

US EPA ARCHIVE DOCUMENT



# **Response to Comments Document**

## **Hazardous Waste Listing Determination for Inorganic Chemicals Industry Wastes (Final Rule)**

**Volume I:  
Responses to Comments ICMP-00001  
through ICMP-00012**

**Public Comments on the  
Inorganic Chemical Manufacturing Listing Determination  
(Proposed September 14, 2000)**

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## **Comment ICMP-00001, Chemical Products Corporation**

Comment 1-1: CPC fully agrees with EPA's conclusion as stated in the Federal Register proposed rule, "We have evaluated the wastes, waste management practices, and potential risk exposure pathways associated with the barium carbonate production processes and propose not to list any wastes from this industry as hazardous under Subtitle C of RCRA. Some wastes in this industry are D002 or D005 characteristic hazardous wastes, which are both currently subject to RCRA Subtitle C regulation and managed in compliance with those regulations. For other wastes, not identified as characteristic hazardous wastes, we have identified no risks of concern associated with the current management of these wastes that would warrant listing. These wastes do not meet the criteria listed under 40 CFR 261.11(a)(3) for listing a waste as hazardous." CPC does, however, wish to request corrections, clarifications, and explanations of some of the text in this section.

Response 1-1: EPA acknowledges CPC's support of the proposed rule.

Comment 1-2: We believe that EPA was incorrect in referring to the AWQC for selenium as a "standard" twice in this FR notice; both occurrences were in the paragraph addressing the treated barium wastes from Chemical Products Corporation. EPA stated, "In addition, we found only one exceedence of AWQC standards among the SPLP leaching data for treated barium wastes. Selenium was found at a level of 0.04-0.06 mg/L, which exceeds the AWQC standard (0.0050 mg/L) by a factor of 8 to 12." AWQCs are not "standards"; they have not been issued by EPA under the Administrative Procedure Act. The drinking water standard for selenium is 0.05 mg/l. Both the MCL and the MCLG for selenium are 0.05 mg/l, thus the level found in the SPLP extract from the barium leaching waste is at the level of the drinking water standard.

EPA should specifically retract the references to the AWQC as a "standard" and fully explain AWQCs in this notice by citing statements found in other EPA documents. We suggest that the statements, "These water quality criteria are not regulations and do not impose legally binding requirements on EPA, States, Tribes or the public." (EPA 822-Z-99-001, National Water Quality Criteria - Correction, April 1999). and "Section 304(a) of the Clean Water Act, 33 U.S.C. 1314(a)(1), requires the Environmental Protection Agency (EPA) to publish and periodically update ambient water quality criteria. These recommended criteria provide guidance for States and Tribes in adopting water quality standards under section 303(c) 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).

Response 1-2: We agree with the commenter's clarification of the status of the AWQC. We are providing the following clarification the preamble: The Agency mistakenly referred to a selenium "standard" (0.0050 mg/L) in the barium carbonate section of the preamble for the proposed rule. 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).

Comment 1-3: CPC requests that EPA present a Health Based Limit (HBL) for selenium in concert with the AWQC for selenium as EPA has done elsewhere in this proposed rule when AWQCs have been presented. Appendix B to the "Barium Carbonate Listing Background Document for the Inorganic Chemical Listing Determination" in the docket for this proposed rule shows a "Health Based Limit: drinking water ingestion" for selenium of 0.078 mg/L and an "AWQC: Human Health" for selenium of 0.17 mg/L in addition to the AWQC cited in the text of this proposed rule. The selenium concentration in the SPLP leachate from CPC's treated barium waste is well below these health-based values.

Response 1-3: We have decided not to list barium carbonate wastes. Therefore, the fact that CPC's waste may be below the HBL for selenium has no impact on our RCRA listing decision and we are taking no position on this issue in today's rulemaking.

Comment 1-4: It is our understanding that the AWQC for selenium is being reviewed and is likely to be revised in the near future. If this is the case, we ask that EPA specifically state that the AWQC for selenium is under review and may be changed, as was done in "National Water Quality Criteria - Correction, April 1999" in reference to the selenium GLI.

Response 1-4: The Agency plans to issue a draft revision of the selenium AWQC for peer review and public comment in March 2002. The Agency plans to issue the final revision in April 2003.

Comment 1-5: Even though the RfD for selenium presented in EPA's IRIS database is nearly a decade old, it appears to us to be well-considered and based upon sound science. A human "No Observed Adverse Effect Level" was identified and then this value was divided by a factor of 3 to protect sensitive populations.

A preliminary review of the recently-published information concerning selenium, however, indicates that selenium intakes at, or above, the RfD may be beneficial to human health. This element appears to be unusual in that the essential concentration in the human diet and the concentration at which mild toxicity (garlic breath and deformation of finger and toe nails) occurs are quite close (Navarro-Alarcon et al., 2000). Human health appears to suffer as chronic selenium intake levels decline.

In EPA's periodic update of ambient water quality criteria for selenium, we ask that EPA carefully review recent information showing supplementation with selenium appears to boost cell-mediated immune responses in addition to protecting against oxidative damage. Both

animal and epidemiological studies have indicated that selenium could constitute a dietary factor with protective action against cirrhosis, cancer, diabetes, and cardiovascular pathologies (Navarro-Alarcon et al., 2000; Hughes, 1999). Human studies have linked increased selenium intake to a reduction in respiratory tract infections (Girodon et al., 1999) and an improvement in asthma control (Godden et al., 1999). Beck et al. (1998) demonstrated that selenium-deficient mice infected with the coxsackievirus B3 developed an increased myocarditis compared with adequately fed mice. The deficiency in selenium was associated with a conversion of the virus from a benign to a virulent strain.

Response 1-5: We have decided not to list barium carbonate wastes. Therefore, the fact that the new studies may suggest that a less stringent HBL is appropriate is not relevant. We have already determined that the selenium in these wastes presents no significant risks under the current HBL. In addition, a revision to the ambient water quality criteria is well beyond the scope of this rulemaking.

Comment 1-6: In explaining why selenium levels in the SPLP extract from barium carbonate production waste equal to the drinking water standard are not of concern, EPA states in the FR proposed rule, "Given the distance over which leachate from the treated barium wastes would need to travel before reaching the river, dilution and attenuation during transport in local groundwater, and further dilution in the Etowah River, we believe the levels of selenium in the leachate would decrease to a level which would no longer pose a risk to the environment." We ask that EPA present specific evidence confirming this assertion. The test well sampled by EPA in June, 1999 immediately downgradient from the landfill in question exhibited a much lower selenium concentration in the groundwater than the SPLP extract from the treated barium carbonate leaching waste; selenium was found at the much lower concentrations of 0.03 mg/l in unfiltered water and 0.01 mg/l in filtered water collected from the down-gradient test well. This information clearly demonstrates the accuracy of EPA's conclusion.

Response 1-6: Our conclusions, which were described in the preamble to the proposal, were made based on our expert judgement of the facts involved. No modeling was conducted.

Comment 1-7: The AWQC information relating to selenium in "National Water Quality Criteria - Correction, April 1999" includes several footnotes. Two of the footnotes are: "L - The  $CMC = 1 / [(f1/CMC1) + (f2/CMC2)]$  where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 ug/l and 12.83 ug/l respectively", and "R- This value was announced (61 FR 58444-58449, November 14, 1996) as a proposed GLI 303(c) aquatic life criterion. EPA is currently working on this criterion and so this value might change substantially in the near future."

As shown in footnote "L" quoted above, the lower oxidation state for selenium has a much higher CMC than the higher oxidation state (if all of the selenium is present as selenate, the

CMC is 12.83 ug/l, whereas if all of the selenium is present as selenite, the CMC is 185.9 ug/l - more than 14 times higher). Since CPC's barium carbonate leaching waste results from a process conducted in a reducing environment, all of the selenium present would be expected to be in the lower oxidation state rather than the higher one. We believe that the likelihood of selenium being present in the lower oxidation state should be mentioned as further evidence that the level of selenium found in the SPLP of CPC's barium carbonate waste poses no risk to the environment.

Response 1-7: We have decided not to list barium carbonate wastes. Therefore, the fact that the selenium may have a lower oxidation state in the environment at the commenter's facility is not relevant. We have already determined that the selenium in these wastes presents no significant risks.

Comment 1-8: We further wish to bring to your attention a minor typographical error in this proposed rule. This proposed rule contains the statement, "The barite ore feedstock facility also produces molten sulfur or sodium hyposulfate from hydrogen sulfide gas piped from the barium carbonate manufacturing process." We produce sodium hydrosulfide rather than sodium hyposulfate

Response 1-8: We acknowledge the correction. However, it has no relevance to our proposed and final decision not to list any barium carbonate wastes.

**Comment ICMP-00002, Monsanto**

Comment 2-1: Specifically, we support and are in full agreement with the agency's determination for not listing any wastes from the Phosphorus Trichloride process as hazardous wastes. The agency has performed a detailed analysis of the wastes generated from the Phosphorus Trichloride process and has confirmed our long standing believe that our Phosphorus Trichloride process wastes do not meet the criteria set out at 40 CFR 261.11(a)(3) for listing a waste as hazardous. We agree that they do not pose any risk of concern associated with the current management of these wastes.

Response 2-1: EPA acknowledges Monsanto's support of the proposed rule.



**Comment ICMP-00003, Chemical Products Corporation**

Comment 3-1a: Chemical Products Corporation (CPC) believes that, in the case of manganese, EPA has not met the requirements for placing a substance in Appendix VII and Appendix VIII. Specifically, CPC believes that sound science demonstrating that manganese in waste presents a hazard to human health or the environment is lacking.

EPA's IRIS database bases its Oral Reference Dose determination on "many large populations consuming normal diets over an extended period of time with no adverse health effects." (quoted from the manganese Substance File). These data represent only a lower bound on safe dose because a "lowest observed adverse effect" dose could not be identified. Quoting the IRIS Substance File again, "While several studies have determined average levels of manganese in various diets, no quantitative information is available to indicate toxic levels of manganese in the diet of humans. Because of the homeostatic control humans maintain over manganese, it is generally not considered to be very toxic when ingested with the diet."

The document written by ATSDR personnel, Johnson and DeRosa (1997), included with these comments, characterizes the sound science relating to manganese toxicity as consisting of four studies; all four of these studies are inhalation studies rather than oral ingestion studies. They state ATSDR-identified research needs for manganese as "a) Dose-response data for acute- and intermediate-duration oral exposures (the subchronic study should include reproductive histopathology and an evaluation of immunologic parameters including Mn effects on plaque-forming cells (SRBC), surface markers (D4:D8 ratio), and delayed hypersensitivity reactions, b) Toxicokinetic studies on animals to investigate uptake and absorption, relative uptake of differing Mn compounds, metabolism of Mn, and interaction of Mn with other substances following oral exposure, c) Epidemiologic studies on the health effects of Mn (special emphasis end points include neurologic, reproductive, developmental, immunologic, and cancer)". In the June 22, 1996 Federal Register (61 FR125), at page 33517, ATSDR provides only a chronic inhalation Minimal Risk Level (MRL) for manganese in the table of MRL values presented there. The July 30, 1997 Federal Register (62FR146), at page 40827, details the same research needs in describing the ATSDR Substance-Specific Applied Research Program; it also identifies needed research relating to manganese exposure including, "Relative bioavailability of different manganese compounds and bioavailability of manganese from soil." Thus, we can only conclude that ATSDR has determined that there are no existing scientific studies demonstrating the toxic, carcinogenic, mutagenic or teratogenic effects of oral ingestion of manganese on humans or other life forms.

Response 3-1a: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 3-1b: An Oral Reference Dose contained in EPA's IRIS database be based upon studies that determine a "Lowest Observed Adverse Effect Level" in conjunction with a "No Observed Adverse Effect Level". This is not the case for the manganese substance file. The IRIS manganese substance file includes the statement, "Donaldson (1987) provides a summary of this documented toxicity of manganese to humans, which has been primarily limited to workers exposed by inhalation. In contrast to inhaled manganese, ingested manganese has rarely been associated with toxicity." Inhalation of manganese in the workplace has been studied; this form of manganese and route of exposure are specific to particular occupational environments.

EPA's IRIS Substance File for manganese further states, "it is also recognized that manganese uptake and elimination are under homeostatic control, generally allowing for a wide range of dietary intakes considered to be safe." This is supported by Greger (1999) who states, "Manganese balance and excretion data are not useful biomarkers of manganese exposure but demonstrate that the body is protected against manganese toxicity primarily by low absorption and/or rapid presystemic elimination of manganese by the liver."

Response 3-1b: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 3-1c: Although toxicity has not been demonstrated in infants, the IRIS Substance File expresses concern for infants fed formula that may have a higher concentration of manganese than human milk. A report by Kawamura et al. (1941) is the only epidemiologic study describing toxicologic responses in humans consuming large amounts of manganese dissolved in drinking water. The most severe symptoms were observed in adults, while children appeared to be unaffected. This argues against the assumption that infants might be more susceptible to high oral doses of manganese.

Response 3-1c: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 3-2: In light of the lack of a sound scientific basis for this proposed rulemaking, CPC respectfully requests that EPA withdraw its proposal to place manganese on Appendix VII and Appendix VIII in 40 CFR 261, and also withdraw its proposal to establish a Universal Treatment Standard for manganese.

[note: see original comment for attachments]

Response 3–2: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today’s final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

## Comment ICMP-00004, American Chemistry Council

### Request for Comment Period Extension

On behalf of the members of the American Chemistry Council<sup>1</sup>, I am requesting that you formally extend the comment period on the recently proposed Inorganic Chemical Manufacturing Wastes listing determination<sup>2</sup> for 30 days, to December 13, 2000.

