 (1992).
417. 40 C.F.R. § 412.13(a).
418. S.D. ADMIN. R. 74:03:18:24 (1992).
419. In addition, the Secretary of the DENR may identify a smaller feedlot as a concentrated animal feeding operation at any time "upon determination that it is a significant contributor of pollution to the waters of the state." S.D. ADMIN. R. 74:03:18:23 (1992).
420. S.D. ADMIN. R. 74:03:18:19 (1992).
421. S.D. ADMIN. R. 74:03:18:20.
422. Natural Resources Defense Council, Inc. v. Train, 396 F. Supp. 1393 (D.D.C. 1975), aff'd as Natural Resources Defense Council, Inc. v. Costle, 568 F.2d 1369 (D.C. Cir. 1977).
423. *Train,* 396 F. Supp. at 1401-02.

This suggestion has now been institutionalized by the EPA in its general permit program.[424] The idea is to group a number of similar permittees that are normally small in size but larger in number. The purpose is to make the regulatory load more manageable by making the permitting of lower priority pollution sources easier. Whereas individual permittees must demonstrate their technological compliance capacity as a condition of doing business (i.e., obtaining the permit), the general permittee just provides notice at the start of business.[425]

South Dakota feedlots appear to come under the state's general permit category for concentrated animal feeding operations. Although performance standards exist, the general permit releases an entire category of polluters from the individualized permit requirement of the CWA.[426] *Train* authorizes the use of general permits as devices by which the EPA can establish priorities within a category, but the EPA may not exempt an entire category from the permit process. Consequently, the South Dakota program is subject to judicial challenge.

7. *Enforcement*

Although an individual feedlot operation is lightly regulated at the beginning, each operator should consider enforcement possibilities. Clearly, the performance standard allows no discharge into waters of the United

424. A "general permit" is a permit which authorizes an entire category of pollution discharges, usually organized by either geographic area or pollution source. For an example of organization by geographic area, see 40 C.F.R. § 122.28. Usually, a general permit is a preapproved category of pollution discharges which require only the "regulated" operator to notify the DENR of intent to operate. The "permit" is usually written, and may contain substantive criteria for qualification and performance standards.

425. Of general permits, Rodgers says:

> These general permits win plaudits from those close to the costs of regulation and censure from those close to the benefits. There is something about a [general] permit, like a mass conversion or a universal truth, that sounds extravagant and presumptuous; would you recommend a single dog license for all the mongrels in the state? One of the more interesting legal features of the practice is the transformation of a device synonymous with individualized obligation—the license or permit—into a technique for fulfilling rulemaking or legislative function. A [general] permit obviously is an exemption by rule in everything but name.

2 RODGERS, *supra* note 151, § 4.12 at 191.

426. The EPA explains its use of the general permit as follows:

> General permits are an important tool for assuring adequate environmental safeguards for large numbers of similar facilities without the administrative and resource burdens involved in individual permit issuance. The EPA wants to emphasize that, except for the procedural differences set out at § 122.28 in the NPDES regulations, general permits are analogous to individual permits in every respect. General permits are still subject to the same reporting and monitoring requirements, limitations, enforcement provisions, penalties, and other substantive requirements as individual permits. General permits should be viewed as an administrative tool enabling the issuance of one permit to authorize a group of dischargers. The general permit program has been available to authorize NPDES States since its inception in 1979. Most general permits utilize a Notice of Intent (NOI) as a mechanism to register covered facilities. The administrative burdens on the permit issuing agency and the cost to dischargers can be reduced by replacing more complicated permit application requirements with simplified requirements. The public notice for a general specifies whether a Notice of Intent (NOI) is required prior to coverage.

57 Fed. Reg. 32475, 32478 (1992). In South Dakota, there is no specific general permit which requires, for example, monitoring and reporting.

States. When a violation occurs, enforcement is possible through a variety of sources. First, there is the federally-authorized citizen suit, which creates federal district court jurisdiction to enforce violations of "an effluent standard or limitation."[427] In addition to the citizen suit, direct enforcement by the state is authorized.[428]

8. *Wetlands*

Feedlot regulation risks overlooking wetlands as "waters of the United States" within the jurisdictional protection of the CWA.[429] It is unlawful to discharge pollutants into a wetland without an appropriate permit and subsequent compliance with the terms of that permit. Because all feedlots in South Dakota are subject to the no discharge requirement of the general permit, discharges into wetlands are forbidden. Permitting filling of wetlands is under the jurisdiction of the United States Corps of Engineers and has not been delegated to the states. It is presumed, however, that the Corps would honor the state's no discharge standard.

