ILLINOIS POLLUTION CONTROL BOARD
July 7, 1995

IN THE MATTER OF:	)	
	)	
PETITION OF CONVERSION SYSTEMS, INC. FOR ADJUSTED STANDARD FROM 35 ILL. ADM. CODE PART 811 (Liner)	)	AS 93-4 (Adjusted Standard-Land)

OPINION AND ORDER OF THE BOARD (by C.A. Manning):

This matter is before the Board on a petition for an adjusted standard filed by Conversion Systems, Inc. (CSI) on July 2, 1993. CSI seeks adjusted standards from the requirements of 35 Ill. Adm. Code Part 811, Standards for new solid waste landfills, Sections 811.306, 811.314, and 811.507, as they apply to its Poz-O-Tec® materials (Poz-O-Tec). These materials are produced through a patented stabilization process utilizing flue gas desulfurization (FGD) sludges and ash produced by coal-burning power generation facilities. CSI seeks the adjusted standard in order to allow owners of chemical waste landfills accepting only FGD sludges and coal combustion wastes to use Poz-O-Tec as a liner and cap material.

Based upon the record before it and upon review of the factors involved in the consideration of adjusted standards, the Board finds that petitioners have demonstrated that grant of an adjusted standard is warranted. Accordingly for reasons more fully set forth below, the Board hereby grants CSI an adjusted standard from 811.306, 811.314, and 811.507.

PROCEDURAL HISTORY

CSI originally filed a petition for adjusted standard concerning its Poz-O-Tec materials on August 24, 1992, which was docketed as AS 92-9. That petition was dismissed by the Board on March 25, 1993, pursuant to CSI's request to voluntarily withdraw the petition. The petition before the Board in the present proceeding was filed on July 2, 1993. Concurrently with the filing of this petition, CSI filed a separate petition for adjusted standard, docketed as AS 93-5, wherein CSI seeks relief from the requirements of 35 Ill. Adm. Code Part 811 so as to allow Poz-O-Tec materials to be disposed of in a monofill without the need for a liner, cap, or leachate collection system.

Also on July 2, 1993, CSI filed a "Motion Regarding Procedural Matters," wherein CSI requested that it be allowed to incorporate by reference the entire record from AS 92-9. CSI also requested that the Board rule upon the issue of whether its failure to include site-specific information would make adjusted standard relief unavailable. On July 20, 1993, the Illinois Environmental Protection Agency (Agency) filed a response to this motion and a motion to dismiss, and CSI filed a reply to the

Agency's response. The Board issued an order on July 22, 1993, which granted CSI's motion to incorporate the record in AS 92-9. On August 26, 1993, the Board issued an order, with two Board Members dissenting, finding that CSI's petition for adjusted standard was an appropriate mechanism for seeking relief, and which accepted the petition for hearing. (See Board Order of August 26, 1993, B. Forcade and C.A. Manning dissenting.) In its August 26, 1993 order, the Board expressed no opinion as to the merits of the petition. No appeal of that order was sought by either the petitioner or the Agency.

The Agency filed two motions for extensions of time to file its response in order to allow the Agency to substitute counsel, and in order to allow negotiations between the parties. The Board granted both extensions of time, the second of which granted the Agency an extension until May 23, 1994 to file its response.

The Board received CSI's Certificates of Publication on August 2, 1993, which indicated that notice of the proposed adjusted standard was published in the State Journal-Register on July 5, 1993, and in the Chicago Sun-Times on July 3, 1993. No requests for public hearing were received, and no hearing was held in this matter. However, on May 19, 1994, the Board assigned a hearing officer to this matter, and directed the parties to hold a pre-hearing conference, which was held June 22, 1994. Subsequently, because the parties wished to continue negotiating, the hearing officer issued an order directing the parties to file status reports on or before November 1, 1994.

