ILLINOIS POLLUTION CONTROL BOARD
February 17, 2000

IN THE MATTER OF:	)	
	)	
PETITION OF HORSEHEAD RESOURCE	)	AS 00-2
AND DEVELOPMENT COMPANY, INC.	)	(Adjusted Standard - RCRA)
FOR AN ADJUSTED STANDARD UNDER	)	
35 ILL. ADM. CODE 720.131(c)	)	

JOHN N. MOORE OF THE LAW OFFICES OF JOHN N. MOORE, P.C. AND PAUL E. GUTERMANN OF AKIN, GUMP, STRAUSS, HAUER & FELD, L.L.P. APPEARED ON BEHALF OF PETITIONER; and

PETER E. ORLINSKY APPEARED ON BEHALF OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.

OPINION AND ORDER OF THE BOARD (by N.J. Melas):

Petitioner Horsehead Resource and Development Company, Inc. (Horsehead) operates a permitted solid waste management facility at 2701 E. 114th St. in Chicago, Cook County, Illinois. Horsehead recycles a hazardous waste, which is a byproduct of steel production, to make zinc-bearing materials. Horsehead has petitioned the Board to determine that its crude zinc oxide (CZO) product from the Chicago facility be classified as a commodity-like material rather than a "solid waste" or "hazardous waste" under the Resource Conservation and Recovery Act (RCRA) and corresponding Illinois hazardous waste rules and regulations[1]. Horsehead wants to sell CZO without being subject to Illinois hazardous waste requirements.

Horsehead has filed a petition for an adjusted standard pursuant to 35 Ill. Adm. Code 720.131(c). Section 720.131(c) allows the Board to determine that certain materials are excepted from the definition of solid wastes (and therefore not hazardous wastes) if the materials meet certain criteria. Horsehead claims that its CZO recovered from electric arc furnace dust (EAF dust) by a high temperature metals recovery (HTMR) process meets the criteria. The Illinois Environmental Protection Agency (Agency) has recommended that the Board grant Horsehead's petition for an adjusted standard.

The Board finds that CZO is excepted from the definition of solid waste. The Board therefore grants Horsehead's petition for an adjusted standard subject to the conditions set forth in this order.

PROCEDURAL HISTORY

[1] RCRA is the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended, 42 U.S.C. 6901 *et seq*. Board regulations at issue in the instant opinion and order are nearly identical to US Environmental Protection Agency (USEPA) regulations promulgated pursuant to RCRA.

On July 20, 1999, Horsehead filed a petition for an adjusted standard (petition) with the Board under 35 Ill. Adm. Code 720.131(c). However, Horsehead failed to timely cause publication of the required notice. As a result, the Board dismissed the petition, but allowed Horsehead leave to refile the petition. See *In re* Horsehead Resource and Development Company, Inc. (August 5, 1999), AS 00-1.

On August 6, 1999, Horsehead refiled the petition for the adjusted standard with the Board. On that same date, Horsehead filed a motion requesting that the Board incorporate the record from docket AS 00-1 into a new docket which the Board numbered docket AS 00-2. Pursuant to Board regulations, Horsehead caused timely publication of the required notice on August 7, 1999, and filed a certificate of publication with the Board on August 11, 1999. See 35 Ill. Adm. Code 106.711 and 106.712.

On July 20, 1999, the Board received a motion to appear *pro hac vice* from attorney John N. Moore, and on September 7, 1999, the Board received a motion to appear *pro hac vice* from attorney Paul E. Gutermann.

Also on July 20, 1999, Horsehead filed an application for non-disclosure of confidential data (non-disclosure application). Horsehead sought to protect certain confidential financial data in the petition pursuant to Section 101.161 of the Board's procedural rules. See 35 Ill. Adm. Code 101.161. Horsehead asked for non-disclosure of certain financial data in its petition pursuant to 35 Ill. Adm. Code 101.161(a)(3) which provides that confidential data may be protected in a Board non-disclosure order. Specifically, Horsehead sought to prevent disclosing the prices that it charges for CZO to two of its customers, Zinc Nacional and Zinc Corporation of America (ZCA). Horsehead also sought to protect certain information on CZO's economic value. App. at 2. Horsehead claimed that disclosure of the information would inhibit its ability to competitively market CZO. App. at 3.

On September 9, 1999, the Board accepted Horsehead's refiled petition for the adjusted standard, granted Horsehead's request to incorporate the record from docket AS 00-1 into docket AS 00-2, granted motions from attorneys John N. Moore and Paul E. Gutermann to appear *pro hac vice*, and granted Horsehead's non-disclosure application. See *In re* Horsehead Resource and Development Company, Inc. (September 9, 1999), AS 00-2.

On August 27, 1999, the Illinois Environmental Protection Agency timely filed its response to Horsehead's petition. In the response, the Agency recommended that the Board grant the petition assuming that Horsehead provided more information on chlorine content in CZO and Horsehead's response in the event of an accidental release of raw material or CZO.

On September 10, 1999, Horsehead filed its reply to the Agency's response. In the reply, Horsehead addressed the Agency's concerns regarding chlorine and procedures in the event of an accidental release.

On October 28, 1999, Board Hearing Officer John Knittle held the required hearing in this matter. See 35 Ill. Adm. Code 106.415(a). Horsehead presented one witness, James M.

