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Hazardous Waste Management System; Identification and Listing of Hazardous Waste: Inorganic Chemical Manufacturing Wastes; Land Disposal Restrictions for Newly Identified Wastes; and CERCLA Hazardous Substance Designation and Reportable Quantities; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 148, 261, 268, 271, and 302

[SWH–FRL–7099–2]

RIN 2050–AE49

Hazardous Waste Management System; Identification and Listing of Hazardous Waste: Inorganic Chemical Manufacturing Wastes; Land Disposal Restrictions for Newly Identified Wastes; and CERCLA Hazardous Substance Designation and Reportable Quantities

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is listing as hazardous three wastes generated from inorganic chemical manufacturing processes. EPA is promulgating these regulations under the Resource Conservation and Recovery Act (RCRA), which directs EPA to determine whether certain wastes generated by inorganic chemical manufacturing industries may present a substantial hazard to human health or the environment. The effects of listing these three wastes as hazardous are to subject them to: comprehensive management and treatment standards under Subtitle C of RCRA; and emergency notification requirements for releases to the environment under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This final rule also adds the toxic constituents found in the wastes being listed as hazardous to the list of constituents that serves as the basis for classifying wastes as hazardous and establishing treatment standards for the wastes. Additionally, EPA is making final determinations not to list the remainder of wastes generated by inorganic chemical manufacturing processes that were described in our proposed listing determination.

Finally, EPA is applying universal treatment standards (UTS) under the Land Disposal Restrictions program to the inorganic chemical manufacturing wastes listed in this rulemaking. The listed wastes must be treated to meet these treatment standards for specific constituents prior to land disposal.

At this time, however, we are deferring final action on all elements of the proposal related to manganese, including the proposal to add manganese to Appendix VII of 40 CFR 261 as a basis for listing K178, to add manganese to Appendix VIII of 40 CFR 261, to add manganese to the UTS and to the BDAT standards for F039, and to set an RQ standard in § 302.4 for manganese.

EFFECTIVE DATE: This rule is effective on May 20, 2002.

ADDRESSES: Supporting materials to this final rule are available for viewing in the RCRA Information Center (RIC), located at Crystal Gateway I, First Floor, 1235 Jefferson Davis Highway, Arlington, VA. The Docket Identification Number is F–2001–ICMF–FFFFF. The RIC is open from 9 a.m. to 4 p.m., Monday through Friday, excluding federal holidays. To review docket materials, it is recommended that the public make an appointment by calling (703) 603–9230. The public may copy a maximum of 100 pages from any regulatory docket at no charge. Additional copies cost $0.15/page. The docket index and some supporting materials are available electronically. See the beginning of the Supplementary Information section for information on accessing them.

FOR FURTHER INFORMATION CONTACT: For general information, contact the RCRA/Superfund Hotline at (800) 424–9346 or TDD (800) 553–7672 (hearing impaired). In the Washington, DC, metropolitan area, call (703) 920–9810 or TDD (703) 412–3323. For information on specific aspects of the rule, contact Ms. Gwen DiPietro, Office of Solid Waste (5304W), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW., Washington, DC 20460. [E-mail address and telephone number: *dipietro.gwen@epa.gov* (703–308–8285).] For technical information on the CERCLA aspects of this rule, contact Ms. Lynn Beasley, Office of Emergency and Remedial Response (5204G), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, [E-mail address and telephone number: *beasley.lynn@epa.gov* (703–603–9086).]

SUPPLEMENTARY INFORMATION: Whenever ''we'' is used throughout this document, it refers to the Environmental Protection Agency (EPA).

The docket index and some supporting documents in the docket for this proposal are available in electronic format on the Internet at:<*http://www.epa.gov/epaoswer/hazwaste/id/inorchem/pr2000.htm*>.

We will keep the official record for this action in paper form. The official record is the paper record maintained at the RCRA Information Center, also referred to as the Docket, at the address provided in the **ADDRESSES** section at the beginning of this document.

Acronyms Used in the Rule

AWQC—Ambient Water Quality Criteria
BDAT—Best Demonstrated Available Technology
BHP—Biodegradation, hydrolysis, and photolysis
CERCLA—Comprehensive Environmental Response, Compensation, and Liability Act
CFR—Code of Federal Regulations
CMBST—Combustion
CWA—Clean Water Act
DAF—Dilution and attenuation factor
ED—Environmental Defense
EPA/USEPA—United States Environmental Protection Agency
HSWA—Hazardous and Solid Waste Amendments
HWIR—Hazardous Waste Identification Rule
HQ—Hazard quotient
HBL—Health-based level
ICP—Inductively Coupled Plasma
IRIS—Integrated Risk Information System
K_d—Soil-water distribution coefficients
kg—Kilogram
LDR—Land Disposal Restrictions
mg—Milligrams
MT—Metric ton
MTR—Minimum technology requirement
ng—Nanograms
NPDES—National Pollutant Discharge Elimination System
NPRM—Notice of Proposed Rulemaking
NRC—National Response Center
NTTAA—National Technology Transfer and Advancement Act of 1995
OSWER—Office of Solid Waste and Emergency Response
PDF—Probability density function
ppm—Parts per million
RFA—Regulatory Flexibility Act
RfD—Reference dose
RQ—Reportable Quantity
RCRA—Resource Conservation and Recovery Act
RIC—RCRA Information Center
SBREFA—Small Business Regulatory Enforcement Fairness Act of 1996
SPLP—Synthetic Precipitation Leaching Procedure
TCDD—2,3,7,8-Tetrachlorodibenzo-p-dioxin
TEQ—Toxicity equivalence
TC—Toxicity Characteristic
TCLP—Toxicity Characteristic Leaching Procedure
TSDF—Treatment, storage, and disposal facility
µg—Micrograms
UMRA—Unfunded Mandates Reform Act of 1995
UTS—Universal treatment standards
USC—United States Code
WHO—World Health Organization

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I. Overview

A. Who Will Be Affected by This Final Rule?

Today's final action will affect those who handle the wastes that we are adding to EPA's list of hazardous wastes under the RCRA program. This action also will affect entities that need to respond to releases of these wastes as CERCLA hazardous substances. These potentially-affected entities are described in detail in the Economics Background Document placed in the docket in support of today's final rule. A summary is shown in Table I—1 below:

TABLE I—1: SUMMARY OF FACILITIES POTENTIALLY AFFECTED BY THE US EPA'S 2000 INORGANIC CHEMICAL MANUFACTURING WASTE LISTING FINAL RULE

SIC Code/ NAIC Code	Industry Sector Name	Number of U.S. Relevant Inorganic Mfg. Facilities
2816/ 325131.	Inorganic Pigments/Ingoranic Dye and Pigment Manufacturing.	1
2819/ 325188.	Industrial Inorganic Chemicals, not elsewhere classified/Other.	[1] 3

[1] Other SIC/NAICS codes may be used by impacted facilities (e.g., 3339/3331419).

The list of potentially affected entities in the above table may not be exhaustive. Our aim is to provide a guide for readers regarding entities likely to be regulated by this action. This table lists those entities that we are aware of that potentially could be affected by this action. However, this action may affect other entities not listed in the table. To determine whether your facility is regulated by this action, you should examine 40 CFR parts 260 and 261 carefully in concert with the final rules amending these regulations that are found at the end of this **Federal Register** document. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding section entitled **FOR FURTHER INFORMATION CONTACT.**

B. What Is the ''Readable Regulations'' Format?

Today's preamble and regulations are written in ''readable regulations'' format. The authors tried to use active rather than passive voice, plain language, a question-and-answer format, the pronouns ''we'' for EPA and ''you'' for the owner/generator, and other techniques to make the information in today's rule easier to read and understand. This format is part of our efforts toward regulatory improvement. We believe this format helps readers understand the regulations, which should then increase compliance, make enforcement easier, and foster better

relationships between EPA and the regulated community.

C. What Are the Statutory Authorities for This Final Rule?

Today's hazardous waste regulations are promulgated under the authority of sections 2002(a), 3001(b), 3001(e)(2), 3004(d)–(m) and 3007(a) of the Solid Waste Disposal Act, 42 U.S.C. 6912(a), 6921(b) and (e)(2), 6924(d)–(m) and 6927(a), as amended several times, most importantly by the Hazardous and Solid Waste Amendments of 1984 (HSWA). These statutes commonly are referred to as the Resource Conservation and Recovery Act (RCRA), and are codified at Volume 42 of the United States Code (U.S.C.), sections 6901 to 6992(k) (42 U.S.C. 6901–6992(k)).

Section 102(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. 9602(a) is the authority under which the CERCLA aspects of this rule are promulgated.

D. How Does the ED v. Whitman Consent Decree Impact This Final Rule?

The 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA require EPA to make listing determinations for several specified categories of wastes, including ''inorganic chemical industry wastes'' (see RCRA section 3001(e)(2)). In 1989, Environmental Defense (ED) filed a lawsuit to enforce the statutory deadlines for listing decisions in RCRA section 3001(e)(2) (*ED* v. *Whitman*; D.D.C. Civ. No. 89–0598). To resolve the listing issues in the case, ED and EPA entered into a consent decree, which has been amended several times to revise deadlines for EPA action. Paragraph 1.g (as amended) of the Consent Decree addresses the inorganic chemical industry:

> EPA shall promulgate a final listing determination for inorganic chemical industry wastes on or before October 31, 2001. This listing determination shall be proposed for public comment on or before August 30, 2000. The listing determination shall include the following wastes: sodium dichromate production wastes, wastes from the dry process for manufacturing phosphoric acid, phosphorus trichloride production wastes, phosphorus pentasulfide production wastes, wastes from the production of sodium phosphate from wet process phosphoric acid, sodium chlorate production wastes, antimony oxide production wastes, cadmium pigments production wastes, barium carbonate production wastes, potassium dichromate production wastes, phenyl mercuric acetate production wastes, boric acid production wastes, inorganic hydrogen cyanide production wastes, and titanium dioxide production wastes (except for chloride process waste solids). However, such listing determinations need not include any wastes which are excluded from hazardous waste regulation under section 3001(b)(3)(A)(ii) of RCRA and for which EPA has determined that such regulation is unwarranted pursuant to section 3001(b)(3)(C) of RCRA.

Today's final rule satisfies EPA's duty under paragraph 1.g to promulgate listing determinations for inorganic chemical industry wastes. Moreover, compliance with the Consent Decree fulfills EPA's duty to make listing determinations for the inorganic chemical industry under section 3001(e)(2) of RCRA.

II. Summary of Today's Action

In today's notice, EPA is promulgating regulations that add three wastes generated by or closely related to the inorganic chemicals industries to the list of hazardous wastes in 40 CFR 261.32. Below are the wastestreams EPA is listing as hazardous with their corresponding EPA Hazardous Waste Numbers.

K176 Baghouse filters from the production of antimony oxide, including filters from the production of intermediates (*e.g.,* antimony metal or crude antimony oxide). (E) [1–2]

K177 Slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (*e.g.,* antimony metal or crude antimony oxide). (T)

K178 Solids from manufacturing and manufacturing-site storage of ferric chloride from acids formed during the production of titanium dioxide using the chloride-ilmenite process. (T)

EPA is listing these wastes as hazardous based on the criteria set out in 40 CFR 261.11. As described in the September 14, 2000 proposed rule (65 FR 55684), we assessed and considered these criteria for each of the residuals generated by the inorganic chemicals industries to determine which wastes warranted listing. This process involved reviewing more than 170 categories of residuals generated in the 14 inorganic chemical manufacturing sectors. Because of the large number of residuals, we first determined whether any of these residuals fell outside the scope of our Consent Decree obligations. We then evaluated the risks posed by each of the remaining residuals. In some cases we used quantitative or qualitative screening methods. For 18 wastes we conducted full-scale modeling to predict risks.

After assessing public comments submitted in response to our proposal, we are finalizing hazardous waste listings for the three wastes noted above. Two of the wastes were evaluated using full-scale risk assessment modeling and the resultant hazardous waste listings for these wastes are finalized based on 40 CFR 261.11(a)(3). The remaining waste (K176) warrants listing based on 40 CFR 261.11(a)(1) because it exhibits hazardous waste characteristics.

Upon the effective date of today's final rule, wastes meeting the listing descriptions will become hazardous wastes and must be managed in accordance with RCRA subtitle C requirements. (Based on our data, residuals newly listed as K176 exhibited one or more of the hazardous waste characteristics prior to the effective date of today's rule, and, as such, currently are subject to hazardous waste control.) Also, please note that the listing for K178 becomes has a different effective date; it does not become effective until authorized states revise their programs to add the listing. With certain limited exceptions, residuals from the treatment, storage, or disposal of these newly listed hazardous wastes also will be classified as hazardous wastes pursuant to the ''derived-from'' rule (40 CFR 261.3(c)(2)(i)). Also, with certain limited exceptions, any mixture of a listed hazardous waste and a solid waste is itself a RCRA hazardous waste (40 CFR 261.3(a)(2)(iii) and (iv), ''the mixture rule'').

Today's rule also takes final action on decisions not to list as hazardous, as discussed in the proposal, the wastes from the following sectors:

—wastes from the production of antimony oxide (with the exception of baghouse filters—K176, and slag—K177)
—wastes from the production of barium carbonate
—wastes from the production of boric acid
—wastes from the production of cadmium pigments
—wastes from the production of hydrogen cyanide
—wastes from the production of phenyl mercuric acetate
—wastes from the production of phosphoric acid
—wastes from the production of phosphorous trichloride
—wastes from the production of phosphorous pentasulfide
—wastes from the production of potassium dichromate

[1–2] As per 40 CFR 261.3(b), the code (E) indicates that this waste is being listed because it exhibits the toxicity characteristic; the code (T), designated for K176 and K177, indicates that these wastes are being listed because they are toxic wastes.

—wastes from the production of sodium chlorate

—wastes from the production of sodium dichromate

—wastes from the production of sodium phosphate

—wastes from the production of titanium dioxide (with the exception of a related waste from subsequent manufacture of ferric chloride acid—K178)

Descriptions of the specific wastestreams can be found in the listing background documents for each sector, available in the docket for the rulemaking. Responses to relevant comments regarding these listings can be found in the Response to Comments Background Document, also available in the docket.

We also are promulgating other changes to the RCRA regulations as a result of the final listing determinations. These changes include adding constituents to Appendix VII of part 261, and setting land disposal restrictions for the newly listed wastes. We are adding the following constituents to Appendix VII of 40 CFR 261 due to the fact that these constituents serve as the basis for new listings and can pose hazards to human health and the environment: arsenic and lead (K176), antimony (K177), and thallium (K178). Section IV.E of today's rule describes the changes to the land disposal restrictions establishing treatment standards for the specific constituents in the newly-listed hazardous wastes.

As explained below in section IV.B., we are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. We received numerous comments related to the risk associated with manganese and the economic impact to many industries, including the steel industry, of adding manganese to the Universal Treatment Standards requirements and to 40 CFR 261, Appendix VIII. Although we continue to believe that manganese poses significant issues that ultimately should be resolved, the court-ordered schedule under which we are operating provides us with no flexibility to take additional time to explore these topics more fully. As a result, we have chosen to defer final action on adding manganese to Appendix VII of 40 CFR 261 as a basis for listing K178; on adding manganese to Appendix VIII of 40 CFR 261; on adding manganese to the treatment standards for K178, to the UTS and to the BDAT standards for F039; and on setting an RQ standard in § 302.4 for K178 that addresses manganese.

Also as a result of this final rule, these listed wastes become hazardous substances under CERCLA. Therefore, in today's rule we are designating these wastes as CERCLA hazardous substances, and adjusting the one-pound statutory default RQs for two of these wastestreams (K176 and K177). The CERCLA RQ adjustments for the K176 and K177 wastes were proposed in the September 14, 2000 proposed rule (65 FR 55684, 55773–55774). We did not propose an adjusted RQ for K178 at that time because we had not yet developed a ''waste constituent RQ'' for manganese, one of the constituents of concern in the K178 waste. Thus we are finalizing the statutory default RQ for K178 and are not finalizing an RQ adjustment for K178 in today's rule. These changes are described in section VII of today's final rule.

III. Summary of Proposed Rule

In the September 14, 2000 proposed rule (65 FR 55684), EPA proposed to list three wastes generated by the inorganic chemicals manufacturing industries as hazardous wastes under RCRA. The wastes that we proposed to list as hazardous were:

- K176—Baghouse filters from the production of antimony oxide.
- K177—Slag from the production of antimony oxide that is disposed of or speculatively accumulated.
- K178—Non-exempt, nonwastewaters from the production of titanium dioxide by the chloride-ilmenite process (this listing does not apply to chloride process waste solids from titanium tetrachloride production exempt under section 261.4(b)(7)).

A summary of these proposed listing determinations is presented below. More detailed discussions are provided in the preamble to the proposed rule and in the Background Documents included in the docket for the proposed rule.

In connection with the proposed K178 listing, EPA proposed to amend Appendix VIII of 40 CFR 261 to add manganese to the list of hazardous constituents.

We proposed to establish treatment standards for each of the three candidate listings. We also proposed to add manganese to the Universal Treatment Standards (UTS) Table in 268.48 and to the F039 treatment standards applicable to hazardous waste landfill leachate. The effect of adding manganese to the UTS Table would be to require all characteristic hazardous wastes that contain manganese as an underlying hazardous constituent above the UTS level to be treated for manganese prior to land disposal.

We proposed to add the three candidate hazardous wastes to the list of CERCLA hazardous substances. We also proposed adjusted Reportable Quantities (RQs) for two of the wastes (K176 and K177).

A. What Wastes Associated With the Inorganic Chemicals Manufacturing Industries Were Determined To Be Outside the Scope of the Consent Decree for the Proposed Rule?

As explained in the preamble to the proposed rule, the Consent Decree does not tell EPA which specific inorganic chemical manufacturing wastes it must evaluate, although it does identify sectors to be assessed. Paragraph 1.g of the Consent Decree contains one exemption (from the Agency's listing determination obligation) for wastes found to be exempt from hazardous waste regulation in previous EPA actions implementing the so-called ''Bevill exemptions'' for mineral processing wastes.

After identifying all of the residuals associated with inorganic chemical manufacturing through data collection and facility investigations, we reviewed the list of residuals and determined the scope of our efforts. We found that some residuals are exempt ''Bevill'' wastes and we, therefore, did not need to address them.[3] We found that other wastes are associated with the manufacture of other materials and not associated with the inorganic chemical manufacturing processes identified in the Consent Decree. With few exceptions, we chose not to evaluate any wastes that are outside the scope of the Consent Decree.

Wastes generated by each of the inorganic chemical manufacturing industries that we determined to be outside the scope of the Consent Decree and, therefore, did not evaluate for the proposed rule are identified and described in the discussions of sector-specific listing determination rationales presented in section III.F of the proposed rule (65 FR 55701, September 14, 2000). Except as discussed below in this preamble, we received no comments that persuaded us to change our positions on any of our proposed findings on the scope of the Consent Decree.

[3] Bevill exempt wastes include wastes generated by mining operations that are produced during extraction and beneficiation operations and an additional 20 categories of wastes generated during mineral processing operations that EPA has determined meet ''high volume/low toxicity'' criteria. The ''Bevill'' exemptions are codified at 40 CFR 261.4(b)(7).

B. Which Wastes Did EPA Propose To List as Hazardous?

1. Baghouse Filters From the Production of Antimony Oxide

We proposed to list as hazardous baghouse filters from the production of antimony oxide. We proposed to list this waste because it exhibits one or more of the characteristics of hazardous waste, and the waste is not consistently managed as a hazardous waste in compliance with RCRA Subtitle C regulations. The hazardous waste listing criterion at 40 CFR 261.11(a)(1) provides that EPA may list a waste as hazardous based upon the fact that it exhibits any of the hazardous waste characteristics. Sampling and analysis undertaken by EPA for this rule show that baghouse filters from the production of antimony oxide exhibit the toxicity characteristic for lead and/or arsenic. Information gathered from RCRA § 3007 questionnaire responses indicated that of the four antimony oxide production facilities generating baghouse filters, none designate their baghouse filters as hazardous waste. Two of the facilities send their baghouse filters to nonhazardous waste disposal facilities. The other two recycle the baghouse filters.

EPA proposed to list baghouse filters from the production of antimony oxide solely based upon the fact that the waste exhibits the toxicity characteristic and generators are not complying with hazardous waste regulations. The Agency did not conduct risk assessment modeling to estimate potential risks to human health from plausible waste management practices. We did not need to model risks posed by lead and arsenic because leachate levels for these constituents exceeded the toxicity characteristic levels. Moreover, in analyzing samples of the waste collected by EPA, we determined that antimony levels in the waste are high (total concentrations can equate to 12% of the waste). Leachate levels for antimony in baghouse filters are up to 48,000 times the drinking water HBL. In the preamble to the proposed rule, we indicated that such high levels of antimony would provide a long-term source of the metal for leaching into ground water and would likely result in risk if modeled.

2. Antimony Slag That Is Speculatively Accumulated or Disposed

We proposed to list as hazardous waste slag from the production of antimony oxide that is disposed of or speculatively accumulated. We based our decision to list this waste as hazardous on the results of modeling of an on-site industrial landfill disposal scenario and a ground-water exposure pathway. Our modeling showed significant risk for antimony with a hazard quotient [4] of 9.4 for life-time non-cancer risk for an exposed child. The antimony hazard quotient for adult non-cancer risk is 4.5.

As explained in the preamble to the proposed rule, our modeling approach for the risk assessment assumed that the antimony slag is placed in an unlined, industrial landfill. At the time of proposal, we knew of one antimony oxide production facility that was speculatively accumulating the slag, storing the waste in drums over several years. The facility operating permit issued by the state mining program required construction of a lined on-site land-based unit for storing the waste in the future. We did not take into account the liner described in the mining permit because our most recent information at that time indicated that construction had not yet been initiated and we believed that it was feasible that the facility could instead choose to landfill the waste offsite. We also noted more general concerns regarding the uncertain efficacy of engineered liners over the modeled risk assessment period, which covers 10,000 years. (See 65 FR 55703 for additional details.)

In addition to the risk assessment results, our proposed listing determination was based on the high total concentrations of antimony in this waste. Our sampling and analysis results showed that the antimony levels in the slag exceed ten percent (up to 127,000 mg/kg) of one waste, by weight. The SPLP antimony concentration exceeds the drinking water HBL by a factor greater than 35,000. We also considered the fact that antimony is persistent in the environment and will not degrade.

3. Non-wastewaters From The Production of Titanium Dioxide by the Chloride-Ilmenite Process

We proposed to list as hazardous waste certain solid wastes generated from the production of titanium dioxide using the chloride-ilmenite process. The proposed listing covered wastes generated at three facilities and included three components in the commingled solids stream: (1) Coke and ore solids removed from the gaseous titanium tetrachloride process stream commingled with a non-exempt vanadium waste; (2) solids removed from ferric chloride acid, if removed from the acid stream after the initiation of chemical manufacturing and/or ancillary operations; and (3) wastewater treatment sludges, to the extent they are generated from oxidation and finishing wastewaters.

Our risk assessment showed potential significant risks to human health and the environment from two constituents in these wastes, manganese and thallium, when managed in an industrial solid waste landfill. In the case of manganese, the high-end hazard quotient for risks to a child was 3.3. The high-end hazard quotient for risk to a child from thallium was 2.4. Our qualitative assessment of risks associated with a municipal solid waste landfill indicated these risks might be higher by an order of magnitude. Similarly, we qualitatively expressed concerns regarding measured levels of chlorinated dioxins and furans in these wastes.

We proposed to limit the scope of the listing to the non-exempt portions of these wastes (i.e., the portions of the wastes not covered by the Bevill exemption). We did not extend the scope of the listing to include exempt mineral processing wastes associated with the chloride-ilmenite process (''chloride process waste solids from titanium tetrachloride production,'' see 40 CFR 261.4(b)(7)(S))[5]. As explained in the preamble to the proposed rule, all exempt mineral processing wastes generated by inorganic chemical manufacturing facilities are outside the scope of the Consent Decree and were not evaluated as part of the Agency's listing determination for wastes generated by this industry.

C. Which Constituents Did EPA Propose To Add to Appendix VIII of 40 CFR part 261?

EPA proposed to add one constituent, manganese, to the list of hazardous constituents at 40 CFR part 261, Appendix VIII. We proposed to find that manganese was a constituent of concern in the titanium dioxide waste that EPA proposed to list as hazardous. Based on our assessment of the available toxicity data, we believed that manganese met the § 261.11(a) criteria for inclusion on Appendix VIII. Therefore, we proposed to add manganese to Appendix VIII of 40 CFR 261.

D. What Was the Proposed Status of Landfill Leachate From Previously Disposed Wastes?

We proposed to amend the existing exemption from the definition of

[4] Hazard quotient is defined as the ratio of the estimated dose of a given chemical to an individual to the reference dose for that chemical.

[5] See 65 FR 55750 for a more detailed explanation of which wastes generated during the production of titanium dioxide are exempt mineral processing wastes.

hazardous waste for landfill leachate generated from certain previously disposed hazardous waste (40 CFR 261.4(b)(15)) to include leachate collected from non-hazardous waste landfills that previously accepted the three proposed listed wastes (K176, K177, K178). We proposed to temporarily defer the application of the proposed new waste codes to such leachate to avoid disruption of ongoing leachate management activities.

The Agency proposed the deferral because information available to EPA at the time indicated that each of the wastes proposed to be listed as hazardous may have been managed previously in non-hazardous waste landfills. Leachate derived from the treatment, storage, or disposal of listed hazardous wastes is classified as hazardous waste by the derived-from rule in 40 CFR 261.3(c)(2). Without such a deferral, we were concerned about forcing pretreatment of leachate even though pretreatment is neither required by nor needed under the CWA.

E. What Were the Proposed Treatment Standards Under RCRA's Land Disposal Restrictions Standards?

We proposed to apply existing universal treatment standards (UTS) for the hazardous constituents of concern that were found to be present at concentrations exceeding the UTS in the proposed listed wastes. We proposed to apply the UTS to these wastes because the waste compositions were found to be similar to other wastes for which applicable treatment technologies have been demonstrated.

For K176 (baghouse filters from production of antimony oxide), we proposed treatment standards requiring treatment to the UTS levels for antimony, arsenic, cadmium, lead, and mercury. For K177 (slag from the production of antimony oxide that is disposed of or speculatively accumulated), we proposed to apply the UTS as treatment standards for antimony, arsenic and lead. In the case of both K176 and K177, we requested data and comment on the stabilization of antimony, given that available data indicated stabilization was effective treatment for wastes with initial antimony concentrations below those found in K176 and K177.

For K178 (nonwastewaters from the production of titanium dioxide by the chloride-ilmenite process), we proposed to apply the UTS as treatment standards for thallium and the chlorinated congeners of dibenzo-p-dioxin and dibenzofuran. In addition, we proposed the option of complying with the technology standard of combustion (CMBST) for the chlorinated dibenzo-p-dioxin and dibenzofuran constituents in K178. Since K178 has metal constituents of concern which would not be treated by the combustion process and would remain in the combustion treatment residual, we proposed to retain metal treatment standards for all circumstances (regardless of whether or not the waste is treated by combustion). This approach would require facilities to conduct compliance testing and analysis for all regulated metal constituents in the combustion treatment residuals prior to disposal.

Universal treatment standards were not previously developed for manganese. We proposed a manganese treatment standard of 3.6 mg/L TCLP, based on high temperature metals recovery technology. We also requested comment on an option of setting a treatment standard for manganese in nonwastewater forms of K178 that is identical to the UTS level for thallium (0.20 mg/L TCLP, based on stabilization). In the case of wastewater forms of K178, we proposed a treatment standard of 17.1 mg/L manganese, based upon sedimentation technology.