The Agency filed its response to the petition for adjusted standard on November 3, 1994, recommending that the adjusted standard be granted, subject to certain additions and amendments. On November 14, 1994 CSI filed a motion for leave to file a reply to the Agency response which the Board granted. The reply indicates that CSI is in agreement with the Agency's proposed amendments to the adjusted standard.

On May 5, 1995, CSI filed a motion requesting that the Board follow its August 26, 1993 order. The Board finds the motion moot for the reasons set forth below in the opinion.

THE ADJUSTED STANDARD PROCESS - SECTION 28.1 OF THE ACT

The Board's responsibility in this matter arises from the Environmental Protection Act (Act) (415 ILCS 5/1 et seq.). The Board is charged therein to "determine, define and implement the environmental control standards applicable in the State of Illinois" (Section 5(b) of the Act) and to "grant . . . an adjusted standard for persons who can justify such an adjustment" (Section 28.1(a) of the Act). More generally, the Board's responsibility in this matter is based on the system of checks

and balances integral to Illinois environmental governance: the Board is charged with the rulemaking and principal adjudicatory functions, and the Agency is responsible for carrying out the principal administrative and enforcement duties.

Section 28.1 of the Act provides that a petitioner may request, and the Board may adopt an individual adjusted standard different from the standard that would otherwise apply to petitioner pursuant to a rule of general applicability. Such a standard is called an adjusted standard. The general procedures that govern an adjusted standard proceeding are found at Section 28.1 of the Act and within the Board's procedural rules at 35 Ill. Adm. Code Part 106.

Where, as here, the regulation of general applicability does not specify a level of justification required for a petitioner to qualify for an adjusted standard, the Act at Section 28.1(c) specifies four demonstrations that must be made by a successful petitioner:

1) Factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;

2) The existence of those factors justifies an adjusted standard;

3) The requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and

4) The adjusted standard is consistent with any applicable federal law.

Instead of seeking relief that is specific to an individual, or a site, CSI is requesting that an adjusted standard be granted from certain sections of Part 811, so that those facilities which produce FGD sludges and ash (approximately 45 coal burning power generation facilities), may purchase CSI's Poz-O-Tec process and dispose of Poz-O-Tec material without having to comply with the existing Part 811 liner and leachate requirements.

As stated previously the Board denied an Agency motion to dismiss the instant petition and that of AS 93-5. Since that time, the Agency and CSI have come to agreement as to the requirements that would be imposed on the purchasers of the Poz-O-Tec process, and the Agency has filed a recommendation to that effect with the Board.

However, in reviewing the language of the proposed adjusted

standard, the Board finds that it imposes requirements on the purchasers and users of the Poz-O-Tec process, and not strictly upon CSI, the individual company who sought and to whom we grant this adjustment to the rules of general applicability. Therefore, in order to ensure that the users of the Poz-O-Tec materials for which the adjusted standard is granted, clearly understand and are legally and regulatorily committed to proper use of the Poz-O-Tec process product, the Board will also open a rulemaking docket to consider incorporating this adjusted standard into a rule of general applicability governing the Poz-O-Tec process of CSI, pursuant to Sections 27 and 28 of the Act.

The Board intends to use this docket to adopt the language of the adjusted standard, as agreed to and drafted by CSI and the Agency, as a new Part 816, entitled "New Utility Waste Landfills." Additionally, we will propose amendments to Part 807, 810, and 811 in order to provide for consistency with a proposed, new Part 816. We also believe that it is appropriate for the Board, and we note that it is within our discretion, to consider a rule of general applicability for the Poz-O-Tec materials pursuant to Section 27 and 28 of the Act.

The following is the Board's examination of the technical merits of the requested adjusted standard.

APPLICABLE REGULATIONS FROM WHICH CSI SEEKS AN ADJUSTED STANDARD

CSI seeks an adjusted standard from the requirements of 35 Ill. Adm. Code Sections 811.306, 811.314, and 811.507. These rules are contained in Subpart C of Part 811 of the Board's landfill rules. Part 811 prescribes the standards applicable to new solid waste landfills, and Subpart C of Part 811 prescribes those standards specifically applicable to chemical and putrescible waste (chemical waste) landfills. Section 811.306 prescribes the liner requirements; Section 811.314 prescribes the final cover requirements, including requirements for a low permeability layer or cap; and Section 811.507 prescribes requirements for compacted earth liners, including the requirement that a test liner be constructed. Each of these is discussed in greater detail below.