In the September notice, the Agency proposes to add manganese to RCRA Appendix VII and Appendix VIII as well as establish wastewater and nonwastewater LDR treatment standards for the metal. Most important to ACC members would be the addition of manganese to the list of Universal Treatment Standards and F039 multi-source leachate.

Including manganese in the RCRA program could have significant effects on ACC members. Because of its presence in catalysts and in steel reaction vessels and piping, many operations may unexpectedly find manganese in their wastestreams at levels identified in the proposal. In addition, since manganese, much like iron, is a common element in nature and its chemical fate depends on the acidity and redox conditions of the surroundings, identification of manganese as a hazardous constituent could have serious ramifications for remediation - regardless of whether the manganese originates in the remediation waste or the natural environment.

Since the proposal to include manganese was buried in a very process-specific notice, we are only beginning to assess the potential effect of this proposal on operations outside inorganic chemical manufacturing. Several companies and industries, until recently unaware of the inclusion of manganese, are evaluating the potential effects of the proposal. Others are collecting data on manganese toxicity to assess the justification for its inclusion and the validity of the specific levels proposed.

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<sup>1</sup>The American Chemistry Council represents the leading companies engaged in the business of chemistry. Council members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. The Council is committed to improved environmental, health and safety performance through Responsible Care®, common sense advocacy designed to address major public policy issues, and health and environmental research and product testing. The business of chemistry is a \$435 billion enterprise and a key element of the nation's economy. It is the nation's largest exporter, accounting for ten cents out of every dollar in U.S. exports. Chemistry companies invest more in research and development than any other business sector.

<sup>2</sup>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. 65 FR 55684, September 14, 2000.

We recognize that EPA is under court order to finalize the inorganic listing determination by October 31, 2001. We have no interest in causing EPA to miss that deadline. However, we cannot support EPA finalizing listing determinations that have not been carefully considered.

Response 4-1: EPA denied ACC's request for an extension of the comment period on November 6, 2000. However, we are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

**Comment ICMP-00005, DuPont**Request for Comment Period Extension

On behalf of E.I. du Pont de Nemours and Company ("DuPont"), this letter requests a thirty (30) day extension of the public comment period -- to December 13, 2000 -- on EPA's recent proposed K178 listing of wastes from the production of titanium dioxide by the chloride-ilmenite process. 65 Fed. Reg. 55,684 (Sept. 14, 2000). This brief extension is essential in order for DuPont to comment meaningfully on EPA's proposal. The basis for this request is summarized below.

Since the proposal was published six weeks ago, DuPont has been actively engaged in reviewing the proposal and developing detailed technical comments for submission to EPA. DuPont has met twice with your staff since the proposal date -- once on October 6 for a clarification of certain issues and again on October 26 for a technical discussion of certain waste streams proposed for listing. Given the number of important issues raised by the proposal, DuPont's comments are likely to be extensive.

DuPont is actively engaged in an extensive data collection effort in order to provide EPA with meaningful comments on the proposed K178 listing. Although DuPont expects to be able to submit partially validated results by the current deadline of November 13, the data validation process will likely continue for another 2-3 weeks beyond that date. Thus, the requested brief extension to December 13, 2000 will allow the orderly submission and consideration by EPA of fully validated analytical results for constituents of concern.

DuPont acknowledges and appreciates the recent agreement by your staff to consider data submitted by November 13 for which data validation results will be completed and submitted some time after November 13. The requested brief extension of the comment period to December 13 will further insure that the data are submitted in the most appropriate and useful format, which in turn will help conserve EPA resources.

Finally, EPA's proposal is based on the results of its risk assessments using the "EPACMTP" computer model to predict the fate and transport of various constituents from the facilities that would be affected by the proposed new K178 listing. 65 FR 55698-99, 55762. It is essential that DuPont be able to review this model, and use it to evaluate new data that DuPont is in the process of obtaining, using the same methodology that EPA used in developing the proposed rule. To date, however, despite DuPont's previous requests, DuPont has been unable to obtain the EPACMTP computer files from EPA and thus has been unable to review and evaluate this model. Although your staff agreed to provide portions of the EPACMTP model by October 31, 2000, this will leave DuPont precious little time to perform the required modeling and properly assess this particular model in the context of DuPont's facilities. Thus, the requested brief extension of the public comment period, up to and including December 13, 2000, is essential to allow adequate opportunity for DuPont to

complete necessary review of the model and evaluate newly acquired data towards providing EPA with meaningful comments.

Response 5-1: EPA denied DuPont's request for an extension of the comment period on November 6, 2000.

## Comment ICMP-00006, Lead Industry Association

Introduction: The following comments are submitted on behalf of Lead Industries Association, Inc. (LIA), a not-for-profit association of producers and industrial consumers of lead and lead products. LIA appreciates the opportunity to submit these comments on EPA's proposal to amend RCRA classifications for hazardous waste. For reasons identified below, LIA objects to EPA's proposal to add manganese to the list of hazardous constituents in Appendix VIII of Part 261, and requests additional time to review the proposal so that LIA can have a meaningful opportunity to comment.

Comment 6-1: In its proposal, EPA seeks to add manganese to the list of hazardous constituents in Appendix VIII "based on scientific studies that demonstrate manganese has toxic effects on humans and other life forms." (65 FR 55687). This listing would establish a new Universal Treatment Standard (UTS) level for non-wastewater wastes of 3.6 mg/liter, which would apply to slag, a characteristic waste produced by secondary lead smelter members of LIA. However, by its own admission, EPA lacks studies demonstrating treatment effectiveness for highly concentrated manganese non-wastewaters. 55 FR 55768. In fact, EPA relies on a single sample from one waste stream to arrive at that value. This is insufficient data to support the proposed treatment standard, and EPA needs to take a closer look at available studies or conduct additional studies to arrive at a more reasoned decision. Thus, LIA objects to the addition of manganese as a hazardous constituent on the ground that there has been insufficient analysis of this issue and on the proposed treatment standard for manganese nonwastewater wastes.

Response 6-1: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 6-2: LIA also requests an extension to submit further comments on the proposed amendments. The widespread potential impact of these amendments on the lead industry or other industries is not evident from the title of the proposed amendments nor from the summary pages, and LIA learned only recently of any potential impacts. In fact, the implications for the lead industry are not clear even after a thorough review of the entire rule, despite the fact that the lead industry is mentioned several times within the proposal. What is clear is that EPA did not provide adequate notice of this rule to all potential stakeholders. EPA exacerbates this problem by stating that it plans to use the list of commenters on the manganese issue "as the only individuals notified of potential changes to this proposed treatment standard." 65 FR 55768. Had LIA not been alerted to this important issue, it may never have had future opportunity to comment on changes to this manganese limit. A similar problem exists with respect to the proposed listing of antimony oxide wastes, which may have substantial impacts on lead smelters.



Response 6-2: EPA denied LIA's request for an extension of the comment period. However, we are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

In addition, EPA clarifies in the preamble to the final rule that the listing will not apply to slag generated by secondary lead smelters, even if those smelters use materials from antimony oxide facilities as inputs. Therefore, the antimony oxide listing decisions will not impact lead smelters. Finally, EPA points out that it routinely publishes notices of proposed rulemaking focused on listing determinations for wastes from a particular industry or group of industries. Any of these notices has the potential to affect other industries. EPA is not required to extend comment periods because such impacts are possible.

Comment 6-3: Further, LIA would like an opportunity to comment on EPA's failure to apply the MINTEQA2 model in its proposal. EPA based its decision not to use MINTEQA2 because "a number of technical issues have been raised concerning the model and its application." 65 FR 55698. However, EPA does not identify those technical issues in its proposal. It is important that stakeholders have the opportunity to comment on EPA's decision and address the "technical issues" that may exist under the MINTEQA2 model.

Response 6-3: See our response to comment 12-8.

Comment 6-4: Thus, to allow a meaningful opportunity to review the proposal and determine the potential impacts on the lead industry, LIA requests an additional 30 days to submit comments on this proposal, including any other issues that may be found to have an impact on the lead industry. In the event that EPA does not grant additional time to comment now or a further opportunity to comment at a future date, LIA submits that EPA has not provided sufficient evidence to justify the proposed listing of manganese as a hazardous waste.

Response 6-4: See our response to comment 6-2 above.

## **Comment ICMP-00007, Color Pigments Manufacturers Association**

Introduction: I am writing on behalf of the Color Pigments Manufacturers Association, Inc. (the "CPMA") to comment on the Proposed Rule, Identification and Listing of Hazardous Waste, Inorganic Chemical Manufacturing Wastes, Land Disposal Restrictions for Newly Identified Wastes and CERCLA Hazardous Substance Designations, 65 FR 55684, September 14, 2000 (the "Proposed Rule"). The CPMA is an industry trade association representing color pigment companies in Canada, Mexico, and the United States. CPMA represents small, medium, and large color pigments manufacturers throughout Canada, Mexico and United States, accounting for 95% of the production of color pigments in North America.

Color Pigments are widely used in product compositions of all kinds, including paints, inks, plastics, glass, synthetic fibers, ceramics, colored cement products, textiles, cosmetics, and artists' colors. Color pigments manufacturers located in other countries with sales in Canada, Mexico and the United States, and suppliers of intermediates to the color pigments industry are also members of the Association.

Our Industry is very much concerned with the addition of manganese as a hazardous waste constituent for all characteristic wastes with Universal Treatment Standards. The following comments will address this issue and our support for EPA's decision to not list production waste from cadmium pigment manufacturing.

### Comment 7-1: Cadmium Pigments

The CPMA supports EPA's decision not to list production wastes from the production of cadmium pigments as hazardous. The current management methods in place for processing cadmium pigments related production wastes is protective of both the environment and human health. These existing management systems should not be compromised by additional restrictions which would not in any way, provide greater protection for the environment.

Additional waste restrictions in this industry will only act to further encourage manufacturing to move away from the United States. Nowhere is this trend away from the United States more evident than the cadmium pigments industry where only one U.S. Manufacturer remains in business.

Response 7-1: EPA acknowledges CPMA's support for the rulemaking.

### Comment 7-2: Manganese Listing as a Hazardous Constituent

EPA solicits comments on the listing of manganese as an underlying hazardous ingredient with a new Universal Treatment Standard ("UTS") and the impact such a listing may have on

other wastes. The listing of manganese as a hazardous waste constituent with a UTS appears wholly unfounded in the Proposed Rule. The preamble to the Proposed Rule contains only conclusory statements without even reasonable references for substantiating EPA's decision. EPA's statement that,

"The volume of wastes for which additional treatment is needed solely due to the addition of manganese to the F039 and UTS lists are therefore expected to be very small." 55 FR 55771

would indicate that EPA has not substantiated a significant risk from the presence of manganese in some characteristically hazardous wastes. Indeed, EPA fails to quantify or identify any such characteristic waste. Nor does EPA quantify a significant risk posed by such a waste in the preamble to the Proposed Rule. Additionally, EPA has not justified the assumption that other wastes which may contain manganese have the same or similar properties associated with the titanium dioxide production waste assessed in the Proposed Rule.

Manganese is an essential nutrient believed critical for normal growth, bone formation and reproduction. Since manganese is an essential human nutrient, some background level and regular intake of this metal is required for good health. EPA fails to analyze in the preamble any cogent rationale for the assumptions that the manganese which may be present in the waste proposed for listing poses a significant threat to health or the environment above background levels when treated or disposed of in its current manner.

Furthermore, the most recent "Toxicological Profile for Manganese and Compounds", published by the Agency for Toxic Substances and Disease Registry "ATSDR"), reviews in detail hundreds of studies in humans, animals and the environment involving manganese. The conclusions from all of these studies provide no evidence for manganese toxicity at low exposure levels, such as those which might be associated with the very low concentrations of manganese envisioned by EPA's universal treatment standard.<sup>3</sup>

With respect to bioaccumulation and bioconcentration, the ATSDR manganese profile states:

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<sup>3</sup>In EPA's Integrated Risk Information System, Principle and Supporting Studies file on Manganese, the "...EPA concludes that an appropriate reference dose for manganese is 10 mg/day (0.14 mg/kg-day). In applying the reference dose for manganese to a risk assessment, it is important that the assessor consider the ubiquitous nature of manganese, specifically that most individuals will be consuming about 2-5 mg Mn/day in their diet. This is particularly important when one is using the reference dose to determine acceptable concentrations of manganese in water and soils." In the same report, the EPA cites the World Health Organization (WHO, 1973), when it "...concluded that 2-3 mg Mn/day is adequate for adults and 8-9 mg/day is 'perfectly safe.' "

"In general, these data [BCF Values] indicate that lower organisms such as algae have larger BCFs than higher organisms. Thus, biomagnification of manganese in the food chain does not appear to be significant (EPA 1984a)." ATSDR p. 77, Chapt. 5, Potential for Human Exposure, (1992)

Moreover, in setting a very restrictive total concentration treatment level for manganese in characteristic wastes, EPA ignores the wide variations in metal solubility which can occur in various compounds. Many compounds may contain manganese as an integral component yet exhibit extremely low bioavailability and solubility in the environment. In setting a total concentration standard EPA ignores this basic fact of chemistry. If a compound does not yield bioavailable manganese, the compound cannot be toxic as a result of manganese and EPA's risk model for manganese as applied to that low soluble compound cannot be correct.

Additionally, as noted in the ATSDR, many manganese compounds are readily adsorbed in many environmental media including natural salts, organic material and clays. As a result, these compounds remain immobile in the environment. The ATSDR states:

"In some cases, adsorption of manganese to soils may not be a readily reversible process. At low concentrations, manganese may be "fixed" by clays, and will not be released into solution readily (Reddy and Perkins 1976)." ATSDR p. 77.