We proposed to add the proposed manganese treatment standard to the existing treatment standards for multi-source leachate (F039). In addition, we proposed to add manganese to the UTS Table at 40 CFR 268.48. These changes would require that all characteristic hazardous wastes that contain manganese as an underlying hazardous constituent above the UTS are treated for manganese before land disposal.

In the case of hazardous debris contaminated with proposed K176, K177, and K178, we proposed that the provisions in 40 CFR 268.45 apply to treatment and disposal of hazardous debris. Hazardous debris treated in accordance with the provisions of 40 CFR 268.45 may be land disposed in a hazardous waste disposal facility. As a result, debris contaminated with proposed K176, K177, and K178 have to be treated prior to land disposal, using specific debris treatment technologies such as extraction, destruction, or immobilization. Residuals generated from the treatment of contaminated debris would have to meet the applicable UTS limits for proposed K176, K177, and K178.

In addition, we proposed to apply the regulations at 40 CFR 268.49 to hazardous soil contaminated with proposed K176, K177, and K178. Soil contaminated with these wastes would have to be treated prior to land disposal, meeting either alternative treatment standards (i.e., 10 times UTS or 90 percent reduction in initial constituent concentrations) or the proposed standards in 40 CFR 268.40.

F. What Risk Assessment Approach Was Used for the Proposed Rule?

We conducted human health risk analyses to support our proposed listing determination decisions for those inorganic chemical wastes where initial screening analyses indicated that further assessment of potential human health risks was necessary. We used a variety of screening methodologies to assess a large number of wastes. This approach was necessary because of the time constraints imposed by the Consent Decree schedule and the large number of wastes that needed to be assessed. However, we believe that the screening methodologies assessed risks very conservatively and that wastes that were ''screened out'' are not likely to present significant risks.

We estimated risks using both ''deterministic'' and ''probabilistic'' human health risk analyses. A deterministic analysis produces a point estimate of risk or hazard by assigning a single value to each parameter used in the analysis. A probabilistic analysis generates a distribution of risk or hazard by allowing one or more of the parameters to take on more than one value, as determined by a probability distribution. We used probabilistic analysis to allow us to quantify individual risk at selected percentiles of the risk distribution (for example, 50th percentile, 90th percentile, 95th percentile). We based our listing decisions on the probabilistic risk estimates. The human health risks represent incremental risks to an individual and are expressed as estimates of excess lifetime cancer risk for carcinogenic (cancer-causing) contaminants and hazard quotients (HQs) for those contaminants that produce other, non-cancer, health effects.

The human health risk assessments that we conducted to support the inorganic chemicals listing determination included five primary tasks: (1) Conducting screening analyses and establishing whether there are constituents of concern in the wastes that warrant further analysis to determine their risk to human health; (2) establishing a scenario under which constituents of concern are released from a waste management unit and subsequently are transported in the environment to a human receptor; (3) estimating the concentrations of constituents to which the receptor might be exposed; (4) quantifying the receptor's exposure to constituents; and

(5) based on the constituent's toxicities, assessing the risks to the receptor. The establishment of exposure scenario assumptions depended on the way a particular waste is managed. For wastes managed on-site (e.g., disposed of in an on-site industrial landfill), we based our assessment of human exposures on the plausibility of ground water being used for drinking water within the vicinity of the facility. Where possible, we identified site-specific hydrogeological information and we determined actual distances from the facility, or waste management unit, to the nearest ground-water drinking water well. If we determined that no drinking water wells could plausibly be impacted by releases from the facility (e.g., we found that ground water was not a viable current or future drinking water resource), we assumed no human exposure via the ground-water pathway. In the case of wastes that could plausibly be managed off-site, we assumed that ground water is used for drinking water (or could be in the future) and we used national data on the distribution of distances from land disposal units to residential wells to assess human exposures and risk.

The preamble to the proposed rule provided a detailed discussion of EPA's risk assessment for the inorganic chemicals listing determination (see 65 FR 55684). A full description of all risk analyses conducted in support of our listing determinations finalized in today's rule can be found in the risk assessment background documents available in the rulemaking docket. (See ''Risk Assessment for the Listing Determinations for Inorganic Chemical Manufacturing Wastes,'' August 2000.)

IV. What Is the Rationale for Today's Final Rule?

A. Final ''No List'' Determinations

The Agency proposed not to list as hazardous any of the wastes from twelve of the inorganic chemical manufacturing sectors we evaluated for the proposed rule. These sectors are: Barium carbonate, boric acid, cadmium pigments, hydrogen cyanide, phenyl mercuric acetate, phosphorous acid from the dry process, phosphorous pentasulfide, phosphorous trichloride, potassium dichromate, sodium chlorate, sodium dichromate and sodium phosphate from wet phosphoric acid production. We received no adverse comment on the proposed decisions for these wastes and did not independently learn of any information requiring us to change our position on any of these waste categories. Therefore, we are making final decisions not to list any wastes from these inorganic chemical manufacturing sectors. A few commenters asked us to clarify issues relating to these determinations that might have impacts outside the scope of this rulemaking. Responses to these comments appear in the Response to Comments document.

The Agency mistakenly referred to a selenium ''standard'' (0.0050 mg/L) in the barium carbonate section of the preamble for the proposed rule (65 FR 55701, September 14, 2000). This selenium level is more appropriately referred to as EPA's recommended Ambient Water Quality Criteria (AWQC) for protection of freshwater organisms from chronic effects (63 FR 68353 as corrected at 64 FR 19781). EPA issues the criteria for selenium and other constituents under the authority of the section 304(a) of the Clean Water Act (CWA), 33 U.S.C. 1314(a)(1). These recommended criteria provide guidance for States and Tribes in adopting water quality standards under section 303(d) of the CWA (EPA–822–F–98–006, Compilation of National Recommended Water Quality Criteria and EPA's Process for Deriving New and Revised Criteria, December 1998).

We also explained in the proposal that we had evaluated risks posed by a number of residual materials that appear to be recycled; we did not first determine whether these materials were ''solid wastes'' under the statute and implementing regulations. We received both supportive and critical comments on our approach to evaluating secondary materials that may be reused or recycled. As discussed in the proposed rule, these determinations are complex, time consuming and best made on a site-specific basis. We continue to believe that the approach used in the proposal is appropriate and, thus, have not made site-specific determinations on whether secondary materials are or are not solid wastes if we could more quickly determine that they did not pose a risk significant enough to warrant listing them as hazardous. The decision not to move forward with further evaluation of a specific secondary material because the risk is not within the range determined to be significant does not imply that the material is or is not a solid waste. Rather, this approach represents an efficient way for EPA to make listing determinations and ensure we meet the requirements of the Consent Decree.

We received comments regarding recent case law regarding the definition of solid waste, which limits our jurisdiction under Subtitle C of RCRA. However, as discussed above and in the proposal, we did not make site-specific or waste-specific decisions on whether or not secondary materials were solid wastes, since we believed that we could more quickly determine whether they pose a listable risk. As a result of our risk-based evaluation, we decided not to list most of the wastes that we evaluated. It was not necessary for these decisions to interpret these cases, which include *Association of Battery Recyclers* v. *EPA,* (208 F. 3d 1047 (D.C. Cir 2000)).

We are promulgating listings for three wastes. None of these decisions required us to address the limits of our statutory jurisdiction. In all cases we have information showing that some facilities dispose of the materials covered by the listings. Moreover, our listings do not apply to secondary materials that we currently consider to be outside of our Subtitle C jurisdiction (e.g., materials used as an effective substitute for commercial products, commercial chemical products being reclaimed, etc.). In one case (slag associated with antimony oxide production, listed as K177), we expressly conditioned the listing to make it clear that slags recycled by reclamation, an activity that we have traditionally considered to fall within our jurisdiction, will not be regulated by the listing, unless the entities involved engage in speculative accumulation. This, however, was a risk-based decision, and did not require us to re-examine the limits of our jurisdiction over solid wastes.

Finally, as mentioned above, we took the position in the proposal that various wastes were exempt from regulation—and outside of the scope of the Consent Decree—under the Bevill amendment regulations. We chose not to evaluate risks from these wastes. With the exception of comments relating to titanium dioxide wastes discussed below, we received no comments persuading us to change our position on the applicability of the Bevill exemption to any of the wastes discussed in the proposal.

B. Deferral of Final Action on Manganese-Related Elements of Proposed Rule

We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. We received numerous comments related to the risk associated with manganese and the economic impact to many industries, including the steel industry, of adding manganese to 40 CFR 261, Appendix VIII. In addition, a number of commenters argued against our proposal to establish a Universal Treatment Standard (UTS) for manganese because they believe that our proposal provided

insufficient notice of this action and that we had not adequately assessed the potential impact to industries other than those generating K178. Commenters also opposed our proposal to add manganese to the Appendix VIII list for the same reasons. They were particularly concerned about potential impacts on corrective action efforts at RCRA sites where manganese may be present. Although we continue to believe that manganese poses significant issues that ultimately should be resolved, the court-ordered schedule under which we are operating provides us with no flexibility to take additional time to explore these topics more fully. As a result, we have chosen to defer final action on adding manganese to Appendix VII of 40 CFR 261 as a basis for listing K178; on adding manganese to Appendix VIII of 40 CFR 261; on adding manganese to the treatment standards for K178, to the UTS and to the BDAT standards for F039; and on setting an RQ standard in § 302.4 for K178 that addresses manganese.

By deferring final action on manganese, we can take additional time to review and analyze the risk and impact issues raised by commenters without compromising our obligations under our consent decree to finalize our listing determinations for the inorganic chemical manufacturing industry. In today's rule we are finalizing our proposal to list K176, K177, and K178. The final K178 listing is based solely on thallium risks as a result of our deferral of the elements of the proposal associated with manganese.

C. Final Antimony Oxide Listing Determinations

In the proposal, we identified three waste categories associated with the production of antimony oxide that we determined warranted evaluation. We proposed to list two of these waste categories: baghouse filters from the production of antimony oxide and slag from the production of antimony oxide that is disposed of or speculatively accumulated. We concluded that the third waste category (empty supersacks) did not pose a substantial present or potential threat to human health or the environment and, therefore, did not warrant listing.

We are promulgating final listings for the two antimony oxide wastes that we proposed to list. As explained below, we are revising the listing language slightly in response to comments. The final listing descriptions are:

K176 Baghouse filters from the production of antimony oxide, including filters from the production of intermediates (e.g., antimony metal or crude antimony oxide). (E)

K177 Slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide). (T)

1. K176 Baghouse Filters

We are finalizing the K176 listing for baghouse filters from antimony oxide production, which includes filters from the production of intermediates (e.g., antimony metal or crude antimony oxide) (see section 3 below for further details about production of intermediates).

a. Proposed Rule

In the proposal, we stated that the baghouse filters are generated by all four of the antimony oxide manufacturers that were producing antimony oxide at the time of proposal. Two of the three filter samples we collected exhibit the toxicity characteristic (TC) for either arsenic or lead. However, none of the manufacturers acknowledged that the waste exhibits the TC. According to responses received from § 3007 questionnaires, two of the four facilities were not handling the waste as hazardous and were sending the filters to non-hazardous incineration or a Subtitle D (non-hazardous waste) landfill. The remaining two facilities were recycling all of their filters. Because the TC is not effectively ensuring proper management for this waste across the industry, we proposed to list the baghouse filters under 261.11(a)(1) on the basis that the waste exhibits a characteristic.

b. Significant Comments and Final Rule

One commenter supported our proposal to list this waste based on the potential for it to exhibit the toxicity characteristic. Another commenter disagreed with the proposed listing as applied to the filters produced at its Montana facility. This commenter raised three types of objections. First, the commenter stated that our sample of baghouse filters from the oxidation furnace did not fail the threshold limits for any element on the TCLP analysis and, therefore, should not be included within the scope of the listing. They noted that the only baghouse filter samples from the Montana facility to fail the TC were from the reduction furnace, not the oxidation furnace (see scope discussion under section 3 below for a discussion on the different types of furnaces).

We do not agree that we should exclude from the listing filters from the commenter's oxidation furnace because our sample of these filters did not exhibit the TC. Our sampling data for the Montana oxidation filters shows TCLP lead levels (2.8 mg/L) that are very close to the TC regulatory lead level (5.0 mg/L). The commenter submitted no additional data supporting the assertion that its oxidation furnace filters do not fail the TC. Given likely variability in the waste, it is quite possible that other samples would have exhibited the TC for lead. Further, we sampled filters from a similar oxidation furnace at a second production facility in La Porte, TX. The La Porte filters contain lead at levels exceeding the TC (8.5 mg/L). The lead levels for both the La Porte facility and the Montana facility are close, within the same order of magnitude. Therefore, based on these factors, we think it is reasonable to assume that the filters from oxidation furnaces will exceed the TC for lead frequently enough to warrant listing, even at the Montana facility. The criteria in 261.11(a)(1) provide generally that EPA can list a solid waste as hazardous if it exhibits any of the characteristics of hazardous waste. We believe our data sufficiently demonstrate that the oxidation filters meet the 261.11(a)(1) test.

Although not directly relevant to a listing under 261.11(a)(1), we also note that the leachable antimony content of the baghouse filters from both oxidation furnaces exceed EPA's antimony health-based level (HBL) for human drinking water consumption by a significant margin. The Montana oxidation furnace filters contain up to 15% antimony and leach 700 times above the drinking water HBL. The La Porte oxidation filters contain up to 9% antimony and leach 1,550 times above the drinking water HBL.[6]

Second, the commenter stated that it recycled all antimony-containing baghouse filters from both the oxidation and reduction furnaces to its reduction furnace to recover antimony and argued that the listing should not apply to such filters. However, as described above, at least two facilities reported disposing of their baghouse filters as non-hazardous wastes. Therefore, we continue to view non-hazardous disposal of baghouse filters as a plausible management scenario for the antimony oxide industry. As EPA acknowledged in the preamble to the proposed rule, some

[6] See Waste Characterization Reports for U.S. Antimony, Thompson Falls, MT and Laurel Industries, La Porte, TX that are in the docket for the proposed rule.

antimony-containing filters may be recycled in certain ways that would make them not solid wastes (and hence not regulated hazardous wastes). For example, when facilities process the antimony oxide product captured in these filters by reinserting the product-containing filters back into the furnace where the antimony oxide originated, without reclamation, these materials would not be solid wastes.[7] If any or all of the commenter's filters are recycled in ways that make them not solid wastes under the definition of solid waste regulations (see 40 CFR 261.2), they will not be subject to this listing.

Finally, the same commenter argued that its baghouse filters from the reduction furnace were from the production of antimony metal, not the production of antimony oxide. As explained below in section 3, we concluded that all of the baghouse filters associated with antimony oxide production remain within the scope of the listing, whether the filters are from the furnace producing the final antimony oxide or from the production of a process intermediate used during the production of antimony oxide. However, as discussed below, if the facility produces a batch of antimony metal which is not used in antimony oxide production, the wastes from that particular batch are not within the scope of the listing. If the facility adequately segregates these batches of antimony metal wastes from the listed wastes associated with antimony oxide production, they would not be listed wastes.

After considering all comments, we continue to consider all filters associated with antimony oxide production as a single class of waste and to find that they warrant listing under 261.11(a)(1), as follows:

K176 Baghouse filters from the production of antimony oxide, including filters from the production of intermediates (e.g., antimony metal or crude antimony oxide). (E)

c. Impact of Recent Revisions to the Mixture and Derived-From Rules on K176

The mixture rule (originally codified at 40 CFR 261.3 (a)(2(iii) and (iv)) subjects mixtures of listed hazardous and nonhazardous wastes to hazardous waste regulation. The rule, however, exempted wastes listed under 261.11(a)(1) because they exhibit a hazardous waste characteristic. Mixtures of such listed wastes generally cease to be regulated as hazardous wastes as soon as the mixture ceases to exhibit the characteristic that caused EPA to list the waste. (Mixtures of nonwastewaters listed because they exhibit a characteristic, however, needed to meet LDR requirements before being land disposed.)

In 1999, EPA proposed to eliminate this mixture-rule exemption for wastes listed under 261.11(a)(1) because they exhibit the Toxicity Characteristic. See 64 FR 63382 (November 19, 1999). In other words, mixtures of wastes listed because they exhibited the TC would continue to be regulated even if the mixture stopped exhibiting the TC. When EPA proposed to list K176, we noted that this proposed narrowing of the mixture rule exemption, if promulgated, would affect the K176 wastes.

EPA promulgated the revision to the mixture rule exception in May 2001. See 66 FR 27266 (May 16, 2001) and new section 40 CFR 261.3(g). As a result, mixtures of K176 and nonhazardous wastes ultimately will not be exempt if the mixture ceases to exhibit the TC. The K176 listing, however, will take effect before the narrowing of the mixture rule exemption. See the discussion of state authorization issues in section VI below.

2. K177 Slag

We are promulgating the K177 listing for slag from antimony oxide production that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide) (see section 3 below for further details about production of intermediates).

a. Proposed Rule

At the time we proposed this listing, all four operating antimony oxide production facilities produced slags from their oxidation furnaces during the production of the final antimony oxide product. All of the facilities reported further processing at least a portion of these slags on-site in different types of furnaces to obtain additional antimony to produce additional antimony oxide. In addition, three of the four facilities ultimately produced slags that were sent off-site for use in secondary lead smelting or antimony production. The remaining facility (Montana) ultimately produced a slag from its reduction furnace that had been accumulating on-site in drums for several years. At the time of proposal, this facility's mining permit required the facility to construct an on-site engineered and lined ''slag storage pit'' for the accumulated slag.

In the proposal, we assessed the risks posed by the on-site accumulation and the potential future use of the ''storage pit'' by modeling an on-site unlined landfill at the Montana facility. We documented domestic ground-water use in the area (four wells in the vicinity), and noted the presence of a residential drinking water well 1.4 miles directly down-gradient from the Montana facility. We stated that residences and wells might be built closer to the facility in the future. This approach was consistent with our modeling assumptions elsewhere in the proposed rule where we modeled potential ground-water exposure based on the potential for ground-water wells to exist and be impacted by on-site waste management practices (e.g., 65 FR 55755). Thus, while our modeling was conservative for the current ground-water usage patterns, it predicted risk for potential future receptors. The results of the risk assessment for the on-site disposal scenario for antimony and arsenic, as stated in the proposal, are presented in Table IV–1:

TABLE IV–1.—PROBABILISTIC RISK ASSESSMENT RESULTS FOR SPECULATIVELY ACCUMULATED ANTIMONY SLAG

Percentile	Antimony hazard quotient		Arsenic—Cancer risk	
	Adult risk	Child risk	Adult risk	Child risk
90%	2.2	4.6	4 E–07	3 E–07
95%	4.5	9.4	1 E–06	9 E–07

[7] As noted above, these filters capture product materials. EPA does not regulate reclamation of these products. See 50 FR 14216, April 11, 1985: ''Under the final rules, commercial chemical products and intermediates, off-specification variants, spill residues, and container residues listed in 40 CFR 261.33 are not considered solid wastes when recycled except when they are recycled in ways that differ from their normal use—namely, when they are burned for energy recovery or used to produce a fuel.''

Because the modeled hazard quotient for antimony exceeded our listing threshold of one for both children and adults at both the 90th and 95th percentiles, we proposed to list this waste. For a more complete description of this analysis, see ''Risk Assessment for the Listing Determinations for Inorganic Chemical Manufacturing Wastes'' (August 2000) in the docket for the proposed rule.

As noted in the proposal, the waste has high levels of total antimony and arsenic, and the leachable levels of antimony from this slag exceed the human oral ingestion HBL by a factor greater than 35,000. In addition, the modeling showed risk at the 90th and 95th percentiles even with elevated dilution and attenuation factors that are associated with this site (DAFs of 1,960 to 3,811 at the 5th and 10th percentiles).[8]. We reasoned that risks could be even greater in other potential management locations (e.g., if plans to place the drummed slag in the onsite ''storage pit'' were to change).

b. Significant Comments and Final Rule

One commenter questioned our risk assessment scenario for the slag. The commenter stated that, contrary to data we obtained from the Montana Ground water Information Center database, there are no residential wells within 4.5 miles down-gradient of the Montana facility. The commenter noted there is a private residential property with a well 1.5 miles up-gradient of the facility. In response to this comment, we further investigated the land use of the area surrounding the facility and determined that the commenter is correct that there is no current residential well in the down-gradient location described in the proposal.[9] However, as noted in the proposal, we did not model releases to a particular well. We used the presence of the well we identified to indicate that ground water is used as a resource in the area. The commenter provided documentation that ground water is used as a resource in the area. According to the commenter, eight to ten residential wells are in use in the area approximately 5 miles down-gradient from the facility, as well as the property 1.5 miles up-gradient. In addition, as we noted in the proposal, we do not see any barriers to people moving closer to the facility in the future, thereby becoming potential receptors. Should people move closer to the facility, ground water almost certainly will be used for drinking water. We note that the facility's mining permit indicates that on-site water production wells are used to supply the laboratory and administrative buildings, which also indicates that the use of ground water in the immediate area is plausible. Therefore, we believe that the management scenario we modeled for the proposal is still plausible.

In addition to wastes that are disposed, the listing captures those wastes that are speculatively accumulated. As noted in the proposal, current regulations classify some potentially recyclable materials that are stored on-site for more than certain timeframes set forth in 40 CFR 261.1(c)(8) as speculative accumulation and classify materials held in excess of these time frames as solid wastes. We believe that the length of time secondary materials are accumulated before being recycled is an important indicator of whether or not they are wastes. This is supported by damage cases where secondary materials that were accumulated over time caused harm. (See 50 FR 614.) EPA has consistently taken this approach towards long-term storage of potentially recyclable materials. ''Under RCRA and the implementing regulations, permanent placement of hazardous waste, including perpetual ''storage'' falls into the regulatory category of land disposal.[10] (See also *American Petroleum Institute* v. *EPA,* 216 F. 3d 50 (D.C. Cir. 2000)). If slags have been speculatively accumulated (i.e., held beyond the timeframes specified in 40 CFR 261.1(c)(8) without recycling) as of the effective date of this final rule, these slags meet the listing description immediately.

As long as facilities legitimately recycle slags without speculatively accumulating them as defined in 40 CFR 261.1(c)(8), they will not be impacted by the listing. In the proposal, we discussed the fact that three of the four antimony oxide production facilities were sending slag that they could no longer process on-site to off-site recycling operations. Two of the facilities (La Porte, TX and New Jersey), both of which are still in operation, send their slag for use in secondary lead smelting, either for the high lead content in the slag or because the antimony is used as a hardening agent in lead. The third facility (Laredo, TX) reported that they sent their slag to an antimony recovery facility in Mexico. The Laredo facility is no longer operating. The fourth facility (Montana) had been holding slag in drums on-site, as described above.

Since the release of the proposal, we have been informed by representatives of the Montana facility and the State that the facility has begun to send slag that it cannot reclaim on-site to an off-site facility for recycling. As noted above, slags that are legitimately recycled without speculative accumulation will not be affected by the listing. However, stockpiling of slags has occurred and we believe the listing is still needed to ensure that continued or future storage will not threaten human health and the environment.

Moreover, we believe the listing is warranted because recycling in the future may be uncertain for facilities still producing antimony oxide in the United States. The current market for antimony oxide is weak. The world commodity price for antimony metal (the principal raw material for antimony oxide production) has been volatile but has mainly increased due to restrictions on Chinese exports. At the same time, the market price for antimony oxide remained relatively flat.[11] If the industry experiences continued economic distress, individual facilities that remain in operation may decide to accumulate slag on-site rather than incurring the costs of shipping the slags off-site for processing. In fact, we have learned that the still-operating New Jersey facility, which had reported recycling its slag in its response to our § 3007 questionnaire, shipped slag off-site to a landfill for disposal in 1999 and is presently accumulating new slag on-site. The facility told EPA Regional personnel that it hopes to recycle this on-site slag if antimony prices rise.[12]

Finally, the two commenters that use two-step processes to produce antimony oxide argued that slags from the first type of furnace in their processes should not be listed because the slags are not generated during the production of

[8] See Table 4–66, ''Ground Water DAFs for Low Antimony Slag Managed in an Onsite Landfill—Thompson Falls, MT,'' in Risk Assessment for the Listing Determinations for Inorganic Chemical Manufacturing Wastes, August, 2000. Note that although there is not a direct correspondence between DAFs and risk, lower DAFs result in higher risk. Therefore, the 5th and 10th percentile DAFs are of particular interest relative to high end risks, e.g., at the 90th and 95th percentiles of the risk distribution.

[9] See docket—notes from calls with U.S. Forest Service at Lolo National Forest and Montana DEQ staff dated January 2001–February 21, 2001.

[10] ''Above Ground Land Emplacement Facility, N.J. Law,'' Letter to Honorable James J. Florio, Chairman, Subcommittee on Commerce, Transportation, and Tourism, Committee on Energy and Commerce, House of Representatives, from J. Winston Porter, Administrator, EPA, dated March 26, 1986.

[11] See U.S. Geological Survey, Mineral Industry Surveys dated June 2000, December 2000 and June 2001 in the docket for the rulemaking.

[12] See phone log for conversation between Sue Burnell, EPA OSW and EPA Region 2 enforcement official, dated 7/3/01 in the docket for today's rulemaking.

antimony oxide. As explained below in section 3, we were only partially persuaded by this argument. We are listing all slags associated with the production of antimony oxide, including slags from the production of process intermediates for antimony oxide. However, we are excluding from the listing slags from batches where none of the material produced is used in the production of antimony oxide. See section 3 for further details.

Because of the documented practice of slag accumulation for long periods of time, the lack of certainty that any current recycling practices will continue absent this listing, and the results of our risk analysis, the listing is warranted to ensure that disposal of all slags associated with the production of antimony oxide as nonhazardous waste does not occur. Therefore, we are finalizing the listing under 40 CFR 261.11(a)(3) as:

K177 Slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide). (T)

3. Scope Issues—Production of Intermediates

Two commenters raised questions with regard to the scope of the antimony oxide listings as they pertain to the generation of intermediates in the production of antimony oxide. Both of these commenters operate two-step antimony oxide processes and both claim that slag from the furnace producing the process intermediate should not be included within the scope of the listing.

The first commenter, which operates the Montana facility, questioned whether the waste materials generated from its reduction furnace fall within the scope of the listing. The commenter's position is that these wastes are generated during the production of antimony metal rather than antimony oxide and, therefore, are outside the scope of the listing. The commenter makes a subsequent argument that because the wastes from this furnace are outside the scope of the listing, our samples of the filters and slags from the reduction furnace should not be used to support either waste listing.

We were partially persuaded by the commenter's views. This commenter's facility includes both reduction and oxidation furnaces. The reduction furnace uses a variety of feedstocks to produce antimony metal. The oxidation furnace uses the antimony metal produced in the reduction furnace as feedstock to produce antimony oxide product. The commenter's production process runs on a batch basis and the facility tracks the antimony metal production output from the reduction furnace based on where it is used.[13] Approximately 90% of the antimony metal produced in the reduction furnace is sent to the oxidation furnace for the production of antimony oxide.[14] In this case, when the antimony metal goes on to the oxidation furnace for antimony oxide production, we consider the antimony metal to be a process intermediate in the production of antimony oxide and we consider the two furnaces to be steps in a single, integrated process designed to produce antimony oxide. We consider the reduction furnace slag and the filters from these batches to be wastes from the production of antimony oxide falling within the scope of the Consent Decree and the listing determination. To eliminate any possible confusion, we have amended the language of the listings to expressly include filters and slag from the production of intermediates, although we think a straightforward reading of the proposed language would have included these wastes anyway.