9. *The Issue of Discharges into Groundwater*

The DENR regulations governing feedlot operations refer specifically to discharges into surface waters. In so doing, they reflect the fact that the federal CWA has not been applied to groundwater. The next question is whether the operator of an animal feedlot has regulatory responsibility for complying with the state's groundwater protection rules.

We have seen that South Dakota statutes mandate limits on groundwater pollution. The DENR has promulgated rules which establish the GDP requirement for any project "that discharges waste or pollutants that *may* move directly *or indirectly* into groundwater . . . ."[430] This requirement basically states any activity placing any material on the ground, which upon entry into the groundwater might cause a violation of groundwater quality standards, must apply for a permit. The regulations specify potentially regulated activities, including feedlots.[431] Since the GDP regulations do not authorize general permits, it is assumed an individual construction permit must be acquired before feedlot operations begin.[432]

427. 33 U.S.C. § 1365(a)(1)(A). Since the no discharge standard is the effluent limitation in the general permit for feedlots, any proof of discharge results in liability. Even if a case of this type is settled prior to trial, the defendant will be liable for attorney and expert fees. Although there are a few jurisdictional hurdles, the principal hurdle is a jurisdictional 60 day prior notice to the regulating agency requirement. Therefore, remedy is effective.

428. Civil penalties of $10,000 per day per violation, or an award for "damages to the environment of this state" are both available. S.D.C.L. § 34A-2-53 (1992). In addition, criminal penalties pursuant to S.D.C.L. § 34A-2-75 are available. All feedlots are subject to liability for discharge violations and should not be diverted by the "no-touch" general permit. The time to avoid liability is before operation—when modern feedlot design techniques can be utilized to avoid liability.

429. 33 C.F.R. § 328.3(a) (1993).

430. S.D. ADMIN. R. 74:03:16:02 (1992) (emphasis added).

431. *Id.*

432. S.D. ADMIN. R. 74:03:16:12 (1992). By its very nature, a feedlot waste management sys-

10. Transfer Facilities

As previously noted, federal and state regulations define an animal feeding operation in part as a lot or facility where animals "have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period . . . ."[433] The question presented is whether the feedlot permit standards apply to stockyards, auction barns, or facilities where livestock are held for transfer to other facilities. Since animals in these facilities are transferred after just a few days, it can be argued the lots involved do not meet the forty-five day requirement. While no cases have resolved the issue, the EPA's Region Six[434] has stated, "[It] believes strongly that it is clearly the intent of the regulation to include transfer facilities, as they house animals almost continuously. It is irrelevant whether they are the same animals for the 45 day duration."[435] Although this opinion does not bind South Dakota, it is a prediction of the outcome for a contest on the point.

11. Future Regulation of Feedlots

Recently, the EPA issued a general permit applicable to all feedlots in Texas, Louisiana, Oklahoma, and New Mexico. The permit is detailed in the management practices it imposes, and may be viewed as the future of feedlot regulation.[436] Although too detailed for review here, one controversial issue is worth noting. The permit defines runoff from land containing the application of manures as a point source of pollution. Such "process water discharges" are required to have a permit. Thus, facilities which stockpile or dispose of manure so that rainwater or the adjacent watercourse removes significant amounts of pollutants to United States waters are point source dischargers.[437]

The Region Six general permit establishes a variety of restrictions on the land application of manure.[438] The Region Six general permit indi-

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tem will gather runoff in order to divert it from surface water. In so doing, the operator is placing the wastes "in a location where they are likely to cause" groundwater contamination. S.D.C.L. § 34A-2-21 (1992). Because statutory liability is potentially substantial, an operator of any size lot will need to apply for the GDP permit. S.D. ADMIN. R. 74:03:16:02 (1992).

433. 40 C.F.R. § 122.23(b)(i).

434. The EPA's Region Six is comprised of the states of Texas, Louisiana, Oklahoma, and New Mexico.

435. 57 Fed. Reg. 32475, 32477 (1992).