Hanrahan, one of its corporate vice presidents. Tr. at 8-10.[2] Knittle found Hanrahan to be credible. Tr. at 34. Horsehead also introduced three exhibits, and Knittle admitted all of them. Tr. at 6-7. At hearing, Hanrahan further addressed the Agency's concerns regarding accidental releases. He also answered Agency questions on the value of CZO and Horsehead's internal manufacturing processes. Tr. at 27-32. At hearing, counsel for the Agency stated that the questions raised in the response had been answered and recommended that the Board grant the requested adjusted standard to Horsehead. Tr. at 34. The Agency offered no exhibits, and the parties chose not to file posthearing briefs.

LEGAL FRAMEWORK

Under Subtitle C of RCRA and corresponding Illinois laws and regulations, hazardous wastes are a subset of solid wastes. A material that is not a solid waste cannot be regulated as a hazardous waste. Illinois hazardous waste regulations govern those who generate, treat, store, dispose, recycle, or transport hazardous waste. See 35 Ill. Adm. Code 722-726, 728.

A solid waste is generally "any discarded material". See 35 Ill. Adm. Code 721.102. A solid waste can become a hazardous waste in two ways. A solid waste can exhibit a "characteristic" of hazardous waste (i.e., toxic, corrosive, ignitable, or reactive). Secondly, the solid waste can be a "listed" hazardous waste if, for example, it comes from a certain type of process such as electroplating. 35 Ill. Adm. Code 721.103; also see generally 35 Ill. Adm. Code 721 Subparts C and D.

Board regulations at 35 Ill. Adm. Code 720.131(c)[3] establish criteria that allow the Board to make exceptions for certain partially-reclaimed materials that would otherwise be considered solid or hazardous wastes. If the partially-reclaimed material in question meets these criteria, then it is not considered a solid or hazardous waste. Section 720.131(c) provides that:

> The Board will determine that those materials that have been reclaimed but must be reclaimed further before recovery is completed are not solid wastes if, after initial reclamation, the resulting material is commodity-like (even though it is not yet a commercial product, and has to be reclaimed further). This determination will be based on the following criteria:
>
> 1) The degree of processing the material has undergone and the degree of further processing that is required;
>
> 2) The value of the material after it has been reclaimed;
>
> 3) The degree to which the reclaimed material is like an analogous raw material;

[2] The transcript of the hearing is cited as "Tr. at _."
[3] The corresponding federal rule is 40 CFR § 260.31(c) (1998).

4) The extent to which an end market for the reclaimed material is guaranteed;

5) The extent to which the reclaimed material is handled to minimize loss; and

6) Other relevant factors. 35 Ill. Adm. Code 720.131(c).

Horsehead claims that its CZO product is not a solid nor hazardous waste. It claims that CZO, which is partially reclaimed from EAF dust, is commodity-like pursuant to the criteria in 35 Ill. Adm. Code 720.131(c). Exh. 1 at 5.[4]

FINDINGS OF FACT

Horsehead is the largest operator of HTMR facilities and the primary recycler of EAF dust in the United States. Tr. at 7, 11; Exh. 1 at 6. Horsehead has traditionally used Waelz rotary kilns to produce zinc products from zinc ores and other materials containing zinc. In the 1970s, operators of Waelz kilns discovered that EAF dust was an effective alternative feedstock to zinc ores. Exh. 1 at 6. Horsehead operates two Waelz rotary kiln HTMR units at its Chicago facility. Tr. at 14; Exh. 1 at 7.

EAF Dust

Most EAF dust is an airborne byproduct of a process in which scrap steel (usually coated with zinc) is melted in an electric arc furnace or mini mill and recycled to form new steel products. The EAF dust is collected in baghouses at the steel plants. Tr. at 11; Exh. 1 at 6, Att. 13; 35 Ill. Adm. Code 721.132. EAF dust contains zinc, in addition to recoverable quantities of cadmium and lead. Tr. at 11; Exh. 1 at 6. In the past, most EAF dust was disposed. Exh. 2 at 3.

Horsehead's Production Process

Horsehead produces CZO by recycling a mixture which is about 90% EAF dust and about 10% hazardous and non-hazardous zinc-bearing feedstocks. Tr. at 12; Exh. 1 at 1, 7. The EAF dust and other feedstocks arrive at Horsehead via enclosed railcar or truck. Upon arrival, Horsehead tests the feedstocks including generator-specific tests for metal content. Tr. at 13; Exh. 1 at 7, Att. 1.

Feedstocks are then introduced directly into the curing and blending (C&B) building without being stored. Tr. at 13, 28-29; Exh. 1 at 7-8, Att. 1. Water is added to the feedstocks before they are cured, blended, and then sent by conveyor belt to a feed hopper. The feedstocks now have a uniform feed composition which allows for optimal efficiency once the feedstocks are introduced into the Waelz kiln HTMR units. Tr. at 13, 28; Exh. 1 at 8. From the feed bins, another conveyor belt supplies the

[4] Horsehead's petition, which was entered into evidence at hearing as an exhibit, is cited as "Exh. 1 at _." Likewise, the Agency's response is cited as "Exh. 2 at _.", and Horsehead's reply is cited as "Exh. 3 at _."

Waelz kilns. Just before the feedstocks enter the Waelz kilns, a carbon source (such as coke) is added. Tr. at 13-14, 28; Exh. 1 at 8, Att. 1.

During the HTMR process, the feedstocks are heated to 1200 degrees Celsius in order to chemically reduce nonferrous metals. Waelz kilns are essentially long rotating tubes with one end higher than the other. As the feedstock flows down the length of the tube, the zinc material is reduced. As it volatizes, it rises up from the feedstocks into a countercurrent airstream. This airstream carries the zinc material out of the upper end of the Waelz kiln. Tr. at 14; Exh. 1 at 8-9, Att. 1.