However, in the less frequent case, when none of the antimony metal from a particular batch produced in the reduction furnace is sent to the oxidation furnace for antimony oxide production, we do not consider this batch of antimony metal to be a process intermediate associated with antimony oxide production. Likewise, the wastes—both slags and filters—generated during such batches would not be associated with the production of antimony oxide. Although we have authority to consider such wastes for listing, we are not taking final action to list these wastes today. We note that we are not required to do so under the Consent Decree.

As noted above, the commenter also asserted that our samples of the reduction furnace slag from this facility did not represent slag from the production of antimony oxide. However, we believe that it is reasonable to assume that our sample came from slags associated with the production of antimony oxide. As noted above, 90% of the antimony metal produced in the reduction furnace is used as an intermediate to produce antimony oxide. All of the slag associated with these batches falls within the scope of the listing. Further, all but a tiny fraction (less than one percent) of the antimony metal that is not used to make antimony oxide is produced on a contract furnace basis for another company. The two companies have an agreement that the metal and the slag generated during this contract production are sent to the second company. This agreement was in place when we sampled the reduction furnace slag and we received no information at the time (or subsequently) indicating that the material was sampled was to be shipped off-site. Therefore, we believe we have a reasonable basis for concluding that the reduction furnace slags that we sampled were associated with antimony oxide production.[15]

If the facility commingles listed and nonlisted slags or filters, the mixture will be subject to regulation as hazardous waste under the RCRA mixture rule, 40 CFR 261.3(a)(2)(iii) and (iv). If the facility can segregate slags and filters that are not associated with antimony oxide production, however, those wastes will not be regulated under this listing. To segregate the wastes, the facility should take steps such as changing filters before and after producing a batch of antimony metal produced on a contract basis.

The second commenter, associated with the facility that has ceased operating since the time of proposal, asserted that the listing should not cover slag formerly produced in the blast furnace at the recently closed Laredo, Texas facility. The commenter explained that the blast furnace produced low grade or ''crude'' antimony oxide that was then inserted into the main antimony oxide furnace to produce salable antimony oxide.[16] To the best of our knowledge, this is the only other facility that produced antimony oxide using a two-step process involving the production of an intermediate (e.g., metal or crude antimony oxide). The commenter argued that EPA had not evaluated blast furnace type operations within the proposed rule. The commenter stated that ''a blast furnace is designed to

[13] See Montana DEQ Hard Rock Program, Operating Permit/Field Inspection Report of U.S. Antimony, dated June 7, 2000 in the docket for today's rulemaking.

[14] See docket for notes from calls with U.S. Antimony dated February 28, 2001 and March 29, 2001.

[15] This same Montana facility has a historic slag pile. Current information suggests that the slag is from the production of antimony metal that was not in any way associated with the production of antimony oxide. (It was generated prior to initiation of antimony oxide production at the facility.) If the information proves to be correct, the pile would not be subject to the listing, even if actively managed after the effective date. See docket for notes on call with U.S. Antimony dated March 8, 2001.

[16] See docket for notes from call with Cookson, dated March 14, 2001.

liberate antimony from its source; therefore, the resulting slag is much lower in antimony content than the slags produced at later stages of the process.''

In response, we first note that the company operating the Laredo facility did not identify the historic pile in its § 3007 survey. Thus, we did not collect data on this pile and did not assess it in the proposal. Next, we note that all of the crude antimony oxide from the Laredo blast furnace was used on-site to produce salable antimony oxide. Therefore, its slag is a waste associated with antimony oxide production. Moreover, we believe that the Laredo blast furnace closely resembles the Montana reduction furnace whose slag we evaluated for listing. Both the Laredo blast furnace and the Montana reduction furnace use antimony source materials plus coke or coal to make an intermediate product. The coke and coal serve as fuel and reducing agent. Kirk-Othmer's Encyclopedia of Chemical Technology categorizes both types of furnaces as pyrometallurgical processes for the recovery of antimony, supporting our belief that these processes operate on very similar principles, using similar raw materials and creating similar wastes.[17] In the course of making listing determinations, we rely on process descriptions, functions, and waste characterization to determine whether processes are sufficiently similar to be evaluated together. We have never taken the position that all facilities covered by a single listing investigation must have identical operations; rather, we evaluate, as a category, facilities that engage in similar operations. Based on this general practice we looked at the function of the Laredo blast furnace and the type and composition of its waste compared to the Montana process and slag that we modeled for the antimony oxide slag listing. As stated above, both the Laredo and Montana furnaces produce an antimony intermediate which is used in further production of antimony oxide. In addition, both processes produce a similar waste, slag, containing the same type of constituents. Therefore, we have concluded that it is reasonable to consider the Laredo blast furnace to be in the same general category of antimony oxide operations that we assessed for listing.

The commenter argues that its blast furnace produced slags with lower antimony content than the slags we assessed for the listing and that their slag, therefore, should not be covered by the K177 listing. The commenter asserted that its blast furnace slag does not present risks warranting listing. We disagree with this characterization of the Laredo slag as being significantly different from the modeled slag. The commenter indicated that the total level of antimony in the Laredo slags was in the range of 1 to 3% of the waste, by weight. In our risk modeling of the Montana site, we used two samples of the Montana slag that contained 1% antimony (sample AC–1–AO–01) and 12% antimony (sample AC–1–AO–06), respectively. Both samples were included in the distribution used to develop the probabilistic risk assessment results, upon which the listing is based. There is approximately a factor of 2 difference in the SPLP measurements between the 1% antimony slag and the 12% antimony slag samples from the Montana facility. Since the results from our risk assessment exceed our level of concern (HQ=1) by considerably more than a factor of 2, there would still be risks of concern had we used only the slag with the lower amount of antimony (i.e., 1%). Therefore, we find the Laredo slag has the potential to pose significant risk. This, in concert with the site differences in hydrogeologic conditions as described below and in the Response to Comments Background Document, supports including the Laredo slag within the K177 listing.

The commenter provided a comparison of the input parameters for our risk assessment at the Montana facility and the parameters which could be applied to the facility in Laredo. The commenter first argued that the maximum Laredo TCLP value was at least an order of magnitude below the SPLP levels used in the Montana risk assessment and, therefore, antimony risks from the Laredo facility would also be an order of magnitude lower than the Montana risks. They believed these lower risks would fall below our threshold for listing (i.e., HQ of one). The commenter then discussed the site conditions at the Laredo facility and argued that those conditions would lower the risk results even further.

We believe that there are some important factors that the commenter did not consider in its analysis and the combined effect of these factors may not result in the lower risks assumed by the commenter. First, the leachate concentrations of antimony from the Laredo slag are significant and exceed health-based levels by orders of magnitude. The single SPLP level reported by the commenter for antimony in the Laredo slag is 2.1 mg/L. The antimony TCLP levels reported by commenter for the slag range from 2.8–25.9 mg/L. These SPLP and TCLP levels are 350–4,100 times EPA's antimony HBL for drinking water (0.006 mg/L). The magnitude of these HBL exceedences suggests that, had we modeled the Laredo slag using the site conditions at Laredo or a regional off-site area, we likely would have found significant risks to human health.

Second, our analysis of the Montana site used site-specific parameters due to the on-site waste management practice. The unique conditions at the Montana site resulted in extremely large dilution and attenuation factors (DAFs) for the risk assessment (for antimony, the DAFs were 1,960 to 3,811 at the 5th and 10th percentiles [18]). A DAF represents the ratio of the leachate concentration to the model-predicted ground-water concentration. The Montana site has high DAFs because it has a porous sand and gravel aquifer that readily dilutes the antimony concentrations in the waste leachate. This situation at the Montana site favors lower risk results. Therefore, had the modeling been conducted using different hydrogeological parameters, such as those described for the Laredo facility by the commenter, we expect the risks would be higher than the results from the Montana site. For example, given the maximum antimony leachate levels reported by the commenter for the Laredo slag, a DAF of over 4,000 would be required to bring the exposure level below the HBL (0.006 mg/L). The hydrogeologic conditions described by the commenter are less favorable than those at the Montana site for generating rapid dilution of the waste leachate and, therefore, such a large DAF is unlikely either at the commenter's site or at any reasonable regional off-site location.

In addition, we do not believe that the analysis of risks from the Laredo slag can be limited to on-site disposal. The off-site disposal scenario is plausible based on the commenter's previous off-site use of the slag in roadbed construction, as well as discussions with the commenter and the State of Texas regarding the potential use of additional slag in off-site roadbed aggregate as part of a site-wide remediation effort. Therefore, considering only the on-site factors at the Laredo facility as discussed by the

[17] Kirk-Othmer citation.

[18] See Table 4–66, ''Ground Water DAFs for Low Antimony Slag Managed in an Onsite Landfill—Thompson Falls, MT,'' in Risk Assessment for the Listing Determinations for Inorganic Chemical Manufacturing Wastes, August, 2000. Note that although there is not a direct correspondence between DAF's and risk, lower DAF's result in higher risk. Therefore, the 5th and 10th percentile DAF's are of particular interest relative to high end risks, e.g., at the 90th and 95th percentiles of the risk distribution.

commenter does not address all our concerns for the slag. Typical off-site scenarios do not support large DAFs, as evidenced by the modeling results for other sectors in this listing rule. For example, the modeling of titanium dioxide wastes in off-site landfills resulted in DAFs for antimony on the order of 3 to 9 at the 5th and 10th percentiles.[19] It is unlikely that the hydrogeological conditions for the regional area near Laredo will result in a DAF that will support the commenter's claim that the risks from the Laredo slag would be lower than what was modeled for the listing.

The Laredo slag also accounts for a much greater volume compared to the volume modeled for the Montana slag. According to the commenter, the waste volume for the Laredo slag is 60,000 MT (plus an additional 60,000 MT of contaminated soil), whereas we modeled a total of 600 MT for the Montana facility. We would expect this greater volume of waste to contribute to increased risks from disposal both on-site and off-site. Finally, the State of Texas has independently determined that this facility poses significant risk and has issued a corrective action order to clean up the site because of antimony contamination. As part of this order, the State is requiring remediation of the historic pile, suggesting that the waste poses risks.

Based on the combination of factors described above, we believe that the commenter did not present a sufficient basis for excluding the historic slag from the blast furnace in Laredo from the K177 listing.

4. Scope—Offsite Recycling

A third commenter requested clarification that slags from lead smelters who had taken antimony oxide slag to recycle the lead content would not be subject to the listing. In response, we note that throughout the proposed rule, we chose not to evaluate risks of wastes generated by facilities that used secondary materials from Consent Decree processes in their production processes. (We did, however, evaluate risks posed when recycling of secondary materials involved use as a fuel or ''use constituting disposal.'') Generally, we considered any wastes produced by a second facility manufacturing a different product to be wastes from a different industrial process, and chose not to evaluate them. Consequently, wastes produced by lead smelters that use antimony oxide slags as feedstocks are not part of today's listing. Since antimony oxide slags that are recycled without speculative accumulation are not within the scope of the listing, the antimony oxide slags sent to the lead smelters are not subject to the listing. However, if the antimony oxide slags are speculatively accumulated prior to use at a lead smelter, than the antimony oxide slags would be subject to the listing and the lead smelter slags would be captured by the derived from rule.

D. Final Titanium Dioxide Listing Determination

1. Overview of Listing Determination

Our proposed rule described our assessment of the various wastes generated by the three titanium dioxide processes used in the United States.[20] We proposed to list one waste, nonwastewaters from the production of titanium dioxide by the chloride-ilmenite process, with an exemption for solids previously identified in 261.4(b)(7) as exempt mineral processing waste. We proposed not to list all other titanium dioxide wastes. These wastes are described further in the proposal and in the Titanium Dioxide Listing Background Document (August 2000) which is available in the docket for the proposed rule.

Today's final rule lists some of the waste material encompassed by the proposed K178 listing. The final rule focuses on solids removed from ferric chloride after the initiation of ferric chloride production and does not, as originally proposed, include the wastewater treatment sludge or the vanadium portion of the reactor solids generated during the production of titanium dioxide by the chloride-ilmenite process. Moreover, as explained above, we no longer base this listing on risks posed by manganese.

2. Overview of K178 Comments

Comments relating to manganese are discussed above in section IV.B. Comments on other issues are summarized here. Three titanium dioxide manufacturers, one trade organization, and one ferric chloride acid distributer submitted comments on our proposed listing determination for the titanium dioxide manufacturing sector. The comments addressed a wide range of topics pertaining to the proposed K178 listing, including interpretations of our Bevill determination, choice of management scenarios for modeling, the validity of specific elements of our modeling, scope of the listing, and toxicity of manganese. One commenter submitted extensive new analytical data characterizing the materials potentially impacted by the listing. This commenter also developed additional K_d measurements for thallium. After closure of the comment period, this same commenter provided important new information regarding its management practices for the materials potentially impacted by the listing (all post-comment period communications are available in the docket for today's rule).

We discuss the key comments influencing our final decision in the following discussion. We developed a separate document containing our responses to all public comments (see Response to Public Comments: Final Listing Determination for Inorganic Chemical Manufacturing Wastes in the docket for today's rule).

3. Overview of K178 Waste Subcategories

At proposal, we indicated that three subcategories of solids (non-exempt nonwastewaters) from the chloride-ilmenite process would be captured by the K178 listing. These three subcategories of solids were identified as: (1) Exempt coke and ore solids (condenser solids for the purposes of this discussion) removed from the gaseous titanium tetrachloride product stream that are commingled with a non-exempt vanadium stream, (2) solids generated during wastewater treatment which are not exempt to the extent they are derived from oxidation and finishing wastewaters, and (3) non-exempt ferric chloride solids removed from the ferric chloride acid stream. Three U.S. plants, all owned by E.I. du Pont de Nemours (DuPont), operate the chloride-ilmenite process. The three plants, located in Edge Moor, Delaware; Johnsonville, Tennessee; and DeLisle, Mississippi, each generate the condenser solids and wastewater treatment sludge subcategories. The Delaware facility is the only facility currently generating the non-exempt ferric chloride residues.

4. Management Scenarios

We based our proposal to list K178 wastes on the ground-water ingestion risks shown in our analysis of plausible management scenarios for the nonexempt wastes contained in the combined solids (Iron Rich ™)

[19] See Table 6–24, ''Comparison of DAFs for Antimony in Ilmenite Process Wastewater Treatment Sludge for 100 Percent and 10 Percent Waste Quantities,'' in Risk Assessment for the Listing Determinations for Inorganic Chemical Manufacturing Wastes, August, 2000. Note that although there is not a direct correspondence between DAF's and risk, lower DAF's result in higher risk. Therefore, the 5th and 10th percentile DAF's are of particular interest relative to high end risks, e.g., at the 90th and 95th percentiles of the risk distribution.

[20] The three processes include the chloride, sulfate and the chloride-ilmenite processes.

generated at the Delaware facility. Prior to the proposal, the Delaware facility reported actual or intended use of the Iron Rich ™ at landfills and in other types of land-based uses in the general vicinity of the plant. Such uses included use as daily or final cover at various landfills, use in construction of berms and dikes, and use as fill material at municipal landfills and elsewhere. We chose to model risks for disposal in an off-site industrial landfill because this seemed a reasonable representation of the varied potential disposal or land-based use scenarios. We modeled hydrogeological conditions representative of conditions within a 100-mile radius of the Delaware facility. We also qualitatively assessed an off-site municipal landfill scenario. We found risks of concern via the ground-water pathway for both the industrial and the municipal landfill practices. Although the Delaware plant had been stockpiling their Iron Rich ™ onsite, the facility has no active landfill capacity, and thus we focused our assessment on the off-site disposal scenario. Both the Tennessee and Mississippi facilities operate on-site landfills. Moreover, both of these facilities segregate their wastewater treatment solids from their condenser solids. We modeled risks from the disposal of wastewater treatment sludge, comprised of exempt and non-exempt solids, in an on-site landfill at the Tennessee facility for potential releases to surface water, but we did not find risks of concern for this scenario (see 65 FR 55761).

In meetings and comments submitted after the close of the comment period, DuPont stated that it had reevaluated the potential for beneficial off-site uses of the Iron Rich ™. DuPont indicated that, in contrast to their plans described prior to proposal and in their initial comments, the company now would not pursue these beneficial use options because of the potential risks that their modeling had predicted could arise from dioxin contaminants in the material as it is currently formulated.[21] DuPont stated that it is looking into the availability of effective treatment processes to reduce the concentrations of organics in the material and confirmed that the Delaware facility was planning to dispose of the Iron Rich ™ in an off-site landfill located outside of the corridor near the plant (e.g., a commercial landfill in South Carolina was identified as a potential disposal site).

Given the recent indications from DuPont that it no longer intends to try to market the Iron Rich ™, and that they are now landfilling the material off-site, we believe that our initial assumptions for management of these wastes are valid. Thus, our evaluation of the risks presented by the waste solids in an industrial or municipal landfill is appropriate and represents a reasonable approach to assessing risks for a listing determination.

DuPont also argued that EPA ignored the fact that the two other plants (in Tennessee and Mississippi) disposed of their solids in on-site landfills, and that EPA's analysis of the wastes at the Tennessee plant showed no risks of concern. As described in more detail below, we are finalizing a listing only for the ferric chloride residues and not the wastewater treatment sludge or condenser solids. This means that the only plant that generates the listed waste is the Delaware facility. Therefore, the management practices at the Tennessee or Mississippi plants are not directly relevant to the potential risks from the listed solids and we did not need to determine whether or not it was likely that these plants would dispose of their solids off-site.

5. Scope Issues—Exempt Mineral Processing Wastes

a. Condenser Solids

As explained in the proposal, we consider the solids from the initial reaction of coke and ore which are separated from the gaseous product stream in the condenser unit to be Bevill-exempt. However, at the time of proposal we thought that facilities commingled these exempt solids after they had been removed from the process with a separate, non-exempt waste stream containing vanadium impurities (generated during titanium tetrachloride purification). We thought gaseous titanium tetrachloride was recovered from this mixture of commingled wastes and returned to the process, and that solid materials, consisting of the condenser coke and ore solids, as well as the non-titanium tetrachloride portion of the vanadium impurities stream, remained outside the process and were ultimately disposed of as a waste. We proposed that the solids derived from the vanadium impurities stream would be covered by the K178 listing.

DuPont and other commenters clarified that the vanadium impurities stream is returned via closed pipes to the condenser unit, and is not, as we previously had thought, commingled with the coke and ore solids after they are removed from the condenser. Commenters clarified that the vanadium impurities stream contains significant levels of titanium tetrachloride; insertion of this stream into the condenser allows for the recovery of this product value. Solid impurities from the vanadium stream drop out of the condenser with the solids from the initial coke and ore reaction. Commenters also clarified that the cooler temperature of the vanadium impurities stream facilitates the operation of the condenser unit. Further, they explained that chloride and chloride-ilmenite plants have been configured in this manner for at least 20 years. Based on these factors, they argued that the vanadium impurities stream is not a waste until it exits the condenser with the solids from the coke and ore reaction.

We now understand that the residuals from the vanadium impurities stream leaves the process as an integral component of the coke and ore solids. Consequently, we no longer consider the vanadium impurities stream to be a separate waste. Moreover, because the residuals from the vanadium impurities stream are not a separable stream when they leave the process, it is now clear that they are Bevill-exempt because they are an integral component of the coke and ore solids.

For these reasons, we have decided to modify our proposed position on the Bevill status of the vanadium impurities stream. The residuals that exit the condenser are part of the solids from the production of titanium tetrachloride exempt under 40 CFR 261.4(b)(7)(S). This supersedes all earlier positions expressed on the Bevill status of the vanadium impurities stream as we now are aware that we previously misunderstood the details of the process.

However, as noted in the proposed rule, we may in the future consider whether we should reassess the status of these wastes as exempt mineral processing wastes. We believe that there may be a need to assess whether future regulatory action is justified for the solids from titanium dioxide manufacturing because they contain significant concentrations of manganese and dioxin. The impacts associated with the presence of these two constituents were not considered at the time the Bevill exemptions were promulgated.

b. Wastewater Treatment Sludge

In the proposal, we explained that the Bevill exemption extends to the portion of the wastewater treatment sludge

[21] "Summary of Meeting Between EPA's Office of Solid Waste and Representatives from DuPont, April 3, 2001. See also letters dated April 16, 2001 and April 27, 2001 to Lillian Bagus, EPA from Gregg Martin, DuPont regarding "Edge Moor Iron Rich ™ Staging Area Screening Assessment."

derived from treatment of titanium tetrachloride wastewaters (and conversely does not exempt the portion of the sludge derived from treatment of titanium dioxide wastewaters). Our position on this issue remains unchanged. Comments supporting this position were submitted by various manufacturers and trade organizations. We did not receive any negative comments on this topic. We continue to believe that this interpretation is consistent with the language of the 1989 Bevill exemption. Consequently, sludge containing solids from the production of titanium tetrachloride are exempt. Sludge containing solids from oxidation and finishing operations are non-exempt. All three facilities commingle their wastewaters and, therefore, generate commingled sludges that are partially Bevill exempt and partially non-exempt. The portion of the wastewater treatment sludge that is non-exempt varies at each facility.

c. Ferric Chloride Residues

Solids are removed from ferric chloride acid at all three DuPont facilities. At the Mississippi and Tennessee plants, the solids are the condenser solids described previously. They are removed from the ferric chloride acid prior to any additional processing of the acid and are exempt mineral processing wastes.[22] The Delaware facility's process is slightly different, generating two separate solids streams, the exempt condenser solids, as well as ferric chloride residues generated from subsequent manufacture of ferric chloride. The Delaware plant sells its ferric chloride as a wastewater and water treatment agent. Prior to sales, the Delaware plant adds a processing chemical (chlorine) to the acid stream, then filters the acid to remove solids. As described in our proposal, the residue removed from the ferric chloride after chlorine addition is generated from the production of ferric chloride. DuPont is no longer engaged in the manufacture of titanium tetrachloride at this point. The residue, therefore, is not a mineral processing waste exempt under 261.4(b)(7)(ii)(S).

Although we did not consider the ferric chloride residues to be wastes generated during the process of producing titanium dioxide, we included them within the scope of the proposed K178 listing to be promulgated under section 3001(e) of RCRA because these residues were being commingled with other non-exempt residues we planned to list under this authority.

In public comments, DuPont argued that the addition of chlorine does not affect the chemical composition of the resultant filtered residues and that the simple addition of chlorine is not a significant enough chemical step to determine that the processing of acid has begun. DuPont contends that we mistakenly assumed that the addition of chlorine to the ferric chloride stream generates or affects the unreacted coke and ore solids that are separated from that solution. DuPont noted that these solids already have been separated from titanium tetrachloride in the titanium dioxide production process, are carried along with the ''waste acid'' through the point of chlorine injection, are not affected by the chlorine injection, and are Bevill-exempt whether separated from the ferric chloride solution before or after chlorine injection. DuPont believes we should recognize that the ferric chloride solids retain their same character and exempt status after the addition of chlorine.

DuPont also contends that the proposal to include the solids from the ferric chloride, which are added to the Iron Rich ™ and also collect in ferric chloride product storage tanks and impoundments, would contradict EPA's prior Bevill determinations. DuPont noted that during prior Bevill determinations, EPA sampled these solids and agreed that they were exempt. They argue the exempt status of these solids was understood not only by the facility and EPA but also by the regulating state agency.

DuPont further contends that the proposal also would contradict the Agency's standards for distinguishing mineral processing from chemical manufacturing, 54 FR 36592, 36616 (September 1, 1989), and its clarification of ''uniquely associated'' wastes in the Phase IV LDR rule. DuPont argued that the solids, when disposed of, are solid wastes that originate from mineral processing operations.

We disagree with these comments. We believe that wastes from the production of ferric chloride are not wastes that are exempt under the Bevill exemption regulations. They are not extraction and beneficiation wastes because the input material (waste acid containing solids from the titanium dioxide manufacturing process) has gone through mineral processing. Once mineral processing begins, all subsequent operations are not considered extraction/beneficiation. See 54 FR at 36619, September 1, 1989. Even if they were considered mineral processing wastes, they are not wastes from any of the 20 specific mineral processing wastes exempted under 261.4(b)(7)(ii). As explained in the proposal, we believe that once the Delaware facility adds chlorine to the waste acid stream, it is engaged in the manufacture of ferric chloride, not the manufacture of titanium tetrachloride, the material for which wastes are exempt under 261.4(b)(7)(ii)(S).

In support of our position, we note that the manufacture of ferric chloride is in no way necessary to the manufacture of titanium tetrachloride or titanium dioxide. The facility does not use any of the ferric chloride in any step of the process that produces either of the two titanium products.

Regarding the Delaware plant, the commenter asserts that the addition of chlorine in the process of making ferric chloride does not alter the solids in the waste acid that it later filters out and mingles with all of its other process solids. This is irrelevant. The issue for the purpose of the Bevill exemption is whether the facility is making titanium tetrachloride or some other product. In determining whether a waste falls within the scope of Bevill exemption for one of the 20 mineral processing wastes, we have never engaged in extending the Bevill applicability to the production of a different product based on an analysis of the similarities or dissimilarities of the waste material.

Moreover, we disagree with this assertion. The waste matrix of concern contains both solids and a measurable amount of liquid waste acid. While we are not convinced that the solids are unaffected by the addition of chlorine, clearly the liquid acid portion of the waste solids has been chemically altered by the addition of chlorine (i.e., the purpose of the chlorine addition is to shift the balance between ferrous and ferric chloride in the acid.[23] Therefore, we believe that at a minimum the acid component of the ferric chloride residue waste matrix does undergo some chemical change as a result of the ferric chloride manufacturing process.

The commenter also observes that we sampled the waste solids from the production of ferric chloride in the mid-1980's, and, when we established the exemption for solid titanium tetrachloride wastes in 1991, we did not assert that these solids were not covered by the exemption. The commenter may be correct that our mid-1980's sample of commingled solids included some

[22] § 261.4(b)(7)(ii)(S): Chloride process waste solids from titanium tetrachloride production.

[23] See section 4.1 of DuPont's November 13, 2000 comments, as well as letter dated May 8, 2001 to Lillian Bagus, EPA, and Stephen Hoffman, EPA, from Gregg Martin, DuPont, regarding ''Proposed K178 Hazardous Waste Listing of Ferric Chloride Solids''.

solids filtered out of ferric chloride production. However, we did not know, at the time that we promulgated the titanium tetrachloride exemption, that the plant filtered out the solids after it added chlorine to the waste acid (i.e., began the manufacture of ferric chloride). The regulatory language, however, is sufficiently clear: EPA defined the exemption as applying to solids from the manufacture of titanium tetrachloride, not ferric chloride production.

Finally, the commenter asserts that the ferric chloride residues meet our three criteria for classification as an exempt manufacturing waste. The criteria as noted at 54 FR 36614–36620 (September 1, 1989) are: (1) Excluded Bevill wastes must be a solid waste as defined by EPA; (2) excluded solid waste must be uniquely associated with mineral industry operations; and (3) the solid waste must originate from mineral processing operations as defined by five specific criteria.

We disagree. We agree with the commenter that the ferric chloride residues are ''solid wastes'' under the first criterion. However, the waste ferric chloride residues do not meet the second criterion. For a waste to be ''uniquely associated'' with the titanium tetrachloride mineral processing operation, the process that generates the waste must be necessary to the production of titanium tetrachloride. As explained above, the Delaware plant does not need to make ferric chloride to manufacture titanium tetrachloride, the only material produced there that gives rise to Bevill-exempt wastes. The plant uses no portion of the ferric chloride produced. Since the ferric chloride residues fail to meet this criterion, we have no need to determine whether they meet the third criterion. Moreover, we would take the position that the ferric chloride residues were not exempt even if we agreed that they ''originated'' in the production of titanium tetrachloride. Residues removed after the facility begins the manufacture of the distinct ferric chloride product (by the addition of chlorine) are not solids from the manufacture of titanium tetrachloride.