436. *See* 58 Fed. Reg. 7610 (1993).

437. This decision has the effect of whittling down the CWA regulatory definition of nonpoint sources. The EPA takes the position these feedlots have, in fact, established a crude liquid manure handling system. A recent decision supports the EPA rule. Concerned Area Residents for the Env't v. Southview Farm, 34 F.3d 114 (2d Cir. 1994) (holding that discharges from a farm's liquid manure spreading operations were discharges from point sources).

438. These restrictions include the following:

> (a) Land application rates of wastes should be based on the available nitrogen content of the solid waste. However, where local water quality is threatened by phosphorous, the application rate should be limited to the recommended rates of available phosphorous for needed crop uptake and provide controls for runoff and erosion as appropriate for site conditions.

rectly protects groundwater by assuming contaminants which leak from liquid manure containment structures will send water and contaminants underground to be discharged into local streams and rivers. Unless a permit applicant affirmatively demonstrates no such hydrologic connection exists, a liner must be installed in containment structures.[439]

X. SEWAGE SLUDGE

1. The CWA Background

Sewage sludge is the semi-solid residue removed from the wastewater process stream.[440] If disposed of incorrectly, it can pose a great threat to groundwater. The regulatory history of sewage sludge begins in 1972, when Congress enacted the CWA prohibition on direct discharges and the construction grant program for publicly-owned treatment works (POTWs). That statute did not, however, directly address the problem of sewage sludge. In 1977, Congress amended the law in two respects. First, it stated in cases where disposal of sewage sludge would result in pollutants entering navigable waters, a permit must first be acquired.[441] Second, it instructed the EPA to develop and issue sludge use and disposal regulations.[442] The

(b) Waste shall not be applied to land when the ground is frozen or saturated or during rainfall events.

(c) Waste manure shall be applied to suitable land only at appropriate times and rates. In addition, run-off of waste from the application site is prohibited.

(d) Disposal of manure shall not contribute to the endangerment of threatened species of plant, fish, or wildlife; nor shall such disposal cause harm to migratory birds. The operator must notify the appropriate fish and wildlife agency in the event of a migratory/endangered species kill on or near retention ponds or in fields where waste has been applied.

(e) All necessary practices to minimize waste manure transport to water courses shall be utilized and documented.

(f) Edge-of-field, grassed strips shall be used to separate water courses from runoff carrying eroded soil and manure particles. Land subject to excessive erosion shall be avoided.

(g) Where land application sites are isolated from surface waters and no potential exists for runoff into a water of the United States, application rates may exceed nutrient crop uptake rates per an approved state program. No land application shall contribute to a violation of water quality standards.

58 Fed. Reg. 7610.

439. 58 Fed. Reg. 7610, 7630 (1993).

440. 2 RODGERS, *supra* note 151, § 4.15 at 232. It is usually "gray and slimy in appearance, highly offensive in odor, and consists of fine silt and readily settleable organic matter." *Id.* It is the after-product of treating municipal and industrial wastewater. Cities are the principal generators and custodians of sludge as a result of their treatment works. The supply of sludge is growing exponentially and disposing of it is an increasing problem.

441. 33 U.S.C. § 1345(a). Rodgers stated: "All this amounts to, . . . is another NPDES program for sludge discharges into navigable waters." 2 RODGERS, *supra* note 151, § 4.15 at 237.

442. 33 U.S.C. § 1345(d), as enacted in 1977, reads as follows:

(d) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after [the date of enactment of this subsection] and from time to time thereafter, regulations providing guidelines for the disposal of sludge and the utilization of sludge for various purposes. Such regulations shall—

(1) identify uses for sludge, including disposal;

(2) specify factors to be taken into account in determining the measures and practices applicable to each such use or disposal (including publication of information on costs);

amendments made clear the manner of disposal and use of sludge remains primarily a matter of state law, although the state law disposal choice must conform to the EPA's performance standards.[443]

The mandated regulations were controversial and slow in coming. Further congressional amendments overtook the regulatory process. In 1987, Congress directed the EPA to identify toxic substances potentially present in sewage sludge and to set numerical limitations for each pollutant.[444] In addition, the EPA was required to impose conditions in NPDES permits issued to POTWs to protect the public from the adverse effects of sewage sludge and to implement the EPA's sewage sludge regulations.[445] These regulations are fully applicable in South Dakota.