The HTMR process results in no waste nor water discharges. Exh. 1 at 8; Exh. 2 at 4; Exh. 3 at 3.

CZO and IRM

The resulting zinc material from the upper end of the Waelz kiln is CZO. It is cooled and collected in Agency-permitted product collectors. An enclosed screw conveyor then transfers the CZO to fully-enclosed pressure differential railcars for shipment. Tr. at 14; Exh. 1 at 8-9, Att. 1; Exh. 3 at 5.

CZO has a much higher zinc content and much lower in iron content than the EAF dust. CZO is approximately 60% zinc as opposed to the HTMR feedstocks which are only about 15% zinc. Tr. at 16; Exh. 1 at 11. The chart below details the change in the constituency from the Waelz kiln HTMR feedstock to CZO.

Major Constituents	HTMR Feedstock (% weight)	CZO (% weight)
Zinc	14.9	58.8
Iron	26.5	5.3
Calcium	5.0	1.0
Manganese	2.2	0.5
Magnesium	2.0	0.4

Silicon	1.5	0.4
Sulfur	1.1	0.9
Chlorine	0.9	4.5
Lead	0.8	3.6
Sodium	0.7	1.7
Potassium	0.6	2.1
Aluminum	0.5	0.1
Fluorine	0.3	0.3

Exh. 1 at 12.

At the lower end of the Waelz kiln, Iron-Rich Material (IRM) is collected. The IRM is about 50% iron, which is double the percentage of iron in the feedstock. IRM is sold for use in asphalt aggregate, cement production, or construction aggregate. Tr. at 11-12, 14-15, 16; Exh. 1 at 8, Att. 1.

Value of CZO

Horsehead changes EAF dust, a product with negative value, into CZO and IRM, products with substantial positive values. EAF dust has a negative value because generators of EAF dust pay for it to be either disposed or recycled. Tr. at 11, 22, 27-28; Exh. 1 at 18, 22. CZO is valuable because it is high in zinc and low in constituents such as iron that cannot be processed at zinc production plants. Exh. 1 at 18, 22-23. Demand for Horsehead's CZO is strong, and, as a result, Horsehead has never stored or stockpiled CZO. Tr. at 20, 24; Exh. 1 at 25.

Worldwide zinc prices are set on the London Metals Exchange (LME). The value of CZO is based on its zinc percentage and the fluctuating price of zinc set by the LME. Zinc purchasers, such as ZCA and Zinc Nacional, may revise this equation and deduct a processing charge from CZO. The value of non-zinc constituents in CZO also affect its price. Exh. 1 at 18-19, 25.

Although the Board determined that Horsehead was not required to disclose the prices that it charges its customers for CZO (See *In re* Horsehead Resource and Development Company, Inc. (September 9, 1999), AS 00-2), Horsehead's adjusted standard petition included prices that other CZO manufacturers have charged to their customers. Although Horsehead did not disclose its CZO prices in its petition, at hearing Hanrahan admitted that Horsehead's prices for its CZO are "in the same range" as the price that AmeriSteel charged to Big River Zinc (BRZ) for a zinc product virtually identical CZO. Hanrahan also admitted that the value of CZO is comparable to roasted zinc concentrates produced from mined ore. Tr. at 20-21, 25; Exh. 1 at 21, 22; Exh. 2 at 3; *In re* Big River Zinc Corporation (April 15, 1999), AS 99-3, slip op. at 13.

CZO Compared to Roasted Zinc Concentrates

Sulfide zinc ores extracted from the ground are typically 3% to 5% zinc. Before zinc ores can reach the quality of CZO, they must be mined, crushed, and milled. The ores are then

subject to sequential floatation/separation, dewatering, and drying which results in a zinc concentrate. Although CZO contains more salts, iron, and lead than zinc concentrates, zinc concentrates contain more sulfur than CZO. Exh. 1 at 24. Zinc concentrates must be roasted to produce roasted zinc concentrates and recover sulfur in the form of sulfur dioxide gas. Exh. 1 at 14, 24, Att. 4. Roasted zinc concentrates are similar enough to CZO that both are suitable as a feedstock in zinc production. Exh. 1 at 23-24.

Markets for CZO

Zinc refineries are not able to process EAF dust, but they are able to process CZO. Exh. 1 at 11, 18. Plants in Japan, Germany, Italy, Spain, France, Mexico, and the United States produce hundreds of thousands of tons of CZO annually. If the plant is an integrated zinc manufacturing complex, the CZO is used on site. If not, the CZO is sold to other companies that manufacture zinc. The Commodities Research Unit, a London-based research firm, issued a report predicting that demand for CZO will continue to grow. In fact, CZO is increasingly replacing the need for zinc ores in European smelters. Exh. 1 at 19-21, 25, Att. 7.

Zinc and Zinc Calcine Production

Horsehead sells CZO to ZCA for use as a feedstock in zinc production at ZCA's plant in Monaca, Pennsylvania.[5] Exh. 1 at 13.

Horsehead also sends CZO to its facility in Palmerton, Pennsylvania to be used as a feedstock for calcining. Tr. at 17; Exh. 1 at 6, 13, 15; Exh. 3 at 3. Calcining further purifies the CZO by washing out salts and removing lead. This washing results in a product called zinc calcine. Compared to CZO which is a little less than 60% zinc, zinc calcine is about 60% to 65% zinc. Horsehead then sells zinc calcine to ZCA. Tr. at 17-18; Exh. 1 at 15, Att. 6; Exh. 3 at 3.