After the close of the comment period, representatives of the commenter told us that the Delaware plant planned to reconfigure its operations.[24] The plant plans to remove the bulk of the residues from the waste acid prior to adding chlorine. The plant also might remove a much smaller amount of solids from the ferric chloride product stream after it adds chlorine. Under such a configuration, we would not consider solids removed from the waste acid prior to the addition of chlorine to be residues from the manufacturing of ferric chloride. They would be solids from the manufacturing of titanium tetrachloride and would be exempt under 261.4(b)(7)(ii)(S). They would not be subject to today's listing. Any residues that the facility removed after it added chlorine to the waste acid stream, however, would continue to be residues from the production of ferric chloride and would continue to be subject to today's listing.

6. Comments Related to the Constituents of Concern and Modeling Issues

a. Toxicity of Manganese

We received comments from DuPont and other commenters on our proposal to list K178 on the basis of human health risks stemming from manganese toxicity. These comments are available in the docket for today's rule. EPA is deferring those elements of our proposal related to manganese. See section IV.B. of the preamble for further clarification.

b. Presence of Thallium in DuPont Wastes

DuPont submitted comments arguing that thallium is not present in its wastes and that thallium should not be used as a basis for listing. DuPont criticized our analysis for thallium in the Delaware Iron Rich ™ sample, arguing that our thallium TCLP value for Iron Rich ™ is artificially high and that our thallium SPLP value for Iron Rich ™ is suspect. In light of these comments, we re-examined our analysis and determined that our thallium TCLP and SPLP results are valid. See Response to Comment Background Document for a more detailed discussion of our evaluation of the validity of DuPont's criticism of our analysis for thallium.

DuPont also argued that its own sampling and analysis of Iron Rich ™ shows that thallium is not present in the levels suggested by EPA. DuPont provided analytical data characterizing eight Iron Rich ™ samples (plus one duplicate). These samples were collected from the filter press where we collected our sample of Iron Rich ™ (DPE–SO–01) and thus are comparable to our sample. All 8 samples and the duplicate were analyzed for total, TCLP and SPLP concentrations of 20 metals, including thallium. We carefully reviewed DuPont's data package. DuPont conducted metals analyses using two analytical methods: inductively coupled plasma with mass spectroscopy (ICP–MS, SW–846 Method 6020B) and inductively coupled plasma (ICP, SW–846 Method 6010B). Our review of these data for DuPont's Iron Rich ™ samples showed that there are numerous analytical problems with DuPont's ICP–MS analyses (see Assessment of Analytical Data Submitted by DuPont in Response to Proposed Inorganic Chemical Industry Hazardous Waste Determination for K178 (October 2001), available in today's docket). Due to these problems, we chose not to consider the ICP–MS results and have assessed only DuPont's more reliable ICP results. Table IV–2 compares our ICP results.

TABLE IV–2.—THALLIUM IN IRON RICH ™, DELAWARE

Analysis	EMI–1 ~ 8	EPA Sample (DPE–SO–01)
Total–6010 B (mg/kg)	<7.1	3.7
		(23.6 DuPont split)
TCLP–6010 B (mg/L)	<0.250	0.28
		(0.27 EPA duplicate)
SPLP–6010 B (mg/L)	<0.050	0.012

As Table IV–2 indicates, DuPont did not detect total or TCLP/SPLP thallium in its Iron Rich ™ samples (EMI–1 to EMI–8 and EMI–6–Dup), although their laboratory did not achieve detection limits as low as our laboratory achieved. We detected total and SPLP thallium in our Iron Rich ™ sample (DPE–SO–01) at levels that are lower than DuPont's detection limits for total and SPLP thallium analysis; we also detected TCLP thallium at a level close to

[24] Letter to Lillian Bagus, EPA from Gregg W. Martin, DuPont regarding ''Edge Moor Iron Rich ™ Staging Area Screening Assessment'', dated April 16, 2001. See also DuPont/EPA April 3, 2001 meeting notes.

DuPont's detection limit for TCLP thallium analysis. Thus, DuPont's data fail to demonstrate that our SPLP analyses are suspect with regard to thallium. DuPont's newly submitted ICP total, TCLP and SPLP thallium results are very similar to our ICP total, TCLP and SPLP thallium results. The results of earlier analytical work by DuPont also show that our values were not artificially high. DuPont's split total thallium value (23.6 mg/kg) for Iron Rich™ (collected and analyzed at the same time our sample was collected prior to proposal) was even higher than our total thallium result (3.7 mg/kg). Note that our laboratory, in the course of analyzing the Iron Rich™ sample, conducted a second thallium analysis with a 10-fold dilution which resulted in a total thallium concentration of 18.4 mg/kg.

DuPont also argues that, based on process knowledge, DuPont does not expect thallium to be present in its wastes at the levels suggested by EPA for any of the three chloride-ilmenite facilities. DuPont said its analyses of ores used in the prior year indicate that thallium generally is not present at levels above 0.050 mg/kg. The highest thallium level in ore detected by DuPont was 0.171 mg/kg, which DuPont estimates would correspond to a solids level of 0.350 mg/kg. DuPont's arguments are not convincing because: (1) No ore analyses were presented for review; (2) DuPont did not describe whether it's limited review was representative of the ores associated with our sampling event or ongoing operations; and (3) DuPont did not assess its other primary raw material, petroleum coke, for thallium. Sampling data from prior analyses submitted by DuPont confirm that thallium has been present in the Iron Rich ™ [25] and similar wastes [26] at levels significantly above what DuPont estimated from its ore analyses.

In summary, we disagree with DuPont's assertion that thallium is not present in its waste.

c. Thallium Distribution Coefficient

DuPont submitted comments challenging our assumptions for the thallium soil-water distribution coefficient (K_d). We found that these comments had merit. As a result, we have modified our proposed findings for the non-exempt wastewater treatment sludge and ferric chloride residues with respect to the industrial solid waste landfill scenario. The impact of these comments was less marked for the municipal solid waste landfill scenario for ferric chloride residues.

The Risk Assessment Background Document for the proposed rule stated that a literature search of sorption studies found no published data on the K_d for thallium. In lieu of published data, we relied on a graphical presentation of data shown in an unpublished draft report in order to establish a range over which to vary K_d and then assumed a log uniform distribution within that range. Out of concern for the absence of published data, DuPont conducted a study of thallium K_d and submitted the data and study documentation to EPA. The DuPont study was done on three different soil types representing a range of soil conditions. Although the data are not inconsistent with the range of K_d values we used in the risk assessment, the DuPont data fall in the upper half of the K_d distribution. Moreover, the DuPont data exhibit a clear concentration dependence and, for two of the three soil types, the data lie in the upper quartile of the K_d distribution at the relatively low concentrations actually found in the Iron Rich™ leachate. In addition, DuPont submitted modeling analyses that show that the model-predicted ground-water concentrations are relatively sensitive to the value of K_d within the range of K_d's of the DuPont data, with higher K_d values producing lower ground-water thallium concentrations.

After examining the data presented by DuPont, we agree that the K_d values from this study appear to be more appropriate to use in assessing risks from the wastes in question. Given this, the dilution and attenuation of thallium in the waste leachate from the non-exempt ferric chloride residues and the non-exempt wastewater treatment sludge is likely to be greater than (and consequently, the risks less than) that estimated in the risk assessment for the proposed rule. However, as explained elsewhere in today's notice, we continue to believe that the ferric chloride residues pose risk due to thallium in municipal solid waste landfills.

d. Ground-Water Mounding

DuPont submitted comments regarding the assumptions we used in our ground-water modeling for infiltration and recharge rates. We agree that these assumptions are somewhat problematic, although we disagree with the remedies suggested by the commenter. This issue was important in our formulation of our final decisions for both the non-exempt wastewater treatment sludge and ferric chloride residues for the industrial landfill scenario, but not for the municipal landfill scenario.

As explained in the Risk Assessment Background Document for the proposed rule, the ground-water modeling analysis at proposal for the combined nonexempt nonwastewaters from the Delaware facility used a set of infiltration and recharge rates that were generated based on a water balance through an assumed unlined landfill under a variety of climatic and soil conditions. However, depending on the characteristics of the underlying aquifer, the infiltration and recharge rates derived from the water balance may exceed the capacity of the subsurface to absorb the water. As a result, mounding of the water table may occur in the ground-water model beneath the landfill. DuPont submitted comments on the proposed rule stating that this model-induced mounding is excessive and can lead to ground-water velocities that are unrealistically high. In their comments, DuPont implemented several different approaches to mitigate the impact of mounding on the model-predicted ground-water concentrations, including modifying the EPACMTP ground-water model. These alternative approaches give larger dilution and attenuation factors (DAF's) than the approach used in the unmodified model for the proposed rule.

We evaluated DuPont's comments and conclude that excessive mounding of ground water can, in fact, occur with the model. However, as discussed in the comment response document for today's rule, we disagree with the alternative approaches suggested by the commenter. These approaches primarily involve substantial reductions in the rate of waste leachate infiltration and, for this reason, they result in higher DAF's. We think a preferable approach within the current model framework is to implement a screening procedure to eliminate incompatible combinations of infiltration and recharge rates and aquifer characteristics. To evaluate what the impact of one such procedure might be, we implemented a simple procedure on a trial basis whereby all instances in

[25] See Attachment to DuPont Edge Moor's § 3007 survey entitled ''Split Metals Analyses from Region III Package,'' Sample No. 3228296, Iron Rich, with total thallium concentration reported at 23.6 mg/kg. See also January 6, 2000 letter to Michael (sic, Max) Diaz, EPA from Jonathan Bacher, VFL, regarding DuPont Iron-Rich Utilization, VFL Technology Approval Application, Attachment I: STL Product Analysis, Sample Number 91941001, with total thallium concentration reported at 28.6 mg/kg.

[26] See Exhibit 13–4 of ''Report to Congress on Special Wastes from Mineral Processing,'' July 1990. See also Tables 3.19, 3.21, and 3.27 of the Titanium Dioxide Listing Background Document for the Inorganic Chemical Listing Determination, August 2000.

which the water table was calculated to rise above the ground surface were eliminated. As described in the Response to Comments Background Document, this procedure resulted in a large number of combinations being eliminated. However, the DAF's at the 5th and 10th percentiles of the distribution were not greatly affected (i.e., they were within a factor of two of the DAF's modeled in the proposed rule).[27] Therefore, we believe that the mounding phenomena, while not infrequent, also is not of such magnitude that it modifies our primary conclusion regarding the potential risks posed by these wastes. As indicated elsewhere in today's notice, EPA continues to be concerned by potential risks from co-disposal with municipal solid waste in a municipal solid waste landfill, given the TCLP test results.

7. Wastewater Treatment Sludge

a. What Was Our Proposed Listing Determination?

Wastewater treatment sludge is one component of the proposed listing for non-exempt nonwastewaters generated from the chloride-ilmenite process. We based our proposal to list this waste component as hazardous on our modeling of the combined nonwastewaters generated at the Delaware facility, which showed that manganese and thallium leach from the combined waste at levels that may pose significant risk to human health from ground-water ingestion.

Wastewater treatment sludges are generated at each of DuPont's chloride-ilmenite facilities from the treatment of commingled wastewaters. The wastewaters are generated from the production of titanium tetrachloride, as well as from the production of titanium dioxide. As described previously in this notice, we proposed an interpretation of the Bevill exemption for this sludge that stated that the portion of the wastewater treatment sludge derived from treatment of titanium tetrachloride wastewaters would be eligible for exemption, while the portion of the sludge derived from titanium dioxide wastewaters (e.g., oxidation and finishing wastewaters) would be nonexempt and subject to the proposed listing determination.

DuPont submitted comments arguing that the combined solids listing should not include wastewater treatment sludges because they have lower levels of hazardous constituents and, therefore, do not contribute significantly to the risk posed by the combined wastestream. Moreover these wastes are generated separately from the condenser solids and ferric chloride solids. The Delaware facility commingles them with the other two types of solids. The Tennessee and Mississippi facilities dispose of them separately, as could the Delaware site (as we assume that they would do if we excluded them from the listing due to cost savings). Consequently, we assessed these sludges as if they were a separate wastestream. As explained below, we concluded that, as a separate wastestream, the wastewater treatment sludges do not present significant risks, and we are not taking final action to list them.

b. What Was the Technical Basis for the Proposed Listing?

To support our proposed listing determination, we collected one sample of chloride-ilmenite wastewater treatment sludge from the Tennessee facility. This sample was taken from a pond used to dewater wastewater treatment sludge prior to landfilling (i.e., the ''Hillside Pond''). This sample contains both exempt and non-exempt wastewater treatment sludge. In addition, we collected a sample of the commingled Iron Rich™ from the Delaware facility. This sample also contains both exempt and non-exempt wastewater treatment sludge. Wastewater treatment sludge accounts for ten percent of the commingled Iron Rich™. We did not sample the wastewater treatment sludge generated at the Mississippi facility. As stated in the proposal, we believe that our sampling and modeling of the sludges generated at the Tennessee and Delaware sites provides an appropriate surrogate for the waste generated at the Mississippi facility, given the similar nature of the processes at all three facilities.

Table IV–3 provides a summary of the analytical data for the Iron Rich™ and Hillside Pond samples that were used to support the proposed listing.

TABLE IV–3.—CHARACTERIZATION OF WASTEWATER TREATMENT SLUDGE FROM THE CHLORIDE-ILMENITE PROCESS, TITANIUM DIOXIDE

Constituent of concern	Iron Rich™ (Delaware) (10% WWT solids)			Hillside Pond WWT solids (Tennessee)		HBL (mg/L)	AWQC (mg/L)	
	Total (mg/kg)	TCLP (mg/L)	SPLP (mg/L)	Total (mg/kg)	SPLP (mg/L)		Human health	Aquatic life
Antimony	0.9	[2] 0.021	0.02	0.7	0.021	0.006	0.014	n/a
Arsenic	2.2	<0.0035	[2] 0.001	2.8	<[1] 0.0035	0.0007	1.8E–05	0.15
Barium	178	[2] 2.4	0.92	49.6	0.12	1.1	n/a	n/a
Boron	30	1.7	0.61	24.5	0.45	1.4	n/a	n/a
Lead	309	[2] 0.032	[2] 0.0032	42.4	[2] 0.002	0.015	.....	0.0025
Manganese	10,600	252	16.3	2,890	1.5	0.7	0.05	n/a
Nickel	91.8	0.5	<0.005	59.8	0.007	0.31	0.61	0.052
Thallium	3.7	0.28	0.012	7.2	<0.0022	0.001	0.0017	n/a
Vanadium	240	[2] 0.0003	<0.005	1,060	<0.005	0.14	n/a	n/a

n/a: not applicable
[1] One half the detection limit was used as a screening level.
[2] Results are less than the typical laboratory reporting limit, but are greater than the calculated instrument detection limits.

We used our SPLP results for the Hillside Pond sample to screen the on-site waste management scenarios at the Tennessee site (i.e., industrial landfill and impoundments). The primary constituents of concern in the SPLP extract were antimony and manganese. Our assessment of potential releases of these constituents to ground-water, which would discharge into the nearby river did not show sufficient risk to human health or aquatic life to serve as

[27] Although there is not a direct correspondence between DAFs and risk, lower DAFs result in higher risks. Therefore, the 5th and 10th percentile DAFs are of particular interest relative to high end risks, e.g., at the 90th and 95th percentiles of the risk distribution.

a basis for listing. In addition, we used our SPLP results for the Iron Rich™ which contained 10 percent wastewater treatment sludge to model an off-site industrial landfill scenario for the Delaware waste. Based on the risk associated with this scenario for manganese and thallium, and the commingled nature of the wastes, we proposed to include the non-exempt portion of the wastewater treatment sludge within the scope of the listing, which would have applied to all three facilities.

As described in the Titanium Dioxide Background Document, our analytical data also showed that chlorinated dioxins and furans are present in the Hillside Pond wastewater treatment sludge (402 ppt TCDD TEQ), as well as in the Iron Rich™ (57 ppt TCDD TEQ). However, we concluded, based on engineering assessment of the process, that the vast majority of the dioxins and furans were associated with the Bevill-exempt portions of the wastewater treatment sludges. Therefore, we did not assess potential risks from the dioxins and furans from the non-exempt wastewater treatment sludge.

c. What Is the Basis for the Final ''No List'' Determination?

In its comments, DuPont argued that its wastewater treatment sludges do not have the same composition as the Iron Rich™ which served as the basis for the proposed listing. DuPont argued that the analytical data for the Iron Rich™ sample is not characteristic of wastewater treatment sludge because Iron Rich™ consists predominantly of coke and ore solids. DuPont argued that the coke and ore solids and the wastewater treatment sludges are not chemically similar.

In particular, DuPont argued that the wastewater treatment sludges generated at its three chloride-ilmenite facilities do not contain manganese or thallium (the two constituents for which we proposed to list the waste as hazardous) at levels of concern. To support its conclusion, DuPont collected 53 samples of its wastewater treatment sludges and conducted total and SPLP leachate analyses of the samples for 20 metals, including manganese and thallium. DuPont used these analytical results to argue that our risk assessment would show significantly less risk if we were to assess the wastewater treatment sludges alone (rather than as a component of the Iron Rich™). (As explained below, DuPont's new totals and SPLP leachate data contained new information on arsenic and antimony that caused us to reassess risks from those constituents as well.)

DuPont also provided sampling and analytical data for its wastewaters from oxidation and finishing in an attempt to demonstrate that the non-exempt sludges derived from treatment of these wastewaters would not contain significant levels of manganese or thallium.

We assessed these new data in the context of the management scenarios we evaluated for the proposal and in light of the other comments (described above) that we believed had merit (e.g., thallium K_d, ground-water mounding). We reassessed the industrial landfill scenario using DuPont's new SPLP data for off-site management of the Delaware wastewater treatment sludge and on-site management of the Tennessee and Mississippi wastewater treatment sludges. We reassessed the municipal landfill scenario using DuPont's new totals data for off-site management of the Delaware wastewater treatment sludge. Because, however, of our decision to defer action on manganese (see section IV.B), the following discussion focuses instead on thallium, antimony and arsenic. The results of these assessments are set out below.

We also assessed DuPont's oxidation and finishing wastewater data but determined that we could not draw meaningful conclusions about the hypothetical concentration of constituents of concern in theoretical wastewater treatment sludges that might form from separate disposal of oxidation and finishing wastewater treatment sludges, if DuPont were to isolate them.

(1) Assessment of Industrial Landfill Scenario for Wastewater Treatment Sludges

Thallium: In its comments, DuPont contends that thallium is not present in its wastewater treatment sludges. DuPont provided data intended to support its claim that its wastewater treatment sludges do not contain thallium. Analytical results submitted by DuPont for the wastewater treatment sludges generated at all three facilities indicate that samples analyzed by DuPont contain no leachable thallium at levels above the HBL. However, as explained in our report, Assessment of Analytical Data Submitted by DuPont in Response to Proposed Inorganic Chemical Industry Hazardous Waste Determination for K178 (October 2001) which can be found in the docket for today's rule, we have significant concerns with the laboratory results provided by DuPont with regard to the presence of total and leachable thallium in the wastewater treatment sludges. Due to our concerns regarding the validity of DuPont's SPLP analytical results for thallium, we cannot agree that DuPont's data demonstrate that thallium is not present in the wastewater treatment sludges. For example, DuPont's ICP (SW6010) thallium data for the Tennessee plant showed thallium detected at levels below the method detection limit; the average concentration of these tentative detections is 0.014 mg/L. While we generally would not rely on these type of tentative data for the purposes of listing a waste, these results contradict DuPont's claim that the wastewater treatment sludge does not contain thallium at levels comparable to those we detected in the Iron Rich™ sample. Therefore, we are continuing to use our measurement of 0.012 mg/L in Iron Rich™ as the thallium concentration for our risk assessment. Table IV–4 provides a summary of the validated thallium SPLP data.

TABLE IV.–4.—THALLIUM SPLP RESULTS FOR DUPONT WASTEWATER TREATMENT SLUDGES AND IRON RICH™ (MG/L)

Waste description	DuPont	EPA
Delaware wastewater treatment sludge ...	<0.053	NA
Tennessee pond sludges	*<0.053	<0.0022
Mississippi pond sludges	<0.053	NA
Delaware Iron Rich™	<0.050	0.012

Thallium HBL = 0.001 mg/L.
NA: not analyzed.
*Thallium was detected in some samples at levels below the method detection limit.

As described previously, DuPont argued that our thallium modeling results overestimate mobility, particularly as impacted by the thallium K_d values we used. DuPont's data indicate that at low concentrations (e.g., on the order of 0.01 mg/L), thallium K_d's lie within the upper end of the range we used in the risk assessment for the proposed rule (>300 to ~800 L/kg for the DuPont data vs. 1 to 1000 in the proposed rule). Taking these data into account, we expect that the hazard quotient for thallium in the wastewater treatment sludges (which we had estimated in the Iron Rich reduced volume analysis for the proposed rule as 0.9 and 1.6 for a child at the 90th and 95th percentiles, respectively) would be reduced to below our listing threshold for the industrial landfill scenario. Consequently, we have changed our position on thallium risks from wastewater treatment sludges in industrial landfill scenarios. We no longer believe that thallium in these wastes poses significant risks.

Arsenic: The data that we collected to support the proposal at the Delaware and Tennessee facilities showed arsenic levels exceeding the HBLs. However, arsenic screened out when we assessed the ground water to surface water pathway at the Tennessee facility. Similarly, our modeling of ground-water risks at the Delaware facility did not predict risks of concern.

Analytical data DuPont submitted in its comments indicate that the combined wastewater treatment sludges generated at the company's DeLisle, Mississippi facility have arsenic levels (as measured by the SPLP) significantly above those that we observed from our sampling and analysis of the Iron Rich™ generated at the Delaware facility and the Hillside Pond sludge generated at the Tennessee facility. (See our review of these data in Appendix C of Assessment of Analytical Data Submitted by DuPont in Response to Proposed Inorganic Chemical Industry Hazardous Waste Determination for K178, October 2001.) DuPont's data show that the average arsenic SPLP levels in the wastewater treatment sludges generated at the Mississippi facility range between 0.031 and 0.11 mg/L, while the HBL for arsenic is 0.0007 mg/L.

We do not predict that these data would support a hazardous waste listing determination. Based on other modeling for potential ground-water releases at the Mississippi site, the wastes are unlikely to present significant risks. The Mississippi site-specific modeling for the proposed rule yielded relatively high dilution and attenuation factors (DAF) for metals. For example, the 10th percentile DAFs ranged from 865 to 8,859 (see Table 4–64 in the risk assessment background document in the docket for the proposal, Risk Assessment for the Listing Determinations for Inorganic Chemical Manufacturing Wastes: Background Document, August 2000). Therefore, it is unlikely that the arsenic levels found in the Mississippi facility's wastewater treatment sludges would present a significant risk, particularly given that we believe these wastewater treatment sludges will continue to be managed on-site. The facility reported in its § 3007 survey that the landfill is not scheduled to close until 2014. Given this readily available management capacity, we do not expect the facility would change their current practices and incur costs associated with shipment and offsite commercial waste management. Therefore, we have decided not to list the wastewater treatment sludges based on the presence of arsenic in the sludges generated at the Mississippi plant.

Antimony: As with arsenic, the data we collected in support of the proposal at the Delaware and Tennessee facilities showed antimony levels exceeding the HBLs. Antimony screened out when we assessed the ground water to surface water pathway at the Tennessee facility; our modeling of ground-water risks at the Delaware facility did not predict risks of concern.

Analytical data submitted by DuPont in comments indicate that the combined wastewater treatment sludges generated at the DeLisle plant have average antimony levels (0.026 mg/L, as measured by the SPLP) comparable to those we observed in our sampling and analysis of the Iron Rich™ (0.02 mg/L) and Johnsonville wastewater treatment sludge (0.021 mg/L). We do not believe these levels pose risk that warrants listing as hazardous waste.

(2) Assessment of Municipal Landfill Scenario for Wastewater Treatment Sludges

We assessed the municipal landfill scenario as plausible for the Delaware wastewater treatment sludges. (See the discussion below related to the plausibility of this scenario for ferric chloride solids, another component of the combined solids generated by the Delaware facility.) For the reasons set out above, we assumed that the comparable Tennessee and Mississippi sludges will continue to be managed on site in existing DuPont landfills. Although DuPont did not conduct TCLP analyses of the Delaware wastewater treatment sludges, we were able to assess the total constituent analyses and conclude that these solids would not likely pose risk if managed in a municipal landfill.

Thallium: DuPont did not detect thallium in any of its eight samples of the Delaware wastewater treatment sludges, with the exception of one value of 0.22 mg/kg that was qualified as questionable due to detection of thallium in associated analytical blanks. For the purposes of a worst case screening analysis, we used this qualified value as a theoretical maximum concentration, and then calculated a corresponding maximum theoretical TCLP concentration of 0.011 mg/L. To determine whether the commenter's concerns regarding the thallium distribution coefficient would reduce this hazard quotient below the listing threshold, we assessed the commenter's modeling runs. In their late comments, DuPont provided the results of a Monte Carlo run for thallium using a K_d of 300 L/kg (which DuPont stated was the appropriate value for this leachate concentration), which increased the 10th percentile DAF that corresponds to our modeling run of 3.9 to 119, a 30-fold increase; this DAF would reduce the theoretical TCLP concentration well below the thallium HBL of 0.001 mg/L. Therefore, we are not concerned that thallium in the Delaware wastewater treatment sludges is likely to pose risk in a municipal solid waste landfill scenario.

Antimony: In lieu of TCLP antimony data, we assessed the total antimony levels in DuPont's SW–846 Method 6010 analyses of combined exempt and non-exempt wastewater treatment sludge: antimony levels ranged from 1.9 to 3.8 mg/kg and were detected in all eight of the sludge samples. Each of these values was detected above the instrument detection limits, but below the method detection limit. See Appendix C of Assessment of Analytical Data Submitted by DuPont in Response to Proposed Inorganic Chemical Hazardous Waste Determination for K178, October 2001. Although we generally would not rely on this type of tentative data for the purposes of listing a waste, we used these values as worst case concentrations for the purposes of screening out the municipal solid waste landfill scenario for the non-exempt portion of the wastewater treatment sludge.

Initially, we calculated a maximum theoretical TCLP value using the maximum total antimony value reported for the wastewater treatment sludge (i.e., 3.8 mg/L divided by 20), yielding a worst case TCLP value of 0.19 mg/L. While this value clearly exceeds the antimony HBL of 0.006 mg/L, we recognized that the wastewater treatment sludge is comprised of exempt and non-exempt components, and that some proportion of this HBL exceedance would be associated with the exempt solids that are outside the scope of this listing determination. To isolate the portion of the risk that is associated with the non-exempt wastewater treatment sludges derived from treatment of oxidation and finishing wastewaters, we used DuPont's antimony analytical data for its major oxidation and finishing wastewater (RIN 13, dryer scrubber water) [28] to estimate what the concentration of antimony would be in the wastewater treatment sludge if (1) all of the antimony in this wastewater were concentrated in the sludge, and (2) this wastewater was the only source of antimony contributing to the sludge antimony concentration. We

[28] See Appendix C of Assessment of Analytical Data Submitted by DuPont in Response to Proposed Inorganic Chemical Industry Hazardous Waste Determination for K178, October 2001.

estimated this maximum theoretical total concentration of antimony from oxidation and finishing wastewaters in the wastewater treatment sludge to be 0.036 mg/kg (see Response to Comments Background Document in the docket for today's rule for the details of this calculation). This concentration is significantly lower than the measured antimony levels in the total wastewater treatment sludge samples, indicating that the non-exempt portion of the wastewater treatment sludge does not contribute much antimony loading to the overall sludge volume. Finally, to complete this screening analysis, we projected a maximum theoretical TCLP value of 0.002 mg/L from the maximum non-exempt antimony sludge concentration by dividing the total value by 20. This TCLP maximum value is below the HBL of 0.006 mg/L. We conclude from this analysis that it is unlikely that the non-exempt portion of the wastewater treatment sludge would pose risk from antimony if the waste were placed in a municipal solid waste landfill.

