NORTH DAKOTA DEPARTMENT OF HEALTH
Environmental Health Section

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REF FILE: U.S. Environmental Protection Agency

April 5, 2000

Honorable Carol M. Browner
Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue NW
Washington, DC 20460

Dear Administrator Browner:

Subject: Regulatory Status of Coal Combustion Waste in North Dakota

The March 2000 report entitled "Laid to Waste" from the Citizens' Coal Council, the *Hoosier Environmental Council, and the Clean Air Task Force* is inaccurate and misrepresents information on disposal of coal fly ash, flue gas desulferization (FGD) waste, and bottom ash in the state of North Dakota. The report also misconstrues the characteristics of the waste and our state's regulatory program. Let us set the record straight.

For the last twenty years, North Dakota has required that all operating landfills and surface impoundments for coal waste disposal be formally permitted by this Department. North Dakota's solid waste rules for coal combustion waste disposal follow the model of the RCRA Subtitle D criteria for municipal solid waste. Our rules for coal waste include:

- Location restrictions;
- Operating criteria;
- Facility design;
- Ground water monitoring and corrective action;
- Closure and post-closure care; and
- Financial assurance.

In our semiarid state, current coal combustion waste disposal sites are carefully constructed with compacted clay liners or composite liners, they control surface water run-on and runoff and some have leachate drainage systems.

SWP EPA 4/6

The state's permit process includes a multiagency review by two divisions of this Department, the North Dakota Geological Survey, the North Dakota State Water Commission, and for facilities located within former mine areas, the North Dakota Public Service Commission, who is the agency approved by the Federal Office of Surface Mining for regulating mining activities in our state. The Department's process also embraces public review and comment.

Contrary to the report, indiscriminate disposal of coal waste into surface mines has not occurred for twenty years; however, many of the permitted landfills are located within carefully constructed facilities that were once part of surface mines. Thick sequences of clay-rich soils associated with North Dakota's coal mines, when properly segregated and conditioned, make excellent material for liner and final cover construction.

The "Laid to Waste" report found historic data dating back to the late '70s and early '80s from five sites showing apparent contamination. Every state in the country has examples of contamination from old waste sites that warrant upgrading and remediation. North Dakota's coal fired electric plants have discontinued unsuitable waste management practices, they monitor groundwater and surface water at old and current facilities and as necessary, take corrective measures to control impacts to the environment.

Through years of investigation and waste analysis, the Department has never found that fly ash, FGD waste, and bottom ash fails the criteria for hazardous waste. Indeed, bottom ash chemically resembles a sand-like material. While fly ash and FGD waste certainly contains dissolvable solids and some heavy metals, the levels fall significantly short of the hazardous waste characteristics. The Department has not found appreciable amounts of mercury in coal combustion waste.

We are disappointed that the writers of the report misconstrued file information and did not review their findings with our staff for clarification. The report did not assess the state's current regulatory requirements. Regulation of fly ash, FGD waste, and bottom ash under Subtitle C of the Resource Conservation and Recovery Act is clearly not warranted, would create confusion and unnecessary paperwork, would not significantly increase protection of human health and the environment, and would discourage beneficial reuse or recycling of byproducts. The state's regulatory program for these power plant wastes meet all the requirements of an effective program and yet does not bridle the industry with unnecessary paper work and regulation.

The Department has not been consulted directly by the EPA regarding this *ex-parte* decision process. We are confident that a thorough review of our state's program would show that waste from coal combustion electric plants are being effectively managed. We would welcome any inquiries on this letter, any other issues discussed in the report, or any other questions on the state's regulatory program.

Should you or your staff have any questions, please feel free to contact either Mr. Steven Tillotson, Ass't Director of the Division of Waste Management, telephone (701) 328-5166, E-mail stillots@state.nd.us or me at (701) 328-5150.