Section 811.306 prescribes the liner requirements applicable to chemical waste landfills. It contemplates use of two types of liners: compacted earth liners and geomembrane liners. A compacted earth liner must be at least 5 feet thick, with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec., and must be constructed in accordance with the quality assurance procedures in 811.Subpart E. Geomembranes may be used only in conjunction with a compacted earth liner system, and must meet certain additional requirements specified in subsection 811.306(e). A

leachate collection system must be used in conjunction with both types of liners. Alternatively, subsection 811.306(g) specifies that alternative technologies or materials may be used to serve as liners if: (1) they provide equivalent or superior performance; (2) the technology or material has been successfully utilized in at least one other similar application; and (3) methods for manufacturing quality control and construction quality assurance can be implemented.

Section 811.314 prescribes requirements for final cover applicable to chemical waste landfills. It specifies that chemical waste landfills must be covered by a final cover consisting of a low permeability layer overlain by a final protective layer. The low permeability layer can consist of a compacted earth layer at least three feet thick with a permeability of $1x10^{-7}$ cm/sec., or a geomembrane which provides equivalent performance. Subsection 811.314(3)(C) allows alternative techniques or materials to be used if they provide equivalent or superior performance.

Section 811.507 requires that a test liner be constructed prior to construction of a full-scale compacted earth liner. The test liner must be constructed of the same design and materials as the full liner, and must satisfy criteria specifying minimum dimensions. Subsection 811.507(b)(5) specifies that the physical properties of the test fill must be tested using field tests for determining hydraulic conductivity, and laboratory tests for hydraulic conductivity and other engineering parameters, including particle size distribution, plasticity, water content, and in-place density.

PROPOSED ADJUSTED STANDARD

In this petition, CSI seeks an adjusted standard to allow landfills which accept only coal combustion and FGD wastes to use Poz-O-Tec materials for their liners and caps. CSI's Poz-O-Tec materials are produced through a patented stabilization process which uses forced-oxidized flue-gas desulfurization scrubber sludge and coal combustion ash as raw materials. (Pet. at 1.) The scrubber sludge is directed to a scrubber blowdown tank, and then to primary and secondary dewatering systems. (Pet. at 7.) The dewatered sludge is then directed to a mixer where fly ash and lime are added. The materials are mixed and then stabilized, producing a highly impermeable monolithic mass (Pet. at 7), with a high unconfined compressive strength and load-bearing capacity, and the capability for autogenous healing of small cracks and fissures (Pet. at 2-3). The material continues to cure over a period of years, becoming stronger. The Poz-O-Tec materials meet the classification criteria for inert waste, with the exception of concentration of total dissolved solids (TDS) and sulfates in the leachate produced. (Pet. at 2.)

Poz-O-Tec materials have been used since 1977 as bases for highways, parking lots and airport runways. (Pet. at 3.) They have been used to construct aquaculture ponds, artificial ocean reefs, and have been formed into construction blocks and used as a substitute for aggregate or stone for the production of concrete blocks. (Pet. at 3) They have also been used to prevent erosion along coastlines and railway embankments, as a monolithic fill material, and to reclaim strip mines from coal mining. (Pet. at 3.)

CSI is seeking this adjusted standard in order to market the Poz-O-Tec process to approximately 45 coal combustion power generation facilities in Illinois. There presently are no such purchasers in Illinois (Pet. at 4); however, this may be because such use may not be permitted pursuant to current Board regulations, and due to the cost differential between surface impounding and landfilling FGD waste subjected to the Poz-O-Tec process pursuant to the chemical waste landfill rules. CSI asserts that this is because surface impoundments are largely unregulated under current law. (Pet. at 4.)