2. *Land Application*

Application of sewage sludge to the land, although the preferred method of disposal, presents a regulatory problem. When sludge is applied to land, it later runs off and reaches waters of the United States. Whether such a discharge is a point source requiring a NPDES permit depends upon whether the discharge qualifies as agricultural runoff. Although agricultural runoff is always a nonpoint source, is land application of manure agriculture? It will be recalled, in the context of feedlot regulation, the EPA's Region Six has chosen to treat land disposal of manure as a point source.[446]

3. *Citizen Suits and Sludge Disposal*

When the EPA's performance standards for sewage sludge become final, they are binding on all sludge disposal activities. Sludge regulations are the equivalent of effluent limitations for purposes of citizen suit jurisdiction. In other words, violation of those performance standards would be enforceable by a citizen. Similarly, a citizen suit would also be the vehicle for challenging runoff of sludge into surface water.[447]

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(3) identify concentrations of pollutants which interfere with each such use or disposal. The Administrator is authorized to revise any regulation issued under this subsection.

33 U.S.C. § 1345(d). In response to this amendment, Rodgers observed: "The federal regulations approved are unusual in the sense that they endorse performance guidelines, in a mild form at least, for a prevalent kind of nonpoint source pollution whose greatest threat is to groundwater resources not traditionally within any understanding of 'navigable waters.' " 2 RODGERS, *supra* note 151, § 4.15 at 238.

443. 33 U.S.C. § 1345(e) states:

> The determination of the manner of disposal or use of sludge is a local determination except that it shall be unlawful for any person to dispose of sludge from a publicly owned treatment works or any other treatment works treating domestic sewage for any use for which regulations have been established . . . except in accordance with such regulations.

33 U.S.C. § 1345(e) (Supp. 1994).

444. 33 U.S.C. § 1345(d). Management practice and numerical criteria are to be adequate to protect the public health and environment as expeditiously as practicable.

445. The regulations are found at 40 C.F.R. § 125, Subpart L and 40 C.F.R. § 501.

446. As a corollary, land application presents the question of whether it is an activity which requires a GDP permit.

447. 33 U.S.C. § 1365.

Y. MINING

1. Overview

Mining, the extraction from the earth of metal bearing ores, has been fundamental to economic development. However, mining also presents one of the more difficult pollution control challenges.[448] Under the federal CWA, a NPDES permit or its state-level equivalent is required before pollutants can be discharged from a point source into waters of the United States. Effluent limitation guidelines are published by the EPA for each industry. The Code of Federal Regulations contains final effluent limitation regulations for several "ore mining" categories.[449]

A special and separate effluent limitation rule exists for gold placer mining.[450] Another set of rules is promulgated for mining minerals such as crushed stone and gypsum.[451] For each of these categories, the federal regulations establish maximum levels of pollutants for a mine's flow of wastewater. Typically, there is a higher limit—the maximum for any one day, and a lower limit—the average the mine cannot exceed in one month for each of these mining categories.

The SDWA indirectly implicates mining because there are primary drinking water regulations for cadmium, lead and arsenic, and secondary standards for copper, iron, manganese, and zinc.[452] RCRA potentially governs the extraction process because the majority of mine waste satisfies the definitions of hazardous or solid waste. Although RCRA regulation of

448. The extraction process itself generates five sources of waste. As described in a recent text, these are:

> First is the mine waste that results from removing the overburden—the soil and rock excavated to get down to the ore. This consists of everything from the plants on top of the ground to the topsoil on which the plants are anchored, as well as all the dirt, clay, and rock lying between the topsoil and the minable ore.
>
> The second waste is the tailings. Typically, the ore is impure and consists of a percentage of the mineral mixed with large amounts of waste rock. The impure ore is initially separated in a gross, approximate way from the waste rock, often through a physical process, such as grinding. The ore is then sent on for further processing, and the waste rock, called tailings, must be disposed of.
>
> Third, water can make its way into the mine or into the tailings or other wastes. This mine water frequently becomes contaminated. For example, the natural oxidation of sulfide minerals or pyrite in rock when exposed to air and water creates sulfuric acid. This acid mixes in the water and drains from the mine or waste pile. The sulfuric acid can also dissolve other metals which will enter the wastewater.
>
> Fourth, waste is generated in chemical extraction processes. The material left in place after the process is completed usually still contains some portion of the chemicals used to leach out the metals, including cyanide or acids. These wastes are "dump/heap leaching wastes."
>
> Finally, wastewater is generated by placer, dredge, and hydraulic mining. This wastewater may contain concentrated levels of toxic metals, including arsenic, cadmium, lead, zinc, and copper.