To ensure efficiency in the zinc manufacturing process, ZCA blends CZO, zinc calcine, roasted zinc concentrates, and other zinc-bearing materials into a uniform feedstock. Exh. 1 at 15; Exh. 3 at 3. This uniform feedstock requires some additional processing at a zinc refinery - namely sintering and thermal reduction. Exh. 1 at 13, 14, Att. 4.

Sintering densifies and hardens the zinc oxides and reduces some of the other constituents in the zinc feed. The zinc oxides are mixed with a carbon source (for fuel) and a silica (to bind the materials together). The sintering machine heats the materials to 900 - 1,200 degrees Celsius. Sintering produces zinc sinter and lead concentrate. The lead concentrate is a feedstock for another process. The zinc sinter is feedstock for an electrothermic furnace. Tr. at 19; Exh. 1 at 13, 14, Att. 4; Exh. 3 at 2.

[5] Horsehead and ZCA are separate companies both owned by Horsehead Industries, Inc. Tr. at 32; Exh. 1 at 13.

The electrothermic furnace removes oxygen and minor constituents of the zinc sinter. The furnace vaporizes and condenses the zinc sinter which produces zinc metal and non- hazardous slag. Exh. 1 at 14, Att. 4. ZCA makes zinc metal slabs and ingots from the zinc metal. Exh. 1 at 13, Att. 4.

Removing Salts. The Agency asked Horsehead to comment on the higher chlorine content in CZO compared to mined concentrates and also asked if the chlorine posed any pollution control problems. Exh. 2 at 3. Horsehead responded that although CZO requires additional processing because it has more salts (the source of the chlorine) than zinc concentrates, zinc concentrates require additional processing because they have far more sulfur than CZO. CZO is a more predictable and uniform feedstock than zinc concentrates because the percentage of zinc in CZO is less variable than in zinc concentrates. Tr. at 22-24; Exh. 1 at 13, 24, Att. 10.

Salts in CZO are removed after CZO has left Horsehead's Chicago facility - both during the calcining process and during the zinc production process. Calcining is essentially a purifying step that increases zinc concentration and reduces the salt content in CZO. As a result, calcining also leads to a reduction in the amount of salts charged to ZCA's sinter machine. Exh. 1 at 16. The salts removed during the calcining process attach to a lead concentrate material which is shipped to another facility in Oklahoma. Tr. at 18. That facility processes the lead concentrate to recover metals. The salts are removed from the lead concentrate into a non-hazardous water stream. This stream is injected into a permitted non-hazardous deep well in Oklahoma for disposal. Tr. at 18-19; Exh. 3 at 3.

Even though most salts are removed from zinc calcine, there are salts in the other zinc-bearing feedstocks (including CZO) prior to sintering. During sintering, much like during calcining, the salts primarily attach to a lead concentrate. Incidental salts in water from this part of the process are sent to an NPDES permitted outfall at the ZCA facility. Tr. at 19; Exh. 3 at 2-3.

Micronutrient Production

CZO is also suitable as an ingredient in the production of micronutrients. Tr. at 17; Exh. 1 at 13. Horsehead sells CZO to Zinc Nacional, a pyrometallurgical facility in Monterey, Mexico. Horsehead transports CZO to the Mexican border where Zinc Nacional takes title to it. Zinc Nacional pelletizes the CZO. The pellets are then subject to a two step calcining process which volatizes certain metal compounds, washes out salts, and produces zinc oxide. Zinc Nacional sells the zinc oxide to agricultural firms which use it as a micronutrient in animal feed. Tr. at 17; Exh. 1 at 17-18.

Loss Minimization and Emergency Procedures

Horsehead claims to have equipment which eliminates, wherever possible, loss of the product into the environment during the manufacturing and shipping processes. Exh. 1 at 26 -28. Horsehead manages its feedstocks in an enclosed negative pressure environment. All transfer points have collection equipment and Agency-permitted baghouses to prevent loss of the material and to recycle any material that is collected. Exh. 1 at 7, 8, 26; Exh. 2 at 4; Exh. 3 at 3. CZO is pneumatically conveyed from permitted product collectors through pipes that extend into enclosed pressure differential rail cars. The rail car loading tank is in an enclosed building. These cars leave Horsehead immediately after CZO is

produced. Off-site transport of CZO must comply with U.S. Department of Transportation regulations. Exh. 1 at 25, 26; Exh. 2 at 4; Exh. 3 at 3, 5.

Horsehead has two Agency-permitted product collectors. Each collector has several compartments, and each compartment has several bags. A compartment or bag can be repaired without interrupting the work of the other compartments. Exh. 3 at 5. Horsehead also has a 24 hour opacity monitors to measure gases exiting from the product collectors. An alarm connected to the opacity monitor alters the Waelz kiln operator if opacity levels increase. Exh. 3 at 4.

To quote Hanrahan, CZO "never sees the light of day". Tr. at 25.

The Agency asked that Horsehead explain its procedures for loss minimization and explain its plans to address an accidental spill, ruptured baghouse, or other loss of CZO. Exh. 2 at 4. Horsehead has implemented several programs that aim to prevent the accidental release of CZO or its constituents. These include: employee training, inspection and monitoring, preventative maintenance, and comprehensive housekeeping. Tr. at 29-30; Exh. 3 at 4. One of the preventative maintenance programs involves constant temperature monitoring of the Waelz kilns. Tr. at 29-30.