Sincerely,

Francis J. Schwindt

Francis J. Schwindt, Chief
Environmental Health Section

FJS:SJT:lb
cc: Murray G. Sagsveen, State Health Officer
Dennis Ruddy, USEPA, Office of Solid Waste
Tom Kennedy, ASTSWMO
Governor Edward T. Schafer
Senator Kent Conrad
Senator Byron Dorgan
Representative Earl Pomeroy

GUIDELINE 11 - ASH UTILIZATION FOR SOIL STABILIZATION, FILLER MATERIALS AND OTHER ENGINEERING USES

North Dakota Department of Health - Division of Waste Management
Telephone 701-328-5166 • Fax 701-328-5200 • Website www.health.state.nd.us

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Attachment: Parameters and Methods for Assessing Leachability* of Fly Ash and Runoff from Fly Ash Utilization Sites in North Dakota (Parameters may be reduced based upon review.)

North Dakota Department of Health is working with a number of power plants, coal-fired boiler operators, coal mines, and other entities wishing to utilize waste materials such as coal-fired fly ash and/or bottom ash for engineering purposes. Some projects such as road stabilization, underground mine stabilization, controlled strength flowable fill, and other uses have been reviewed and approved by the Department based on an evaluation of the material's engineering and environmental properties. Persons proposing use of waste materials for beneficial reuse need to demonstrate that the material will be beneficially used without adversely impacting the environment.

Beneficial reuse must be carefully considered to ensure it is not simply *"use constituting disposal"* or *"sham recycling."* Proposers should be familiar with the state's environmental laws and rules, including the North Dakota Solid Waste Law, Chapter 23-29 North Dakota Century Code (NDCC); the North Dakota Solid Waste Management Rules, Article 33-20 North Dakota Administrative Code (NDAC); as well as the state's Water Pollution laws, Chapter 61-28 NDCC, which includes Section 61-28-08 which states in part:

> "It shall be unlawful for any person:
>
> a. To cause pollution in any waters of the state or to place or cause to be placed any waters in a location where they are likely to cause pollution of any waters of the state . . ."

The Department needs to review important aspects of any proposal, including, but not limited to the ash quality and quantity, the proposed use of the ash, site characteristics, potential receptors, how the material will be handled, contingency plans in case adverse environmental conditions arise, how the site will be monitored to ensure environmental protection, what will be done when use of the material is completed, any local health or zoning issues, site closure and reclamation, etc. At a minimum, any proposal should address the following:

1. **Background information on the source, quality, and quantity of the ash** including the generator of the ash; the type of facility, the boilers, the pollution control equipment, etc., used in generating and collecting the ash; the source and the type of fuel used in the process; the variability of the ash; whether it is a mixture of other materials or waste streams, how it is stored and handled prior to any disposal or use, and any other information necessary.

2. **Analysis of the ash,** including both existing information and, as necessary, some leach

analysis. Information that might be provided would include mineralogical properties and total analysis plus an assessment of the environmental leachability of the ash materials. At a minimum, an ash leach test on one or more representative samples utilizing either: (1) a **modified** EPA Synthetic Precipitation Leaching Procedure (SPLP) Method 1312, with a solution to solid ratio 4:1, or (2) A modified ASTM D-3987 procedure with a solution to solid ratio of 4:1. A list of chemical parameters is attached to this memorandum. The detection limits for analysis must be substantially below the safe drinking water standards.

3. **A discussion and details on the proposed use of the ash**, including any admixtures, fill materials, soil, etc., should be provided. Information that is essential for review includes a description of the actual beneficial use; the mix ratio and design lift thickness; type and quality of fill materials, moisture levels, compaction, and engineering properties (including the strength and durability of materials), and what the material will be covered with, assessment of weathering, material breakup, etc., should be provided.

4. **A laboratory simulation** of the environmental properties of the proposed use should be addressed. Laboratory simulation testing to replicate field conditions determine leachability of the material as-placed should be provided. Upon discussion with the Department, a field simulation test should be agreed upon that will be adequate to determine any impact on the environment from initial waste placement, and any impact through continued weathering, mechanical abrasion, erosion, field runoff, etc. Various simulation tests have been approved by the Department, including kinetic tests simulating infiltration of water through fill materials.