With respect to manganese in the environment, EPA also fails to substantiate that manganese has ever represented a problem which requires additional regulation to solve. In short, EPA appears to have created a solution in search of a problem. For instance the ATSDR states with respect to manganese levels in the ambient environment that:

"These data indicate that concentrations [of manganese] in all areas have tended to decrease over the past three decades (EPA 1984a; Kleinman et al. 1980)." ATSDR p. 78, section 5.4.1

Manganese is also an important component of most foods. Levels may rise to as high as 4 parts per million in milk products, meats, fish and eggs. Infant formulas may contain up to 1000 parts per billion manganese. (ATSDR p. 80 section 5.4.4) We find no rationale in the Proposed Rule which would explain EPA's decision to set waste treatment levels at concentrations below those which are common in the food supply.

Response 7-2: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 7-3: With respect to the economic impact of the proposal to list manganese as a universal treatment constituent for characteristic wastes, the time allowed for comment on this Proposed Rule would not allow our members to complete such an analysis. It is clear however, that EPA has not even started to make a rational analysis of the impact of this proposal. EPA states that:

"EPA does not anticipate that waste volumes subject to treatment for F039 or characteristic wastes would significantly increase because waste generators already are required to comply with the treatment requirements for other metals that may be present in the wastes. The volumes of wastes for which additional treatment is needed solely due to the addition of manganese to the F039 and UTS lists are therefore expected to be very small." 65 FR 55771/3

This statement can only lead the reader to conclude that EPA has not investigated likely consequences of this proposal on business. Indeed, EPA has no actual knowledge of the waste quantities or treatment requirements impacted as a result of the Proposed Rule.

Response 7-3: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 7-4: Therefore, we request that EPA withdraw its designation of manganese as a hazardous waste constituent.

Response 7-4: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

**Comment ICMP-00008, Kerr-McGee**

Comment 8-1: Kerr-McGee Chemical LLC ("Kerr-McGee") hereby submits these supplemental comments to its separately submitted comments on Detection of CDDs and CDFs and Possible Re-assessment of Bevill Exemption Status.

In those comments, Kerr-McGee objected for various technical reasons to EPA's use of sampling data for CDDs and CDFs with respect to titanium dioxide production from the chloride process. In order to be able to investigate and comment upon this subject further, KerrMcGee requested in writing from EPA that the agency provide the chain-of-custody report for the CDD/CDF sample and field blank for Kerr-McGee's Hamilton, Mississippi plant. As of today's date marking the close of the comment period. EPA has not provided this report to Kerr-McGee, nor has it been placed in the administrative record. Kerr-McGee believes that the unavailability of this report constitutes a further reason, in addition to those cited in its other comments, why EPA should not use these data in any way.

Response 8-1: Kerr McGee received the chain-of-custody sheets on November 13, 2000, for the samples and field blank collected at its Hamilton, Mississippi plant for the CDD/CDF analysis. See Kerr McGee's Comment ICMP-L0002. The chain-of-custody sheets have been added to the revised Sampling and Analysis Data Report for Kerr McGee which is available in the docket for today's rule.

Comment 8-2: Summary of Comments

EPA correctly proposes not to list any wastes from the titanium dioxide chloride process as hazardous wastes.

EPA incorrectly describes the manufacturing process employed in titanium dioxide chloride process. EPA incorrectly refers to recycled vanadium-containing material as a waste. In addition, EPA improperly assesses Bevill-exempt vanadium-containing waste for hazardous waste listing purposes.

Response 8-2: EPA acknowledges Kerr McGee's support for the rule. See our response to comment 22-3.

Comment 8-3: EPA Proposed Listing Decision

Kerr-McGee supports EPA's proposal not to list as hazardous wastes any of the wastes from the titanium dioxide chloride process. Kerr-McGee agrees with EPA's determination that hazardous waste listing is not warranted for these wastes.

Response 8-3: EPA acknowledges Kerr McGee's support for the rule.

Comment 8-4: Corrections Regarding the Titanium Dioxide Chloride Process and Wastes

Kerr-McGee owns and operates two titanium dioxide chloride process plants. One is located in Hamilton, Mississippi, and the other, which Kerr-McGee acquired from Kemira, is located in Savannah, Georgia. Based on its knowledge of these plants and its reading of the Proposal and Background Document, in light of EPA's April 1998 Final Technical Background Document: Identification and Description of Mineral Processing Section and Waste Stream (the "Identification Document")<sup>4</sup>, Kerr-McGee requests that EPA correct a few errors in how the process and wastes are described. These corrections do not affect EPA's ultimate determination not to list any chloride process wastes as hazardous wastes.

#### Comment 8-4a: Vanadium Waste

In the Proposal, EPA describes and assesses "vanadium waste" from the chloride process.<sup>5</sup> 65 FR 55748-50. The Proposal describes vanadium oxychloride as a volatile metal compound that exits the chlorination as "overhead vapor" in the gaseous product stream. It describes the removal of vanadium compounds in the purification process by complexing with mineral oil and reducing with hydrogen sulfide or by complexing with copper. It also describes vanadium waste as being returned to the reaction area for  $TiCl_4$  recovery with remaining vanadium wastes incorporated in solids streams. A somewhat similar description of what is called "vanadium sludge" appears in the Background Document on pages 6 and 70. The 1998 Identification Document describes the removal of "spent vanadium oxychloride" on page 676, and the process flow diagram on page 669 shows the removal of vanadium oxychloride from a step called "chemical treatment" and going to some unidentified location. No process flow diagram appears in the Background Document. The Proposal, Background Document and Identification Document all refer to this vanadium stream as a waste, and the Proposal assesses whether to list it as a hazardous waste.

EPA's chloride process description with respect to vanadium in these three documents is erroneous and needs to be corrected by EPA. EPA has incorrectly described material which is being recycled as a waste and has incorrectly assessed for hazardous waste listing purposes vanadium-containing wastes which are within the Bevill exemption, and therefore not subject to a hazardous waste listing determination.

Contrary to what the Proposal, the Background Document and the Identification Document indicate, there is no separate vanadium waste stream in the chloride process. The Background Document contains no sample of this waste stream for the chloride process

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<sup>4</sup>The Identification Document was prepared in connection with EPA's Phase IV Land Disposal Restrictions, 63 FR 28555 (May 26, 1998).

<sup>5</sup>EPA also describes and assesses vanadium waste from the chloride-ilmenite process. Kerr-McGee makes no comment on that process.

because no such waste exists.<sup>6</sup> Like other metal chlorides, vanadium oxychlorides are removed from the chloride process via the cyclone.<sup>7</sup> As illustrated by the attached chloride process flow diagram, vanadium oxychlorides are a part of the stream that is recycled from TiCl<sub>4</sub> purification to TiCl<sub>4</sub> condensation for the further recovery of titanium values.<sup>8</sup> This is a closed, internal recycle stream, and it is not a waste.

As the process flow diagram further illustrates, vanadium oxychlorides are also present in the "crude liquid TiCl<sub>4</sub>" recycle stream that goes from TiCl<sub>4</sub> condensation to the crossover. This recycle stream has two functions. First, it cools the gaseous product stream from the reactor allowing unreacted solids to be removed from the product stream in the cyclone that exists between the cross-over and TiCl<sub>4</sub> condensation.<sup>9</sup> Second, it allows for the further recovery of titanium values. The crude liquid TiCl<sub>4</sub> stream is also an internal, closed recycle stream, and not a waste.

Notwithstanding the incorrect depiction of the vanadium waste stream in the 1998 Identification Document, there is no separate vanadium waste stream, and vanadium-containing solids exiting the cyclone have always been part of the Bevill exempt chloride process solids from titanium tetrachloride production. The inclusion of vanadium-containing wastes within this Bevill exemption is demonstrated graphically and perhaps most clearly by Exhibit 13-2 in EPA's July 1990 Report to Congress on Special Wastes from Mineral Processing, a copy of which is attached hereto. This drawing shows that waste solids from chlorination/purification of titanium bearing ores to produce titanium tetrachloride is special mineral processing (Bevill) waste.

The application of the Bevill exemption to vanadium-containing waste is also confirmed by the fact that it is generated during titanium tetrachloride production. As noted in the Proposal, the Bevill exemption applies to chloride process solids from the production of titanium tetrachloride. 65 FR 55750-51. Indeed, EPA has drawn a bright line between the Bevill-exempt solids from titanium tetrachloride production and the non-exempt solids

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<sup>6</sup>The Background Document refers to a vanadium sludge generated at the Hamilton plant. Kerr-McGee knows of no such waste stream.

<sup>7</sup>These wastes are part of what is referred to as "chlorinator solids" (RIN 6) and (RIN 3) in Table 3.34 of the Background Document.

<sup>8</sup>Because vanadium oxychlorides and TiCl<sub>4</sub> have similar boiling points, mineral oil is used to concentrate vanadium oxychlorides because these compounds are more soluble than TiCl<sub>4</sub> in this medium.

<sup>9</sup>EPA's process descriptions repeatedly omit this cyclone which remove the non-volatile metal chlorides and unreacted coke and ore from the gaseous product stream as described in the Proposal. 65 FR 55748.



generated after titanium tetrachloride is produced as a saleable mineral product. See 65 FR 55750, quoting 54 FR 366211. Hence, as a titanium tetrachloride production waste, vanadium-containing waste is Bevill-exempt.

While EPA has indicated that vanadium wastes are not Bevill-exempt in the Proposal and the Background Document, that indication appears to be based on an erroneous process description appearing in the Identification Document which has carried over into these two documents. This error should be corrected,<sup>10</sup> but it does not effect a narrowing of the Bevill exemption, because EPA emphasized in the current rulemaking as in the Land Disposal Restriction Phase IV rulemaking that it is not intending to modify the scope of the Bevill exemption via these rulemakings or the support documents. See 65 FR 55688 ("We emphasize that we are not reopening any Bevill decisions made in earlier actions regarding the Bevill exemption.") and 63 FR 28584. Furthermore, EPA has noted that the Identification Document provides guidance but is not legally binding. 63 FR 28593.

It was erroneous for EPA to have assessed vanadium-containing wastes for hazardous waste listing purposes. As EPA notes in the preamble to the Proposal, the consent decree does not require the agency to make listing determinations for Bevill exempt wastes, and EPA does not intend to do so in this rulemaking. 65 FR 55689. Because EPA assessed vanadium wastes from the chloride process, it should make clear in the preamble to the final rule that this was an error so as to nullify an erroneous interpretation that these vanadium wastes are not Bevill-exempt.

[see original comment for 2 flow diagrams.]

Response 8-4a: As described further in response to comments 8-2 and 22-3, we acknowledge our erroneous description of the vanadium stream and are no longer extending the scope of the listing to incorporate solids associated with this stream. The 1998 Identification Document will be edited to reflect the change in technical understanding of the titanium tetrachloride process.

#### Comment 8-4b: Manganese Wastes

EPA incorrectly states that at the Hamilton plant wastes from manganese production are commingled with wastes from sodium chlorate and titanium dioxide production. *Sampling and Analytical Data Report for Record Sampling and Characterization of Wastes from The Inorganic Titanium Dioxide Manufacturing Sector, Kerr-McGee Corporation, Hamilton, Plant page 5.* At the Hamilton plant, separate waste treatment systems exist for manganese production from those for sodium chlorate and titanium dioxide production. This confusion

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<sup>10</sup>In the Proposal EPA makes a helpful clarification as to Bevill exemption coverage of solids in gases from the chlorinator in addition to solids removed by the cyclone. See 65 FR 55750-51.

does not affect EPA's decision not to list these wastes. As EPA notes in the Proposal, the constituents of these waste streams were addressed in the risk assessments conducted for either titanium dioxide or for sodium chlorate. See 65 FR 55736 (noting that constituents in commingled waste streams not assessed for the listing of sodium chlorate wastes were assessed for titanium dioxide wastes).

Response 8-4b: EPA acknowledges the error we made in the Sampling and Analytical Data Report for Record Sampling and Characterization of Wastes from the Inorganic Titanium Dioxide Manufacturing Sector, Kerr-McGee Corporation, Hamilton, Plant page 5. As Kerr McGee indicated, the error did not affect our decision not to list the wastes. We corrected the error and placed a revised document in the docket for the rulemaking. Four other places, the preamble sections III. F. 11. d. (1) and (5) (65 FR 55734 and 55738) and pages 16 and 33 of "the sodium chlorate listing background document for the inorganic chemical listing determination," where we describe Kerr McGee's sodium chlorate production and wastes were also examined and we found no such error.

Comment 8-5: Kerr-McGee Chemical, LLC, ("Kerr-McGee") submits these comments on EPA's proposed rule published at 65 FR 55683 (September 14, 2000) ("the Proposal"). These comments object to EPA's use of manganese in the risk assessments underlying the proposed hazardous waste listings, the proposed K178 treatment standard and proposed universal treatment standard for manganese and the proposed addition of manganese to Appendices VII and VIII. Kerr-McGee is also submitting separate comments that address other aspects of the Proposal. The Ferroalloy Association (TFA) also plans comments regarding manganese and TFA's comments are hereby incorporated by reference.

Response 8-5: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 8-6: The IRIS Oral Reference Dose for Manganese Should Not Be Used in this Rulemaking

The risk assessment performed by the EPA in the document titled Risk Assessment for the Listing Determinations for Inorganic Chemical Manufacturing Wastes: Background Document (USEPA, 2000), utilized the oral reference dose (RfD) published for manganese in the Integrated Risk Information System (IRIS) database. The IRIS RfD is 0.047 mg/kg-day, which is reached by applying a modifying factor of three to a dose of 0.14 mg/kg-day is not scientifically supportable, overly conservative and should not be used in this rulemaking. The Oral RfD documentation was completed during the first half of 1995 and contains no references subsequent to 1994. Some significant references published before 1994 that address concerns expressed in the RfD documentation were omitted from that document.