In this petition, CSI does not seek an adjusted standard applicable to a specific site; rather, it seeks to allow an adjusted standard applicable to its Poz-O-Tec process when used throughout the state. CSI states that there are approximately 45 coal combustion facilities in Illinois which could take advantage of the Poz-O-Tec process. (Pet. at 6.) These facilities have baghouses or electrostatic precipitators, and would be required to operate FGD systems in order to use the Poz-O-Tec process and material made available by this adjusted standard. (Pet. at 6.) The adjusted standard would not affect any of the other requirements in the chemical waste landfill rules of Part 811 other than those rules from which CSI's Poz-O-Tec process and material is receiving an adjusted standard today in AS93-5.

Pursuant to the relief requested by CSI in the instant petition and the related petition of AS 93-5, facilities which have decided to utilize the Poz-O-Tec process would have two available disposal options: monofilling pursuant to the relief requested by CSI in AS 93-5, or constructing a liner and cap of Poz-O-Tec materials, pursuant to the relief requested in the instant petition. A facility's decision as to which option to use would be dependent upon the ratio of flyash and sludge in its waste stream. CSI asserts that most facilities will be able to consistently produce high quality Poz-O-Tec materials with a permeability less than or equal to $1x10^{-7}$ cm/sec. (Pet. at 8.) These materials could be disposed of in a monofill, which is the subject of CSI's adjusted standard petition in AS 93-5.

However, some facilities will not generate sufficient fly ash to consistently produce materials with a permeability less

than or equal to $1x10^{-7}$ cm/sec. (Pet. at 8.) These facilities would produce a sufficient quantity of Poz-O-Tec materials to construct a liner and cap meeting the $1x10^{-7}$ cm/sec. standard. This would be accomplished by storing fly ash until an adequate supply is available to produce high quality Poz-O-Tec materials. (Pet. at 8.) The landfill would then be constructed and operated in accordance with the chemical waste landfill rules. The adjusted standard proposed in the instant proceeding would allow facilities to pursue this second option.

The proposed adjusted standard would allow facilities to use a Poz-O-Tec liner which is at least five feet thick, which has a permeability of $1x10^{-7}$ cm/sec. or less and an unconfined compressive strength of 150 psi or greater. The permeability and unconfined compressive strength must be verified through the construction and field testing of a test pad. The landfill must receive for disposal only FGD sludges and coal combustion wastes, and must be constructed at least five feet above the water table. The cap could be constructed of the same material as the liner, and must be at least three feet thick. Site owners would be required to do site-specific contaminant modelling, groundwater modelling and assessment and remedial action.

JUSTIFICATION IN SUPPORT OF THE ADJUSTED STANDARD - THE SECTION 28.1(c) FACTORS

In support of its petition for adjusted standard, CSI asserts that the Board did not consider the specific properties of the Poz-O-Tec materials when it adopted the liner rules. (Pet. at 23.) Additionally, although Section 811.306(g) of the Board's landfill regulations specifies a procedure by which alternative liner materials and technologies can be used, CSI is unable to use that procedure for liners constructed of its Poz-O-Tec material. Section 811.306(g) specifies that when alternative materials are used for a landfill liner, they are required to show that they provide equivalent or superior performance to clay or geomembrane liners, that the technology or material has been successfully utilized in at least one application similar to the proposed application, and that manufacturing and construction quality assurance can be implemented.

CSI believes that it has demonstrated through its petition that a Poz-O-Tec liner and cap would provide equivalent or superior performance to a clay liner or geomembrane liner. (Pet. at 24.) Though CSI cannot demonstrate the successful utilization of Poz-O-Tec in at least one similar application, this may be because no such similar application yet exists. (Pet. at 25.) Petitioner points out that, while Poz-O-Tec has not been used as the liner for a landfill, it has been used successfully as the liner for a surface runoff collection pond. (Pet. at 25.) Although the materials used in that application were inferior to

those that would be required under the proposed adjusted standard, no leakage was reported over a period of nine years. (Pet. at 25.)