Arsenic: Although we have TCLP data for the combined Delaware facility wastestreams that make up Iron Rich, we have no TCLP data for the wastewater treatment sludge component of this waste. Also, DuPont did not conduct TCLP analysis of this waste in its post-proposal sampling effort. In lieu of such data, we estimated TCLP leachate values for the sludge by starting with the total arsenic levels in DuPont's data for Delaware wastewater treatment sludge and calculating a theoretical maximum TCLP value. Specifically, DuPont's ICP analysis indicated that arsenic was present in four of eight samples at levels above the instrument detection limit, but below the method detection limit. The average of these four values was 4.0 mg/kg. Although we generally would not rely on this type of tentative data for the purposes of listing a waste, we used these values as worst case concentrations for the purposes of our screening analysis. The theoretical maximum TCLP value associated with this average total concentration is 0.2 mg/L (4.0 mg/kg /20). We then used this value (instead of the measured Iron Rich™ TCLP value) to extrapolate risk from the risk values calculated for the proposal. This worst case analysis indicated that there could be risk (i.e., 2E–04) higher than our listing threshold; however, this analysis seriously overstated the potential risk associated with placing the non-exempt portion of the Delaware wastewater treatment sludge in a municipal solid waste landfill for a number of reasons. The actual risk associated with arsenic in this waste would likely not exceed the listing threshold if we conducted full-scale risk assessment without so many compounding conservative assumptions. These assumptions include: (1) We do not have actual TCLP data for this wastewater treatment sludge and have made worst case assumptions by assuming all the arsenic would leach out; (2) this screening analysis overestimates risk because it was based on the entire volume of Iron Rich, while the wastewater treatment sludge volume only accounts for 10 percent of the Iron Rich, and the non-exempt portion of the wastewater treatment sludge volume is very small; (3) this analysis relies on total arsenic concentrations that we estimated from analytical results that were below the method detection limit, which increases their uncertainty; (4) correcting the ground-water mounding problem identified by the commenter (see section 6.d above) also would tend to lower the estimated risk. After considering all of these factors, we do not believe we have sufficient evidence to list the non-exempt portion of the wastewater treatment sludge based on arsenic risk. The details of this analysis are provided in the docket for today's rule.

(3) What Is the Final Listing Determination for Wastewater Treatment Sludges?

We have made a final decision not to list the non-exempt wastewater treatment sludges because we do not believe this waste is likely to pose risk in either an industrial solid waste landfill or a municipal solid waste landfill, the plausible management scenarios for this waste.

8. Ferric Chloride Residues

Since we concluded that the vanadium component of the combined waste solids was Bevill-exempt, and found that the wastewater treatment sludge component did not pose risks justifying a listing, we assessed the last component of the combined solids separately. As explained below, we concluded that this component does pose significant risks, and we are taking action to list it today.

a. Where Are Non-Exempt Ferric Chloride Residues Generated?™

Ferric chloride residues that are subject to today's listing are generated at the Delaware plant wherever solids settle or are removed from the acid stream *after* initiation of ferric chloride manufacturing. Examples include residues that accumulate in acid storage tanks or surface impoundments. Ferric chloride residues also have been accumulating at the Delaware site in the facility's Cherry Island staging area as a component of Iron Rich™. To the extent that the accumulated Iron Rich™ is actively managed after the effective date of today's rule, those residues also will be subject to the listing.

In addition, while the Delaware facility is the only site currently impacted by this final listing, if other chloride-ilmenite plants began *manufacturing* ferric chloride for sales, any residues separated from their ferric chloride after initiation of ferric chloride manufacturing also would be subject to the listing.

Several commenters requested that we clarify whether the listing will impact solids that may settle out of or be removed from ferric chloride after the acid has been sold and transferred off-site. We intended to list only solids from the *manufacture* of ferric chloride. Our listing covers only residues generated while ferric chloride is being made and additional residues that settle out while the product is stored on-site at the ferric chloride manufacturing facilities (since that on-site storage is associated so closely with the manufacturing of the product). We did not intend for the listing to extend to residues that might be generated after this product is sent off-site. We have no data on management practices used off-site to ascertain how frequently ferric chloride purchasers or intermediates store ferric chloride purchased from various sources in the same tank. Nor do we have any analytical data to characterize any residues that might settle out from these off-site storage tanks. Therefore, we are clarifying that the listing does not include residues removed from ferric chloride after sale and transfer off-site. Note that residues generated off-site from storage and use of the ferric chloride acid product are not subject to the Consent Decree requirements for today's final rule because ferric chloride use was not covered by the Consent Decree. We also note that such residues would be subject to regulatory control if they exhibit any of the hazardous waste characteristics.

b. Summary of Available Data

We conclude that the ferric chloride residues closely resemble the Iron Rich™ samples that we collected, as well as those Iron RichTM samples collected by DuPont. Coke and ore solids are removed from the titanium tetrachloride process in several steps at the Delaware facility (all other chloride and chloride-ilmenite plants generate these solids in one step). The bulk of the solids are removed in a primary solids

separation step at the Delaware facility, and the ferric chloride residues are removed in the subsequent condenser step.[29] The only difference between these streams is that: (1) The ferric chloride residue contains the contribution of vanadium impurities (described previously in section 5.a above); and (2) the ferric chloride residue would also contain potentially higher concentrations of iron chlorides. The risks we are assessing are not related to either vanadium or iron chloride compounds. Both categories of waste are commingled to form Iron Rich™. DuPont described both categories of waste as being ''coke and ore'' and provided no arguments to the effect that the ferric chloride residues were more or less contaminated than the primary solids. We, therefore, conclude that the data characterizing the commingled Iron RichTM, which is 80 percent primary solids and 10 percent ferric chloride residues, is an appropriate surrogate for the ferric chloride residues. (The remaining 10 percent of the total volume consists of the wastewater treatment sludges discussed above).

Table IV–5 summarizes the available and valid EPA and DuPont analytical data (focusing on ICP analytical results, as described previously) for Iron Rich™ for the three metals that we modeled for the proposed listing and are assessing in this final rule (antimony, arsenic, and thallium).[30]

As explained below, DuPont's new data do not persuade us that this waste does not present significant risks. Even with DuPont's data, we continue to predict significant risks in offsite municipal landfills.

Finally, we noted that DuPont's data on antimony and arsenic show higher concentrations than our data. We reviewed this data and concluded that it did not support a listing based on an offsite industrial landfill scenario. DuPont's TCLP data for antimony and arsenic are somewhat uncertain, if valid, it would tend to corroborate our listing.

TABLE IV–5. SUMMARY OF ANALYTICAL DATA FOR IRON RICH™

[As surrogate for ferric chloride residues]

Constituent	Analysis	DuPont analyses								EPA sample DPE–SO–01	Health based level (mg/L)
		EMI–1	EMI–2	EMI–3	EMI–4	EMI–5	EMI–6	EMI–7	EMI–8		
Antimony	Total	3.5	3.66	3.55	<2.2	<2.2	3.96	3.11	3.17	0.9	
	TLCP	0.17	<0.155	<0.155	<0.155	<0.155	<0.155	<0.155	<0.155	0.021	0.006
	SPLP	0.0571	<0.031	0.044	0.041	0.056	0.048	<0.031	0.0248	0.02	
Arsenic	Total	<3.1	4.33	<3.1	<3.1	<3.1	<3.1	4.96	<3.1	2.2	
	RCLP	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.26	<0.22	<0.0035	0.0007
	SPLP	<0.043	<0.043	<0.043	<0.043	<0.043	<0.043	<0.043	<0.043	0.001 (1)	
Thallium	Total	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1	3.7 23.6 Dupont split analysis. 18.4, EPA analysis at 10x dilution.	
	TCLP	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250	0.28 0.27 EPA duplicate analysis.	0.001
	SPLP	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.012	

(1) Results are less than the typical laboratory reporting limit, but are greater than the calculated instrument detection limits.

c. Assessment of Industrial Solid Waste Landfill Scenario for Ferric Chloride Residues

To respond to DuPont's comments, we reexamine our proposed findings regarding significant risk in an off-site industrial solid waste landfill scenario for the ferric chloride residues generated at the Delaware facility. As discussed earlier, this plant is the only generator of the ferric chloride residues from the production of ferric chloride and this plant has no on-site capacity for landfilling. The plant is currently shipping the waste off-site for Subtitle D landfilling; clearly our modeled management scenario continues to be relevant.

The proposal described risk associated with the entire volume of Iron Rich™, as well as with a reduced volume (10%) of waste, in an off-site industrial landfill scenario. DuPont reported that the ferric chloride residues account for 10 percent of the Iron Rich™ volume. Therefore, we believe that the reduced volume analysis conducted for the proposed rule (see 65 FR 55763) is an appropriate framework to use in reexamining risks for the ferric chloride residues.

Our reexamination, using DuPont's SPLP results is presented below.

Thallium: DuPont's thallium SPLP detection limits (<0.050 mg/L) exceed our analytical result of 0.012 mg/L. We do not believe DuPont's data refutes ours. While we found risk at proposal associated with our analytical results, we believe the commenter's previously discussed concerns regarding the thallium distribution coefficient (see section 6.c above) have merit. DuPont's data indicate that at low concentrations (e.g., on the order of 0.01 mg/L), thallium K_d's lie within the upper end of the range we used in the risk assessment for the proposed rule. Specifically, DuPont's data indicate that the K_d's range from >300 to ~800 L/kg, while the K_d values we used in our modeling for the proposal ranged from 1 to 1,000, with a median of 30. Taking these data into account, we expect that the hazard quotient for thallium in the ferric chloride residues (which we had estimated in the Iron Rich™ reduced volume analysis for the proposed rule as 0.9 and 1.6 for a child at the 90th and 95th percentiles, respectively) would be reduced to below our listing threshold for the industrial landfill scenario because the higher K_d's measured by DuPont would result in more attenuation in the modeled aquifer, and consequently lower ground-water concentrations and, therefore, less risk.

[29] DuPont described the process at p. 3.4 of their 11/13/2000 comments as follows: ''In equipment downstream of the reactor, crude gaseous titanium tetrachloride is extracted from the majority of high boiling metal chlorides and un-reacted coke and ore solids by condensation, drying, and gravity separation. Following this separation, the hot gas is then condensed to obtain a crude liquid titanium tetrachloride. The crude liquid must be further purified to extract titanium tetrachloride from the remaining non-titanium metal chlorides (particularly vanadium chlorides) and remaining suspended solids (e.g., iron chloride and un-reacted coke and ore).''

[30] As discussed in section IV.B, we are not taking final action on manganese in today's rule.

Antimony: DuPont's average SPLP antimony results for eight samples of Iron Rich™ was 0.038 mg/L, which is slightly higher than but consistent with our result of 0.02 mg/L. Using this average value in our modeling framework, we estimate that we would generate a hazard quotient of 0.76, still below our listing threshold. (The ground-water model we used for the proposed rule is linear with respect to leachate concentrations over a limited range, and thus when the only variable being adjusted is leachate concentration, we can proportionately adjust the corresponding risk value to project what the risks would be if we were to re-run the model.) While using DuPont's maximum value likely would raise the projected hazard quotient to 1.1, slightly above the listing threshold of unity, we do not feel that these results are sufficiently compelling to cause us to expand the basis for listing to include antimony on Appendix VII for K178. In particular, if we had run our probabilistic model using DuPont's eight values in our leachate concentration distribution, the impact of the maximum value would have been reduced and the resultant hazard quotient likely would not have exceeded one.

Arsenic: DuPont's arsenic SPLP detection limits (<0.043 mg/L) are too high to make any conclusions regarding risk or comparability to our 0.001 mg/L result for the Iron Rich™. Using our data, we did not find risk supporting a proposed listing determination associated with arsenic at the concentrations we measured in the industrial solid waste scenario.

d. Assessment of Municipal Solid Waste Landfill Scenario for Ferric Chloride Residues

The proposal also described qualitatively that risks would be higher if modeled in a municipal solid waste landfill scenario. We continue to believe this scenario supports our decision to list this waste. The practical difference between the Agency's modeling of a municipal landfill scenario and an industrial solid waste landfill scenario is the leachate input parameter. As described in the proposed rule (see 65 FR 55695), we believe that the TCLP is the most appropriate leaching procedure to use for wastes in the municipal landfill scenario, while the industrial landfill scenario is better modeled using SPLP results.

After the proposal, when we modified our conclusion concerning the industrial solid waste landfill scenario, we took a closer look at risks from the municipal solid waste landfill. Using the reduced volume analysis described in the proposal, as well as EPA's TCLP results described in Table IV–5, we estimated risk results for the municipal solid waste landfill scenario, as presented in Table IV–6:

TABLE IV–6.—GROUND-WATER PATHWAY RISK ASSESSMENT RESULTS FOR K178 MUNICIPAL LANDFILL SCENARIO EXTRAPOLATED FROM REDUCED (10%) VOLUME ANALYSIS EPA DATA

Constituents of concern	Hazard quotients			
	90th% adult	90th% child	95th% adult	95th% child
Antimony	0.113	0.21	0.21	0.42
Thallium	9.3	21	18.7	37.3

Note: Arsenic was not included in the reduced volume analysis for the proposal because of the low risk shown in the full volume analysis.

We then examined DuPont's new analytical data, and substituted it for ours where warranted. We also took into account the revisions to our ground-water modeling warranted by DuPont's comments on the K_d for thallium and ground-water mounding (as described above). We still find significant risks associated with thallium for a municipal landfill scenario. The following discussion expands upon this conclusion.

Thallium: DuPont's thallium TCLP detection limits (<0.250 mg/L) are too high to make any conclusions regarding risk or comparability to our 0.28 mg/L TCLP result. As discussed above in section 6.b, we are unconvinced by DuPont's concerns regarding the validity of our analytical data. Consequently, we have chosen to use our data in our reevaluating. The extrapolated hazard quotient of 37.3 in the table above is well above our listing threshold of one. To determine whether the commenter's concerns regarding the thallium distribution coefficient would reduce this hazard quotient below the listing threshold, we assessed the commenter's modeling runs. In their late comments, DuPont provided the results of a Monte Carlo run for thallium using a K_d of 300 L/kg, which increased the 10th percentile DAF that corresponds to our modeling run of 3.9 to 119, a 30-fold increase; this DAF would not reduce the hazard quotient below the listing threshold. In previous submittals, DuPont provided the results of their K_d measurements, and identified one of the three soil matrices analyzed as being particularly comparable to the soils in the plant vicinity (i.e., Baptistown NJ loam). For the concentration range of concern (i.e., 0.28 mg/L), DuPont's graphical analysis of the measurement data indicates that the thallium K_d for the Baptistown loam is approximately 200 L/kg. If DuPont had used this value in its Monte Carlo analysis, the resultant DAF would have been lower than 119, and the resultant hazard quotient would have still exceeded the hazard quotient threshold for listing of one. Furthermore, data for the Lynge, Denmark sandy loam show a K_d that is even lower (~140 L/kg) at this concentration level. In addition, as stated previously, we do not think that the ground-water mounding issue raised by the commenter is of sufficient magnitude to change our conclusions. For these reasons, we continue to conclude that, in this scenario, thallium still poses significant risks that serve as a basis for listing.

Antimony: One of DuPont's Iron Rich™ samples (EMI–1) contained antimony in the TCLP results (0.17 mg/L) above DuPont's analytical detection limit and above the health-based limit (0.006 mg/L), while the remaining seven DuPont samples did not contain antimony above the detection limit (<0.155 mg/L). Because of the proximity of the detected value to the detection limit, it is not possible to determine whether the result is an anomaly. DuPont's Sample EMI–1 results, if used in our modeling analysis, would generate a hazard quotient above our listing threshold (3.4 for the 95th% child scenario). We are choosing not to expand the basis for listing to include antimony on Appendix VII for K178 because of the uncertainty in the analytical data provided by DuPont. Furthermore, the thallium results provide sufficient basis to support a hazardous waste listing.

Arsenic: The arsenic TCLP result for one of the eight DuPont samples (EMI–7) exceeds the Agency's HBL by a factor of 371. Because of the proximity of the detection limits for DuPont's other samples to the detected value, we cannot determine whether or not this result is an anomaly. In addition, we did not conduct modeling for arsenic in our reduced volume analysis and, therefore, cannot (in the time remaining before the consent decree deadline) project risk associated with the ferric chloride residues waste volume. We are choosing not to expand the basis for listing to include arsenic on Appendix VII for K178 because of the uncertainty in the analytical data provided by DuPont. Furthermore, the thallium results provide sufficient basis to support a hazardous waste listing.

In summary, our modeling, using both our analytical data as well as DuPont's indicates that the ferric chloride residues warrant being listed as hazardous waste due to potential thallium risks associated with the municipal landfill scenario.

e. Dioxin Content as an Additional Supporting Risk Factor

As described in the proposal, our data demonstrate that Iron Rich ™ contains levels of polychlorinated dibenzo-p-dioxins and dibenzofurans that exceed our soil ingestion level for these compounds. Dioxin and furan concentrations are commonly converted to an equivalent concentration (TEQ) of 2,3,7,8-tetrachlorodibenzo-p-dioxin, the most toxic of the PCDDs and PCDFs. Using the toxicity equivalent factors developed by the World Health Organization, [31] we estimate that Iron Rich ™ contains 58 parts per trillion of TCDD equivalents, a concentration that exceeds our soil ingestion health-based limit.

In a meeting with EPA [32], DuPont indicated that the company's analyses of its wastes showed an average TCDD equivalent concentration of 1.1 parts per billion, twenty times higher than our measured values in a sample collected at the DuPont Delaware facility. DuPont conducted a limited risk assessment of potential releases of the Iron Rich ™ currently stockpiled on DuPont's Cherry Island property to the adjacent Delaware River. [33] Based on the dioxin risks predicted by this modeling, DuPont indicated that it will undertake significant changes in waste management practices to minimize potential releases of the Iron Rich ™ to the environment, and is investigating the effectiveness of various process changes to reduce dioxin levels in its waste.

We continue to believe that the presence of dioxins and furans in the ferric chloride residues is a supporting basis for listing this waste as hazardous. While we have elsewhere stated that the dioxin content in the titanium dioxide wastes is closely linked to the Bevill exempt solids, the ferric chloride residues subject to today's listing would be eligible for Bevill exemption if it were not for the processing (i.e., addition of trim chlorine) that signifies that the facility has initiated production of ferric chloride. Solids from production of ferric chloride are not eligible for the special mineral processing exemption provided for solids from titanium tetrachloride production. Therefore, we conclude that the ferric chloride solids contain significant concentrations of dioxins and furans.

9. Conclusions

We believe we have sufficient basis to list non-exempt ferric chloride residues as hazardous wastes. Our data indicate that thallium is readily mobilized from this waste in a municipal landfill scenario, at levels that are likely to exceed health-based thresholds in drinking water. While the commenter provided information that suggests the risks may be somewhat reduced from those we described at proposal, the risks for thallium in the municipal scenario continue to exceed our listing thresholds. Therefore, we are finalizing the listing as:

K178 Residues from manufacturing and manufacturing-site storage of ferric chloride from acids formed during the production of titanium dioxide using the chloride-ilmenite process (T)

We view this separate waste as a waste from the production of ferric chloride, not a waste from the production of titanium dioxide. Therefore, we do not consider it to be subject to either the Consent Decree or section 3001(e)(2) of RCRA.

10. RCRA Versus HSWA Listing

At proposal, we took the position that we were promulgating all of the listings under section 3001(e) of RCRA, a provision added by the Hazardous and Solid Waste Amendments of 1984 (HSWA). Rules promulgated under HSWA authorities take effect in all states at the same time. Because of the changes to the scope of the K178 listing in response to public comments, we are now classifying the K178 listing determination as a non-HSWA listing because, as explained above in the discussion of the Bevill exemption, we consider it to be a waste from the production of ferric chloride, not a waste from the production of titanium dioxide.

Section 3001(e)(2) of RCRA, a HSWA provision, specifies a list of industries for which the Agency is to assess and make listing determinations on the wastes generated by those industries. The ED Consent Decree identifies the scope of our obligations under section 3001(e)(2). It does not require EPA to assess wastes from the production of ferric chloride. Consequently, EPA is using its ''pre-HSWA'' listing authority under section 3001(b)(1) to identify these ferric chloride residues as listed hazardous wastes. As such, this non-HSWA listing will become effective in authorized states as a matter of state law once the states adopt the listing; it will become effective under federal law when EPA approves revisions to the states' programs.

E. What Is the Status of Landfill Leachate Derived From Newly-Listed K176, K177, and K178 Wastes?

As noted in the proposed rule, actively managed landfill leachate and gas condensate generated at non-hazardous waste landfills derived from previously-disposed and newly-listed wastes could be classified as K176, K177, or K178. We proposed to temporarily defer the application of the new waste codes to such leachate to avoid disruption of ongoing leachate management activities while the Agency decides if any further integration is needed of the RCRA and CWA regulations consistent with RCRA section 1006(b)(1).

We are finalizing the revisions to the temporary deferral in § 261.4(b)(15) with no change from the proposed rule. One commenter supported the proposed deferral; however, the commenter was concerned about uncertainties for landfill operators in leachate management requirements based on different approaches used in recent listings. The commenter sought a single

[31] Van den Berg, M.L. Birnbaum, A.T.C. Bosveld, et al. 1998. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife. Environmental Health Perspectives 106: 775–792.

[32] ''Summary of Meeting Between EPA's Office of Solid Waste and Representatives from Dupont, April 3, 2001. Also, see letters to Lillian Bagus, EPA from Gregg W. Martin, DuPont re ''Edge Moor Iron Rich™ Staging Area Screening Assessment,'' dated April 16, 2001, and ''Edge Moor Iron Rich Staging Area Screening Assessment Unit Correction,'' dated April 27, 2001.

[33] Letters to Lillian Bagus, EPA from Gregg W. Martin, DuPont dated April 16, 2001 and April 27, 2001.

solution to the derived-from issue for leachate and suggested that the opportunity exists under either the CWA effluent guidelines or the Hazardous Waste Identification Rule (HWIR).

As we noted in the proposal, we believe a temporary deferral is warranted. We believe that it is appropriate to defer regulation on a case-by-case basis to avoid disrupting leachate management activities, and to allow us to decide whether any further integration of the two programs is needed.[34] While the commenter suggested there were ''uncertainties'' in leachate management requirements, no specific problems were identified. In any case, a broader exemption for landfill leachate under another regulatory program is beyond the scope of the current rulemaking.

We also received one other related comment concerning the existing exclusion for industrial wastewater discharges that are regulated under the National Pollutant Discharge Elimination System (NPDES) Permit Program. Such discharges are specifically excluded from regulation as hazardous wastes under 40 CFR 261.4(a)(2). The commenter apparently is concerned about discharges of landfill leachate, and suggested that EPA should issue regulations to ensure that landfills have adequate leak detection/leachate collection systems and that these systems are not infiltrated by ground water. The commenter is concerned that leachate may be diluted with ground water in these systems to meet discharge standards.

The regulation in 40 CFR 261.4(a)(2) excludes any industrial wastewater point source discharges that are ''subject to regulation under section 402 of the Clean Water Act, as amended.'' This language follows closely the statutory exclusion from the definition of solid waste (section 1004(27) of RCRA). The regulations do not include any limitations on the types of landfills that might use such a permitted discharge.

The commenter did not present any reason why regulations might be needed to ensure dilution from local ground water does not occur prior to collection. We also note that regulations are already in place for the design and operation of leachate collection systems for Subtitle C hazardous waste landfills (40 CFR 264, subpart N) and municipal solid waste landfills that accept hazardous wastes from conditional exempt small quantity generators (40 CFR 258.40). The goal of those regulations is to prevent leachate from infiltrating ground water. Determining whether these or other types of landfills need additional controls addressing leak detection and leachate control systems and their impact on their NPDES discharges is a major effort well beyond the scope of this rulemaking.

F. What Are the Final Treatment Standards Under RCRA's Land Disposal Restrictions for the Newly-Listed Hazardous Wastes?

1. What Are EPA's Land Disposal Restrictions (LDRs)?

RCRA requires us to establish treatment standards for all hazardous wastes destined for land disposal. These are the ''land disposal restrictions'' or LDRs. For any hazardous waste identified or listed after November 8, 1984, we must promulgate LDR treatment standards within six months of the date of identification or final listing (RCRA section 3004(g)(4), 42 U.S.C. 6924(g)(4)). RCRA also requires us to set as these treatment standards ''* * * levels or methods of treatment, if any, which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized.'' (RCRA section 3004(m)(1), 42 U.S.C. 6924(m)(1).)

Once a hazardous waste is prohibited from land disposal, the statute provides only two options for legal land disposal: meet the treatment standard for the waste prior to land disposal, or dispose of the waste in a land disposal unit that satisfies the statutory ''no migration'' test. A ''no migration'' unit is one from which there will be no migration of hazardous constituents for as long as the waste remains hazardous. (RCRA sections 3004 (d), (e), (f), and (g)(5).) The antimony oxide wastes identified for listing as hazardous in this rule under HSWA authorities will be subject to all the land disposal restrictions on the date that the federal listing becomes effective (six months after promulgation of this final rule). The non-HSWA ferric chloride (K178) listing will not be subject to LDR restrictions until authorized states revise their regulations and obtain EPA approval of revisions to their authorized state programs.

We gathered data on waste characteristics and current management practices for wastes that will be listed by this action. These data can be found in the administrative record for this final rule. An examination of the constituents that are the basis of the listings shows that we have previously developed numerical treatment standards for most of the constituents. We have determined that it is technically feasible and justified to apply existing universal treatment standards (UTS) to the hazardous constituents in K176, K177, and K178 that were found to be present in these wastes at concentrations exceeding the treatment standards, because the waste compositions are similar to other wastes for which applicable treatment technologies have been demonstrated.[35] A list of the regulated hazardous constituents and their associated treatment limits can be found below in Table IV–7 and in the regulatory Table 268.40—Treatment Standards for Hazardous Wastes.

We have provided in the BDAT Background Document a review of technologies that can be used to meet the numerical concentration limits for K176, K177, and K178, assuming optimal design and operation. Where we are promulgating numerical concentration limits, the use of other technologies capable of achieving the treatment standards is allowed, except for those treatment or reclamation practices constituting land disposal or impermissible dilution (see 40 CFR 268.3).