The Oral RfD value of 0.14 mg/kg-day for the intake of food is based on a reported no observable adverse effects level (NOAEL) of 10 mg/day. The selection of 10 mg/day as the NOAEL appears to be based on three studies of dietary intake for manganese. In a 1989 report, the Food and Nutrition Board of the National Research Council (NRC) determined an "estimated safe and adequate daily dietary intake" (ESADDI) for manganese to be 2 to 5 mg/day. A 1987 study by nutritionists Freeland-Graves et al. suggested a range of 3.5 to 7 mg/day based on human health studies. The third study published by the World Health Organization (WHO) in 1973 reported the average daily consumption of manganese to range from 2 to 8.8 mg/day. In this report the WHO concluded that an intake of 8 to 9 mg/day is "perfectly safe".

In a 1996 document, the WHO reported updated dietary intakes for manganese. In that report the intake range was given as 2 to 20 mg/day. The WHO concluded: "The intake of manganese can be as high as 20 mg/day without apparent ill effects" (WHO, 1996). The NRC is currently reviewing dietary reference intakes for various micronutrients including manganese. As part of this review, the NRC plans to determine "tolerable upper intake levels" for each nutrient.

The EPA's selection of 10 mg/day as a "NOAEL" appears to be based on the upper end of dietary intake guidelines rather than being based on an intake that is actually safe for human consumption with no observable adverse effects. Based on the more recent data published in the WHO report and the ongoing review by NRC, a NOAEL of 20 mg/day is a more reasonable intake rate on which to base the RfD.

Important studies subsequent to 1994 (also ignored in the 2000 risk assessment) have been reported that mitigate the need for a modifying factor. As justification for this modifying factor of 3, in the 5/1 /1996 Reference Dose for Chronic oral exposure to manganese, the EPA cited four concerns:

1. "There is some evidence of increased uptake of manganese in water by fasted individuals"  
The oral reference dose for manganese is based on chronic human consumption. This suggestive evidence cited by EPA is more indicative of the lack of competing cations ( $\text{Ca}^{+2}$ ,  $\text{Fe}^{+2}$ ) in the fasting state than of a different chemical form of manganese. At any rate, it is highly unlikely that a significant portion of any individual's drinking water is consumed in the fasting state (either adults or infants) and therefore this concern over increased uptake of manganese by fasted individuals irrelevant for a lifetime oral exposure, which is the basis of the risk assessment.
2. "The study by Kondakis et al 1989 raised the possibility of adverse health effects associated with lifetime consumption of drinking water containing about 2 mg/L of manganese."

Vieregge et al, 1995<sup>11</sup> reported an ecological cross sectional study of 41 adults with chronic exposure to manganese in their drinking water at up to 2.16 mg/L compared with 74 control subjects with less than 0.05 mg/L manganese. In addition to standard questionnaires, neurological examinations and blood tests, Vieregge et al used instrumental testing including tests for hand tremor and rapidity of motion. No clinical, sub-clinical or subjective differences attributable to manganese were observed in this important study. This study used more sensitive tests and did not confirm the Kondakis et al 1989 study (which found subjective differences (questionnaire) and hair manganese concentration differences attributed to manganese but did not perform any sensitive instrumental testing for sub-clinical movement disturbances). EPA failed to consider the Vieregge et al study, which discounts this concern raised by EPA, in the 1995 RfD documentation or the 2000 risk assessment.

3. "Although toxicity has not been demonstrated, there is concern for infants fed formula that typically has a much higher concentration of manganese than does human milk. If powdered formula is made with drinking water, the manganese in the water would represent an additional source of intake."

Stastny et al 1984<sup>12</sup> demonstrated that, although infant formulas contained significantly higher manganese levels than human milk, there were no difference in blood levels manganese levels among infants fed formula compared with breast fed infants. Lonnerdal 1985<sup>13</sup>, 1989<sup>14</sup> reported that relative manganese absorption from breast milk is much higher than from infant formulas. This was explained by the presence of lactoferrin in human milk which may facilitate iron and manganese uptake. High concentrations of casein in cow's milk and cow's milk formulas limit trace element absorption and the presence of phytate in soy formula limits absorption of trace elements.

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<sup>11</sup> Long term exposure to manganese in rural well water has no neurological effects. Vieregge P, Heinzow B, Korf G, Teichert HM, Schleifenbaum P, Mosinger HU. Can J Neurol Sci 1995 Nov; 22(4):286-9.

<sup>12</sup> Manganese intake and serum manganese concentration of human milk-fed and formula-fed infants. Stastny D, Vogel RS, Picciano MF : Am J Clin Nutr 1984 Jun; 39(6):872-8.

<sup>13</sup> Dietary factors affecting trace element bioavailability from human milk, cow's milk and infant formulas. Lonnerdal B. Prog Food Nutr Sci. 1985; 9(1-2):35-62.

<sup>14</sup> Trace element absorption in infants as a foundation to setting upper limits for trace elements in infant formulas. Lonnerdal B J Nutr. 1989 Dec; 119(12 Suppl):1839-44.

Cow-milk formulas currently contain 30-75 ug/L manganese and soy formulas contain 100-300 ug/L down from the 300-1,400 ug/L concentrations a few years ago (Lonnerdal 1997<sup>15</sup>). Soy protein isolate formulas still contain 1.5% phytates and all soy-based formulas and are now, iron-fortified (American Academy of Pediatrics 1998<sup>16</sup>). Both the phytate and iron in soy based formulas inhibit manganese absorption. These studies and the absence of any reports in the literature of neonatal manganese toxicity attributable to infant formula or water demonstrate that this concern expressed by EPA is not scientifically supported.

4. "There is some evidence that neonates absorb more manganese from the gastrointestinal tract, that neonates are less able to excrete absorbed manganese, and that in the neonate the absorbed manganese more easily passes the blood-brain barrier"

Although EPA does not cite a reference for this statement, it appears to be largely based on radioactive tracer studies conducted in the 1970's on rodents. Fechter 1999<sup>17</sup> concludes that more recent "data show that the neonatal rodent is significantly more effective in eliminating manganese than previously believed based on tracer studies".

Manganese is known to be essential for normal skeletal development. Recent studies indicate that significant physiological responses occur during pregnancy and lactation to help assure adequate manganese for the infant. Stastny et al 1984 demonstrated that mean human milk concentrations decreased with progression of lactation from 6.6 ug/L during the first month to 3.5 ug/L by the third month.

Wilson et al 1992<sup>18</sup> studied 40 very low birth weight infants. Plasma manganese levels were determined at birth and then serially to 3 months of

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<sup>15</sup>Effects of milk and milk components on calcium magnesium, and trace element absorption during infancy. Lonnerdal B : *Physiol Rev* 1997 Jul; 77(3):643-69.

<sup>16</sup>Soy Protein-based Formulas: Recommendations for Use in Infant Feeding American Academy of Pediatrics- Committee on Nutrition. *Pediatrics* Vol. 101 No. 1 January 1998, pp. 148-153.

<sup>17</sup>Distribution of Manganese in Development. Fechter LD, *NeuroToxicology*. 1999 20(2-3): 197-202

<sup>18</sup>Plasma manganese levels in the very low birth weight infant are high in early life. Wilson DC, Tubman TR, Halliday HL, McMaster D. *Biol Neonate* 1992; 61(1):42-6.

age. Mean plasma manganese concentration was 3.6 ug/L at birth and 3.0 ug/L at 3 months of age. These levels were approximately 3-fold greater than those of a group of 9 adults analyzed using the same methods (mean 1.1 ug/l Manganese was also measured in parenteral nutrition fluids, breast milk and 3 pre-term formulas. There was no relationship between manganese intake and plasma manganese concentration.

Spencer 1999<sup>19</sup> demonstrated that maternal whole blood manganese levels increase throughout pregnancy and are approximately 3-fold higher in the neonate. Krachler et al 1999<sup>20</sup> demonstrated that manganese was 150% higher in cord blood than in maternal blood and that manganese concentrations in colostrum were twice that in maternal serum.

Kawamura et al in 1941 reported the only epidemiological study describing toxicological responses in humans consuming large amounts of manganese dissolved in drinking water. Twenty five cases of classical manganese poisoning were described with symptoms including lethargy, increased muscle tonus, tremor and mental disturbances. The most severe symptoms were observed in elderly people, while children appeared to be unaffected.

These findings confirm a physiological concentrating effect of manganese throughout pregnancy and more dramatically so in the neonate indicating a vital role in fetal development. There are no reports in the literature of neonatal manganese toxicity or of pediatric manganese toxicity in the absence of total parenteral nutrition or biliary atresia. Available human evidence suggests that the very young are the least susceptible population for manganese neurotoxicity and that this concern by EPA is not well-founded.

In adopting these modifying factors, EPA failed to take into account the fact that manganese is essential for normal physiological functioning and that disease states are associated with both deficiencies and toxicity. Applying conservative modifying factors to prevent any possibility of toxicity magnifies the risk of deficiency. Conflicting standards of this sort lead to either alarm and/or cynicism among the public and scientists.<sup>21</sup> Obviously, there should not be overlap between public policy decisions for toxic clean up efforts and food fortification.

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<sup>19</sup>Whole Blood Manganese Levels in Pregnancy and the Neonate. Spencer A. Nutrition 1999 Oct; 15(10):731-4

<sup>20</sup>Trace Element Transfer from the mother to the newborn-investigations on triplets of colostrum, maternal and umbilical cord sera. Krachler M, Rossipal E, Micetic-Turk D Eur J Clin Nutr 1999 Jun; 53(6):486-94.

<sup>21</sup>Dietary Standards for Manganese: Overlap between Nutritional and Toxicological Studies. Greger JL. J. Nutrition 1998; 128(2): 368S-371S.

An additional reason for not using the RfD based on the modification factor applied by EPA in 1995 is that this modification factor and RfD have not been peer-reviewed. In 1996, EPA instituted a Pilot Program to adopt or update IRIS databases, which was originally applied to 11 chemicals, 64 FR 14570 (April 12, 1996). This Pilot Program added external peer review to the IRIS database development process. The process also consisted of internal peer review and limited public involvement.

A recent EPA report has confirmed that the quality of information was improved in the IRIS assessments done during and after the 1996 Pilot Program as compared to those done before.<sup>22</sup> This report was required by HR 106-379 directing EPA to study the extent to which IRIS assessments “document the range of uncertainty and variability of data” because Congress was “concerned about the accuracy of information” contained in IRIS. This report also emphasized the need to update older assessments with more recent scientific data and risk assessment methods.

Response 8-6: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today’s final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 8-7: Comments on Sodium Chlorate Manufacturing Waste Descriptions and Listing Proposals

Kerr-McGee Chemical, LLC, (“Kerr-McGee”) submits these comments on EPA’s proposed rule published at 65 FR 55683 (September 14, 2000) (“the Proposal”). Kerr McGee supports EPA’s proposal not to list wastes from the sodium chlorate production process as hazardous wastes. EPA incorrectly states that at the Hamilton plant wastes from manganese production are commingled with wastes from sodium chlorate and titanium dioxide production. *Sampling and Analytical Data Report for Record Sampling and Characterization of Wastes from The Inorganic Titanium Dioxide Manufacturing Sector, Kerr-McGee Corporation, Hamilton, Plant page 5.* At the Hamilton plant, separate waste treatment systems exist for manganese production from those for sodium chlorate and titanium dioxide production. This confusion does not effect EPA’s decision not to list these wastes. As EPA notes in the Proposal, the constituents of these waste streams were addressed in the risk assessments conducted for either titanium dioxide or for sodium chlorate. See 65 FR 55736 (noting that constituents in commingled waste streams not assessed by the listing of sodium chlorate wastes were assessed for titanium dioxide wastes). Kerr-McGee is submitting separate comments addressing other aspects of the Proposal.

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<sup>22</sup>Characterization of Data Uncertainty and Variability in IRIS Assessments: Pre-Pilot vs. Pilot/Post-Pilot, July 28, 2000 NCEA - U.S. EPA Contract No. 68-C-99-238 Task Order No.2.

Response 8-7: See our response to comment 8-4b.

Comment 8-8: Comments on Detection of CDDs and CDFs and Possible Re-assessment of Bevill Exemption Status

Introduction: Kerr-McGee Chemical, LLC, ("Kerr-McGee") submits these comments on EPA's proposed rule published at 65 FR 55683 (September 14, 2000). These comments object to EPA's use of sampling data for CDDs and CDFs in its assessment of hazardous waste listings and as a basis for a possible reconsideration of the Bevill status for chloride process waste solids from titanium tetrachloride production, 40 CFR 261.4(b)(7)(ii)(S).

Comment 8-8a: There Is No Basis for EPA to Reconsider the Bevill Exemption for Chloride Waste Solids from Titanium Tetrachloride Production

EPA states in the Proposal that it is considering whether to re-assess the Bevill-exempt status of chloride waste solids from titanium tetrachloride production because the Agency found measurable levels of dibenzo-p-dioxins (CDDs) and dibenzo-p-furans (CDFs) in chloride process wastes and because these compounds were not assessed as part of the rulemakings which established the mineral processing exemptions. 65 FR 55751. Although EPA states that it is only "considering" such a re-assessment and although EPA has promised that any reassessment would involve a separate analysis and opportunity for notice and comment, Kerr McGee believes that it is improper for data to suggest that any such reassessment might be warranted based on the data collected and its theories of CDD and CDF formation in chlorinators.

Response 8-8a: The Agency's final Bevill rule (56 FR 27312) promulgated on July 13, 1991 stated that, "If EPA finds that this exemption is not protective of human health and the environment and if an examination of titanium tetrachloride waste management shows any continuing or new problems, the Agency will reconsider this subtitle D determination for chloride process waste solids from titanium tetrachloride production." The Agency has uncovered new information regarding CDDs and CDFs in these waste solids. The Agency will not take any further action as part of this rule regarding a reevaluation of the Bevill status of chloride process waste solids from titanium tetrachloride. EPA will provide notice and opportunity to comment prior to taking any action that would affect the current exemption for these titanium tetrachloride wastes.