Horsehead is also prepared to handle an accidental release. If a release were to occur, trained Horsehead personnel would respond. The area where CZO is managed is completely paved with either asphalt or concrete which would contain a CZO spill. The paved surface also allows for easier cleanup of the spilled material with vacuum trucks, road sweepers, or other equipment. Horsehead has also made arrangements with the proper regulatory agencies, fire departments, hospitals, and third party vacuum companies. The recovered CZO would be returned to the recycling process. Tr. at 30-31; Exh. 3 at 4.

DISCUSSION

In this section, the Board will first address whether CZO is a solid waste. Next, the Board discusses if the provision at 35 Ill. Adm. Code 720.131(c) is available to Horsehead. Lastly, the Board evaluates the factors at 35 Ill. Adm. Code 720.131(c).

Is CZO a Solid Waste?

Section 720.131(c) of the Board's rules allows the Board to except materials that would otherwise be defined as solid wastes[6]. The Board must first determine if CZO is a solid waste. If CZO is not a solid waste, Horsehead does not need an adjusted standard.

A "solid waste" is any "discarded material" which the regulations do not otherwise exclude. See 35 Ill. Adm. Code 721.102(a)(1). One way that a material may be deemed "discarded" is by being "recycled" in a manner described at Section 721.102(c) of the Board's rules. See 35 Ill. Adm.

[6] As previously noted, hazardous wastes are a subset of solid wastes pursuant to RCRA Subpart C.

Code 721.102(a)(2). Section 721.102(c)(3) and Appendix Z to Part 721 of the Board's rules provide that if a "listed sludge" is "recycled" by being "reclaimed", it is a solid waste.[7]

Employing the definition set forth above, the Board finds that CZO is a solid waste. CZO is considered a "listed sludge." A "sludge" is defined as a "solid . . . waste generated from [an] . . . air pollution control facility . . ." 35 Ill. Adm. Code 721.101(c)(2); 35 Ill. Adm. Code 720.110. Horsehead recovers CZO from EAF dust. EAF dust is collected in air pollution control facilities at steel plants and is therefore a sludge. EAF dust is "listed" because it is listed as a hazardous waste from a specific source. EAF dust is listed as code K061, "emission control dust/sludge from the primary production of steel in electric furnaces". 35 Ill. Adm. Code 721.132.

While this listing applies to EAF dust rather than CZO, a material derived from the treatment of a listed hazardous waste is itself also a listed hazardous waste. 35 Ill. Adm. Code 721.103(c)(2)(A), (d)(2). In promulgating the federal RCRA regulations which are the basis for these State regulations, USEPA emphasized that "all of the residues from treating the original listed wastes are likewise considered to be the listed waste . . . ." 54 Fed. Reg. 1,056, 1,063 (Jan. 11, 1989). Thus, CZO is also considered a listed sludge.

Next, the Board finds that EAF dust and the resulting CZO are being recycled by reclamation. USEPA stated that materials are considered reclaimed if "material values . . . are recovered as an end-product of a process (as in metal recovery from secondary materials)" or if they are "processed to remove contaminants in a way that restores them to their original usable condition." 50 Fed. Reg. 614, 633 (Jan. 4, 1985). Horsehead processes EAF dust via HTMR to remove contaminants and recover CZO. After further treatment of CZO including further removal of contaminants, the resulting zinc materials can be processed into zinc metal or used in animal feed.

CZO is a listed sludge that is recycled by being reclaimed. Therefore, CZO is a solid waste.

Applicability of Section 720.131(c)

USEPA stated that, generally, a waste which is being reclaimed remains a waste until the entire reclamation process is completed. 50 Fed. Reg. 614, 620, 633, 634, 655 (Jan. 4, 1985). Section 720.131(c) of the Board's rules is an exception to this principle. USEPA explains that the federal counterpart to Section 720.131(c) is for those situations in which "the initial reclamation step is so substantial that the resulting material is more commodity-like than waste-like even though no end-product has been recovered." 50 Fed. Reg. 614, 655 (Jan. 4, 1985).

The Board finds that EAF dust that has been processed in the Waelz kiln HTMR units has been initially reclaimed but not fully reclaimed. After treatment in the Waelz kilns, CZO contains much more

[7] A detailed discussion of how materials becomes solid waste can be found at Petition of Chemetco, Inc. for an Adjusted Standard From 35 Ill. Adm. Code. 720.131(a) and (c) (March 19, 1998), AS 97-2, slip op. at 11-12.

zinc that EAF dust contains. In addition, the Waelz kilns decrease the amount of IRM and contaminants such as calcium and manganese. Exh. 1 at 12.

However, CZO requires further processing in order to recover end products. Salts are removed from the CZO that is sent to Horsehead's Pennsylvania facility to make zinc calcine. ZCA blends CZO, zinc calcine, and other materials; sinters these blended materials; and then send them to an electrothermic furnace. The finished products are zinc slabs and zinc ingots. The CZO that Horsehead sends to Zinc Nacional is pelletized and calcined before it suitable as a micronutrient in animal feed.

The Board finds that Section 720.131(c) of the Board's rules is applicable in this case. Once EAF dust has been initially processed in a Waelz kiln HTMR unit, it has only been initially reclaimed, not fully reclaimed.

Section 720.131(c) Factors

The Board must determine whether CZO is commodity-like based on the factors at Section 720.131(c) of the Board's rules. Based on the analysis of the factors below, the Board finds that CZO is commodity-like. The Board addresses each of the factors herein.