EPA would like to take this opportunity to reiterate how treatment standards are established and the role of risk-based standards in treatment standard development. This policy is well documented in past LDR rulemakings, including the Phase IV rulemaking (May 26, 1998; 63 FR 28556). Dilution and attenuation are typically considered in the risk assessment, but are not used in the development of treatment standards. The treatment standards represent a calculation of the expected performance range of an applicable technology operating on a difficult to treat waste such that 99 percent of the batches meet the standard. All land disposal restriction treatment standards must satisfy the requirements of RCRA section 3004(m) by specifying levels or methods of treatment that "'substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from that waste so that

[34] EPA's Office of Water recently examined the need for national effluent limitations guidelines and pretreatment standards for wastewater discharges (including leachate) from certain types of landfills (see proposed rule at 63 FR 6426, February 6, 1998) EPA decided such standards were not required and did not issue pretreatment standards for Subtitle D landfill wastewaters sent to POTWs (see 65 FR 3008, January 19, 2000).

[35] Also see LDR Phase II final rule, 59 FR 47982, September 19, 1994, for a further discussion of UTS.

short-term and long-term threats to human health and the environment are minimized.'''' As EPA has discussed many times, the RCRA section 3004(m) requirements may be satisfied by technology-based standards or risk-based standards. This conclusion was upheld in Hazardous Waste Treatment Council v. EPA, 886 F.2d 355, 362–64 (D.C. Cir. 1989), where technology-based LDR treatment standards were upheld as a permissible means of implementing RCRA section 3004(m) provided they did not require treatment beyond the point at which threats to human health and the environment are minimized.

2. What Are the Treatment Standards for K176? (Baghouse Filters From the Production of Antimony Oxide, Including Filters From the Production of Intermediates (e.g., Antimony Metal or Crude Antimony Oxide))

The identified constituents for which treatment is required prior to land disposing this waste are antimony, arsenic, cadmium, lead, and mercury. No commenters challenged either the applicability or achievability of the universal treatment standards proposed for K176 wastes. We are promulgating the proposed standards without change. The nonwastewaters treatment standard for antimony is 1.15 mg/L TCLP; arsenic is 5.0 mg/L TCLP; cadmium is 0.11 mg/L TCLP; lead is 0.75 mg/L TCLP; and mercury is 0.025 mg/L TCLP. In the event that there are wastewater treatment residuals from treatment of K176 (which under the derived-from rule also will be considered K176), the wastewater treatment standards are as follows: antimony is 1.9 mg/L; arsenic is 1.4 mg/L; cadmium is 0.69 mg/L; lead is 0.69 mg/L; and mercury is 0.15 mg/L.

3. What Are the Treatment Standards for K177? (Slag From the Production of Antimony Oxide that Is Speculatively Accumulated or Disposed, Including Slag From the Production of Intermediates (e.g., Antimony Metal or Crude Antimony Oxide))

The identified constituents for which treatment is required prior to land disposing this waste are antimony, arsenic, and lead. We proposed the UTS levels for these constituents as the treatment standards for K177 wastes. No commenters challenged either the applicability or achievability of the universal treatment standards proposed to be transferred to K177 wastes. We are promulgating the proposed standards without change. The nonwastewater treatment standard for antimony is 1.15 mg/L TCLP, for arsenic is 5.0 mg/L TCLP, and for lead is 0.75 mg/L TCLP. In the event that there are wastewater treatment residuals from treatment of K177 (which under the derived-from rule also would be considered K177), the wastewater treatment standard for antimony is 1.9 mg/L, for arsenic is 1.4 mg/L, and for lead is 0.69 mg/L.

4. What Are the Treatment Standards for K178? (Solids From Manufacturing and Manufacturing-Site Storage of Ferric Chloride From Acids Formed During the Production of Titanium Dioxide Using the Chloride-Ilmenite Process)

The constituents of concern in this waste described in our proposal were thallium, manganese, and the chlorinated congeners of dibenzo-p-dioxin and dibenzofuran. We proposed to apply the UTS levels to thallium and the chlorinated congeners of dibenzo-p-dioxin and dibenzofuran, as indicated in Table IV–7. In addition, we proposed the option of complying with the technology standard of combustion (CMBST) for the chlorinated dibenzo-p-dioxin and dibenzofuran (dioxins and furans) constituents present in K178. For manganese we proposed, as our leading option, a nonwastewater treatment standard of 3.6 mg/L TCLP based upon a high temperature metals recovery technology and wastewater treatment standard of 17.1 mg/L manganese, based upon sedimentation technology. After considering the comments described below, today we are promulgating the treatment standards as proposed for thallium and the chlorinated congeners of dibenzo-p-dioxin and dibenzofuran. We are deferring action on all aspects of the regulation of manganese at this time as explained earlier in section IV.B.

TABLE IV–7.—TREATMENT STANDARDS FOR K178

Regulated hazardous constituent		Wastewaters	Nonwastewaters
Common name	CAS [1] No.	Concentration in mg/L [2], or technology code [3]	Concentration in mg/kg [4] unless noted as "mg/L TCLP", or technology Code
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822–39–4	0.000035 or CMBST [5]	0.0025 or CMBST [5]
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562–39–4	0.000035 or CMBST [5]	0.0025 or CMBST [5]
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673–89–7	0.000035 or CMBST [5]	0.0025 or CMBST [5]
HxCDDs (All Hexachlorodibenzo-p-dioxins)	34465–46–8	0.000063 or CMBST [5]	0.001 or CMBST [5]
HxCDFs (All Hexachlorodibenzofurans)	55684–94–1	0.000063 or CMBST [5]	0.001 or CMBST [5]
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	3268–87–9	0.000063 or CMBST [5]	0.005 or CMBST [5]
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	39001–02–0	0.000063 or CMBST [5]	0.005 or CMBST [5]
PeCDDs (All Pentachlorodibenzo-p-dioxins)	36088–22–9	0.000063 or CMBST [5]	0.001 or CMBST [5]
PeCDFs (All Pentachlorodibenzofurans)	30402–15–4	0.000035 or CMBST [5]	0.001 or CMBST [5]
TCDDs (All tetrachlorodi-benzo-p-dioxins)	41903–57–5	0.000063 or CMBST [5]	0.001 or CMBST [5]
TCDFs (All tetrachlorodibenzofurans)	55722–27–5	0.000063 or CMBST [5]	0.001 or CMBST [5]

TABLE IV–7.—TREATMENT STANDARDS FOR K178—Continued

Regulated hazardous constituent		Wastewaters	Nonwastewaters
Common name	CAS [1] No.	Concentration in mg/L [2], or technology code [3]	Concentration in mg/kg [4] unless noted as "mg/L TCLP", or technology Code
Thallium	7440–28–0	1.4	0.20 mg/L TCLP

[1] CAS means Chemical Abstract Services. When the waste code and/or regulated constituents are described as a combination of a chemical with its salts and/or esters, the CAS number is given for the parent compound only.
[2] Concentration standards for wastewaters are expressed in mg/L and are based on analysis of composite samples.
[3] All treatment standards expressed as a Technology Code or combination of Technology Codes are explained in detail in 40 CFR 268.42 Table 1—Technology Codes and Descriptions of Technology-Based Standards.
[4] Except for Metals (EP or TCLP) and Cyanides (Total and Amenable) the nonwastewater treatment standards expressed as a concentration were established, in part, based upon incineration in units operated in accordance with the technical requirements of 40 CFR part 264, subpart O or 40 CFR part 265, subpart O, or based upon combustion in fuel substitution units operating in accordance with applicable technical requirements. A facility may comply with these treatment standards according to provisions in 40 CFR 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.
[5] For these wastes, the definition of CMBST is limited to: (1) combustion units operating under 40 CFR 266, (2) combustion units permitted under 40 CFR part 264, Subpart O, or (3) combustion units operating under 40 CFR 265, Subpart O, which have obtained a determination of equivalent treatment under 268.42(b).

a. Comments Regarding Dioxins and Furans

Comments were received on the appropriateness of the proposed treatment standards for dibenzo-p-dioxin and dibenzofuran, and manganese. However, no data were received or arguments made to demonstrate that the proposed standards were not achievable.

A commenter argued that application of the octachlorodibenzo-p-dioxin (OCDD) and octachlorodibenzofuran (OCDF) standards should be deferred pending anticipated lawsuits challenging the Chlorinated Aliphatics final rule (65 FR 67068, November 8, 2000) in which EPA promulgated Universal Treatment Standards for these constituents. However, this aspect of the final rule was not challenged. EPA is promulgating treatment standards for dioxin congeners, including OCDD and OCDF, in K178 wastes as proposed, because treatment of these constituents is necessary to reduce the risks to human health or the environment that these constituents pose.

The commenter also stated that EPA should not set standards for OCDD and OCDF, because the constituents are not toxic. As explained in more detail in the Response to Comments document, we disagree with the commenter and are promulgating the proposed standards for all dioxins and furans including the OCDD and OCDF congeners. A full discussion of the toxicity of these compounds also was presented in the final chlorinated aliphatics final listing determination at 65 FR 67108. We conclude OCDD and OCDF are toxic.

We are promulgating treatment standards for dioxin and furan congeners in K178, because toxic dioxin and furan congeners are present in this waste at concentrations well above the promulgated treatment standards for these underlying hazardous constituents. For example, OCDF was measured in EPA record sample of the combined Iron Rich ™ wastestream at 58 μg/kg dry weight, well above its treatment standard of 5 μg/kg (see Tables 2–9 and 2–10 in EPA's Best Demonstrated Available Technology (BDAT) Background Document for Inorganic Chemical Production Wastes—K176, K177, K178 (for the final rule)). If OCDD and OCDF were to be excluded from the K178 treatment standard, they would go untreated. Absent treatment standards for dioxins, the newly listed wastes would have less stringent treatment standards by application of 40 CFR 268.9(b) than the wastes are currently subject to, because these wastes are generally corrosive. Having demonstrated the presence of these constituents at levels that require treatment, we are acting to protect human health and the environment from the release of the significant levels found in the untreated waste form.

b. Comments Regarding Thallium

Comments relative to thallium centered on its occurrence in the wastes. If the occurrence of thallium is as the commenter's data indicates, then little of the K178 generated waste would require treatment for thallium. However, we found that the commenter's analysis obtained higher detection limits than we did. Our record sampling showed thallium concentrations in this waste of 0.28 mg/L TCLP (65 FR 55761, September 14, 2000). This is a level that would require treatment. Consequently, we believe it is appropriate to set treatment standards for thallium for K178. In instances when the waste exhibits thallium concentrations below the treatment standard, no treatment for thallium will be necessary prior to land disposal. Therefore, we are promulgating the inclusion of thallium in the final treatment standards.

c. Comments Regarding Manganese

For comments concerning manganese see the Response to Comment Background Document. Because EPA decided to defer final action on all aspects of manganese regulation at this time, manganese related comments are not being addressed at this time.

d. What Final Changes Are Being Made to F039?

The F039 waste code applies to hazardous waste landfill leachates in lieu of the treatment standards established for the original waste codes associated with each of the wastes from which the leachate is derived, when multiple waste codes would otherwise apply. F039 wastes are subject to numerical treatment standards. We proposed to add manganese to the constituents regulated by F039 to maintain the implementation benefits of having one waste code for multi-source leachate. In today's final rule, we have decided to defer regulation of manganese in F039 wastes at this time.

e. Manganese as an Underlying Hazardous Constituent

We had proposed to add manganese to the table of Universal Treatment Standards (UTS) at 40 CFR 268.48. We are not, however, promulgating the addition of manganese to the UTS at 40 CFR 268.48 at this time. Had the proposal been promulgated, all characteristic wastes that have manganese as an underlying hazardous constituent above the UTS levels listed at 40 CFR 268.48 would have required

treatment of manganese before land disposal.

G. Is There Treatment Capacity for the Newly Listed Wastes?

1. Introduction

Under the land disposal restrictions (LDR) determinations, the Agency must demonstrate that adequate commercial capacity exists to manage listed hazardous wastes in compliance with BDAT standards before the Agency can restrict the listed waste from further land disposal. The Agency performs capacity analyses to determine the effective date of the LDR treatment standards for the proposed listed wastes. This section summarizes the results of EPA's capacity analysis for the wastes covered by today's rule. For a detailed discussion of capacity analysis-related data sources, methodology, and detailed responses to comments for each waste covered in this rule, see Background Document for Capacity Analysis for Land Disposal Restrictions: Inorganic Chemical Production Wastes (Final Rule) (October 2001) (i.e., the Capacity Background Document).

EPA's decisions on whether to grant a national capacity variance are based on the availability of alternative treatment or recovery technologies capable of achieving the prescribed treatment standards. Consequently, the methodology focuses on deriving estimates of the quantities of newly-listed hazardous waste that will require either commercial treatment or the construction of new on-site treatment or recovery as a result of the LDRs. The resulting estimates of required commercial capacity are then compared to estimates of available commercial capacity. If adequate commercial capacity exists, the waste is restricted from further land disposal unless it meets the LDR treatment standards prior to disposal. If adequate capacity does not exist, RCRA section 3004(h)(2) authorizes EPA to grant a national capacity variance for the waste for up to two years or until adequate alternative treatment capacity becomes available, whichever is sooner.

2. What Are the Capacity Analysis Results for K176, K177, and K178?

In conducting the capacity analysis for the wastes newly-listed by today's rule, we examined data on waste characteristics and management practices gathered for the inorganic chemical hazardous waste listing determinations. We also examined data on available treatment or recovery capacity for these wastes. The sources for these data are the public comments, the RCRA § 3007 Survey for the Inorganics listing determination distributed in the spring of 1999, record sampling and site visits (see the docket for today's rule for more information on these survey instruments and facility activities), the available treatment capacity data submission that was collected in the 1990's, and the 1995 and 1997 Biennial Reports.

For K176 and K177 wastes, we used the information from the surveys, sampling, and site visits which indicate that there is no quantity of the wastewater form of K176 or K177 that is expected to be generated and therefore, there is no quantity of the wastewater form of K176 or K177 that will require alternative commercial treatment. These wastes are typically present in a nonwastewater form. EPA determines that required alternative treatment capacity for K176 nonwastewaters is estimated to be eight tons per year. There is sufficient available capacity to manage the K176 waste.

For K177 waste, one commenter indicated that a facility of antimony oxide production in Laredo, TX is currently storing approximately 60,000 tons of slag in a pile. This facility has ceased operation in the United States. As discussed earlier (section IV), EPA has determined that this slag will qualify as K177 on the effective date of this rulemaking. In addition, the facility has a volume of contaminated soil roughly equivalent to the volume of the slag pile. If the slag and soil are excavated and handled after the effective date, the volume of waste potentially subject to regulation is 120,000 tons. This site is already under a corrective action order with the State of Texas to clean up the site because of antimony contamination. As part of this effort, the State expects to require remediation of the historic waste pile. In cases involving corrective action, it is possible to treat and/or manage hazardous waste without triggering LDR treatment standards. If the slag of contaminated soil is not removed from the land via excavation (e.g., in situ treatment), then the LDR standards will not be applied to these wastes. In addition, if hazardous slag or contaminated soil is excavated, LDR standards will only apply if the subsequent management is considered ''land disposal'' for the purposes of the LDR program.

The K177 listing is conditional: if a facility legitimately recycles its wastes without speculatively accumulating them and without use constituting disposal, it will not be regulated as a listed waste. Thus, the listing and the LDRs may not apply to these materials. Therefore, the facility may require little off-site commercial treatment capacity for its K177 waste and soil contaminated with K177 waste. Additional information regarding these wastes is presented in the Capacity Background Document.

With the above discussion, EPA determines that required alternative treatment capacity for K177 nonwastewaters is estimated to be 20 tons per year. Additionally, there is a potential that capacity will be needed for the waste pile containing an estimated 60,000 tons of slag (K177) and estimated 60,000 tons of contaminated soil from one facility. Even if the additional 120,000 tons of K177 slag and contaminated soil from the facility must be managed off-site as hazardous waste and the waste is not legitimately recycled or left in place, we anticipate that commercially available stabilization, as well as other technologies, can be used to meet the treatment standards applicable to the waste. We estimate that the commercially available stabilization capacity is at least eight million tons per year based on the 1995 Biennial Report. Thus we find there is sufficient capacity to treat the K177 hazardous wastes that will require treatment.

EPA proposed not to grant a national capacity variance for K176 or K177 wastewaters or nonwastewaters. No commenters challenged either the variance determination or available treatment or disposal capacity for wastewater or nonwastewater forms of these wastes. Nor does the potential treatment of the additional K177 slags and soils described above appear to require a capacity variance. Therefore, EPA is finalizing its decision not to grant a capacity variance for wastewater and nonwastewater forms of K176 and K177.

For ferric chloride residues (K178) waste, our data indicate that the waste is typically generated as a nonwastewater. We did not identify any wastewater forms of these wastes and therefore did not anticipate that alternative management for wastewaters is required. For nonwastewaters, when listed as hazardous, the waste can no longer be land disposed without meeting applicable treatment standards. In the proposed rule, we initially estimated that approximately 7,300 tons per year may require alternative treatment (derived from public information since data on amounts of treatment solids were originally reported as confidential in the § 3007 Survey).

In public comments to the proposed rule, one commenter estimated that the quantity of K178 generated nationwide is as high as 167,000 tons per year, which is much higher than that initially estimated by EPA in the proposed rule. The commenter provided few details explaining the discrepancy, and therefore EPA cannot agree with the commenter regarding this estimate. Further, the finalized listing definition is narrower in scope than the proposed listing, only one facility (rather than three) is expected to generate the waste, and the one facility may be able to segregate its waste to reduce the total quantity of K178 that must be treated. However, even if EPA used the commenter's higher waste quantity in its capacity assessment, sufficient capacity would be available to treat generated K178 wastes.

The commenter also requested a national capacity variance for the proposed K178 wastes. The commenter claimed that because K178 must be treated for dioxin, insufficient treatment capacity is available because only a single facility in the U.S. currently is permitted to treat dioxin-containing wastes. EPA disagrees with this assessment. EPA notes that the proposed land disposal restrictions for K178 are identical to those finalized for F032 (wood preserving wastes, 62 FR 26000, May 12, 1997) and K174 (chlorinated aliphatics wastes, 65 FR 67110, November 8, 2000). These treatment standards (as well as the treatment standards proposed for K178) can be met by the technology-specific standard of CMBST, defined as, (1) combustion units operating under 40 CFR 266, (2) combustion units permitted under 40 CFR part 264, subpart O, or (3) combustion units operating under 40 CFR 265, subpart O, which have obtained a determination of equivalent treatment under 268.42(b). Additionally, EPA verified through telephone conversations that several facilities can, in fact, accept wastes with such a treatment standard (this information is presented in the Capacity Background Document). These facilities have sufficient capacity to treat the single generator's ferric chloride residues.

From the available information, the affected facility may manage K178 waste in surface impoundments (i.e., in wastewater treatment systems that contain land based units). If the waste is managed in unretrofitted impoundments,[36] it would thus be land disposed in a prohibited manner. These impoundments can be retrofitted, closed, or replaced with tank systems. If impoundments continue to be used to manage K178 waste, the units will be subject to RCRA Subtitle C requirements. In addition, any hazardous wastes managed in the affected impoundment after the effective date of today's rule are subject to land disposal prohibitions.[37] However, a facility may continue to manage newly listed K178 in surface impoundments, provided they are in compliance with the appropriate standards for surface impoundments (40 CFR parts 264 and 265 subpart K) and the special rules regarding surface impoundments (40 CFR 268.14). EPA notes that those provisions require basic ground-water monitoring (40 CFR parts 264 and 265 subpart F) and recordkeeping. Surface impoundments that are newly subject to RCRA subtitle C minimum technology requirements due to promulgation of a new hazardous waste listing are afforded up to 48 months after promulgation of the new listing to retrofit the surface impoundments to meet minimum technological requirements (see RCRA section 3005(j)(6)(A), 40 CFR 265.221 (h)). (Note that in this case, the listing is ''non-HSWA,'' so the minimum technology deadline would be 48 months after EPA approves a revision to an authorized state program that adopt this listing.)

In our assessment for the proposed rule, we assumed that facilities can segregate waste-streams and separately manage the newly-proposed K178 waste. Based on the finalized listing definition for K178, we continue to expect that the generating facility can segregate its waste-streams. However, the quantity is far lower than discussed in the proposal since the final listing is narrower than the proposed listing and only one facility is expected to generate the waste. We now estimate that approximately 45 tons per year may require alternative treatment. Even if the facility cannot segregate its wastestreams (and, therefore, generates a higher quantity of waste requiring treatment), we expect that available treatment capacity exists to manage such a higher quantity of generated waste.

In addition to the amount generated from year to year, the facility that generates K178 commented that they have stockpiled a significant quantity of Iron-Rich on-site, which would be listed as hazardous waste K178 following the effective date. According to the comment, the estimated quantity is 500,000 tons. EPA believes that it is unlikely that the entire quantity will require offsite treatment capacity after the effective date. For example, the facility could work with the State Implementing Agency to close the unit in place without actively managing the units. Even if the entire 500,000 ton quantity becomes subject to the K178 listing after the effective date, we expect that commercial facilities could store this quantity of material and subsequently manage it using treatment such as combustion or non-combustion technologies over a period of several years should the demand for such capacity arise. In addition, because this is a non-HSWA rule and will take effect only after authorized states adopt parallel listings under state law and EPA authorizes revisions to the codified state programs, there will be additional time (beyond six months) for the facility to identify and implement management options for the stored K178 waste. We anticipate that commercially available combustion capacity is adequate to meet the demands. For more information on the Agency's research on combustion capacity for K178, please refer to the Capacity Background Document.

As discussed earlier for K178 treatment standards, we are promulgating numerical treatment standards for K178 wastes. We anticipate that commercially available incineration, followed by stabilization if necessary, can be used to meet these treatment standards. We also are promulgating the specified technology standard of combustion (CMBST) as an alternative compliance option for hazardous organic constituents in the K178 wastes. The units treating the waste by using CMBST will be subject to certain standards, and facilities will have to meet the treatment standard for the regulated metal constituent prior to disposal. We assume that facilities will achieve compliance with the final treatment standards using incineration, stabilization, or both. Based on an evaluation of 1995 and 1997 BRS data, well over one million tons of liquid, sludge, and solid commercial combustion capacity are available. The quantity of commercially available stabilization capacity is at least eight million tons per year based on an evaluation of 1995 Biennial Report data. Additional discussion of the applicability of these estimates for treating wastes with characteristics

[36] A unretrofitted impoundment is one not satisfying the minimum technology requirements (MTR) specified in sections 3004(o) and 3005(j)(11).

[37] See RCRA § 3004(m)(1) ''Simultaneously with the promulgation of regulations under subsection (d), (e), (f), or (g) prohibiting one or more methods of land disposal of a particular hazardous waste * * * promulgate regulations specifying those levels or methods of treatment * * *''

similar to K178 is presented in the Capacity Background Document.

Based on the foregoing, we conclude that sufficient treatment capacity is available to manage newly-listed K178 wastes. Therefore, EPA is finalizing its decision not to grant a capacity variance for wastewater and nonwastewater forms of K178. For K176, K177, and K178 wastes, the customary time period of six months is sufficient to allow facilities to determine whether their wastes are affected by this rule, to identify on-site or commercial treatment and disposal options, and to arrange for treatment or disposal capacity, if necessary. Moreover, since this listing is a non-HSWA rule, the LDR standards will take effect only after authorized states adopt parallel listings under state law and EPA authorizes revisions to the codified state programs. Therefore, LDR treatment standards for the affected wastes covered under today's rule become effective when the listing determinations become effective—the earliest possible date. This conforms to RCRA section 3004(h)(1), which indicates that land disposal prohibitions must take effect immediately when there is sufficient protective treatment capacity available for the waste.

Further, soil and debris contaminated with these newly identified wastes may be subject to the LDRs (see LDR Treatment Standards for Soil in LDR Phase IV Final Rule, 63 FR 28602, May 26, 1998; 40 CFR 268.45 Treatment Standards for Hazardous Debris). EPA proposed not to grant a national capacity variance for soil and debris contaminated with the newly listed wastes (K176, K177, and K178). EPA received no comments regarding this issue. We believe that the vast majority of contaminated soil and debris contaminated with these wastes, if generated, will be managed on-site and, therefore, will not require substantial commercial treatment capacity. Therefore, we are not granting a national capacity variance for hazardous soil and debris contaminated with these newly identified wastes. LDR treatment standards for K176, K177, and K178 hazardous soil and debris will therefore become effective when these listing determinations become effective.

Based on the 1999 RCRA § 3007 Survey for the Inorganics listing determination, followed by record sampling and site visits, no respondents submitted any data about underground injection management of the newly-listed wastes. Also, based on the 1999 RCRA § 3007 Survey followed by record sampling and site visits, no respondents submitted any data indicating that mixtures of radioactive wastes and the newly-listed inorganic chemical wastes are generated. EPA did not receive comments indicating that these wastes are underground injected or that they are mixed with radioactive wastes or with both radioactive wastes and soil or debris. Therefore, EPA is not granting a national capacity variance for underground injected wastes, mixed radioactive wastes, or soil and debris contaminated with these mixed radioactive wastes. LDR treatment standards for K176, K177, and K178 underground injected and mixed wastes (if any exists) will therefore become effective when these listing determinations become effective.

Finally, EPA may consider a case-by-case extension to the effective date based on the requirements outlined in 40 CFR 268.5, which includes a demonstration that adequate alternative treatment, recovery, or disposal capacity for the petitioner's waste cannot reasonably be made available by the effective date due to circumstances beyond the applicants' control, and that the petitioner has entered into a binding contractual commitment to construct or otherwise provide such capacity.

3. What Is the Capacity Analysis Result due to the Proposed Revision of the F039 Standard?

With respect to the revision to F039, as discussed earlier in section IV.B., we are no longer adding manganese to the list of constituents for F039. Consideration of capacity for treatment of this waste is no longer relevant.

V. When Must Regulated Entities Comply With the Provisions in Today's Final Rule?

A. Effective Date

The effective date of today's rule is May 20, 2002. Provisions promulgated under HSWA authorities will take effect in both the federal regulations and authorized state programs at that time. The K178 listing, promulgated under section 3001(b), an non-HSWA authority, will not take effect in any authorized state until that state promulgates a rule adopting the listing. It will not take effect under federal law until EPA authorizes the revision to the state program. The LDR requirements for K178 also will not apply immediately in authorized states. See the discussion in the state authorization section below.

B. Section 3010 Notification

Pursuant to RCRA § 3010, the Administrator may require all persons who handle hazardous wastes to notify EPA of their hazardous waste management activities within 90 days after the wastes are identified or listed as hazardous. This requirement may be applied even to those generators, transporters, and treatment, storage, and disposal facilities (TSDFs) that have previously notified EPA with respect to the management of other hazardous wastes. The Agency has decided to waive this notification requirement for persons who handle wastes that are covered by today's hazardous waste listings and already have (1) notified EPA that they manage other hazardous wastes, and (2) received an EPA identification number. The Agency has waived the notification requirement in this case because it believes that most, if not all, persons who manage the wastes listed as hazardous in today's rule already have notified the Agency and received an EPA identification number. However, any person who generates, transports, treats, stores, or disposes of these newly listed wastes and has not previously received an EPA identification number must obtain an identification number pursuant to 40 CFR 262.12 to generate, transport, treat, store, or dispose of these hazardous wastes by February 19, 2002 for K176 and K177. In authorized states, for K178, identification numbers will not be required until the state revises its rules to establish a K178 listing. After the state regulations are revised, identification numbers would be obtained from the authorized state pursuant to its applicable requirements.