Comment 8-8b: The data which EPA refers to are summarized in the Titanium Dioxide Listing Background Document for the Inorganic Chemical Listing Determination ("the Background Document"). Chloride process waste sampling data are reported in the Sampling and Analytical Data Report for Record Sampling and Characterization of Wastes from the Inorganic Sodium Chlorate and Titanium Dioxide Manufacturing Sectors; Kerr-McGee Corporation, Hamilton, Mississippi -- USEPA, August 10, 1999 ("*Hamilton Data Report*") and in *Sampling and Analytical Data Report for Record Sampling and Characterization of Wastes from the Inorganic Sodium Chlorate and Titanium Dioxide*



*Manufacturing Sectors; Kemira Pigments, Inc., Savannah, Georgia -USEPA, September 9, 1999 ("Savannah Data Report").* The CDD and CDF data in these reports are not valid and cannot be relied upon by EPA.

The Hamilton Data Report indicates that the purpose of the sampling visit was to sample sodium chlorate wastes and that the sampling team discovered the opportunity to sample titanium dioxide wastes only after their arrival. See page 5. CDD/CDF analysis on the Hamilton samples was conducted three months after the sampling event, on "left over" samples, at a laboratory approximately 2,000 miles from the original lab. Samples were initially sent to APPL, Inc. in Fresno, California. The samples were then forwarded to Pace Labs in Minneapolis. *Page 60.* In contrast, Savannah Dioxin samples arrived at Pace Labs the day after being taken at the plant.

The dioxin samples were analyzed outside of the holding time interval specified in the Quality Assurance Project Plan and the results were classified as not "Compliant" by Pace Labs. *Hamilton Sampling Report, page 38.*

The solid samples for the Savannah plant were analyzed for leachable CDD/CDF three months after sampling. This period is outside of the sampling plan's time interval. See *Savannah Data Report, page 47.*

Response 8-8b: EPA is not taking any action today based on these analytical results and does not need to establish their validity at this time. Nonetheless, EPA has concluded that the holding time has not adversely affected the analysis. The holding times specified in our Quality Assurance Project Plan (QAPP) for extraction and analysis of PCDD and PCDF were based on the required holding times listed in Table 2-34 of December 1996 Version of the Third Edition of SW-846, as updated by Updates I, II, IIA, IIB, III and IIIA. SW-846 is the EPA methods manual, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," which contains EPA-approved sampling and analysis methods for use under the RCRA Program.

PCDD and PCDF are very stable in a variety of matrices and will not degrade easily in the environment. EPA has recently removed the holding times for extraction (or leaching) and analysis of PCDD and PCDF. We no longer have a holding time requirement for the analysis of PCDD and PCDF. See Table 2-40 of Draft Update IVB to the Third Edition of SW-846 for the revision. A recent Federal Register notice (65 FR 70678, November 27, 2000) announced the availability of Draft Update IVB.

Dioxin samples collected from Kerr-McGee's Hamilton and Savannah facilities were extracted (or leached) and analyzed for PCDD/PCDF outside the holding times stipulated in the QAPP. Results of that sample were, therefore, classified as not "Compliant" by Pace Labs. As explained earlier, we no longer have a holding time requirement of the analysis because PCDD and PCDF are quite stable and will not degrade easily in the environment. We believe the PCDD and PCDF data in the Hamilton Data Report and in the Savannah Data Report are valid and can be relied upon by EPA. Even if PCDD/PCDF were degraded because the analysis was performed outside

the holding time, we would have under-estimated, not over-estimated, the PCDD/PCDF levels in Kerr McGee samples.

Furthermore, analysis of waste samples collected from other titanium dioxide producers also confirms the presence of PCDD/PCDF in wastes generated from manufacturing of titanium dioxide.

Comment 8-8c: Reconsideration of the Bevill status for an industry is a major policy decision, one that should certainly not be made in reliance upon invalid sampling data, as EPA has done here. Moreover, significance of any valid CDD/CDF sampling data must be carefully evaluated in light of other factors. Surely one such factor is the relationship of any reported values to background levels caused by their sources. For example, the Hamilton plant is in the center of what has been a vast cotton growing area in Mississippi for scores of years. Given the widespread use of CDD/CDF in pesticides for crops, especially cotton, this factor must be assessed in any interpretation of CDD/CDF sampling data for waste solids or other media.

It would also be improper for EPA to initiate reconsideration of the Bevill exemption based upon the rather facile and alarmingly misleading theory of CDD/CDF formation in chlorinators that is expressed in the Background Document on pages 79 to 82. Citing a patent description, EPA states that the chloride-ilmenite process involves carbon, chlorine and heat, which it alternately refers to as "a number of conditions" and "critical conditions" for CDD/CDF formation that EPA has found in other processes. Uncritical readers of these statements may incorrectly assume that these conditions are all that is necessary for CDD/CDF formation and that if present, formation of these chemicals is inevitable. These assumptions, of course, are not true. Also, since EPA states that "the vast majority" but apparently not all of these processes involve these three conditions, one wonders how these conditions can be considered "critical" if CDD/CDF can be formed in their absence. This theory produced what EPA describes as its "expectation that dioxins and furans were likely to be formed during the chlorination process" which in turn may have produced, as the above comments point out, an overly eager willingness to accept the sampling data as confirmation of the this theory. *Background Document at 80*. In any event, a much more critical approach should have been taken by EPA in analyzing these data and in reaching conclusions based on these data.

Response 8-8c: The commenter provided no data demonstrating that dioxins and furans are not, in fact, present in their wastes, and no theory as to why dioxins would not form in their process, despite the known presence of chlorine, carbon (i.e., coke), and elevated temperatures. Further, the commenter did not discount the presence of CDDs and CDFs in other titanium dioxide manufacturers' wastes or explain why these compounds would not also be present in its wastes. Irrespective, we are not re-opening the Bevill determination for the currently exempt solids in this final rule, but simply are providing notice that we may in the future give notice that we are contemplating such an action.



## Comment ICMP-00009, American Chemistry Council - Titanium Dioxide Panel

### EXECUTIVE SUMMARY

The Titanium Dioxide Panel ("the Panel") of the American Chemistry Council submits these comments in response to the Environmental Protection Agency's (EPA's) proposed rule under the Resource Conservation and Recovery Act (RCRA) to list as hazardous certain wastes generated from inorganic chemical manufacturing processes. EPA also proposes not to list as hazardous various other process wastes (Federal Register: September 14, 2000, volume 65, Number 179, page 55683). Members of the Titanium Dioxide Panel include the following U.S. producers of titanium dioxide (TiO<sub>2</sub>): DuPont; Kerr-McGee Chemical LLC; Kronos Inc.; Millennium Chemicals Inc.; and, Huntsman-Tioxide Inc.

The Titanium Dioxide Panel makes the following points in its comments:

- The Panel supports comments of the American Chemistry Council, which have been provided to EPA in a separate submission.
- The Panel generally supports the tiered risk assessment methodology used for EPA's listing determinations, other than the assessment as it applies to manganese.
- The Panel supports the decision by EPA not to list the screened-out wastes.
- The Panel supports the full consideration of site-specific factors in risk assessment for either on-site or off-site management of materials that did not screen out in earlier evaluations.
- The Panel supports consideration of actual management practices by EPA in the final rule.
- The Panel supports EPA's recognition that many practices involving use or re-use materials from manufacturing operations would not present any significant risk of exposure and thus could appropriately be screened out of further consideration.
- The Panel supports EPA's conclusion that dioxins and furans should not be used as the basis for listings in this rulemaking.
- The Panel believes that EPA's discussion of the "Bevill" status of waste streams requires revision. The Panel recommends that for the final rule. EPA acknowledge that Bevill determinations often involve a detailed review of facility-specific practices and processes.

- The Panel supports EPA's decision to assess the potential need for listing of mixtures based solely on the non-exempt portion of the waste mixture.
- The Panel believes that materials that are not solid wastes are also not wastes for the purposes of evaluating the Bevill exempt status.
- The Panel believes that metal chlorides separated from the in-process titanium tetrachloride purification stream are mineral processing wastes, not chemical processing wastes.
- EPA mischaracterized vanadium-containing material from the chloride process. EPA needs to correct this and in the final rule acknowledge the "solid" status of the vanadium stream.
- EPA needs to correct another error and in the final rule acknowledge that the titanium tetra-chloride purification stream is an in-process stream, not a solid waste. Because the in-process titanium tetrachloride purification stream is used within an on-going and continuous process and never "disposed of," the stream is not within EPA's regulatory jurisdiction under Subtitle C of RCRA.
- The Panel supports the position that manganese should not be added to EPA's list of RCRA Appendix VIII Hazardous Constituents.

COMMENTS OF THE TITANIUM DIOXIDE PANEL  
ON THE PROPOSED INORGANIC CHEMICALS LISTING RULE

INTRODUCTION

The Titanium Dioxide Panel ("the Panel") of the American Chemistry Council submits these comments in response to the Environmental Protection Agency's (EPA's) proposed rule under the Resource Conservation and Recovery Act (RCRA) to list as hazardous certain wastes generated from inorganic chemical manufacturing processes. EPA also proposes not to list as hazardous various other process wastes (Federal Register, September 14, 2000, volume 65, Number 179). Members of the Titanium Dioxide Panel include the following U.S. producers of titanium dioxide (TiO<sub>2</sub>): DuPont; Kerr-McGee Chemical LLC; Kronos Inc.; Millennium Chemicals Inc.; and, Huntsman-Ti oxide Inc. In addition to their own specific comments, the Titanium Dioxide Panel supports the comments of the American Chemistry Council, which have been provided to EPA in a separate submission (letter dated November 13, 2000 to David Bussard of EPA from the American Chemistry Council).

Comment 9-1: THE PANEL GENERALLY SUPPORTS THE RISK ASSESSMENT METHODOLOGY USED FOR THE LISTING DETERMINATIONS, OTHER THAN THE ASSESSMENT AS IT APPLIES TO MANGANESE.

A. EPA Properly Used Screening as Part of its Risk Assessment Methodology.

As part of its risk assessment methodology, EPA used a tiered approach, by initially using a variety of screening methodologies rather than conduct full scale risk assessment modeling for all the waste streams under consideration. In so doing, EPA appropriately conserved its own resources and those of industry by using a set of conservative assumptions that adequately demonstrated that the wastes screened out would not pose any significant risk to human health and the environment. The Panel supports this tiered approach since it conserves time and resources while still establishing a sufficiently sound scientific basis for concluding that no further evaluation is warranted with respect to the screened-out wastes from the production of titanium dioxide. The Panel further supports the decision by the Agency not to list these screened-out wastes.

B. EPA Generally Considered Site-Specific Factors in Assessing Risk Posed.

EPA collected extensive data and supporting information from titanium dioxide (TiO<sub>2</sub>) producers in preparation for the proposal. For on-site practices, EPA generally made use of this information on current waste management practices and representative site-specific factors in assessing the risk of these practices where fuller assessment beyond screening was indicated. The Panel supports the full consideration of such site-specific factors in risk assessment for either on-site or off-site management of materials that did not screen out in earlier evaluations.

C. The Panel Supports the Consideration of Actual Practices.

EPA appropriately considered the use of specific current waste management units, *i.e.*, tanks or on-site landfills, at facilities. The Agency appropriately recognized that these facilities with these units are likely to continue use of these units rather than pursue use of less cost-effective alternatives (*i.e.*, off-site disposal at a third-party or municipal landfill). Hence, the Panel supports consideration of actual management practices by the Agency in the final rule.

Furthermore, the Panel supports the Agency's recognition that many practices involving use or re-use of materials from manufacturing operations would not present any significant risk of exposure and thus could appropriately be screened out of further consideration.

D. EPA Properly Decided Not To Use Dioxins and Furans as Appendix VII Constituents in this Rulemaking

The Panel supports EPA's conclusion that dioxins and furans should not be used as the basis for listing in this rulemaking. As EPA indicated, it has not undertaken a

sufficient evaluation of potential risk to support action on this issue in this rulemaking. Furthermore, in many instances, such action would have been outside the scope of the listing decisions required to be addressed under the consent decree.

Response 9-1: EPA acknowledges ACC's support of the rule.

Comment 9-2: EPA'S DISCUSSION OF THE "BEVILL" STATUS OF WASTE STREAMS REQUIRES REVISION

Comment 9-2a: Bevill Determinations Involve Detailed Review of Facility Practices.

The Panel concurs with EPA's statement in the preamble that the process of determining whether specific waste streams are Bevill-exempt is "not always simple." The Panel underscores the view that EPA should proceed cautiously in making generic statements on the Bevill status of waste streams based upon only a general assessment of the manufacturing and processing steps that generate a waste. The Panel recommends that EPA acknowledge in the final rule that these types of assessments often involve detailed review of facility-specific processes and operations and may be more appropriately made on that basis.

Response 9-2a: EPA agrees that Bevill opinions must take relevant site-specific information into account. Where appropriate, EPA has issued, and will continue to issue, opinions for categories of similar processes using site specific information to support this type of determination. In this rulemaking, the Agency evaluated site specific information as input into reaching Bevill opinions about a group of facilities using the same processes. For this rule, EPA has considered site-specific information submitted by affected facilities to ensure that its understanding of their processes and wastes was correct and to make warranted exceptions to categorical opinions.

Comment 9-2b: The Panel Supports EPA's Decision to Assess Potential Need for Listing of Mixtures Based Solely on the Non-Exempt Portion of the Mixture.