The Degree of Processing the Material has Undergone and the Degree of Further Processing that is Required

USEPA has explained the federal counterpart to each of the Section 720.131(c) factors. In explaining this factor, USEPA stated "the more substantial the initial processing, the more likely the resulting material is to be commodity-like." 50 Fed. Reg. 614, 655 (Jan. 4, 1985). In the instant case, the initial processing of the EAF dust begins in the C&B building at Horsehead's Chicago facility where EAF dust is blended with small amounts of other zinc bearing materials and treated in order to provide a uniform composition for the Waelz kiln HTMR units. Tr. at 13, 28-29; Exh. 1 at 7-8, Att. 1. The primary initial processing occurs in the Waelz kilns, where the HTMR process separates out IRM and contaminants from the EAF dust to form CZO. HTMR increases the percentage of zinc from about 15% in EAF dust to nearly 60% in CZO. Tr. at 14; Exh. 1 at 8-9, 12, Att. 1. The primary input into the Waelz HTMR kiln unit is EAF dust, a material that generally cannot be used as a feedstock in zinc production. After treatment in the Waelz kiln HTMR units, two of the resulting products are IRM and CZO. CZO can be used a feedstock in zinc production.

As discussed above, despite the initial processing at the Horsehead Chicago facility, CZO must undergo further processing before it becomes either zinc ingots, zinc slabs, or a micronutrient in animal feed.

The Board need not determine whether all of the subsequent processing constitutes reclamation under RCRA. The Board finds that the processing at Horsehead's Chicago facility which turns EAF dust into CZO is substantial. The Board therefore finds that this factor supports Horsehead's claim that CZO is commodity-like.

The Value of the Material After it has been Reclaimed

USEPA stated that "the more valuable a material is after initial processing, the more likely it is to be commodity-like." 50 Fed. Reg. 614, 655 (Jan. 4, 1985). EAF dust has a negative value because generators typically pay others to take it away. Tr. at 11, 22, 27-28; Exh. 1 at 18-22. Although Horsehead's contract terms for CZO are protected by non-disclosure, at hearing and in its petition Horsehead indicated that CZO is valuable. Tr. at 20-21, 25; Exh. 1 at 2, 21. Horsehead claimed and the Agency agreed that the sales price for CZO is similar to the sales price for roasted zinc concentrates. Tr. at 20-21, 25; Exh. 1 at 21; Exh. 2 at 3.

The Board finds that CZO has significant value.

The Degree to which the Reclaimed Material is Like an Analogous Raw Material

USEPA stated "[i]f the initially-reclaimed material can substitute for a virgin material, for instance as a feedstock to a primary process, it is more likely to be commodity-like." 50 Fed. Reg. 614, 655 (Jan. 4, 1985).

A good deal of processing, notably HTMR, is required before EAF dust becomes CZO. Likewise, a good deal of processing is required before mined sulfide zinc ores become roasted zinc concentrates, which have a constituency similar to CZO. Such processing includes crushing, milling, sequential flotation/separation, dewatering, drying, and roasting. Exh. 1 at 14, Att. 4.

Although they are not identical, both CZO and roasted zinc concentrates are suitable as feedstock for zinc production processes such as the ones described above at ZCA and Zinc Nacional. CZO has the advantage of containing a narrower range of zinc (56% to 61%) than zinc concentrates (48% to 61%) which makes CZO a more predictable and uniform feedstock. CZO contains more salts than zinc concentrates, and, as a result, much CZO is calcined before the sintering step at a zinc refinery. However, zinc concentrates contain more sulfur than CZO, and, as a result, zinc concentrates must be roasted before sintering. Exh. 1 at 16, 24.

The Board finds that CZO is similar to mined zinc concentrates and can be substituted for roasted zinc concentrates in zinc production processes.

The Extent to which an End Market for the Reclaimed Material is Guaranteed

USEPA stated "[i]f the [petitioner] can show that there is an existing and guaranteed end market for the initially reclaimed material (for instance, value, traditional usage or contractual arrangements), the material is more likely to be commodity-like." 50 Fed. Reg. 614, 655 (Jan. 4, 1985).

Horsehead currently has contracts with ZCA and Zinc Nacional for the sale of its CZO. Exh. 1 at 22, Att. 8, Att. 9. Horsehead's CZO is sent either to its facility in Palmerton, Pennsylvania, ZCA, or Zinc Nacional. Horsehead has never stored or stockpiled CZO. Tr. at 20, 24; Exh. 1 at 25. Horsehead either transfers or sells all of the CZO that it produces.

At least a dozen plants all over the world produce hundreds of thousands of pounds of CZO every year. Exh. 1 at 20. Obviously, such large scale production indicates that markets exist for CZO.

In its response to Horsehead's petition, the Agency stated that end markets for CZO appear to be guaranteed. Exh. 2 at 3. The Board agrees and finds that there is an end market for Horsehead's CZO and an end market for CZO in general.

The Extent to which the Reclaimed Material is Handled to Minimize Loss

USEPA stated that "the more carefully a material is handled, the more it is commodity-like." 50 Fed. Reg. 614, 655 (Jan. 4, 1985). When a material is handled to minimize loss, it indicates that the material has value. Loss minimization methods also reduce environmental hazards because they aim to prevent releases of material. Exh. 2 at 3.

All transfer points in Horsehead's Chicago facility have collection equipment and baghouses which allow Horsehead to collect released material and return it to the CZO manufacturing process. Exh. 1 at 7, 8, 26; Exh. 2 at 4; Exh. 3 at 3. Immediately after CZO is produced, Horsehead conveys it from product collectors via a pipe that extends into closed pressure differential rail cars for off-site shipment. These railcars are in an enclosed building. Tr. at 25; Exh. 1 at 18, 26. Horsehead has 24-hour opacity monitors to measure if any gases escape from the product collectors. Alarms alert plant personnel if there is a release, and the affected part of the product collector can be shut down for repairs to minimize further losses. Exh. 3 at 4.