C. Generators and Transporters

Persons who generate newly identified hazardous wastes may be required to obtain an EPA identification number if they do not already have one (as discussed in section VIII.B, above). If generating or transporting these wastes after the effective date of this rule, generators of the wastes listed today will be subject to the generator requirements set forth in 40 CFR part 262. These requirements include standards for hazardous waste determination (40 CFR 262.11), compliance with the manifest (40 CFR 262.20 through 262.23), pre-transport procedures (40 CFR 262.30 through 262.34), generator accumulation (40 CFR 262.34), record keeping and reporting (40 CFR 262.40 to 262.44), and import/export procedures (40 CFR 262.50 through 262.60). We note that the generator accumulation provisions of 40 CFR 262.34 allow generators to accumulate hazardous wastes without obtaining interim status or a permit only in certain specified units; the regulations also place a limit on the maximum amount of time that wastes

can be accumulated in these units. If these wastes are actively managed in surface impoundments or other units that are not tank systems, containers, drip pads, or containment buildings as outlined in 40 CFR 262.34, accumulation of these wastes is subject to the permitting requirements of 40 CFR parts 264 and 265, and the generator is required to obtain interim status and seek a permit (or modify interim status or a permit, as appropriate). Also, persons who transport newly identified hazardous wastes will be required to obtain an EPA identification number (if they do already have one) as described above and will be subject to the transporter requirements set forth in 40 CFR part 263.

D. Facilities Subject to Permitting

The listings for antimony oxide wastes, K176 and K177, in today's rule are issued pursuant to HSWA authority. Therefore, EPA will regulate the management of the newly identified hazardous wastes until states are authorized to regulate these wastes. EPA will apply Federal regulations to these wastes and to their management in both authorized and unauthorized states. The listing for the titanium dioxide waste, K178, in today's rule is issued pursuant to non-HSWA authority. Therefore, the listing will not become effective at the state level until adopted by the state and at the federal level when the revision to the state program is authorized by EPA. Facilities located in states authorized for the RCRA program should check with their state offices to determine when the K178 listing becomes effective in the state.

1. K176 and K177: Facilities Newly Subject to RCRA Permit Requirements

Facilities that treat, store, or dispose of K176 and K177 wastes that are subject to RCRA regulation for the first time by this rule (that is, facilities that have not previously received a permit pursuant to section 3005 of RCRA and are not currently operating pursuant to interim status), might be eligible for interim status (see section 3005(e)(1)(A)(ii) of RCRA). To obtain interim status based on treatment, storage, or disposal of such newly identified wastes, eligible facilities are required to comply with 40 CFR 270.70(a) and 270.10(e) by providing notice under section 3010 and submitting a Part A permit application no later than May 20, 2002. Such facilities are subject to regulation under 40 CFR Part 265 until a permit is issued.

In addition, under section 3005(e)(3) and 40 CFR 270.73(d), not later than November 20, 2002, land disposal facilities newly qualifying for interim status under section 3005(e)(1)(A)(ii) also must submit a Part B permit application and certify that the facility is in compliance with all applicable ground-water monitoring and financial responsibility requirements. If the facility fails to submit these certifications and a permit application, interim status will terminate on that date.

2. K178: Facilities Newly Subject to RCRA Permit Requirements

Facilities that treat, store, or dispose of K178 waste that are subject to RCRA regulation for the first time by this rule (that is, facilities that have not previously received a permit pursuant to section 3005 of RCRA and are not currently operating pursuant to interim status), might be eligible for interim status (see section 3005(e)(1)(A)(ii) of RCRA). To obtain interim status based on treatment, storage, or disposal of this newly identified waste, eligible facilities are required to comply with 40 CFR 270.70(a) and 270.10(e) by providing notice under section 3010 and submitting a Part A permit application no later than 180 days after the K178 listing becomes effective. Once the K178 listing becomes effective, such facilities are subject to regulation under 40 CFR part 265 until a permit is issued.

In addition, under section 3005(e)(3) and 40 CFR 270.73(d), not later than 365 days after the K178 listing becomes effective, land disposal facilities newly qualifying for interim status under section 3005(e)(1)(A)(ii) also must submit a Part B permit application and certify that the facility is in compliance with all applicable ground-water monitoring and financial responsibility requirements. If the facility fails to submit these certifications and a permit application, interim status will terminate on that date.

3. K176 and K177: Existing Interim Status Facilities

Pursuant to 40 CFR 270.72(a)(1), all existing hazardous waste management facilities (as defined in 40 CFR 270.2) that treat, store, or dispose of the newly identified K176 and K177 wastes and are currently operating pursuant to interim status under section 3005(e) of RCRA, must file an amended Part A permit application with EPA no later than the effective date of today's rule, (i.e., May 20, 2002). By doing this, the facility may continue managing the newly listed wastes. If the facility fails to file an amended Part A application by that date, the facility will not receive interim status for management of the newly listed hazardous wastes and may not manage those wastes until the facility receives either a permit or a change in interim status allowing such activity (40 CFR 270.10(g)).

4. K178: Existing Interim Status Facilities

Pursuant to 40 CFR 270.72(a)(1), all existing hazardous waste management facilities (as defined in 40 CFR 270.2) that treat, store, or dispose of the newly identified K178 waste and are currently operating pursuant to interim status under section 3005(e) of RCRA, must file an amended Part A permit application with EPA no later than the effective date of the K178 listing, (i.e., once the state adopts or is authorized for the K178 listing). By doing this, the facility may continue managing the newly listed waste. If the facility fails to file an amended Part A application by the required date, the facility will not receive interim status for management of the newly listed hazardous waste and may not manage the waste until the facility receives either a permit or a change in interim status allowing such activity (40 CFR 270.10(g)).

5. K176 and K177: Permitted Facilities

Facilities that already have RCRA permits must request permit modifications if they want to continue managing newly listed K176 and K177 wastes (see 40 CFR 270.42(g)). This provision states that a permittee may continue managing the newly listed wastes by following certain requirements, including submitting a Class 1 permit modification request by the date on which the waste or unit becomes subject to the new regulatory requirements (i.e., the effective date of today's rule), complying with the applicable standards of 40 CFR Parts 265 and 266 and submitting a Class 2 or 3 permit modification request within 180 days of the effective date.

Generally, a Class 2 modification is appropriate if the newly listed wastes will be managed in existing permitted units or in newly regulated tank or container units and will not require additional or different management practices than those authorized in the permit. A Class 2 modification requires the facility owner to provide public notice of the modification request, a 60-day public comment period, and an informal meeting between the owner and the public within the 60-day period. The Class 2 process includes a ''default provision,'' which provides that if the Agency does not reach a decision within 120 days, the modification is automatically authorized for 180 days. If the Agency does not reach a decision by

the end of that period, the modification is permanently authorized (see 40 CFR 270.42(b)).

A Class 3 modification is generally appropriate if management of the newly listed wastes requires additional or different management practices than those authorized in the permit or if newly regulated land-based units are involved. The initial public notification and public meeting requirements are the same as for Class 2 modifications. However, after the end of the 60-day public comment period, the Agency will grant or deny the permit modification request according to the more extensive procedures of 40 CFR Part 124. There is no default provision for Class 3 modifications (see 40 CFR 270.42(c)).

Under 40 CFR 270.42(g)(1)(v), for newly regulated land disposal units, permitted facilities must certify that the facility is in compliance with all applicable 40 CFR Part 265 ground-water monitoring and financial responsibility requirements no later than May 20, 2002. If the facility fails to submit these certifications, authority to manage the newly listed wastes under 40 CFR 270.42(g) will terminate on that date.

6. K178: Permitted Facilities

Facilities that already have RCRA permits must request permit modifications if they want to continue managing newly listed K178 waste (see 40 CFR 270.42(g)). This provision states that a permittee may continue managing the newly listed waste by following certain requirements, including submitting a Class 1 permit modification request by the date on which the waste or unit becomes subject to the new regulatory requirements (i.e., the effective date of the K178 listing), complying with the applicable standards of 40 CFR parts 265 and 266 and submitting a Class 2 or 3 permit modification request within 180 days of the effective date.

Generally, a Class 2 modification is appropriate if the newly listed waste will be managed in existing permitted units or in newly regulated tank or container units and will not require additional or different management practices than those authorized in the permit. A Class 2 modification requires the facility owner to provide public notice of the modification request, a 60-day public comment period, and an informal meeting between the owner and the public within the 60-day period. The Class 2 process includes a ''default provision,'' which provides that if the Agency does not reach a decision within 120 days, the modification is automatically authorized for 180 days. If the Agency does not reach a decision by the end of that period, the modification is permanently authorized (see 40 CFR 270.42(b)).

A Class 3 modification is generally appropriate if management of the newly listed waste requires additional or different management practices than those authorized in the permit or if newly regulated land-based units are involved. The initial public notification and public meeting requirements are the same as for Class 2 modifications. However, after the end of the 60-day public comment period, the Agency will grant or deny the permit modification request according to the more extensive procedures of 40 CFR part 124. There is no default provision for Class 3 modifications (see 40 CFR 270.42(c)).

Under 40 CFR 270.42(g)(1)(v), for newly regulated land disposal units, permitted facilities must certify that the facility is in compliance with all applicable 40 CFR part 265 ground-water monitoring and financial responsibility requirements no later than the effective date of the K178 listing. If the facility fails to submit these certifications, authority to manage the newly listed waste under 40 CFR 270.42(g) will terminate on that date.

7. K176, K177 and K178: Units

Units in which newly identified hazardous wastes are generated or managed will be subject to all applicable requirements of 40 CFR 264 for permitted facilities or 40 CFR 265 for interim status facilities, unless the unit is excluded from such permitting by other provisions, such as the wastewater treatment tank exclusions (40 CFR 264.1(g)(6) and 265.1(c)(10)) and the product storage tank exclusion (40 CFR 261.4(c)). Examples of units to which these exclusions could never apply include landfills, land treatment units, waste piles, incinerators, and any other miscellaneous units in which these wastes may be generated or managed.

8. K176 and K177: Closure

All units in which newly identified hazardous wastes are treated, stored, or disposed after the effective date of this regulation that are not excluded from the requirements of 40 CFR 264 and 265 are subject to both the general closure and post-closure requirements of subpart G of 40 CFR 264 and 265 and the unit-specific closure requirements set forth in the applicable unit technical standards subpart of 40 CFR 264 or 265 (e.g., subpart N for landfill units). In addition, EPA promulgated a final rule that allows, under limited circumstances, regulated landfills, surface impoundments, or land treatment units to cease managing hazardous waste but to delay subtitle C closure to allow the unit to continue to manage non-hazardous waste for a period of time prior to closure of the unit (see 54 FR 33376, August 14, 1989). Units for which closure is delayed continue to be subject to all applicable 40 CFR 264 and 265 requirements. Dates and procedures for submittal of necessary demonstrations, permit applications, and revised applications are detailed in 40 CFR 264.113(c) through (e) and 265.113(c) through (e).

9. K178: Closure

All units in which a newly identified hazardous waste is treated, stored, or disposed after the effective date of the listing that are not excluded from the requirements of 40 CFR 264 and 265 are subject to both the general closure and post-closure requirements of subpart G of 40 CFR 264 and 265 and the unit-specific closure requirements set forth in the applicable unit technical standards subpart of 40 CFR 264 or 265 (e.g., subpart N for landfill units). In addition, EPA promulgated a final rule that allows, under limited circumstances, regulated landfills, surface impoundments, or LTUs to cease managing hazardous waste but to delay Subtitle C closure to allow the unit to continue to manage non-hazardous waste for a period of time prior to closure of the unit (see 54 FR 33376, August 14, 1989). Units for which closure is delayed continue to be subject to all applicable 40 CFR 264 and 265 requirements. Dates and procedures for submittal of necessary demonstrations, permit applications, and revised applications are detailed in 40 CFR 264.113(c) through (e) and 265.113(c) through (e).

VI. How Will This Rule Be Implemented at the State Level?

A. Applicability of Rule in Authorized States

Under section 3006 of RCRA, EPA may authorize a qualified State to administer and enforce a hazardous waste program within the State in lieu of the federal program and to issue and enforce permits in the State. A State may receive authorization by following the approval process described under 40 CFR 271.21. See 40 CFR part 271 for the overall standards and requirements for authorization. EPA continues to have independent authority to bring enforcement actions under RCRA sections 3007, 3008, 3013, and 7003. An authorized State also continues to have independent authority to bring enforcement actions under State law.

After a State receives initial authorization, new Federal requirements promulgated under RCRA authority existing prior to the 1984 Hazardous and Solid Waste Amendments (HSWA) do not apply in that State until the State adopts and receives authorization for equivalent State requirements. In contrast, under RCRA section 3006(g) (42 U.S.C. 6926(g)), new Federal requirements and prohibitions promulgated pursuant to HSWA provisions take effect in authorized States at the same time that they take effect in unauthorized States. As such, EPA carries out HSWA requirements and prohibitions in authorized States, including the issuance of new permits implementing those requirements, until EPA authorizes the State to do so.

Authorized States are required to modify their programs when EPA promulgates Federal requirements that are more stringent or broader in scope than existing Federal requirements. RCRA section 3009 allows the States to impose standards more stringent than those in the Federal program. See also § 271.1(i). Therefore, authorized States are not required to adopt Federal regulations, both HSWA and non-HSWA, that are considered less stringent than existing Federal requirements.

B. Authorization of States for Today's Final Rule

EPA is promulgating today's rule under both HSWA and non-HSWA authorities. EPA is promulgating the two listings for antimony oxide wastes, K176 and K177, under section 3002(e)(2) of RCRA, which is a requirement added by the HSWA amendments. In addition, the requirements of the Land Disposal Restriction (LDR) program promulgated today are imposed under sections 3004(g)-(m), which also are HSWA requirements. Therefore, we will add the new requirements for K176, K177 and the LDRs to Table 1 at 40 CFR 271.1(j), which identifies Federal program requirements promulgated pursuant to HSWA. After the effective date, EPA will implement these portions of the rule in all States, including authorized States, until the States are authorized for the new provisions.

Note: There will be a delay in the effectiveness of the LDRs for K178, as discussed further below.

Once authorized States modify their programs to adopt equivalent rules and receive authorization for such rules from EPA, those rules become RCRA Subtitle C requirements that apply in the States in lieu of the equivalent federal requirements.

For the portions of the rule that are promulgated pursuant to HSWA, a State submitting a program modification may apply to receive either interim or final RCRA authorization under RCRA sections 3006(g) or (b) on the basis that State regulations are, respectively, substantially equivalent or fully equivalent to EPA's regulations. The procedures and schedule for State program modifications for either interim or final authorization are described in 40 CFR 271.21 and 271.24. Note that all HSWA interim authorizations will expire on January 1, 2003 (see 40 CFR 271.24(c)).

As explained earlier in this preamble, in May 2001 we promulgated a revision to the mixture rule that revised an exemption previously available to wastes listed because they exhibited the toxicity characteristic. As a result, mixtures of K176 and non-hazardous wastes will be regulated as hazardous wastes even if the mixture does not exhibit the TC. Although today's K176 listing is being promulgated under a HSWA authority, so it will take effect in six months in all states (unless a state already has a more stringent listing rule), the revision to the mixture rule was not promulgated under any HSWA authority. That revision will not take effect until authorized states revise their programs to adopt the change to the mixture rule and EPA approves the revision.

In the preamble to the May, 2001 rule, we stated that the mixture rule changes were not more stringent than or broader in scope than existing rules, so that authorized states were not required to adopt them. In other words, no state is required to promulgate an exemption for wastes that were listed solely for a characteristic. Moreover, at that time, there were no wastes listed because they exhibited the TC. The narrowing of the mixture rule exemption for TC listed wastes had no apparent impact. That narrowing, however, will impact mixtures containing today's K176 listing, keeping them in the Subtitle C regulatory program where previously they would have largely been exempt from the program. The portion of the May 2001 mixture rule that eliminated the exemption for TC listed wastes is more stringent than any state program which includes a mixture rule exemption that gives relief to wastes listed because they exhibit the TC. Accordingly, authorized states that exempt mixtures of wastes listed for a characteristic where the mixtures do not exhibit a characteristic must narrow their exemptions to eliminate relief for mixtures of TC listed wastes, as provided by 271.21. The revised mixture rule exemption is codified at 261.3(g).

As noted earlier in this preamble, the final listing for K178 includes wastes from the production of ferric chloride, not wastes from the production of titanium dioxide. Ferric chloride manufacturing is not one of 14 inorganic chemical sectors identified in the Consent Decree. The decree describes the full scope of EPA's obligations to assess wastes under section 3001(e)(2). Consequently, EPA is not exercising any authority under 3001(e)(2) to list residues from the production of ferric chloride. EPA is promulgating this new listing under its pre-HSWA listing authority in section 3001(b)(1). Therefore, the K178 listing only will become effective under RCRA in an authorized State once the State amends its regulations and the amended regulations are authorized by EPA. For States without RCRA authorization, the listing requirements for K178 become effective on the effective date of today's rule.

All of the provisions of today's final rule are considered to be more stringent than or broader in scope than the base RCRA program. Therefore, authorized States are required to adopt and become authorized for both the HSWA and non-HSWA portions of the rule.

All Land Disposal Restriction rules are adopted under HSWA statutory authority, regardless of the statutory authority for the corresponding waste listing. However, consistent with prior rules establishing LDR requirements for new, non-HSWA listings, the treatment standards and prohibitions for K178 will not have immediate regulatory effect. LDR rules can only apply to ''hazardous wastes.'' The ferric chloride solids will not be hazardous wastes under RCRA until a State adopts a rule listing them as hazardous wastes and EPA authorizes the State's new rule. Therefore, the LDR provisions for K178 will become effective state-by-state, when EPA actions authorizing State regulations that list K178 take effect. See, e.g., 55 FR 22520, 22667 (June 1, 1990 (LDR ''first third'' rule)).

VII. What Are the Reportable Quantity Requirements for the Newly-Listed Wastes Under the Comprehensive Environmental Response, Compensation, and Liability Act?

All hazardous wastes listed under RCRA and codified in 40 CFR 261.31 through 261.33, as well as all solid waste that are not excluded from regulation as a hazardous waste under 40 CFR 261.4(b) and that exhibits one or more of the characteristics of a RCRA hazardous waste (as defined in 40 CFR

261.21 through 261.24), are hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended (see CERCLA section 101(14)(C)). CERCLA hazardous substances are listed in Table 302.4 at 40 CFR 302.4 along with their reportable quantities (RQs). If a hazardous substance is released in an amount that equals or exceeds its RQ, the release must be reported immediately to the National Response Center (NRC) pursuant to CERCLA section 103.

A. When Do I Have To Report My Releases?

Under CERCLA section 103(a), the person in charge of a vessel or facility from which a hazardous substance has been released in a quantity that is equal to or exceeds its RQ must immediately notify the NRC as soon as that person has knowledge of the release. The toll-free telephone number of the NRC is 1–800–424–8802; in the Washington, DC, metropolitan area, the number is (202) 267–2675. In addition to this reporting requirement under CERCLA, section 304 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) requires owners or operators of certain facilities to report releases of extremely hazardous substances and CERCLA hazardous substance to State and local authorities. Immediately after the release of an RQ or more of an extremely hazardous substance or a CERCLA hazardous substance, EPCRA section 304 notification must be given to the community emergency coordinator of the local emergency planning committee for any area likely to be affected by the release, and to the State emergency response commission of any State likely to be affected by the release.

Under section 102(b) of CERCLA, all hazardous substances (as defined by CERCLA section 101(14)) have a statutory RQ of one pound, unless and until the RQ is adjusted by regulation. In today's final rule, we: (1) List the following three wastestreams as RCRA hazardous wastes; (2) designate these wastestreams as CERCLA hazardous substances; and (3) adjust the one-pound statutory RQs for two of these wastestreams. The wastestreams are as follows:

K176 Baghouse filters from the production of antimony oxide, including filters from the production of intermediates (e.g., antimony metal or crude antimony oxide).

K177 Slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide).

K178 Solids from manufacturing and manufacturing-site storage of ferric chloride from acids formed during the production of titanium dioxide using the chloride-ilmenite process.

B. What Was the Basis for the RQ Adjustment?

Our methodology for adjusting the RQs of individual hazardous substances begins with an evaluation of the intrinsic physical, chemical, and toxicological properties of each hazardous substance. The intrinsic properties examined—called ''primary criteria''—are aquatic toxicity, mammalian toxicity (oral, dermal, and inhalation), ignitability, reactivity, chronic toxicity, and potential carcinogenicity.

Generally, for each intrinsic property, EPA ranks hazardous substances on a scale, associating a specific range of values on each scale with an RQ value of 1, 10, 100, 1,000, or 5,000 pounds. The data for each hazardous substance are evaluated using various primary criteria; each hazardous substance may receive several tentative RQ values based on its particular intrinsic properties. The lowest of the tentative RQs becomes the ''primary criteria RQ'' for that substance.

After the primary criteria RQ are assigned, substances are evaluated further for their susceptibility to certain degradative processes, which are used as secondary adjustment criteria. These natural degradative processes are biodegradation, hydrolysis, and photolysis (BHP). If a hazardous substance, when released into the environment, degrades relatively rapidly to a less hazardous form by one or more of the BHP processes, its RQ (as determined by the primary RQ adjustment criteria), generally is raised one level. Conversely, if a hazardous substance degrades to a more hazardous product after its release, the original substance is assigned an RQ equal to the RQ for the more hazardous substance, which may be one or more levels lower that the RQ for the original substance.

The standard methodology used to adjust the RQs for RCRA hazardous wastestreams differs from the methodology applied to individual hazardous substances. The procedure for assigning RQs to RCRA wastestreams is based on an analysis of the hazardous constituents of the wastestreams. The constituents of each RCRA hazardous wastestream are identified in 40 CFR part 261, Appendix VII. We determine an RQ for each constituent within the wastestream and establish the lowest RQ value of these constituents as the adjusted RQ for the wastestream.

We proposed to promulgate a one pound RQ for constituents in K176 and a 5000 pound RQ level for constituents in K177. We did not propose any adjustment for K178 because we had not yet developed a primary ''waste constituent RQ'' for manganese, one of the constituents of concern. We did not receive any comments on our proposed RQs. In today's final rule, we assign a one-pound adjusted RQ to the K176 wastestream, and an adjusted RQ of 5,000 pounds to the K177 wastestream. The adjusted RQs for these wastestreams are based on the lowest RQ value of the constituents present in each wastestream and are presented in Table VII–1 below.

TABLE VII—1. ADJUSTED RQS FOR WASTESTREAMS K176 AND K177

Wastestream	Wastestream constituent	Wastestream constituent RQ (lb.)	Wastestream RQ (lb.)
K176	arsenic	1	1
	lead	10	
K177	antimony	5,000	5,000

We are deferring action on the manganese elements of the proposal, as described in section IV.B. The statutory RQ of 1 for K178 may be adjusted in the future.

C. What if I Know the Concentration of the Constituents in My Waste?

If you know the concentration levels of all the hazardous constituents in a particular inorganic chemical manufacturing waste you may apply the mixture rule (see 40 CFR 302.6(b)) to the actual concentrations. You would need to report a release of any of the wastes when an RQ or more of any of their respective hazardous constituents is released.

VIII. Administrative Assessments

A. Executive Order 12866

Under Executive Order 12866, [58 FR 51,735 (October 4, 1993)] the Agency must determine whether the regulatory action is ''significant'' and therefore subject to OMB review and the requirements of the Executive Order. The Order defines ''significant regulatory action'' as one that is likely to result in a rule that may: (1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel, legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The Agency estimated the costs of today's final rule to determine if it is a significant regulatory action as defined by the Executive Order. The analysis considered compliance costs and economic impacts for inorganic chemical producers affected by this rule. We estimate the total cost of the rule to be between $$115,200 to $171,000 annually. This analysis suggests that this rule is not economically significant according to the definition in E.O. 12866. However, pursuant to the terms of Executive Order 12866, it has been determined that this rule is a ''significant regulatory action'' because it raises novel, legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order. As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

Detailed discussions of the methodology used for estimating the costs, economic impacts and the benefits attributable to today's final rule for listing hazardous wastes from inorganic chemical production, followed by a presentation of the cost, economic impact and benefit results, may be found in the background document: Economic Analysis of the Final Rule For Listing Hazardous Waste From Inorganic Chemical Production, which was placed in the docket for today's final rule.

1. Methodology Section

To estimate the cost and economic impacts to potentially affected firms and benefits to society from this final rulemaking, we evaluated § 3007 survey responses from inorganic chemical producers, firm financial reports, and chemical production data. For the final rule, we conducted a cost and economic impact analysis for actual inorganic chemical producing facilities rather than the model facilities we evaluated for the proposed rule. Also for the final rule, we evaluated a single scenario focused on actually affected facilities rather than the two scenarios we assessed for the proposal. The additional scenario in the proposal included facilities where the Agency completed quantitative risk assessment involving fate and transport modeling of potential releases of wastes generated by these facilities to evaluate potential effects on human health and the environment but for which no listings were proposed.

To estimate the incremental cost of this rulemaking, we reviewed baseline management practices and costs to affected firms. Where more than one baseline management method was used (e.g., municipal incineration and landfilling), we accounted for the costs of either more than one form of baseline management or selected and accounted for the cost associated with the least expensive baseline management (which would overestimate rather than underestimate the cost of the rule).

We modeled the most likely post-regulatory waste management scenarios resulting from the listings (e.g., disposal in a Subtitle C hazardous waste landfill for K178, recycling or land disposal for K176 and K177) and the estimated cost of complying with these post-regulatory management scenarios. The difference between the baseline management cost and the post-regulatory cost is the incremental cost of the rulemaking.

To estimate the economic impact of today's final rulemaking, we compared the incremental cost of the rulemaking with model firm sales and either net profit or product value. The Agency also considered the ability of potentially affected firms to pass on compliance costs to customers in the form of higher prices.

2. Results

Volume Results. Data reviewed by the Agency indicates that there are three inorganic chemical producers affected by today's final rule. The data report that these firms generated 72.4 metric tons of inorganic chemical production waste annually that are affected by today's final rule. Because today's listing description for K178 is limited to nonexempt ferric chloride residues, the Agency believes that the affected volume of K178 will be limited to 45.4 metric tons rather than the 11,797 tons of these solids that are generated annually.[38] The estimated volume of wastes associated with the production of antimony oxide has not changed.

EPA is aware that there also are historically generated materials the management of which could result in increased costs due to the K177 and K178 listings, if these materials are actively managed after the effective date of this final rule. These materials include: 1) 120,000 tons of historically generated antimony oxide slag and contaminated soil in Laredo, Texas, 2) 500,000 tons of stockpiled Iron Rich™ in Edge Moor, Delaware, and 3) an unknown quantity of ferric chloride surface impoundment solids in Edge Moor, Delaware. EPA has not included these volumes in its economic analysis of this rule because it is assumed that these materials will not be actively managed after the effective date of this rule.

Cost Results. We estimate the total annual incremental costs from today's final rule to be between $115,200 to $171,000 for all facilities. Sectors costs are summarized in Table VIII–1 .

[38] Prior to proposal, the commenter had provided data that ferric chloride filter solids make up to 10 percent of 120,000 to 140,000 tons of ''Iron Rich''' generated annually by the facility. See Titanium Dioxide Listing Background Document for the Inorganic Chemical Listing Determination, August 2000, p. 53. Using the midpoint of this range and the maximum percentage of Iron Rich'' composition, EPA used a value of 13,000 tons (11,797 metric tons) of solids for its economic analysis supporting the proposal. During post-proposal meetings with EPA, the commenter indicated it would be technically feasible and cost-effective to modify its process so that all but 45 tons of solids would be Bevill-exempt post-rule.