CSI further points out that the adjusted standard it seeks would apply only to essentially inert wastes, which are completely compatible with the liner. (Pet. at 23.) In contrast, the chemical waste landfill rules are generally applicable to a wide range of wastes, which pose a wide spectrum of hazards to the environment. (Pet. at 23.) CSI asserts that requiring such landfills to install a clay liner would impose an economically unreasonable burden upon coal combustion power generation facilities. (Pet. at 23.) As part of demonstrating the unreasonable burden, CSI has also set forth the compliance alternatives available to coal burning power generation facilities that produce FGD sludges and ash for disposal.

Compliance Alternatives

In its original petition in AS 92-9, incorporated by reference into this proceeding, CSI presented an analysis of existing management alternatives for FGD by-products currently available to coal burning power generation facilities. This analysis was based on a study performed for CSI by Environmental Resources Management (ERM). ERM investigated the following management options for disposal of FGD by-products:

1) Wet Impoundment/Gypsum Stacking - This option consists of directing the FGD slurry from a scrubber system to a settling pond, where FGD solids are settled out. Effluent from the settling pond is either recycled into the scrubber system or treated and discharged, while settled solids are periodically removed. The settled solids can be stacked around the perimeter of the settling pond to increase its height, or can be stored in a reclaim area for subsequent landfill disposal;

2) Macroencapsulation of Dewatered FGD Sludge - This option consists of dewatering the FGD sludge and placing it into a lined landfill. The landfill would be capped upon closure. The landfill could be used for either disposal of the FGD sludge, or co-disposal of the FGD sludge and fly ash;

3) Disposal of Dewatered FGD Sludge in an Unlined Cell - This option is identical to option #2, Macroencapsulation of Dewatered Sludge, with the exception that the materials are disposed of in an unlined cell; and

4) Fixation and Stabilization of FGD Sludge (Poz-O-Tec process) - This option involves treating the FGD sludge with the Poz-O-Tec process and disposing of it in a lined or unlined landfill.

ERM investigated each of these options using a theoretical model power plant generating 600 MW or more of power, burning 3% sulfur coal with 12% ash and a heat content of 11,000 Btu/lb, and using a 90% efficiency scrubber. Options were investigated under scenarios where the disposal site was unlined, singly lined, or doubly lined, and where the leachate was trucked or piped, and where FGD sludge was disposed of alone or co-disposed with fly ash.

The ERM study analyzed the costs for each disposal option, including total capital cost, total yearly operation and maintenance cost, and total annualized cost. CSI asserts that all options using a double liner are economically unreasonable, and unlined options do not satisfy regulatory requirements.

The ERM study estimated the total annualized cost for each option using a singly-lined landfill and piping for leachate as follows:

Disposal Method	Total Annualized Cost
Wet Pond/Stacking	$22.95 million
Macroencapsulation (gypsum only)	$16.60 million (additional cost of $2.8 million for disposing of fly ash)
Macroencapsulation (gypsum and flyash)	$15.75 million
Poz-O-Tec Process	$17.16 million

The ERM study found that the cost of disposal using the Poz-O-Tec process with no liner was $15.87 million. CSI asserts that disposal using the Poz-O-Tec process and a liner constructed of Poz-O-Tec which meets the $1x10^{-7}$ cm/sec standard for permeability would be somewhere between the $17.16 million cost when using a liner and the $15.87 million cost for unlined disposal. The Agency is in general agreement with CSI's discussion of the various disposal options, although the Agency did not conduct a separate investigation of these costs.