In the event of an accidental release, Horsehead is prepared to clean up any spilled CZO and return it to the recycling process. In the event of a spill, trained personnel would use vacuum trucks, road sweepers, and other equipment to gather the CZO. Any area in which a CZO spill could occur is paved. Paved surfaces allow for an easier and much more complete cleanup of spilled CZO than non-paved surfaces. Tr. at 30-31; Exh. 3 at 4.

The Board finds that Horsehead handles CZO in order to minimize loss.

Other Relevant Factors

BRZ's Adjusted Standard. Horsehead claims that the Board's recently-granted adjusted standard for the Big River Zinc Corporation (BRZ) supports its petition for an adjusted standard. See *In re* Big River Zinc Corporation (April 15, 1999), AS 99-3; *In re* Big River Zinc Corporation (May 6, 1999), AS 99-3. In that adjusted standard, the Board held that the EAF zinc oxide to be received by BRZ for further processing was commodity-like instead of a solid waste. Horsehead claims that the EAF zinc oxide received and processed by BRZ is virtually identical to the CZO produced by Horsehead. Both EAF zinc oxide and CZO are produced from EAF dust in an HTMR process, contain very similar concentrations of zinc, and are used as a primary feedstock in the production of zinc products. Tr. at 8, 26; Exh. 1 at 2, 10, 28, 33, Att. 11; Exh. 3 at 1-2. Furthermore, in the BRZ opinion, the Board examined EAF zinc oxide and engaged in a nearly identical analysis - including

consideration of the factors at Section 720.131(c) of the Board rules - to determine that the EAF zinc oxide that BRZ was to receive and process was excepted from the definition of solid waste. *In re* Big River Zinc Corporation (April 15, 1999), AS 99-3, slip op. at 9-15.

There is one difference between BRZ's petition for an adjusted standard and Horsehead's petition. BRZ is a zinc refinery. It petitioned to have EAF zinc oxide declassified as an input to its production process. Horsehead, on the other hand, is seeking to have CZO declassified as an output of its production process. According to USEPA

> "[a]pplicable regulatory requirements for the waste before initial reclamation are unaffected. The initial reclaimer will thus be a RCRA storage facility, and have to obtain a permit to store the wastes before reclaiming them. If a variance should be granted, however, the recovered material is not a waste and the subsequent reclaimer is not a RCRA facility." 50 Fed. Reg. 614, 655 (Jan. 4, 1985).

In other words, Horsehead is an initial reclaimer and BRZ is a subsequent reclaimer. The Board finds it irrelevant whether the initial reclaimer or the subsequent reclaimer is asking for the adjusted standard. The adjusted standard does not relieve the initial reclaimer from complying with RCRA. Thus, the Board's adjusted standard for BRZ's EAF zinc oxide is a relevant factor supporting Horsehead's contention that CZO is commodity-like.

AmeriSteel Variance. Horsehead points out that in 1998 the Tennessee Department of Environmental Conservation (TDEC) provided AmeriSteel a variance from the definition of solid waste for its EAF zinc oxide product. AmeriSteel supplies this product to BRZ. Tr. at 26-27; Exh. 1 at 30-31, Att. 12. In its petition Horsehead cites a letter signed by the Director of TDEC's Division of Solid Waste Management attesting that AmeriSteel's EAF zinc oxide is granted a variance from classification of a solid and hazardous waste for five years, beginning September 11, 1998. Exh. 1 at Att. 12. TDEC determined that the EAF zinc oxide satisfied the Tennessee regulations for a variance from the classification of hazardous waste. The Tennessee regulations are nearly identical to federal and Illinois regulations. Exh. 1 at Att. 12; Tenn. Comp. R. & Regs. tit. 1200, ch. 1-11-.01(4)(a)(3), ch. 1-11-.01(4)(b) (1999). However, Horsehead does not provide any evidence of TDEC's analysis of Tennessee's regulations. There is no discussion of the factors that Tennessee should have applied in making the variance determination. As a result, the Board will not cite to TDEC's variance for AmeriSteel as a relevant factor.

SCDR Exclusion. Horsehead also states that USEPA excluded a material called splash condenser dross residue (SCDR) from the definition of solid waste. Horsehead claims that this should also be a relevant factor. Exh. 1 at 31; 56 Fed. Reg. 41164, 41173-41174 (Aug. 19, 1991). SCDR is the partially reclaimed small-volume byproduct of certain HTMR processes which use K061 hazardous waste as an input. SCDR is collected from a splash condenser and stored for up to two weeks before being sold to either zinc refiners or reused on-site in the HTMR process. SCDR also contains a significant amount of zinc (50% to 60%). USEPA did not grant a variance for SCDR, but

instead excluded it by rule from the definition of solid waste. In doing so, USEPA applied the federal equivalent of the Section 720.131(c) factors. 40 C.F.R. § 260.31(c); 56 Fed. Reg. 41164, 41174 (Aug. 19, 1991). The analysis, however, is cursory at best. The Board finds that the SCDR exclusion is not a relevant factor.

Conserving Natural Resources. Horsehead correctly points out that recycling EAF dust conserves natural resources by decreasing the need to mine non-renewable zinc ores. In addition, Horsehead's recycling process means that less EAF dust is sent to landfills. Tr. at 27; Exh. 1 at 1, 2, 28, 32, Att. 13; Exh. 2 at 4. Although the Board encourages increased recycling, it cannot be classified as a "relevant factor" because it is not relevant to the determination that CZO is commodity-like.