CELIA CAMPBELL-MOHN, BARRY BREEN & J. WILLIAM FUTRELL, ENVIRONMENTAL LAW: FROM RESOURCES TO RECOVERY 784-85, (1993) (citations omitted).

449. The ore mining categories include: (1) Iron; (2) Aluminum; (3) Uranium, Radium and Vanadium; (4) Mercury; (5) Titanium; (6) Tungsten; (7) Nickel; (8) Antimony; (9) Copper, Lead, Zinc, Gold, Silver, Molybdenum; (10) Platinum. 40 C.F.R. § 440.

450. 40 C.F.R. § 440 Subpart L.

451. 40 C.F.R. § 436.

452. 40 C.F.R. § 141.11(b).

mine waste is far from being a reality, a regulatory structure is coming into place.

Mines can be a particular problem for groundwater. Often, both surface and underground mines extend below the water table, so dewatering to expand mining is common. Water pumped from a mine may be mineralized or otherwise contaminated. The presence of polluted water can also deter effective reclamation of the mine site.

Coal is regulated separately under the federal Surface Mining Control and Reclamation Act (SMCRA) of 1977.[453] SMCRA follows the typical federal standards/state implementation approach of many federal environmental laws.[454] If a state established program is in compliance with federal standards, it will enjoy delegated enforcement authority.[455] SMCRA departs somewhat from the standard format for federal coal lands. Even where a state has assumed primacy for regulations under SMCRA, federal approval is still required for mining federal lands.[456] For a state to permit coal mining on federal lands, it must enter into a cooperative agreement with the Office of Surface Mining (OSM) in the Department of Interior.[457] This cooperative agreement applies to "split estate" land, where the surface is privately-owned, but the subsurface coal is federally-owned.

2. *State Regulation of Mining*

The South Dakota BME is authorized to regulate most types of mining by permit and other rules. This regulatory process is divided into an exploration[458] and a full mining operation section. Exploration is not directly

453. 30 U.S.C. 1201-1328.

454. SMCRA focuses on reclamation of the surface coal mine site after removal of the coal. A plan must be approved before the mining commences and is subject to federal regulations which directly implicate groundwater. For example, the regulations state:

> (1) *Recharge capacity of reclaimed lands.* The disturbed area shall be reclaimed to restore approximate premining recharge capacity through restoration of the capability of the reclaimed areas as a whole to transmit water to the ground water system. The recharge capacity should be restored to support the approved postmining land use and to minimize disturbances to the prevailing hydrologic balance at the mined area and in associated offsite areas. The permittee shall be responsible for monitoring according to paragraph (h)(3) of this section to ensure operations conform to this requirement.
>
> (2) *Ground water systems.* Backfilled materials shall be placed to minimize adverse effects on ground water flow and quality, to minimize offsite effects, and to support the approved postmining land use. The permittee shall be responsible for performing monitoring according to paragraph (h)(3) of this section to ensure operations conform to this requirement.

30 C.F.R. § 715.17(h). Regular monitoring of groundwater for quality and flow characteristics is also required. *Id.*

455. South Dakota has achieved "primacy" under SMCRA and also has a cooperative agreement in place. 30 C.F.R. § 941.700 (1993). *See* S.D. ADMIN. R. ch. 74:29 (1993).

456. 30 U.S.C. § 1273.

457. 30 U.S.C. § 1273(c); 30 C.F.R. § 745 (1993).