   One publication that has been utilized for evaluating ash utilization in a mine setting is the publication *"Draft Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia"* by Dr. William A. Price, Reclamation Section, Energy and Minerals Division, Ministry of Employment and Investment, Bag 5000, Smithers, British Columbia, V0J2N0. Other information is available in Departmental files or may be proposed by the applicant based on the conceptual field application. Laboratory simulation of the field application methods might also entail testing of the materials due to its fate in the environment through weathering, breakup, erosion, abrasion, excavation, etc.

5. **The site characteristics**, including soils, topography, geology, hydrogeology, groundwater quality, surface water conditions and flow, vegetation, etc.

6. **Potential receptors**, including nearby communities, residences, parks, natural areas, neighboring land use, waterways, site drainage, groundwater conditions and quality groundwater wells, and any other information necessary to assess potential impacts to health and the environment.

7. **Description of the material handling and conceptual construction**, including transport and storage of materials, placement of materials, equipment, construction techniques, moisture application and monitoring, mixing, testing, etc., as well as controls and monitoring of windblown dust, stormwater and/or any ponded water must be described.

8. **The proposal should address reasonable contingencies** such as discontinuance of the application methods, cleanup of the site should environmental damage occur, final disposal

of placed materials after the life of the project, etc.

9. **Approval by any local health, environmental, and permitting authorities** must be obtained before the project is conducted. Any Departmental approval is contingent upon and does not supersede compliance with all local environmental, health, and building code requirements.

10. **Monitoring of surface, groundwater, air, and soil** may be required.

11. The proposer should provide routine reports on construction and operation progress, monitoring results, final construction details and, for ongoing projects, periodic re-analysis of the ash material on an annual basis or, more often, under the following circumstances:

    a. The process generating that waste changes, such as the installation of different boilers, *burners, pollution control equipment, or any other process change which might* influence the character of the waste being utilized;

    b. In the event that the raw material or type of fuel changes; and

    c. Any other changes or variances which may influence the characteristics of the ash/product or the mixture used in the construction project.

This outline is provided for guidance purposes only. Additional requirements or conditions may be stipulated by the Department, dependent on the particular application, site characteristics, or other regulatory requirements.

Should you have any questions regarding these matters, please feel free to contact the Department at (701) 328-5166. More information on the state's environmental laws and rules are available at our Website www.state.nd.us

North Dakota Department of Health - Division of Waste Management

Parameters and Methods for Assessing Leachability* of Fly Ash and Runoff from Fly Ash Utilization Sites in North Dakota

(parameters may be reduced based upon review)

a. Basic water parameters:

(1) Appearance (including color, foaming, and odor)
(2) pH[1]
(3) Specific conductance[2]
(4) Temperature

b. General geochemical parameters:

(1) Ammonia nitrogen
(2) Total hardness
(3) Iron
(4) Calcium
(5) Magnesium
(6) Manganese
(7) Potassium
(8) Total alkalinity
(9) Bicarbonate
(10) Carbonate
(11) Chloride
(12) Fluoride
13) Nitrate + Nitrite, as N
(14) Total phosphorus
(15) Sulfate
(16) Sodium
(17) Total dissolved solids (TDS)
(18) Total suspended solids (TSS)
(19) Cation/anion balance
(20) Sodium Adsorption Ratio (SAR)

c. Heavy Metals:

Group A:

(1) Arsenic
(2) Barium
(3) Boron
(4) Cadmium
(5) Chromium
(6) Lead
(7) Mercury
(8) Selenium
(9) Silver

Group B:

(10) Antimony
(11) Beryllium
(12) Cobalt
(13) Copper
(14) Nickel
(15) Thallium
(16) Vanadium
(17) Zinc

d. *For Fly Ash waste analysis, naturally occurring radionuclides:*

(1) Gross Alpha Particle Radioactivity (pCi/1)
(2) Radium 226 and 228 (pCi/1)
(3) Uranium

*Ash leach test on one or more representative sample(s) using a **modified** EPA Synthetic Precipitation Leaching Procedure (SPLP) method 1312 with a **solution to solid ratio of 4:1. A modified ASTM D-3987 procedure with a solution to solid ratio of 4:1 may also be used.** Laboratory detection limits must be substantially below the level of any state or federal drinking water standard or goal.