In the instant petition, CSI has addressed the issue of compliance alternatives from the perspective of a facility which has decided to use the Poz-O-Tec process for reasons other than construction of a liner and cap materials. (Pet. at 10.) For these facilities, CSI states that the only cost differential between compliance with the proposed adjusted standards and compliance with the currently applicable regulations is the cost of a clay liner versus the cost of Poz-O-Tec liner, since the

cost to install either type of liner would be similar. (Pet. at 10.) CSI estimates that for the ERM theoretical landfill, a clay liner and cap which meet the minimum requirements under the regulations would cost $18 million. (Pet. at 11.) In contrast, for facilities which have decided to use the Poz-O-Tec process, the cost of the additional materials needed to produce high quality Poz-O-Tec for the liner and cap would be approximately $2.7 million. (Pet. at 11.) CSI thus estimates that these facilities could save approximately $15.3 million.

Health and Environmental Effects

CSI asserts that liners and caps made of Poz-O-Tec materials, when used at chemical waste landfills accepting only FGD sludges and coal combustion wastes, will provide environmental protection equivalent or superior to earthen or geomembrane liners and caps. (Pet. at 29.) CSI asserts that a landfill using Poz-O-Tec materials will generate leachate which is similar to that produced under any disposal option investigated by ERM. A landfill which uses Poz-O-Tec would generate leachate which meet the Board's inert waste standards, except for total dissolved solids (TDS) and sulfates. However, a landfill which uses Poz-O-Tec will generate significantly less leachate than other disposal methods. (Pet. at 17.)

CSI asserts that the only difference between a clay liner and a Poz-O-Tec liner concerning leachate production would result from the ability of clay to attenuate contaminants. (Pet. at 18.) CSI asserts that many clays do not have such an ability, and that such attenuation is generally not applicable to TDS or sulfates, the only contaminants for which Poz-O-Tec leachate exceeds the Board's inert waste standards. Furthermore, CSI points out that the landfill rules do not require liners to attenuate waste constitutents.

In its petition, CSI also addresses the issue of cracking. CSI asserts that while Poz-O-Tec materials are less plastic than clay, they are far stronger. CSI asserts that with an unconfined compressive strength of greater than 150 psi as called for in the proposed adjusted standard, a Poz-O-Tec liner more than four feet thick could span any void which may develop beneath a landfill. Furthermore, CSI asserts that if any small cracks or fissures were to develop, the autogenous healing properties of Poz-O-Tec would heal them.

Consistency with Federal Law

CSI asserts and the Agency agrees that none of the requirements from which relief is sought were promulgated, in whole or in part, pursuant to federal requirements. Therefore the requested relief can be granted consistent with federal law.

AGENCY RECOMMENDATION

In its response to the petition for adjusted standard, the Agency states that it generally agrees with the information presented in CSI's petition, and recommends that the adjusted standard be granted. However, the Agency raised concerns regarding certain aspects of the proposed adjusted standard, including curing of the test pad, commencement of the full-scale liner, and appropriate evaluation testing. The Agency raised these concerns to CSI and proposed amendatory language to address them. CSI has agreed to the inclusion of this amendatory language in the adjusted standard.

The Agency proposed an amendment to the proposed adjusted standard specifying additional criteria for construction of the test liner. The test liner must be completely constructed, such that all that remains is curing, before construction of the full-scale liner can begin. The test liner must be fully evaluated and the results must be provided to the Agency. If the liner fails to meet the specified performance standards, and if the Agency so directs, the user must excavate and properly dispose of all Poz-O-Tec liners at the site, and any waste deposited in and around such liners.

The other amendments which the Agency proposed include a requirement that the Poz-O-Tec liner material have an unconfined compressive strength greater than or equal to 150 psi, a requirement that the user prepare an acceptable groundwater impact assessment, and a requirement that the bottom liner and low permeability layer of the cap be constructed according to a quality assurance program in accordance with 35 Ill. Adm. Code 811. Subpart E. The Agency also proposes that the adjusted standard include a provision specifying that the user comply with the Act and 35 Ill. Adm. Code to the extent not addressed by the adjusted standard.

We find that the Agency's proposed amendments clarify the requirements applicable to those using the adjusted standard, and we therefore will include them in the adjusted standard.