458. "Exploration" is defined as:

> [T]he act of searching for or investigating a mineral deposit, including sinking shafts, tunneling, drilling test holes, digging pits or cuts or other works for the purpose of extracting samples, including bulk samples, prior to commencement of development or extraction operations, and test facilities to prove the commercial grade of a mineralized deposit.

regulated. Rather, a firm which seeks to explore need only file a "notice of intent" to conduct an exploration operation.[459] A detailed form is mandated,[460] but the key requirement is the reclamation plan[461] which provides rehabilitation for the area involved. Enforcement of the reclamation plan is principally through the requirement of a financial surety,[462] although enforcement provisions are included.[463]

Several provisions of the rules governing exploration relate directly to groundwater. For example, one provision requires water quality testing in area domestic wells.[464] Risk to water resources is a factor considered in the BME's determination of financial surety.[465] Test holes must be sealed,[466] and the BME must be notified whenever a test hole penetrates an aquifer.[467]

After exploration, assuming a firm intends to proceed with a full mining operation, a mining permit is required from the BME.[468] This permit applies to both surface and subsurface mining,[469] and is good for "the life of the mine."[470] The key regulatory component is the reclamation plan.[471]

Surface or underground mines being opened "on previously mined lands with existing unreclaimed land disturbance may not be required to reclaim" the existing sites.[472] The permissive statutory language suggests the decision rests in the discretion of the BME. Importantly, water discharges from previously mined material will be subject to regulation via the CWA's NPDES permit.

The reclamation plan itself must include a detailed description of the process to be used to rehabilitate the land, the "baseline water quality and water level of all areas of aquifers potentially affected by the proposed mining operation," and the location of potential water sources for the mining operation.[473] The plan is submitted to the BME for approval. The BME is required to set bond at a level sufficient to "guarantee the costs of

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S.D.C.L. § 45-6C-3(6) (Supp. 1994).

459. S.D.C.L. § 45-6C-6 (1983).
460. S.D.C.L. § 45-6C-7 (1983).
461. S.D.C.L. § 45-6C-8 (1983).
462. S.D.C.L. § 45-6C-19 (Supp. 1994).
463. S.D.C.L. §§ 45-6C-39 to 45 (1983).
464. S.D.C.L. § 45-6C-18 (1983).
465. S.D.C.L. § 45-6C-20 (1983).
466. S.D.C.L. § 45-6C-31 (1983).
467. S.D.C.L. § 45-6C-34 (1983).
468. S.D.C.L. § 45-6B-5 (Supp. 1994).
469. S.D.C.L. § 45-6B-3(11) (Supp. 1994).
470. S.D.C.L. § 45-6B-5 (Supp. 1994).
471. S.D.C.L. § 45-6B-7 (1983). "Reclamation" is defined as:

> [T]he employment during and after a mining operation of procedures reasonably designed to minimize as much as practicable the disruption from the mining operation and to provide for the rehabilitation of affected land through the rehabilitation of plant cover, soil stability, water resources, or other measures appropriate to the subsequent beneficial use of such mined and reclaimed lands . . . .

S.D.C.L. § 45-6B-3(14).

472. S.D.C.L. § 45-6B-8 (1983).
473. S.D.C.L. § 45-6B-7(9) (1983).

reclamation of affected public and private lands."[474] Interestingly, the wording of the statute is that the BME "shall grant a permit . . . if the application complies with [all] the requirements . . . [of] local, state and federal laws."[475] The Board may not deny a permit, unless one of the enumerated technical reasons is present.[476] The BME may deny a permit if it finds the land is unsuitable for a mining operation.[477] Thus, the BME's major act of discretion is in determining whether land is "unsuitable for a mining operation."[478]

The statute states land is unsuitable when certain enumerated conditions cannot be effectively mitigated.[479] Of course, the BME can only make an informed guess on whether the five categories will be satisfactorily mitigated. In most regulatory settings, the potential problem is met by limiting the permit to a set term, such as five years. In those cases, if a particular problem area is shown to require more careful attention, permit conditions can be modified during the renewal process.[480] Enforcement is available when an operator violates a term of a permit.[481] However, in a "life of the mine permit," the BME failed to include a condition which addressed or required mitigation of one of the five "unsuitable land" categories mentioned above. Apparently, the more meaningful permits from the point of view of environmental protection are the NPDES surface water discharge and the GDP permits for discharges into groundwater.