EPA appropriately fulfilled its obligations under consent decree with respect to mixtures of exempt and non-exempt wastes. The Panel supports the Agency's decision to assess risks and potential need for listing based only upon the nonexempt portion of such waste mixtures.

Response 9-2b: EPA acknowledges ACC's support of the rule.

Comment 9-2c: Materials that are Not "Solid Wastes" are also Not Wastes for the Purposes of Evaluating Bevill Exempt Status.

The Panel notes that EPA's decision not to evaluate its jurisdiction with respect to materials that are re-used or recycled in some way in light of the D.C. Circuit decision in Association of Battery Recyclers v. EPA necessarily has a negative impact on the accuracy of the Agency's assessment of the Bevill status of certain waste streams. Those manufacturing streams that

are outside the Agency's jurisdiction under the Battery Recyclers decision and hence not "solid wastes" also are not "solid wastes" for purposes of evaluating their status under the Bevill exemption.

Response 9-2c: The Bevill exclusion only applies to solid wastes. This position was originally stated in the first Bevill rule at 54 FR 36614 (September 1, 1989). The Agency has never changed this position. If we had determined that any materials were not "solid wastes" for listing purposes in this rulemaking, we also would have concluded that they were not "solid wastes" for Bevill exemption purposes. 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 this is the appropriate approach 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 listable risk. The decision not to move forward with further evaluation of a specific secondary material because we expect no listable risk does not imply that the material is or is not a solid waste, but rather, represents an efficient way for EPA to make a list/no-list decision and ensure we meet the requirements of the Consent Decree.

Comment 9-2d: Metal Chlorides Separated from the In-Process Titanium Tetrachloride Purification Stream are Mineral Processing Wastes, Not Chemical Processing Wastes.

The Agency has long maintained "that Congress did not intend the Bevill exclusion to extend to processing operations that are performed after (emphasis added) the production of a saleable mineral product." 54 FR 36620/1, September 1, 1989 (emphasis added). Similarly, the Agency has also maintained that it "considers titanium tetrachloride, produced during the titanium chloride process, to be a saleable [mineral] product; any processing subsequent (emphasis added) to its production is considered to be chemical processing." 54 FR 36620/1, September 1, 1989 (emphasis added).

The Agency reaffirms that it still maintains this position in its sector specific discussion of titanium dioxide in the proposed rule. "Mineral processing ends when titanium dioxide is produced in the oxidation unit. Further steps are chemical manufacturing. The Agency defines the beginning of oxidation as the beginning of chemical manufacturing because the facility is using a saleable mineral product, titanium tetrachloride, to produce titanium dioxide." 65 FR 55750, September 14, 2000.

The practice of introducing a treating agent just prior to distillation of crude liquid titanium tetrachloride, which is not yet a saleable mineral product, is to facilitate the most economical extraction of the intermediate product, titanium tetrachloride. For this reason, metal chlorides separated from the in-process titanium tetrachloride purification stream are clearly mineral processing wastes, NOT chemical processing wastes.

Response 9-2d: Chemical manufacturing, as defined in the September 1, 1989 Bevill rulemaking (54 FR 36592) does not necessarily begin with the introduction of a treating agent at the



distillation step. Solid wastes from the distillation step would be viewed by the Agency as mineral processing wastes if they are disposed. See also our response to comment 22-3a-6 (DuPont).

Comment 9-2e: EPA Mischaracterized Vanadium-Containing Material from the Chloride Process.

Comment 9-2e(1): The Vanadium Material is Physically Solid.

The vanadium material generated during distillation is a "solid" material. EPA errs factually with its statement that the vanadium waste stream is not "solid" and therefore cannot be Bevill exempt. EPA needs to correct this error in the final rule by acknowledging the "solid" status of the vanadium stream.

Response 9-2e(1): See response to Comment 22-3a-2.

Comment 9-2e(2): The Titanium Tetrachloride Purification Stream is an In-Process Stream, Not a Solid Waste.

The proposed rule incorrectly identifies the in-process titanium tetrachloride purification stream as a liquid "non-exempt vanadium waste." 65 FR 55760/5 (September 14, 2000). Rather, this stream is a valuable in-process material that is being further processed to maximize yield of the intermediate product, titanium tetrachloride. This is performed by continuously processing the stream within the same process that generates it. In fact, the in-process titanium tetrachloride purification stream is even more valuable than the crude gaseous titanium tetrachloride with which it is co-processed, as it contains significantly higher concentrations of titanium tetrachloride. This stream is not a solid waste, because it is never discarded.

Under RCRA, in order for a material to be considered a "solid waste," that material must first be a "discarded material." RCRA § 1004(27). Congress clearly and unambiguously used the term "discarded" in its ordinary sense to mean "disposed of," "thrown away" or "abandoned." Congress thus intended "to regulate under RCRA only materials that have truly been discarded." Consequently, materials are not "discarded" and are not "solid wastes" if they are "in-process materials employed in an ongoing manufacturing process" because they are not being "disposed of" "thrown away" or "abandoned." *American Mining Congress v. EPA*, 824 F.2d 1177, 1184, 1192 (D.C. Cir. 1987) (AMC I). The validity of this standard for determining when a material becomes a "solid waste" has again been recently confirmed by the D. C. Circuit in *Association of Battery Recyclers, Inc. v. EPA*, 208 F.3d 1047, 1056 (D.C. Cir. 2000).

Accordingly, the in-process titanium tetrachloride purification stream is not a "solid waste" as defined for purposes of the hazardous waste regulations. Rather, this material is

immediately used within an on-going and continuous process of manufacturing an intermediate product, purified titanium tetrachloride. It is never "disposed of," "thrown away," or "abandoned." In contrast, it is continuously processed in order to maximize the yield of titanium tetrachloride. Therefore, the in-process titanium tetrachloride purification stream is not within the EPA's regulatory jurisdiction under Subtitle C of RCRA.

Response 9-2e(2): See our response to comments 9-2d and 22-3a-2 (DuPont). We agree that vanadium solids when separated from ferric chloride waste acids are Bevill exempt solid wastes.

Comment 9-3: Manganese Should Not Be Added to EPA's List of RCRA Appendix VIII Hazardous Constituents.

#### Introduction

EPA is proposing (65 FR 55687, September 14, 2000) to add manganese to the list of hazardous constituents in Appendix VIII to 40 CFR 261.

Regarding criteria for addition to Appendix VIII, EPA at existing 40 CFR 261.11 states, "Substances will be listed on Appendix VIII only if they have been shown in scientific studies to have toxic, carcinogenic, mutagenic, or teratogenic effects on humans or other life forms."

Comment 9-3a: Manganese is an Essential Mineral.

Greger (NeuroToxicology, 1999) quotes other references stating that manganese is an essential element.

According to the 1999 edition of the most widely used basic nutrition college text in the United States, Understanding Nutrition by Whitney and Rolfes:

The human body contains a tiny 20 milligrams of manganese, mostly in bones and metabolically active organs such as the liver, kidneys, and pancreas. Manganese acts as a cofactor for many enzymes that facilitates dozens of different metabolic processes. For example, manganese metalloenzymes assist in urea synthesis, the conversion of pyruvate to a TCA cycle compound, and the prevention of lipid peroxidation by free radicals.

The Food and Nutrition Board of the National Research Council (Recommended Daily Allowances, 10th edition, 1989) has established an estimated safe and adequate daily dietary intake for manganese to foster adequate dietary consumption of this essential trace element.

Response 9-3a: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's

final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 9-3b: EPA Has Not Demonstrated via Scientific Studies that Manganese has Toxic, Carcinogenic, Mutagenic, or Teratogenic Effects on Humans When Ingested in Drinking Water and Therefore Has Not Shown that Manganese Warrants Addition to Appendix VIII.

EPA has compiled an extensive health assessment in support of inhalation hazard in the 1996 Integrated Risk Information System (IRIS) substance file for manganese used as the basis for the addition to Appendix VIII in the proposed rulemaking. The inhalation hazard described by EPA and Agency of Toxic Substances and Disease Registry (ATSDR) is already addressed via the inclusion of manganese as a Hazardous Air Pollutant under the Clean Air Act.

However, neither the IRIS substance profile nor the ATSDR draft Toxicological Profile for Manganese (September 1997) establishes a conclusive link between manganese in drinking water ingestion and toxicity to humans.

One reason for the apparent lack of manganese toxicity to humans via oral ingestion is that iron and calcium in the diet or in dietary supplements limit manganese absorption (Whitney and Rolfes, 1999). Greger (NeuroToxicology, 1999) elaborates, "... the body is protected against manganese toxicity by low absorption and/or rapid presystemic elimination of manganese by the liver but not the kidneys."

The IRIS substance file (page 6 of 37) refers to a 1941 report by Kawamura et al. (Kitasato Arch. Exon. Med 1 S: 145-169) as "the only epidemiologic study describing toxicologic responses in humans consuming large amounts of manganese dissolved in drinking water." Velazquez and Ru (in Risk Assessment of Essential Elements, Mertz, 1994) review the Kawamura paper and note that the "concentration of manganese at the time of exposure was probably at least 28 mg Mn/L" and further that "the total intake was at least 58 mg Mn/day." Referring to the study by Kawamura, ATSDR states, "Thus, while there is no doubt these people were exposed to manganese, there is considerable doubt that all of the features of this outbreak (particularly the deaths) were due to manganese alone." (p. 45)

The IRIS substance file also discusses neurological effects suggested to be related to chronic intake of drinking water containing 1.8 to 2.3 mg/L of manganese in northwest Greece (p. 4 of 37). ATSDR (p. 47) reviews the same study by Kondakis et al (Arch. Environ. Health, 1959) and concludes, "Thus, this study supports but does not prove that chronic oral intake of manganese can lead to neurological changes in humans."

Furthermore, Vieregge et al. (Cart. .I. Neurol. Sci., 1995) directly contradict the Kondakis study by demonstrating that long term exposure to rural well water containing 0.3 to 2.16 mg/L has no neurological effects.

The International Programme on Chemical Safety of the World Health Organization (Concise International Chemical Assessment document on Manganese and its Compounds, 1999) sums up the overall situation stating, "The available evidence for adverse effects associated with chronic ingestion of excess manganese is suggestive but inconclusive."

Response 9-3b: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

## CONCLUSION

The Titanium Dioxide Panel of the American Chemistry Council is pleased to submit these comments to EPA regarding the inorganic chemicals listing rule. Should the Agency have any questions regarding these comments, please contact Jonathon T. Busch, Manager of the Titanium Dioxide Panel (703/741-5633).

## Comment ICMP-00010, Association of Battery Recyclers

### Introduction

The Association of Battery Recyclers ("ABR") appreciates the opportunity to provide comments on the U.S. Environmental Protection Agency's ("EPA's") Proposed Rule titled "Hazardous Waste Management System; Identification and Listing of Hazardous Waste: Inorganic Chemical Manufacturing Wastes; Land Disposal Restrictions for Newly Identified Wastes; and CERCLA Hazardous Substances Designation and Reportable Quantities," which was published at 65 FR 55684 (Sept. 14, 2000) (the "Proposed Rule").

ABR is a national trade association that has represented the lead recycling industry for more than twenty-five years. Members of the ABR include battery manufacturers, lead chemical manufacturers, secondary lead smelters, and consultants and vendors to the lead recycling industry. The battery recycling industry members of the ABR collectively represent approximately 85% of the lead recycling capacity currently available in the United States.

ABR's comments on the Proposed Rule are limited to two issues: 1) the inadequate and misleading notice concerning the potentially far-reaching aspects of the Proposed Rule; and 2) the addition of manganese to the list of hazardous constituents in 40 CFR Part 261 Appendix VIII, the addition of manganese to the table of underlying hazardous constituents in 40 CFR § 268.48, and the addition of a universal treatment standard for manganese in the Table UTS in 40 CFR § 268.48.

### Comment 10-1: Notice Issues

The title of the Proposed Rule reflects its focus on the potential identification and listing of hazardous wastes from the inorganic chemical manufacturing industry. The title also notes that the proposal pertains to Land Disposal Restrictions for such "newly identified wastes." Likewise, in the summary section of the Proposed Rule, the preamble states, "Section IV of today's proposal describes the proposed changes to the land disposal restrictions, which would establish treatment standards for specific constituents in the wastes proposed for listing." 65 FR 55687 (emphasis added).

The narrow title and summary of the Proposed Rule are misleading. In fact, the potential effects of the Proposed Rule are much broader with respect to land disposal restrictions for wastes containing manganese, which heretofore has not been a regulated constituent under subtitle C of RCRA. In background documents for the Proposed Rule, EPA acknowledges that manganese is an essential element, and is ubiquitous in the environment and found in low levels in water, air, soil, and food. See "Risk Assessment for the Listing Determinations for Inorganic Chemical Manufacturing Wastes: Background Document" ("Background Risk Assessment") (August 28, 2000) at J-25. By proposing to add manganese to 40 CFR Appendix VIII and Table UTS in 40 CFR § 268.48, however, the Proposed Rule affects any listed or characteristic hazardous waste that contains manganese. Prior to land disposal,

these wastes would now have to be treated and tested to demonstrate compliance with the proposed manganese UTS of 17.1 mg/l for wastewaters or 3.6 mg/L TCLP for nonwastewaters.

ABR believes the notice provided for the Proposed Rule is inadequate in light of the potentially far-reaching effects of the rule. It is clear from the preamble and background documents relating to the Proposed Rule that there is very little information concerning the presence of manganese in hazardous wastes and possible treatment technologies for manganese. To date, manganese has not been regulated under RCRA subtitle C. Consequently, there has been no need for regulated parties to determine 1) the presence of manganese in their wastes, 2) whether manganese in such wastes are amenable to treatment, and 3) potentially appropriate treatment technologies and the capabilities of such treatment technologies. All of this information is relevant to the issues on which EPA requests comment; however, because manganese is currently unregulated, it is unlikely that industry would have the necessary data available within the time frame established by EPA to provide meaningful comments. In light of this inadequate notice, ABR requests a reasonable extension so that it may have an opportunity to develop data relevant to the issues raised in the Proposed Rule and, if necessary, submit further comments on the proposed changes to the subtitle C regulations.