CONCLUSION

CSI has demonstrated that there are factors relating to use of the Poz-O-Tec materials for liners and caps at landfills accepting only FGD and coal combustion wastes that are substantially and significantly different from the factors relied upon by the Board in adopting the regulation of general applicability, and that the existence of those factors justifies an adjusted standard. Of course, CSI's Poz-O-Tec process was not considered by the Board when it drafted the landfill rules since CSI did not participate therein, and while the landfill rules do provide a procedure whereby alternative materials and

technologies can be used, that procedure cannot be relied upon where, as in the present case, there is not at least one other similar application of the material or technology. CSI has demonstrated that use of Poz-O-Tec materials will provide protection against environmental contamination as great or greater than that provided by clay liners, and that the proposed adjusted standard may be granted consistent with any applicable federal law.

The Board hereby finds that petitioners have demonstrated that an adjusted standard is appropriate in order to allow the use of Poz-O-Tec materials for liners and caps at landfills which contain solely FGD and coal combustion wastes. Therefore, the Board will adopt an adjusted standard for the use of CSI's Poz-O-Tec materials and process subject to the conditions agreed upon by the Agency and CSI.

This opinion constitutes the Board's conclusions of law and findings of fact in this matter.

ORDER

The Board grants an adjusted standard pursuant to 415 ILCS 5/28.1, to the Poz-O-Tec process and materials of Conversion Systems, Inc. subject to the provisions and conditions set forth below. The Board directs the Clerk of the Board to open a rulemaking docket to consider incorporating this adjusted standard into a rule of general applicability.

Notwithstanding the liner and cap requirements set forth at 35 Ill. Adm. Code 811.306, 811.314 (solely to the extent that it may preclude Poz-O-Tec materials from being used as a landfill cap) and 811.507(a)(5), FGD sludges and coal combustion waste produced by coal combustion power generating facilities utilizing a lime or limestone scrubber system may be used for liner or cap construction for the purposes of Subpart C of Part 811 provided that:

1. The materials have been processed using the Poz-O-Tec stabilization process from Conversion Systems, Inc.;

2. The permeability of the liner material shall be demonstrated to be less than or equal to $1x10^{-7}$ cm/sec after placement and curing based upon a geometric average of the permeability testing results prior to the placement of any waste upon the liner;

3. The material has an unconfirmed compressive strength of greater than or equal to 150 psi based upon an arithmetic average of the strength testing results;

4. The bottom liner shall have a minimum thickness of five feet but this thickness may be increased as necessary to make the demonstrations required by 35 Ill. Adm. Code Parts 812 or 815;

5. This base of the liner shall be constructed at least five feet above the average historical groundwater table;

6. Only coal combustion wastes and FGD sludges produced from power generating facilities utilizing lime or limestone scrubber systems shall be placed into the landfill;

7. A final cover system shall be installed in accordance with the requirements of 35 Ill. Adm. Code 811.314 except that the low permeability layer of the cap shall consist of Pox-O-Tec materials which are at least three feet thick;

8. The following material testing procedures will be implemented:

   A. Creation and Sampling of Test Pad

      (1) The owner/operator of the disposal site shall construct a test pad in accordance with 35 Ill. Adm. Code 811.507(a), unless waived by the Agency pursuant to subsection(b) of that section;

      (2) The test pad shall be allowed to cure for 56 days at 73° Fahrenheit (or equivalent cure);

      (3) After curing, fifty samples will be taken using a 4 inch diameter coring bit; and

      (4) The specimens will be trimmed to proctor cylinder size utilizing an abrasive blade masonry saw, and tested for unconfined compressive strength and coefficient of permeability as described in subsection C, below. Of the specimens taken from the pad, twenty will be analyzed for their coefficient of permeability and thirty will be analyzed for their unconfined compressive strength.

   B. Collection of Production Samples

      Samples will be collected from the production of Poz-O-Tec in the following manner:

(1) Utilizing a large scoop, five gallon buckets of freshly produced material will be collected at uniform intervals during construction of the test pad and shipped to a laboratory for analysis.