Z. CONCLUSION

The law pertaining to groundwater protection is a hodge-podge. No pattern emerges and there is no agreement on a "best" approach. None-

474. S.D.C.L. § 45-6B-20 (1983).
475. S.D.C.L. § 45-6B-32 (1983).
476. *Id.*
477. S.D.C.L. § 45-6B-32(8).
478. *Id.*
479. S.D.C.L. § 45-6B-33 (Supp. 1994). The specified conditions are:

> (1) Reclamation of the affected land pursuant to the requirements of this chapter is not physically or economically feasible;
>
> (2) Substantial disposition of sediment in stream or lake beds, landslides or water pollution cannot feasibly be prevented;
>
> (3) The land to be affected by a proposed mining operation includes land that is special, exceptional, critical or unique as defined in § 45-6B-33.3 and satisfactory mitigation is not possible;
>
> (4) The proposed mining operation will result in the loss or reduction of long-range productivity of aquifer, public and domestic water wells, watershed lands, aquifer recharge areas or significant agricultural areas; or
>
> (5) The biological productivity of the land is such that the loss would jeopardize threatened or endangered species of wildlife indigenous to the areas; or
>
> (6) The board finds that any probable adverse socioeconomic impacts of the proposed mining operation outweigh the probable beneficial impacts of the operation.

Id.

480. However, South Dakota mining permits are for "the life of the mine." S.D.C.L. § 45-6B-5 (Supp. 1994). Thus, the critical regulatory issue is whether the BME has authority to modify a permit if the permit did not accurately predict the necessary protections for the land. Interestingly, the answer is elusive.
481. S.D.C.L. §§ 45-6B-48 to 50.

theless, groundwater remains important to South Dakota's economy. Meaningful economic growth is dependent upon a reliable and clean supply of water, a fact emphasized by the realization that South Dakota lacks financial resources to develop alternative water sources such as long-distance, all-weather pipelines. Although Congress may occasionally provide relief by financing construction of large water projects such as the WEB Pipeline or the proposed Lewis & Clark Pipeline, these projects would only provide water to specific areas, leaving the remainder of the state dependent on groundwater. Thus, the future of South Dakota's water resources demands protection of groundwater aquifers from contamination.

At the federal level, Congress acquiesced in judicial conclusions that an ambiguous CWA does not apply to groundwater.[482] It then followed with several regulatory and remedial statutes which focused specifically on such groundwater threats as major chemical spills, hazardous and domestic waste disposal, and underground rejection of wastes. Congress later expressed its concern indirectly by regulating drinking water quality at the tap.

Congress perceived the need to use local land use controls to prevent water pollution as early as 1972, when the CWA was enacted. Planning was intended to be fully integrated into the water pollution control strategy of the CWA. Before permits would be issued or federal construction grants made, there was to be a systematic plan allowing decision-makers to address the more difficult pollution problems first. In practice this was turned around; standards were established and implemented through permit programs before the planning programs had a chance to develop. Nonetheless, planning was a feature which gradually became more important.

States typically maintain two systems of regulatory laws which affect the quality of groundwater. One system focuses on the administration of natural resources use. The second system addresses groundwater protection directly. South Dakota relies upon WQS. As previously described,[483] however, WQS are an ineffective enforcement vehicle, readily manipulated to meet demands of prevailing economic forces.

South Dakota's groundwater protection program has many exceptions, including those for the state's agriculture and mining industries. By choosing to base its protection strategy on ambient standards, South Dakota will inevitably allow considerable pollution to occur prior to enforcement. Moreover, the fact that an intense permit-based program is administered by a small department suggests effective implementation will be difficult to achieve. Reliance upon ambient water quality standards places the burden of proving violations on the implementing agency, and requires expensive monitoring. South Dakota law subjects virtually every discharge to a permit requirement, a difficult approach to enforce. Thus, what exists is full

482. Exxon Corp. v. Train, 554 F.2d 1310 (5th Cir. 1977).

483. For a discussion of these standards, see *supra* notes 134-58.

authority to act on a case-by-case basis. If a discharger is caught, the State can elect to take action. Unfortunately, there is no overall plan for groundwater protection.

One approach to a successful state program is to concentrate on the prevention of pollution. As stated earlier, groundwater is simply a fingerprint of human activity on the surface of the land. The activities pursued on the surface of the land will ultimately be reflected in the quality of the underlying groundwater aquifer. It follows that groundwater protection is a problem in land use management and control. Effective and comprehensive land use controls can also hold down the costs of regulation by avoiding the pollution at the outset. Only in such a situation can meaningful pollution prevention occur.