Response 10-1: EPA denied ABR's request for extension. However, we are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

#### Comment 10-2: Regulation of Manganese

Comment 10-2a: In its proposal, EPA seeks to 1) add manganese to the list of hazardous constituents in 40 CFR Part 261 Appendix VIII, 2) add manganese to the table of underlying hazardous constituents in 40 CFR § 268.48, and 3) establish universal treatment standards for manganese under 40 CFR §268.48. According to the preamble to the Proposed Rule, manganese is a constituent of concern in nine of the waste streams for the inorganic chemical manufacturing industry that EPA considered for listing. Of those nine waste streams containing manganese, however, EPA only found a significant risk in one of the waste streams, which it chose to list as a hazardous waste: nonexempt nonwastewaters from chloride ilmenite process. See 55 FR at 55760-63. This was the only process where the Background Risk Assessment supporting the proposed rule indicates a Hazard Quotient of greater than 1 for manganese. The other two newly listed waste streams did not contain manganese as a constituent of concern.

Notwithstanding this limited information in the record for this rulemaking, EPA is proposing for the first time to add manganese to the list of hazardous constituents and the table of underlying hazardous constituents, and is proposing universal treatment standards for

manganese. EPA is undertaking this action because it "believe[s] the available studies clearly show that manganese has toxic effects on humans and other life forms." 65 FR 55763. There is no information in the preamble supporting this statement, however. The only support for this position is a reference is to the Background Risk Assessment, which itself is not very clear on this issue. The Background Risk Assessment notes that manganese is an essential element in humans, and that the World Health Organization has determined that an average daily consumption of manganese in the range of 8 to 9 mg/day for adults is "perfectly safe." Background Risk Assessment at J-26. Notwithstanding, without any specific explanation, EPA establishes an oral reference dose ("RfD") for purposes of the Proposed Rule at 10 mg/day. EPA claims in the Background Risk Assessment that it has "medium confidence" in the RfD and the studies upon which the RfD is based; however, a separate document from the Office of Air Quality Planning and Standards states: "EPA has low to medium confidence in the studies on which the RfDs for manganese were based, due to the lack of data on dietary manganese in the three populations studied; low to medium confidence in the database due to varying reports of manganese toxicity in the literature; and, consequently, low to medium confidence in the RfDs." See "Manganese and Compounds Hazard Summary, Unified Air Toxics Website, Office of Air Quality Planning and Standards" at p. 3 (attached). It is not evident from the record what changes in the studies upon which EPA relies would cause the agency to alter its position concerning its confidence in the RfD for manganese.

The preamble also references EPA's IRIS database for support for regulating manganese. The IRIS Substance File for Manganese notes that manganese "is a ubiquitous element that is essential for normal physiologic functioning in all animal species," that "manganese is ubiquitous in foodstuffs," that the normal daily intake of dietary manganese may exceed EPA's RfD of 10 mg/day, particularly for a vegetarian diet, that "[i]n contrast to inhaled manganese, ingested manganese has rarely been associated with toxicity," and that "because of the homeostatic control humans maintain over manganese, it is generally not considered to be very toxic when ingested in the diet." See IRIS Substance File - Manganese: CASRN 7439-96-5 (attached). This record cannot fairly be characterized as "clearly showing" the toxic effects of manganese at the levels established for regulation by EPA.

Response 10-2a: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 10-2b: Based on the severely limited record in this rulemaking, ABR has similar concerns with respect to establishing the universal treatment standard for nonwastewaters containing manganese, which would be applicable to all hazardous wastes sent for land disposal. EPA appears to rely on a single sample from one waste stream to arrive at the proposed manganese UTS for nonwastewaters of 3.6 mg/L TCLP. Moreover, by its own admission EPA notes that it lacks any studies demonstrating treatment effectiveness for highly

concentrated manganese nonwastewaters. 55 FR 55768. This record is insufficient to support the establishment of the proposed universal treatment standard for all hazardous wastes, and is insufficient to establish that the treatment standard is achievable for the broad range of wastes for which it will apply. ABR believes additional data is needed to support any such standard.<sup>23</sup>

Response 10–2b: We are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today’s final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

#### Summary

ABR believes that the notice provided by EPA for the Proposed Rule, in which EPA attempts to add manganese to the list of hazardous constituents in 40 CFR Part 261 Appendix VIII, to add manganese to the table of underlying hazardous constituents in 40 CFR 5 268.48, and to establish a universal treatment standard for manganese in 40 CFR §268.48, is inadequate. Also, ABR believes the existing record for the proposed rule does not establish that manganese warrants listing as a hazardous constituent, and EPA has not demonstrated that the proposed UTS is appropriate and achievable for all wastes subject to it.

These are the extent of ABRs comments. However, they did provide a significant number of attachments on manganese. See the original ABR submission in the docket for the proposed rule for these attachments.

Response to Summary Comments: See our response to comment 6-1 and 10-1.

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<sup>23</sup>EPA further complicates the notice problem with respect to this Proposed Rule by cryptically stating that it "may use the list of commenters on this topic as the only individuals notified of potential changes to this proposed treatment standard." 65 FR 55768



**Comment ICMP-00011, OxyChem**

Comment 11-1: OxyChem actively participates in several trade associations such as the American Chemistry Council (ACC), the American Industrial Health Council (AIHC), Synthetic Organic Chemical Manufacturers Association (SOCMA), American Petroleum Institute (API), Chlorine Institute (CI) and the Chlorine Chemical Council (CCC). OxyChem is fully supportive of the comments submitted by these organizations as part of this docket.

Response 11-1: ACC was the only group of those listed above to respond to the proposed rule. See our response to the ACC comment sets (9 and 15).

Comment 11-2: OxyChem concurs with the decision to list baghouse filters from the production of antimony oxide as hazardous wastes when they are disposed. However, if the baghouse filters can be recycled through the production process to enable a more complete usage of the antimony raw material, we understand the proposed listing does not apply. We applaud the agency's consideration of this direct recycling through the production process to not represent waste management. OxyChem believes that the Agency's approach is consistent with the rulings of the U.S. Circuit Court of Appeals for the District of Columbia regarding the definition of 'solid waste.'

Response 11-2: EPA meant only that, to the extent that existing rules exclude such filters from regulation, the listing would not apply. EPA is taking no action to expand or narrow existing rules regarding the regulation of recycling.

Comment 11-3: OxyChem concurs with the decision to list slag from the production of antimony oxide only when it is disposed or speculatively accumulated. We applaud the agency's understanding that the direct recycling of this material through the production process does not constitute waste management, but is further processing to gain additional raw material value.

Response 11-3: EPA based its decision on the lack of risks associated with management of the slag up to the point it was used in a different non-consent decree industry. EPA did not limit the scope of the listing because it determined that management of the slag up to the point it was used in a different non-consent decree industry did not present a risk that would warrant listing the waste as hazardous.

Comment 11-4: OxyChem concurs with the decision not to list any of the residual streams from the sodium dichromate manufacturing process. The constituents in sodium dichromate manufacturing residuals do not pose a human health or environmental risk and are already being managed in a manner protective of human health and the environment.

Response 11-4: EPA acknowledges the commenter's support.

## Comment ICMP-00012, National Mining Association

### Introduction

The National Mining Association (NMA) hereby submits its written comments on the Environmental Protection Agency's (EPA's or agency's) September 14, 2000, proposed rule referenced above (65 FR 55684), also known as the "Inorganics Listing Proposal".

Among other things, the proposed rule would list three inorganic chemical waste streams as hazardous wastes pursuant to Subtitle C of the Resource Conservation and Recovery Act (RCRA). These three streams are: (1) baghouse filters from the production of antimony oxide; (2) slag from the production of antimony oxide that is disposed of or speculatively accumulated; (3) nonwastewaters from the production of titanium dioxide by the chloride-ilmenite process. In reaching the decision to propose these three listings, EPA examined fourteen different inorganic chemical sectors. That examination included considerations of the scope of the Bevill Amendment and its coverage or non-coverage of processing waste streams in specific mineral sectors including, but not necessarily limited to, antimony oxide, titanium dioxide, barium carbonate, and kernite ore boric acid production. The proposed rule also involves considerations of whether particular materials are or are not solid wastes under RCRA.

NMA comprises the producers of most of the nation's coal, metals, industrial and agricultural minerals; the manufacturers of mining and mineral processing machinery, equipment and supplies; and the engineering and consulting firms, financial institutions and other firms serving the mining industry. NMA and its members have, since the inception of RCRA Subtitle C and the enactment of the Bevill Amendment, been deeply involved in EPA's efforts to implement the mandates of the Bevill Amendment as it pertains to the mining and mineral processing industry's wastes. Moreover, NMA in its own right and through its predecessor organization the American Mining Congress has been intimately involved in regulatory and judicial developments affecting the agency's definition of solid waste. Thus, the interests of NMA and its members in the proposed rule are more than clear.

### Overview of NMA's Comments

Accordingly, NMA's comments focus on the Inorganics Listing Proposal's relationship to the scope of the Bevill Amendment as it affects this industry, particularly the mineral processing sector. It is clear that EPA in this proposed rule has made significant errors in its evaluation of the Bevill Amendment status of various materials.

Our comments also focus on the Inorganics Listing Proposal's consistency, or lack thereof, with the RCRA statutory and case law defining the scope of EPA's jurisdiction under RCRA. Here, again, the agency has made numerous significant errors in evaluating the status of materials under the statutory definition of solid waste; indeed, it appears that the agency

has, for the most part, ignored relevant case law or, when acknowledging such case law, has totally mischaracterized it.

NMA comments also touch on several issues related to the agency's risk assessment. NMA supports the approach taken in this proposed rule to the use of the Toxicity Characteristics Leaching Procedure (TCLP) and Synthetic Precipitation Leaching Procedure (SPLP) tests. Nonetheless, the NPRM takes an inefficient and counterproductive approach by conducting risk assessments on materials before determining whether or not those materials are wastes subject to agency RCRA jurisdiction. Furthermore, EPA alludes to but fails to identify so-called recently raised technical issues that allegedly have caused the agency to forego use of a basic risk assessment model, the MINTEQA2 model. Finally, NMA comments note that the agency's risk assessment, particularly for manganese, is very seriously flawed.

#### Comment 12-1: Procedural Failings of the Proposed Rule

This proposed rule contains some fundamentally unfair procedural shortfalls. We have noted above the agency's failure to provide any identification, much less explanation, of the so-called technical issues leading EPA to forego use of the MINTEQA2. Such a failure substantially deprives interested parties of the ability to comment meaningfully on a key component of EPA's risk assessment in this proposed rule.

In addition, there is an over-riding issue of procedural fairness: the agency's failure to provide an adequate period for comment on this proposed rule. The agency has been working on the substance of this proposed rule, in one form or another, for several years. The Docket Index for this proposal lists well over 300 documents<sup>24</sup>, totaling several thousands of pages, many of them highly technical in nature. Yet the agency allotted only 60 days for interested parties to examine the rulemaking record, determine which issues and documents were critical to their interests, obtain and analyze those relevant record materials (only some of which were available on the Internet), and then prepare and submit written comments on the proposed rule. Even for just one element alone, e.g., the manganese risk assessment, 60 days is not an adequate period within which to prepare and submit comments that reasonably address all the critical factors therein.<sup>25</sup> In rejecting requests to

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<sup>24</sup> By August 30, 2000, two weeks prior to the proposal's publication in the Federal Register, there already were 327 documents in the docket for this proposed rule.

<sup>25</sup> NMA endorses the comments submitted by the Lead Industries Association (LIA) on the adequacy of the comment period and the agency's manganese risk assessment.

extend the comment period,<sup>26</sup> EPA took refuge behind the terms of a consent decree<sup>27</sup> and thus allowed that decree to result in a clearly unreasonable comment period.

Response 12-1: Although the proposal covered many industry sectors, EPA proposed to list only three wastestreams from two sectors. This limited the number of issues that industry commenters needed to address. Moreover, some commenters succeeded in submitting very detailed comments. Finally, although EPA decided not to extend the comment period, it considered numerous late comments. EPA provided adequate opportunity to comment on this proposal. See response to comment 12-8 regarding the MINTEQA2 model.

Comment 12-2: EPA HAS INCORRECTLY EVALUATED THE STATUS OF VARIOUS MATERIALS UNDER THE BEVILL AMENDMENT

Comment 12-2a: EPA Cannot And Should Not Re-evaluate The Bevill Status Of Chloride Waste Solids From Titanium Tetrachloride Production, And If It Does EPA Must Perform A Bevill Study and Regulatory Determination.

"Chloride waste solids from titanium tetrachloride production" ("chloride solids") are excluded pursuant to the Bevill Amendment process from regulation under Subtitle C of the Resource Conservation and Recovery Act ("RCRA"). 40 CFR § 261.4(b)(7). In the Inorganics Listing Proposal, EPA states that:

These compounds [chlorinated dibenzo-p-dioxins ("CDPs") and dibenzo-p-furans ("CDFs")] were not assessed, however, as part of the rulemakings which established the mineral processing exemptions, and so these results could present new issues for these wastes if such compounds were found to pose unacceptable risks. During the development of the mineral processing exemption, EPA anticipated certain conditions might suggest the appropriateness of re-opening these exemptions [footnote omitted]. We are considering whether we should re-assess the status of these wastes as exempt mineral processing wastes.<sup>28</sup>

Under the terms of the Bevill amendment and its regulations, EPA is precluded from such "re-assessment." Moreover, even if EPA had the authority to engage in a re-assessment, the record does not justify such action. Finally, any such action by EPA would require a Bevill

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<sup>26</sup> There have been numerous requests made to EPA to extend the comment period on this rule. Such requests have been submitted by, among others, the American Chemistry Council, LIA, and NMA.