Rev: 04/01

Policy Memorandum No. 15 to Mine Operators

DATE: January 13, 1999 (Revised)
(Original Issue Date November 5, 1985)

TO: All Mine Operators and Lignite Energy Council

FROM: Commissioners Reinbold, Hagen and Wefald
Neil Knatterud, North Dakota Department of Health

SUBJECT: Performance Bond Release for Waste Disposal Operations Located on Mined Lands

The Commission has adopted a policy to totally release the performance bond amount of mined acreage utilized for the disposal of large quantities of ash from coal conversion facilities, sanitary landfills operated by a city, or other long term solid waste disposal sites. Prior to Commission approval of such a bond release, a long-term industrial land use must be implemented in order to allow an exemption from the 10-year revegetation responsibility period pursuant to NDAC Section 69-05.2-12-09(2). This includes the issuance of the appropriate permits by the State Department of Health and county zoning authorities and the construction of the facility to a degree that it is ready for use. Final closure, revegetation and monitoring of these sites will have to be carried out in accordance with applicable State Department of Health and or county requirements.

The purpose of this policy is to eliminate duplication of regulation by the Commission and State Department of Health on waste disposal sites constructed on mined lands. It is also understood that future use of these sites following waste disposal and closure will probably be limited due to the final topography and the desire to maintain a permanent vegetation cover on the areas. However, with the respreading of sufficient topsoil and subsoil, most of the closed disposal sites will be capable of being hayed or having other well managed uses. As part of this policy, the Commission has assumed that sufficient topsoil and subsoil will be set aside and respread on these areas upon site closure to ensure a good vegetative cover to provide long term site stability, as well as having the capability to produce hay crops. Nearly all approved waste disposal sites

located on mined lands were selected for that use following soil, overburden, and coal removal. All available topsoil and sufficient subsoil from these lands were removed to meet soil respreading requirements in the Commission's mining and reclamation rules.

The State Department of Health rules require that at least six inches of soil be respread on solid waste disposal sites as part of closure. This "minimum" thickness is specified since the amount of suitable soil is limited at many pre-existing waste disposal sites on non-mined lands. However, in the case of solid waste disposal sites located on mined lands, considerably more than six inches of soil is removed prior to mining to meet the Commission's soil respread requirements. Therefore, before granting final bond release on mined areas used for long-term waste disposal activities, the Commission will require a showing that sufficient topsoil and subsoil have been set aside to provide a total respread thickness of at least 24 inches of soil for sites where the cover material is non-sodic spoil and 36 inches where the cover is sodic spoil, with a minimum topsoil thickness of 8 inches. Exceptions to these thicknesses will be allowed if the quantities of topsoil and subsoil removed prior to mining are less than those needed to provide these thicknesses.

These thicknesses of topsoil and subsoil are considered sufficient to ensure long term site stability and good vegetative production on the disposal sites upon final closure. The State Department of Health discourages cropping or grazing of the closed disposal sites due to the possibility of abusive practices that may cause the soil and other capping materials to erode and expose the wastes that were disposed. However, it is very likely that many of these areas will be suitable for haying (or other well managed uses) when the vegetation is adequately established.

The bond release application and Commission release procedures for approved waste disposal areas must comply with all applicable provisions of NDAC Chapter 69-05.2-12.

Bruce Hagen	Leo M. Reinbold	Susan E. Wefald
Commissioner	President	Commissioner

Neil Knatterud
Director, Solid Waste Division
North Dakota Department of Health