(2) Five proctor cylinder specimens will be prepared from each bucket of freshly produced material. Three of these five cylinders will be tested for unconfined compressive strength and the other two will be tested for permeability.

(3) Additional uncured samples will be taken as necessary for preparation and testing to determine criteria for moisture content, lime content, the ratio of fly ash to sludge and in-place density. Testing for these parameters shall be conducted in accordance with standard test methods appropriate for the particular parameter. The criteria shall be established so as to reasonably ensure that the material disposed of will achieve the permeability and strength requirements set forth in subsection E, below.

C. Strength and Permeability Testing

(1) Uncured samples will be taken to a laboratory, placed into proctor cylinders, compacted to simulate field conditions (ASTM method D-1557-91), cured in sealed containers for 56 days at 73° (or equivalent cure) and tested for coefficient of permeability and unconfined strength using the following test methods:

- U.S. Army Corp. of Engineers Engineering Manual 1110-2-1906 Appendix Vii, Falling-Heal Permeability Test with Permeameter Cylinder.

- ASTM Method D5102; Standard Method for Unconfined Compressive Strength of Cohesive Soils.

(2) Field samples will be tested using the same methods as specified in subsection C91), above.

D. Data Correlation

Laboratory data and field data will be compared to determine any statistically significant differences using standard statistical correlation methodologies.

E. Subsequent Testing

Upon completion of field verification, as described above, the owner/operator of the site shall conduct QC/QA testing by taking monthly samples of freshly produced Poz-O-Tec materials, and sending those samples to a laboratory where they will be formed into proctor cylinder specimens for testing. Two of those samples will be tested for their coefficient of permeability, three for unconfined compressive strength, and one each for the parameters set forth in subsection B(3), above. Laboratory testing for permeability and strength must be conducted in accordance with the test methods referenced in Section C(1) of these procedures. Test results must demonstrate a coefficient of permeability of less than or equal to $1x10^{-7}$ cm/sec using a geometric average of the permeability testing results, and an unconfined compressive strength of greater than or equal to 150 psi using an arithmetic average of the strength testing results.

9. The landfill shall be designed, constructed and operated in compliance with all applicable requirements of 35 Ill. Adm. Code Parts 811, 812 and 815 other than Section 811.306, 811.324 and 811.507; and

10. The bottom liner and low permeability layer of the cap shall be constructed according to a construction quality assurance program in accordance with 35 Ill. Adm. Code 811, Subpart E;

11. The person or entity using the material in this manner shall prepare an acceptable groundwater impact assessment pursuant to 35 Ill. Adm. Code 811.317(b), 812.316, 813.304, or 815.203, as appropriate for the given facility;

12. The person or entity using the material in this manner shall construct a Poz-O-Tec test liner, such that all that remains is the curing of the test liner, before construction of the actual full-scale Poz-O-Tec liner may commence in accordance with 35 Ill. Adm. Code 811.407(a)(1-4). The test liner must be fully evaluated with the results provided to the Agency. If

the test liner evaluation results indicate a failure of the test liner to meet any of the requisite performance standards, and if the Agency so directs, the user must excavate and properly dispose of all Poz-O-Tec liners at the site, as well as any waste deposited in and around such liners; and

13. The person or entity using the material in this manner complies with the Illinois Environmental Protection Agency ("the Agency") (415 ILCS 5/1 et seq.) and 35 Ill. Adm. Code 811, to the extent those provisions are not otherwise addressed herein.

IT IS SO ORDERED.

Section 41 of the Environmental Protection Act (415 ILCS 5/41 (1992)) provides for the appeal of final Board orders within 35 days of the date of service of this order. The Rules of the Supreme Court of Illinois establish filing requirements. (See also 35 Ill. Adm. Code 101.246. "Motions for Reconsideration".)

J. Theodore Meyer, R.C. Flemal and J. Yi concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 7th day of July, 1995, by a vote of 7-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board