TABLE VIII–1. ESTIMATED INCREMENTAL COST BY INORGANIC CHEMICAL SECTOR

Sector	Volume of Affected Waste (tons)	Estimated Incremental Annual Cost (1999 $)	Number of Affected Facilities
Antimony Oxide	27	$730 to $14,000	2
Titanium Dioxide	45.4	$114,500 to $157,000	1
Total	72.4	$115,200 to $171,000	3

Economic Impact Results. To estimate potential economic impacts resulting from today's final rule, we used first order economic impacts measures such as the estimated incremental costs of complying with the new listing regulations and expressed these costs as a percentage of the affected firms' sales and reported or estimated profits.[39] We used these measures to evaluate potential impacts to affected inorganic chemical producers. For affected inorganic chemical producers in the antimony oxide and titanium dioxide sectors, we estimated the incremental annual costs of this rulemaking to be less than one percent of affected firms' sales. For one of the antimony oxide producers, the incremental costs of the rule are less than one percent of their profit. The other antimony oxide producer reports negative earnings. For the titanium dioxide producer, the incremental costs of rule are less than one percent of the firm's profit. More detailed information on this estimate can be found in the economic analysis placed into today's docket.

3. Public Comment

A number of commenters expressed concern that EPA's economic analysis did not account for incremental costs associated with adding manganese to the Universal Treatment Standard (UTS) table at 40 CFR § 268.48. Commenters stated that the addition of manganese to the UTS list could add substantial costs to the treatment of characteristic wastes, delay hazardous waste site cleanups, and adversely impact affected generators of these wastes. Because EPA is not adding manganese to the UTS list in this rulemaking, the commenters' concerns about these potential costs and impacts will not occur as a result of today's final rule.

One public commenter stated that EPA had significantly underestimated the cost of the proposed K178 listing to the company. The commenter stated that our economic analysis failed to include the costs of incinerating the waste and retrofitting surface impoundments. The commenter also stated that we did not estimate correctly the volume of waste affected by the listing. EPA disagrees with these comments because they do not reflect cost-minimizing post-regulatory behavior on the part of the affected entity. In our economic analysis for the proposed rule, we modeled full segregation of the ferric chloride residues from the production of titanium dioxide (chloride-ilmenite process). EPA believes that the affected entity will undertake process modifications to segregate the potentially affected volumes of its wastes into Bevill-exempt (i.e., not hazardous waste) and nonexempt components prior to the rule's effective date. We, therefore, modeled the volume of ferric chloride residues, which is a relatively small volume of waste compared to the original material we believed would be listed. Although we believe that incineration of the remaining volume would not have been necessary, because non-thermal treatment technologies such as solvent extraction and chemical dechlorination present cost-effective alternatives to combustion, we modeled incineration as selected treatment for this waste for our upper-bound of the cost range. In the event that the ferric chloride residues exhibit a hazardous waste characteristic when generated, the generator would have an obligation to treat dioxins and furans, if any, present in the waste. In this case, the only incremental cost attributable to the rule is the difference between Subtitle C hazardous waste landfill and Subtitle D nonhazardous landfill disposal. The commenter did not provide any data or reasoning about why source segregation of this material is either technically infeasible or economically impractical.

B. Regulatory Flexibility Act (RFA), as Amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA)

The RFA generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedures Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, a small entity is defined as: (1) A small business that has fewer than 1000 or 100 employees per firm depending upon the SIC code the firm primarily is classified in[40]; (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

There is one potentially affected inorganic chemical producing firm that is a small entity. This firm is located in the antimony oxide sector. We have determined that this firm will incur costs of less than one percent of the firm's sales. Although this firm has reported negative earnings, the maximum incremental annual cost of the rule is approximately $430 which represents approximately 1 percent of the negative earnings. This firm also has the opportunity of recycling both its slag and baghouse filters which would

[39] When profit information is either unavailable or highly variable from year to year, the Agency has chosen to use a profit surrogate in completing the economic impact analysis of this final rule. According to Dun and Bradstreet's Industry Norms and Key Business Indicators (1995) the average net after tax profit for inorganic chemical producers in the 2819 SIC code was 6.3 percent. When needed, this percentage is applied to reported sales of affected firms in order to estimate their profits.

[40] The Small Business Administration has classified firms in the manufacturing sector (SIC Codes 20–39) and wholesale trade sector (SIC Codes 50–51) as small businesses within the sector based on the number of employees per firm. See Small Business Size Standards, 61 FR 3280, 3289 (January 31, 1996). Thus, to determine if a inorganic chemical producer is a small business, the primary SIC code of the firm would have to be determined. The small entities in today's rulemaking are in two SIC codes: (1) 2812 Alkalies and Chlorine, size standard 1000 employees and (2) 5082 Construction and Mining (except Petroleum) Machinery and Equipment size standard 100 employees.

remove these materials from the scope of today's listing. The Agency does not believe that these costs will impose a significant impact on this firm's operations. The Agency also believes that one firm in the antimony oxide sector does not constitute a substantial number of small entities.

After considering the impact of both of these factors from today's final rule on the small entity, I certify that this action will not have a significant economic impact on a substantial number of small entities.

C. Paperwork Reduction Act

The information collection requirements in this rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. An Information Collection Worksheet (ICW) document has been prepared (ICR No. 1968.01) and a copy may be obtained from Susan Auby, Collection Strategies Division; U.S. Environmental Protection Agency (2822); 1200 Pennsylvania Ave. N.W.; Washington, DC 20460 or by calling (202) 260–2740. A copy may also be downloaded off the internet at *http://www.epa.gov/icr.* The information requirements are not effective until OMB approves them.

The effect of listing the wastes described earlier is to subject industry to management and treatment standards under the Resource Conservation and Recovery Act (RCRA). However, this final rule represents only an incremental increase in burden for generators and subsequent handlers of the newly listed wastes, and affects the following existing RCRA information collection requirements: Notification, Generator, Generator Standards, and Biennial Report (the chart below provides details). This final rule does not contain any new information collection requirements, nor does it modify any existing information collection requirements.

As a result of the final rule, EPA estimates that four (4) facilities will be newly subject to existing RCRA information collection requirements for the newly listed wastes. The exhibit below presents the estimated annual hour and cost burden for these four facilities to comply with the existing recordkeeping and reporting requirements associated with generating and managing hazardous wastes. We estimate that the four facilities would incur an annual burden of approximately 77 hours and $3,630 in carrying out existing information collection requirements for their newly listed wastes. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR Chapter 15. The OMB control number for the information collection requirements in this rule will be listed in an amendment to 40 CFR part 9 in a subsequent FR document after OMB approves the ICR.

EXHIBIT 1.—ANNUAL HOUR AND COST BURDEN UNDER EXISTING ICRS FOR NEWLY LISTED INORGANIC CHEMICAL WASTES [1]

ICR name and number	Annual labor hours	Annual labor cost	Annual capital cost	Annual O & M cost	Total annual cost
Notification (261)	1	$68.00	$0.00	$0.00	$68.00
Manifest (801)	25	1,182.00	0.00	6.00	1,186.00
Generators (820)	49	2,212.00	0.00	4.00	2,218.00
Biennial Report (976)	2	157.00	0.00	2.00	159.00
Total	77	3,619.00	0.00	12.00	3,631.00

[1] EPA has proposed to list these wastes as hazardous (see 65 *FR* 55684).

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

Today's rule contains no Federal mandates (under the regulatory provisions of Title II of the UMRA) for State, local, or tribal governments or the private sector. In any event, EPA has determined that this rule does not

contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. The total expenditure to the private sector in any one year is less than $2 million (for more information see the Economic Analysis of the Final Rule For Listing Hazardous Waste From Inorganic Chemical Production) and less than $300,000 per year for State, local and tribal governments. Thus, today's rule is not subject to the requirements of sections 202 and 205 of the UMRA.

E. Executive Order 12898: Environmental Justice

EPA is committed to addressing environmental justice concerns and is assuming a leadership role in environmental justice initiatives to enhance environmental quality for all populations in the United States. The Agency's goals are to ensure that no segment of the population, regardless of race, color, national origin, or income bears disproportionately high and adverse human health or environmental impacts as a result of EPA's policies, programs, and activities and that all people live in safe and healthful environments. In response to Executive Order 12898 and to concerns voiced by many groups outside the Agency, EPA's Office of Solid Waste and Emergency Response formed an Environmental Justice Task Force to analyze the array of environmental justice issues specific to waste programs and to develop an overall strategy to identify and address these issues (OSWER Directive No. 9200.3–17).

Today's final rule covers wastes from inorganic chemical production. It is not certain whether the environmental problems addressed by this rule could disproportionately affect minority or low-income communities. Today's final rule is intended to reduce risks of hazardous wastes and to benefit all populations. As such, this rule is not expected to cause any disproportionately high and adverse impacts to minority or low-income communities versus non-minority or affluent communities.

In making hazardous waste listing determinations, we base our evaluations of potential risk from the generation and management of solid wastes on an analysis of potential individual risk. In conducting risk evaluations, our goal is to estimate potential risk to any population of potentially exposed individuals (e.g., home gardeners, adult farmers, children of farmers, anglers) located in the vicinity of any generator or facility handling a waste. Therefore, we are not putting poor, rural, or minority populations at any disadvantage with regard to our evaluation of risk or with regard to how the Agency makes its final hazardous waste listing determinations.

In deciding today to list wastes as hazardous (i.e., baghouse filters from the production of antimony oxide, including filters from the production of intermediates (e.g., antimony metal or crude antimony oxide); slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide); and, residues from manufacturing and manufacturing-site storage of ferric chloride from acids formed during the production of titanium dioxide using the chloride-ilmenite process), all populations potentially exposed to these wastes or potentially exposed to releases of the hazardous constituents in the wastes will benefit from the final listing determination. In addition, listing determinations take effect at the national level. The wastes being listed as hazardous will be hazardous regardless of where they are generated and regardless of where they may be managed. Although the Agency understands that the final listing determinations may affect where these wastes are managed in the future (in that hazardous wastes must be managed at subtitle C facilities), the Agency's decision to list these wastes as hazardous is independent of any decisions regarding the location of waste generators and the siting of waste management facilities.

Similarly, in cases where the Agency is not listing a solid waste as hazardous because the waste does not meet the criteria for being identified as a hazardous waste, these decisions are based upon an evaluation of potential individual risks located in proximity to any facility handling the waste. Therefore, any population living in close proximity to a facility that produces a solid waste that the Agency did not list as hazardous would not be adversely affected either because the waste is already being managed as a hazardous waste in the Subtitle C system or because the solid waste does not pose a sufficient risk to the local population.

F. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045, ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997), applies to any rule that: (1) Is determined to be ''economically significant'' as defined under E.O. 12866 and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency. This final rule is not subject to the Executive Order because it is not economically significant as defined in E.O. 12866 and because the Agency does not have reason to believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. Today's final rule is intended to avoid releases of hazardous constituents to the environment at levels that will cause unacceptable risks. We considered risks to children in our risk assessment. The more appropriate and safer management practices in this final rule are projected to reduce risks to children potentially exposed to the constituents of concern.

G. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 6, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.'' ''Policies that have tribal implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and the Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes.''

This final rule does not have tribal implications. It will not have substantial direct effects on tribal governments, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes, as specified in Executive Order 13175. No Indian tribes own or operate facilities generating wastes affected by this rulemaking. Further, no regulated entities affected by this rulemaking are located in areas subject to Indian tribal government jurisdiction. Thus, Executive Order 13175 does not apply to this rule.

H. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

This final rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This final rule directly affects inorganic chemical producers. There are no State and local government bodies that incur direct compliance costs by this rulemaking. State and local government implementation expenditures are expected to be less than $300,000 in any one year.[41] Thus, the requirements of section 6 of the Executive Order do not apply to this rule. This final rule would preempt State and local law that is less stringent for these inorganic chemical production wastes as hazardous wastes. Under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901 to 6992k, the relationship between the States and the national government with respect to hazardous waste management is established for authorized State hazardous waste programs [42 U.S.C. 6926 (§ 3006)] and retention of State authority [42 U.S.C. 6929 (§ 3009)]. Under § 3009 of RCRA, States and their political subdivisions may not impose requirements less stringent for hazardous waste management than the national government. By publishing and inviting comment on the proposed rule, we provided State and local officials notice and an opportunity for appropriate participation. Thus, we complied with the requirements of section 4 of the Executive Order.

[41] For more information, please refer to Chapter 6 of the background document Economic Analysis of the Final Rule For Listing Hazardous Waste From Inorganic Chemical Production, which was placed in the docket for today's final rule.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities, unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This final rulemaking involves technical standards. EPA has selected the Toxicity Characteristic Leaching Procedure (TCLP) for treatment standards associated with hazardous metal constituents in wastes listed in today's final rule. The TCLP is the standard test method used to evaluate the toxicity characteristic for the definition of hazardous waste (see 40 CFR 261.24) and treatment standards for metal constituents under the Land Disposal Restrictions (see 40 CFR 268.40 and 268.48.). The Agency has used the TCLP in completing its treatment standards for the same hazardous metal constituents across a range of listed and characteristic hazardous wastes. The performance level for leachability is based on the Best Demonstrated Commercially-Available Technology (BDAT). The use of the TCLP for the same constituents assures uniformity and consistency in the treatment of hazardous waste in fulfillment of the Congressional Mandate to minimize long-term threats to human health or the environment. 42 U.S.C. § 6924(m). The use of any voluntary consensus standard would be impractical with applicable law because it would require a different leaching method than is currently used to determine hazardous characteristics. The use of different chemical methods to assess hazardousness of the waste and compliance with treatment standards would create disparate results between hazardous waste identification and effective treatment of land disposed hazardous wastes. We have not, therefore, used any voluntary consensus standards. In the proposed rulemaking, EPA solicited public comment to identify potentially-applicable voluntary consensus standards and to explain why such standards should be used in this regulation. EPA did not receive public comment on any voluntary consensus standards that could be used in this regulation.

J. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.,* as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA submitted a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. § 804(2). The portions of this rule that will take effect earliest will be effective May 20, 2002.

K. Executive Order 13211: Energy Effects

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. The scope of this rule is limited in nature to three affected facilities. In addition the total annual cost of this rule is between $115,200 to $171,000. These costs represent less than 1 percent of the affected facilities sales and are not expected adversely impact energy use and management in the United States.

List of Subjects

40 CFR 148

Administrative practice and procedure, Hazardous waste, Reporting and recordkeeping requirements, Water supply.

40 CFR 261

Environmental protection, Hazardous materials, Waste treatment and disposal, Recycling.

40 CFR Part 268

Environmental protection, Hazardous materials, Waste management, Reporting and recordkeeping requirements, Land disposal restrictions, Treatment standards.

40 CFR Part 271

Environmental protection, Administrative practice and procedure,

Confidential business information, Hazardous material transportation, Hazardous waste, Indians-lands, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Water pollution control, Water supply.

40 CFR Part 302

Environmental protection, Air pollution control, Chemicals, Emergency Planning and Community Right-to-Know Act, Extremely hazardous substances, Hazardous chemicals, Hazardous materials, Hazardous materials transportation, Hazardous substances, Hazardous waste, Intergovernmental relations, Natural resources, Reporting and recordkeeping requirements, Superfund, Waste treatment and disposal, Water pollution control, Water supply.

Dated: October 31, 2001.

Christine T. Whitman,

Administrator.

For the reasons set forth in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as follows:

PART 148—HAZARDOUS WASTE INJECTION RESTRICTIONS

1. The authority citation for part 148 continues to read as follows:

Authority: Sec. 3004, Resource Conservation and Recovery Act, 42 U.S.C. 6901 *et seq.*

2. Section 148.18 is amended by revising paragraph (k) and adding paragraph (l) to read as follows:

§ 148.18 Waste-specific prohibitions—newly listed and identified wastes.

* * * * *

(k) Effective May 20, 2002, the wastes specified in 40 CFR 261.32 as EPA Hazardous Waste Numbers K176, K177, and K178 are prohibited from underground injection.

(l) The requirements of paragraphs (a) through (k) of this section do not apply:

(1) If the wastes meet or are treated to meet the applicable standards specified in subpart D of 40 CFR part 268; or

(2) If an exemption from a prohibition has been granted in response to a petition under subpart C of this part; or

(3) During the period of extension of the applicable effective date, if an extension has been granted under § 148.4.

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

3. The authority citation for part 261 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, 6922, 6924(y), and 6938.

4. Section 261.4 is amended by revising paragraph (b)(15) to read as follows:

§ 261.4 Exclusions.

* * * * *

(b) * * *

(15) Leachate or gas condensate collected from landfills where certain solid wastes have been disposed, provided that:

(i) The solid wastes disposed would meet one or more of the listing descriptions for Hazardous Waste Codes K169, K170, K171, K172, K174, K175, K176, K177, and K178, if these wastes had been generated after the effective date of the listing;

(ii) The solid wastes described in paragraph (b)(15)(i) of this section were disposed prior to the effective date of the listing:

(iii) The leachate or gas condensate do not exhibit any characteristic of hazardous waste nor are derived from any other listed hazardous waste;

(iv) Discharge of the leachate or gas condensate, including leachate or gas condensate transferred from the landfill to a POTW by truck, rail, or dedicated pipe, is subject to regulation under sections 307(b) or 402 of the Clean Water Act.

(v) As of February 13, 2001, leachate or gas condensate derived from K169–K172 is no longer exempt if it is stored or managed in a surface impoundment prior to discharge. After November 21, 2003, leachate or gas condensate derived from K176, K177, and K178 will no longer be exempt if it is stored or managed in a surface impoundment prior to discharge. There is one exception: if the surface impoundment is used to temporarily store leachate or gas condensate in response to an emergency situation (*e.g.,* shutdown of wastewater treatment system), provided the impoundment has a double liner, and provided the leachate or gas condensate is removed from the impoundment and continues to be managed in compliance with the conditions of this paragraph (b)(15)(v) after the emergency ends.

* * * * *

5. In § 261.32, the table is amended by adding in alphanumeric order (by the first column) under the subgroup ''Inorganic Chemicals'' to read as follows:

§ 261.32 Hazardous waste from specific sources.

* * * * *

Industry and EPA hazardous waste No.	Hazardous waste	Hazardous code
* * *	* * *	*
Inorganic chemicals:		
* * *	* * *	*
K176	Baghouse filters from the production of antimony oxide, including filters from the production of intermediates (e.g., antimony metal or crude antimony oxide).	(E)
K177	Slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide).	(T)
K178	Residues from manufacturing and manufacturing-site storage of ferric chloride from acids formed during the production of titanium dioxide using the chloride-ilmenite process.	(T)
* * *	* * *	*

Appendix VII to Part 261—Basis for Listing Hazardous Waste

6. Appendix VII to part 261 is amended by adding the following wastestreams in alphanumeric order (by the first column) to read as follows:

EPA hazardous waste No.	Hazardous constituents for which listed
* * * * * * *	
K176	Arsenic, Lead.
K177	Antimony.
K178	Thallium.

PART 268—LAND DISPOSAL RESTRICTIONS

7. The authority citation for part 268 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, and 6924.

Subpart C—Prohibitions on Land Disposal

8. Section 268.36 is added to read as follows:

§ 268.36 Waste specific prohibitions—inorganic chemical wastes

(a) Effective May 20, 2002, the wastes specified in 40 CFR part 261 as EPA Hazardous Wastes Numbers K176, K177, and K178, and soil and debris contaminated with these wastes, radioactive wastes mixed with these wastes, and soil and debris contaminated with radioactive wastes mixed with these wastes are prohibited from land disposal.

(b) The requirements of paragraph (a) of this section do not apply if:

(1) The wastes meet the applicable treatment standards specified in subpart D of this part;

(2) Persons have been granted an exemption from a prohibition pursuant to a petition under § 268.6, with respect to those wastes and units covered by the petition;

(3) The wastes meet the applicable treatment standards established pursuant to a petition granted under § 268.44;

(4) Hazardous debris has met the treatment standards in § 268.40 or the alternative treatment standards in § 268.45; or

(5) Persons have been granted an extension to the effective date of a prohibition pursuant to § 268.5, with respect to these wastes covered by the extension.

(c) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in § 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains regulated constituents in excess of the applicable subpart D levels, the waste is prohibited from land disposal, and all requirements of this part are applicable, except as otherwise specified.

9. In § 268.40, the Table is amended by adding in alphanumeric order new entries for K176, K177, and K178 as follows:

§ 268.40 Applicability of treatment standards.

* * * * *

TREATMENT STANDARDS FOR HAZARDOUS WASTES

[Note: NA means not applicable]

Waste code	Waste description and treatment/regulatory Subcategory [1]	Regulated hazardous constituent	Common name / CAS [2] No.	Wastewaters: Concentration in mg/L [3], or Technology Code [4]	Nonwastewaters: Concentration in mg/kg [5] unless noted as "mg/L TCLP", or Technology Code
*	* *	*	*	*	*
K176	Baghouse filters from the production of antimony oxide, including filters from the production of intermediates (e.g., antimony metal or crude antimony oxide).	Antimony	7440–36–0	1.9	1.15 mg/L TCLP
		Arsenic	7440–38–2	1.4	5.0 mg/L TCLP
		Cadmium	7440–43–9	0.69	0.11 mg/L TCLP
		Lead	7439–92–1	0.69	0.75 mg/L TCLP
		Mercury	7439–97–6	0.15	0.025 mg/L TCLP
K177	Slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide).	Antimony	7440–36–0	1.9	1.15 mg/L TCLP
		Arsenic	7440–38–2	1.4	5.0 mg/L TCLP
		Lead	7439–92–1	0.69	0.75 mg/L TCLP
K178	Residues from manufacturing and manufacturing-site storage of ferric chloride from acids formed during the production of titanium dioxide using the chloride-ilmenite process.	1,2,3,4,6,7,8- Heptachlorodibenzo-p-dioxin. (1,2,3,4,6,7,8-HpCDD)	35822–39–4	0.000035 or CMBST [11].	0.0025 or CMBST [11]
		1,2,3,4,6,7,8- Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	67562–39–4	0.000035 or CMBST [11].	0.0025 or CMBST [11]
		1,2,3,4,7,8,9- Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	55673–89–7	0.000035 or CMBST [11].	0.0025 or CMBST [11]
		HxCDDs (All Hexachlorodibenzo-p-dioxins).	34465–46–8	0.000063 or CMBST [11].	0.001 or CMBST [11]

TREATMENT STANDARDS FOR HAZARDOUS WASTES—Continued

[Note: NA means not applicable]

Waste code	Waste description and treatment/ regulatory Subcategory [1]	Regulated hazardous constituent	Common name	Wastewaters	Nonwastewaters
			CAS [2] No.	Concentration in mg/L [3], or Technology Code [4]	Concentration in mg/kg [5] unless noted as "mg/L TCLP", or Technology Code
		HxCDFs (All Hexachlorodibenzofurans).	55684–94–1	0.000063 or CMBST [11].	0.001 or CMBST [11]
		1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin. (OCDD)	3268–87–9	0.000063 or CMBST [11] 0.005 or.	0.005 or CMBST [11]
		1,2,3,4,6,7,8,9-Octachlorodibenzofuran. (OCDF)	39001–02–0	0.000063 or CMBST [11].	0.005 or CMBST [11]
		PeCDDs (All Pentachlorodibenzo-p-dioxins)	36088–22–9	0.000063 or CMBST [11].	0.001 or CMBST [11]
		PeCDFs (All Pentachlorodibenzofurans)	30402–15–4	0.000035 or CMBST [11].	0.001 or CMBST [11]
		TCDDs (All tetrachlorodi-benzo-p-dioxins).	41903–57–5	0.000063 or CMBST [11].	0.001 or CMBST [11]
		TCDFs (All tetrachlorodibenzofurans).	55722–27–5	0.000063 or CMBST [11].	0.001 or CMBST [11]
		Thallium	7440–28–0	1.4	0.20 mg/L TCLP
*	*	*	*	*	*	*

Footnotes to Treatment Standard Table 268.40:

[1] The waste descriptions providedin this table do not replace waste descriptions in 49 CFR part 261. Descriptions of Treatment/Regulatory Subcategories are provided, as needed, to distinguish between applicability of different standards.

[2] CAS means Chemical Abstract Services. When the waste code and/or regulated constituents are described as a combination of a chemical with its salts and/or esters, the CAS number is given for the parent compound only.

[3] Concentration standards for wastewaters are expressed in mg/L and are based on analysis of composite samples.

[4] All treatment standards expressed as a Technology Code or combination of Technology Codes are explained in detail in 40 CFR 268.42 Table 1—Technology Codes and Descriptions of Technology-Based Standards.

[5] Except for Metals (EP or TCLP) and Cyanides (Total and Amenable) the nonwastewater treatment standards expressed as a concentration were established, in part, based upon incineration in units operated in accordance with the technical requirements of 40 CFR part 264, Subpart O or 40 CFR part 265, Subpart O, or based upon combustion in fuel substitution units operating in accordance with applicable technical requirements. A facility may comply with these treatment standards according to provisions in 40 CFR 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.

[11] For these wastes, the definition of CMBST is limited to: (1) Combustion units operating under 40 CFR 266, (2) combustion units permitted under 40 CFR part 264, Subpart O, or (3) combustion units operating under 40 CFR 265, Subpart O, which have obtained a determination of equivalent treatment under 268.42(b).

PART 271—REQUIREMENTS FOR AUTHORIZATION OF STATE HAZARDOUS WASTE PROGRAMS

10. The authority citation for Part 271 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), and 6926.

11. Section 271.1(j) is amended by adding the following entries to Table 1 and Table 2 in chronological order by date of publication to read as follows.

§ 271.1 Purpose and scope.

* * * * *

(j) * * *

TABLE 1.—REGULATIONS IMPLEMENTING THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

Promulgation date	Title of regulation	**Federal Register** reference	Effective date
* *	* *	* *	*
10/31/01	Listing of Inorganic Chemical Manufacturing Wastes.	[*insert Federal Register page numbers*].	5/20/02.
* *	* *	* *	*

TABLE 2.—SELF-IMPLEMENTING PROVISIONS OF THE SOLID WASTE AMENDMENTS OF 1984

Effective date	Self-implementing provision	RCRA citation	FEDERAL REGISTER reference
* *	* *	* *	*
5/20/02	Prohibition on land disposal of K176, K177, and K178 wastes, and prohibition on land disposal of radioactive waste mixed with K176, K177, and K178 wastes, including soil and debris.	3004(g)(4)(C) and 3004(m)	11/20/02.
* *	* *	* *	*

PART 302—DESIGNATION, REPORTABLE QUANTITIES, AND NOTIFICATION

12. The authority citation for Part 302 continues to read as follows:

Authority: 42 U.S.C. 9602, 9603, and 9604; 33 U.S.C. 1321 and 1361.

13. In § 302.4, Table 302.4 is amended by adding the following new entries in alphanumeric order at the end of the table to read as follows:

§ 302.4 Designation of hazardous substances

* * * * *

TABLE 302.4—LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES

[Note: All comments/notes are located at the end of this table]

Hazardous substance	CASRN	Regulatory synomyms	Statutory			Final RQ	
			RQ	Code †	RCRA waste No.	Category	Pounds (Kg)
* *	*	*	*		*		*
K176			*1	4	K176	X	1 (0.454)
Baghouse filters from the production of antimony oxide, including filters from the production of intermediates (e.g., antimony metal or crude antimony oxide)							
K177			*1	4	K177	D	5,000 (2270)
Slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide)							
K178			*1	4	K178	X	1 (0.454)
Residues from manufacturing and manufacturing-site storage of ferric chloride from acids formed during the production of titanium dioxide using the chloride ilmenite process.							
* *	*	*	*		*		*

† Indicates the statutory source as defined by 1, 2, 3, and 4 below.
4—Indicates that the statutory source for designation of this hazardous substance under CERCLA is RCRA section 3001.
1* Indicates that the 1-pound RQ is a CERCLA statutory RQ.

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