The Board finds that the only "other relevant factor" which supports the commodity-like nature of CZO is the Board's 1999 adjusted standard for BRZ's EAF dust zinc oxide.

Conditions on the Adjusted Standard

The Board is setting conditions on Horsehead's adjusted standard. The conditions are similar to those placed on BRZ for its adjusted standard. See *In re* Big River Zinc Corporation (May 6, 1999), AS 99-3.

The adjusted standard only applies to CZO produced from EAF dust via HTMR at Horsehead's Chicago facility and only applies to the CZO while it remains in Illinois.

As noted above, Horsehead claims that the EAF zinc oxide that BRZ receives and processes is virtually identical to the CZO that Horsehead produces. As the Board did with BRZ, the Board will require Horsehead to sample and test the material as a condition of the adjusted standard. Horsehead must test the CZO it produces for its percentage by weight of zinc, lead, iron, total gangue materials (silica plus calcium plus magnesium), and chloride. These are the same constituents for which BRZ must test its EAF zinc oxide under its adjusted standard. See *In re* Big River Zinc Corporation (May 6, 1999), AS 99-3, slip op. at 6. As a result, the Board mandates that Horsehead regularly test samples of its CZO for content according to generally accepted practices such as procedures outlined by USEPA. The Board also mandates that Horsehead maintain records of the sampling and test results. This will allow the Agency to assess whether Horsehead is indeed processing EAF dust via HTMR.

The Board wants to ensure that the adjusted standard only applies to CZO that is destined to undergo processing for recovery of an end product at either another Horsehead facility or another entity's facility. In addition, the Board also wants to ensure that Horsehead will not accumulate CZO at its Chicago facility. Section 720.131(c) of the Board's rules only applies to situations in which initial reclamation has taken place and further reclamation must take place in order to recover an end product. Thus, the adjusted standard only applies to CZO that (1) is destined for or has arrived at another Horsehead facility, (2) is under a legally binding contract for sale from Horsehead to another entity, or (3) has been acquired by another entity under a legally binding contract for sale from Horsehead. The Board also mandates that Horsehead maintain records regarding the destination of all CZO that it

produces under this adjusted standard. These conditions are similar to conditions that the Board placed on BRZ's adjusted standard, but have been tailored to the facts of this case.

Horsehead has several options if it objects to the conditions that the Board has placed on its adjusted standard. First, under the Board's procedural rules, Horsehead may file a motion to reconsider with the Board. Second, Horsehead may appeal the adjusted standard to the Illinois Appellate Court. Third, Horsehead may consider CZO a solid waste instead of handling the material under the conditions of the adjusted standard.

CONCLUSION

The Board finds that Horsehead has established that CZO, which is produced by subjecting EAF dust to an HTMR process, is commodity-like. Thus, the Board finds that CZO is excepted from the definition of solid waste. The Board grants Horsehead's petition for an adjusted standard pursuant to Section 720.131(c) of the Board's regulations subject to the conditions set forth in this order.

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

ORDER

1. The Board finds that crude zinc oxide (CZO), which is produced by subjecting electric arc furnace (EAF) dust from the primary production of steel (K061 under 35 Ill. Adm. Code 721.132) to a high temperature metals recovery (HTMR) process, is excepted from the definition of solid waste and grants Horsehead Resource Development Company (Horsehead) an adjusted standard pursuant to 35 Ill Adm. Code 720.131(c).

2. The adjusted standard is subject to the following conditions:

    a. The determination described in paragraph one of the order applies only to CZO:

        (1) that has been subject to Horsehead's HTMR process at its facility in Chicago, Illinois and that will undergo further processing for the eventual recovery of an end product;

        (2) that is in Illinois; and

        (3) that will depart or has departed from Horsehead's Chicago facility and that:

            (a) is destined for or has arrived at another Horsehead facility;

            (b) is under a legally binding contract for sale from Horsehead to another entity; or

(c) has been acquired by another entity under a legally binding contract for sale from Horsehead ;

b. Horsehead must maintain records identifying the destinations, including purchasers, of all CZO that Horsehead produces under this adjusted standard;

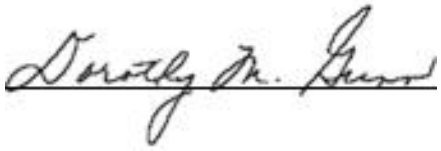
c. Each month, Horsehead must take representative samples of the CZO that it produces. Horsehead may composite the samples. Horsehead must test each sample on a monthly basis to determine the percentage by weight of zinc, lead, iron, total gangue materials (silica plus calcium plus magnesium), and chloride in the sample. Each sample must be collected and tested in accordance with generally accepted practices, such as those specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," USEPA Publication No. SW-846 (Third Edition, Updates I, II, IIA, IIB, and III); and

d. Horsehead must maintain records of the information required in paragraphs 2(b) and 2(c) of this order for a period of three years and must make them available for the Illinois Environmental Protection Agency (Agency) to inspect and copy at any reasonable time during normal business hours upon the Agency's request.

IT IS SO ORDERED.

Section 41 of the Environmental Protection Act (415 ILCS 5/41 (1998)) provides for the appeal of final Board orders to the Illinois Appellate Court within 35 days of service of this order. Illinois Supreme Court Rule 335 establishes such filing requirements. See 172 Ill. 2d R. 335; see also 35 Ill. Adm. Code 101.246, Motions for Reconsideration.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 17th day of February 2000 by a vote of 6-0.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board