<sup>27</sup> The consent decree in question is that reached between EPA and the Environmental Defense Fund (EDF) as a result of the litigation brought by EDF in EDF v. Browner, D.D.C. Civ.No.89-0598)

<sup>28</sup> 65 FR 55751

study and regulatory determination, and must involve industry and other stakeholders in a meaningful way.

Response 12-2a: As stated in the proposal and as implemented in the final rule, we are not re-opening the Bevill status of the chloride process solids. These solids remain exempt under 261.4(b)(7).

We disagree with the commenter regarding the premise that EPA is precluded from future re-assessment of existing Bevill exemptions. Section 3001(b)(3)(A) in no way precludes further assessments of these materials. The Agency's final Bevill rule (56 FR 27312) promulgated on July 13, 1991 stated that, "If EPA finds that this exemption is not protective of human health and the environment and if an examination of titanium tetrachloride waste management shows any continuing or new problems, the Agency will reconsider this subtitle D determination for chloride process waste solids from titanium tetrachloride production."

While we have limited the scope of the final rule to those activities mandated by consent decree, we believe the data developed as part of this investigation revealed new information that may warrant re-assessment with respect to the appropriateness of the 261(b)(7) exemption. In particular, our study documented the presence of chlorinated dioxins and furans in the solids, for which the Agency had not previously tested. The proposal also described risks for thallium and manganese that exceed the Agency's listing thresholds in commingled exempt and non-exempt solids for the chloride ilmenite sector, in a material that was largely composed of exempt solids. At some point in the future, apart from this final rule, EPA may conduct additional analyses regarding this new information as it pertains to the 261.4(b)(7) exemption. Any regulatory determination stemming from those additional analyses would be compliant with the requirements of section 3001 and would be subject to all applicable opportunities for notice and comment.

We note that we are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

Comment 12-2a(1): EPA lacks the authority to revisit its Bevill Determination for chloride waste solids from titanium tetrachloride production.

EPA submitted its Second Report to Congress on Mineral Processing Wastes on July 31, 1990. 55 FR 32135 (1990). EPA published its regulatory determination for mineral processing wastes, including chloride solids, in June 1991. 56 FR 27300 (June 13, 1991).

The Agency has explicitly recognized that its regulatory determinations are "one-time" decisions that can not be revisited. In EPA's April 1989 proposed rule for the management of mineral processing wastes, the Agency firmly rejected the idea that additional studies and regulatory determinations would be done in the future for mining and mineral processing wastes, emphasizing that the Agency's obligation under RCRA to undertake studies and

make regulatory determinations were one-time responsibilities. EPA explained that after "examining the history of the Bevill exclusion in depth," the Agency had determined that the obligations imposed by Section 8002 were "one-time" obligations even though "technological advances and changing market conditions may lead to the genesis of new waste streams . . ." 54 FR 15316, 15337 (Apr, 17, 1989). EPA explained that "a one-time decision will serve to encourage rather than discourage environmentally sound mineral production and waste treatment process innovations" and will give industry "substantial knowledge of the regulatory regime that it will face." 54 FR at 15338. EPA came to its conclusion that the Report to Congress and the regulatory determination are one-time obligations because "Congress directed EPA to conduct a *single* study of wastes generated by mineral mining . . . and the statutory language includes explicit time limits on the Bevill exclusion, which apply to the submission of the required Report to Congress and subsequent regulatory determination." *Id.*<sup>29</sup>

In promulgating the final rule on mineral processing wastes, EPA once again emphasized that its duty to report to Congress and make a regulatory determination were one-time obligations. After the proposed rule, commenters had specifically argued that EPA's regulatory determinations should not be one-time decisions, and should be revisited in the future. 54 FR at 36595-56. In response, EPA reiterated its position that after preparing a report to Congress and a regulatory determination, the Agency had satisfied its obligation under Section 8002 of RCRA and would not undertake these obligations again. *Id.* at 36596.

EPA also explained that "the 1985 Report, and the subsequent regulatory determination [for] extraction and beneficiation wastes, discharged its statutory duty with respect to all extraction and beneficiation wastes." *Id.* EPA "disagree[d] that it [wa]s necessary for the Agency to commit to further studies of extraction and beneficiation wastes under section 8002(p)." *Id.*

In *Solite v. EPA*, 942 F.2d 473 (D.C. Cir. 1991), NMA and other petitioners challenged EPA's decision that the Bevill Amendment required only a "one-time" determination. The D.C. Circuit rejected NMA's challenge, citing *Environmental Defense Fund v. EPA*, 852 F.2d 1316, 1329 (D.C. Cir. 1988) ("EDF II") for the proposition that "we clearly enough rejected the theory that Congress intended the coverage of the Bevill exclusion to evolve with time." *Solite*, 952 F.2d at 491. The *Solite* Court upheld EPA's position that the Bevill process was a one-time event.

Since 1985, industry has been bound by EPA's position, upheld by the D.C. Circuit, that EPA will not reexamine the status of extraction, beneficiation and mineral processing waste streams. This position has provided industry and the states with a stable regulatory

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<sup>29</sup> In an earlier proposed rule on mineral processing wastes, EPA had also stated that "there [would] be no further studies or regulatory determinations." 53 FR 41288 (Oct. 20, 1988).

environment that has contributed to a growth in State environmental regulation. The statement in the Inorganics Listings Proposal cited by EPA from the 1991 preamble where EPA said it might reconsider its Bevill Determination for chloride waste solids is inconsistent with, and contradicted by, EPA's long standing statements on the "one time" nature of Bevill determinations, as well as the Solite decision. Thus, EPA cannot "reassess" the status of chloride solids.

Response 12-2a(1): We do not read the statute or the Bevill exemption rules to imply that wastes exempted under the Bevill provisions would forever be shielded from regulation or further re-assessment. EPA believes that this comment misunderstands both the nature of EPA's and the D.C. Circuit's statements about the "one-time" nature of EPA's Bevill determinations, as well as the nature of our decisions here.

In 1989, when EPA was deciding which mineral processing wastes were exempt under the Bevill Amendment, mining interests argued that the door should be left open to allow additional wastes to be excluded in the future. EPA refused, reasoning that the Congressionally-mandated process of excluding wastes under Bevill need only occur once. As EPA explained at the time, the Agency had previously

proposed to make a one-time determination of Bevill status. Wastes not yet in existence and wastes not meeting the high volume/low hazard criteria during any of the past five years would therefore not be eligible for Bevill exclusion status in the future...

54 Fed. Reg. at 36,595-96 (JA 2138-2139). On review, the D.C. Circuit agreed with the Agency, ruling that "EPA's position is surely reasonable and we must uphold it." Solite, 952 F.2d at 491.

This comment misunderstands the above-quoted passages, and the Court's holding in Solite affirming EPA's position that the Bevill Amendment requires only a "one time determination" that "would not be allowed to evolve over time." The cited portion of Solite only addresses whether EPA has an *obligation* under the Bevill Amendment to revise its regulatory determinations over time, by considering whether newly generated waste streams fall within the exemption. The Solite court held that the statute did not require EPA to continually revise its regulatory determination over time whenever industry identified waste streams that did not exist at the time EPA made the determination. 952 F.2d at 491. The Court did not hold that EPA has no discretionary authority to revise existing Bevill exemptions. Nor did the Court find that EPA could not interpret the scope of the 1989 regulation as to particular wastes. Since EPA demarcated the scope of the Bevill exemption for mining and mineral processing wastes, the Agency has on several occasions determined whether particular wastestreams in fact fall within the original exemption.

In this rulemaking EPA is simply applying the existing exemption for chloride process waste solids to the wastestreams before it. EPA interpreted the scope of the existing exemption, finding

that some subcomponents of this waste produced at chloride-ilmenite facilities were included in the scope of the original exemption, while others were not.

Comment 12-2a(2): The Data Cited By EPA Do Not Justify Any Reassessment of the Bevill Status of Chloride Solids.

EPA suggests that it is considering a reassessment based on the alleged presence of CDDs and CDFs in chloride solids. The data which EPA relies on are summarized in the Titanium Dioxide Listing Background Document for the Inorganic Chemical Listing Determination ("the Background Document"). Chloride process waste sampling data are reported in the sampling and Analytical Data Report for Record Sampling and Characterization of Wastes from the Inorganic Sodium Chlorate and Titanium Dioxide Manufacturing Sectors; Kerr-McGee Corporation, Hamilton, Mississippi - USEPA, August 10, 1999 ("Hamilton Data Report" and in Sampling and Analytical Data Report for Record Sampling and Characterization of Wastes from the Inorganic Sodium chlorate and Titanium Dioxide Manufacturing Sectors; Kemira Pigments, Inc., Savannah, Georgia - USEPA, September 9, 1999 ("Savannah Data Report"). For the reasons described in detail in the comments of Kerr-McGee Chemical, LLC, that have been submitted to this docket, CDD and CDF data in these reports are not valid and cannot be relied upon by EPA to justify any "reassessment" of chloride solids.

Response 12-2a(2): See our response to comment 8-8b (Kerr McGee).

Comment 12-2a(3): Even If EPA Had the Authority to Reassess the Bevill Status of Chloride Solids, EPA Would Be Required to Perform a Bevill Study and Regulatory Determination, and Involve Industry in a Meaningful Way

Even assuming that EPA had the authority to reexamine the Bevill status of chloride solids, the Agency would first have to undertake a study in compliance with Sections 8002 (f) and (p) of RCRA. 42 U.S.C. § 6982(f), (p); see also Environmental Defense Fund v. EPA, 852 F. 2d. 1309, 1310 ("EDF II"). Congress stipulated that the following factors were to be considered in the study:

1. source and volumes of the waste generated per year;
2. present disposal and use of the waste;
3. potential danger to human health and the environment from the disposal and reuse of the waste;
4. proof of actual danger (through documented cases) to human health and the environment;
5. alternatives to current disposal methods;
6. the costs of such alternatives;
7. the impacts of those alternatives on other natural resources; and



8. current and potential use of the wastes.

42 U.S.C. §§ 6982(f), (p); 51 FR at 24,497. The Agency would also have to evaluate existing federal and state regulatory controls. 42 U.S.C. § 6982(p). Data collection activities would include, among other things, soliciting public comments, obtaining updated data on waste characteristics and waste management and conducting an in-depth examination (far beyond what is currently in the record) of the extent to which any of the wastes have been implicated in environmental contamination incidents. Industry and the states would have to be included as integral and meaningful parts of the study process. When the study was completed, the Agency would then have to publish a report detailing the results of the study and submit that report to Congress. 42 U.S.C. § 6982(p).

Within six months after the Agency reports to Congress, EPA would have to make a "regulatory determination" based upon the findings of the study. *Id.* § 6921(b)(3)(C). As the D.C. Circuit held in *EDF I*, "it is appropriate for the regulatory determination to be based on consideration of all the factors enumerated in section 8002(p)." *EDF I*, 852 F.2d at 1314-1315." EPA would have to hold hearings and provide an opportunity for public comment on the regulatory proposal before finalizing any regulations. *Id.* § 6921(b)(3)(C).

It is clear, therefore, that to "reassess" the Bevill status of chloride solids, EPA would have to complete a Report to Congress and make a regulatory determination, both to be based on the factors set forth in RCRA. Failure to do so would doom any such "re-assessment" by EPA.

Response 12-2a(3): While the Agency disagrees with the commenter that it does not have the authority to conduct such reevaluations, in today's rule the Agency is not changing the Bevill status of any of the 20 Bevill exempt mineral processing waste streams noted at 40 CFR 261.4(b)(7). EPA takes no position today on the procedural requirements for such a re-evaluation.

Comment 12-3: EPA Has Unlawfully Concluded That Waste Streams Generated From The Production Of Barium Carbonate from Primary Barite Ore Are Not Bevill Exempt

When evaluating barium carbonate production, EPA identifies a "Georgia facility" that "uses locally mined barite ore, containing barium in the form of barium sulfate, as the primary feedstock." EPA states that "[t]he ore is crushed and milled, thermally reduced in a roasting kiln, and leached with water to dissolve the barium." Subsequent production steps follow.

EPA alleges that wastes produced from these crushing and milling operations, as well as wastes generated from the roasting and leaching operations, are not beneficiation wastes. 65 FR 55706. EPA apparently justifies this conclusion based on footnote 29, which asserts that "primary barite ore has widespread use in drilling muds for the petroleum and numerous other uses, including use as feedstock for barium chemicals." *Id.* EPA's contention is that because this primary barite ore can be so used, it is what EPA describes as "a saleable

mineral product," and that any processes using saleable mineral products are chemical manufacturing, and not beneficiation or mineral processing operations. Id.

EPA's position is contradicted by both the Bevill Amendment and its own regulations. Congress included the following within the scope of the Bevill Amendment: "solid waste from the extraction, beneficiation and processing of ores and minerals." 42 U.S. C. sec. 6921(b)(3)(A)(ii). EPA's own regulations identify the industry production operations performed at the Georgia facility as beneficiation. 40 CFR §261.4(b)(7)(i). "Crushing" and "grinding" operations fall within the beneficiation definition. Id. "Roasting" before leaching, and the leaching operation itself, are included as "beneficiation" activities. Id. Because all of these beneficiation operations use primary barite ore, or materials containing minerals from primary barite ore, as feedstock, the wastes generated from these operations are Bevill exempt. Moreover, wastes generated from any other operations that qualify as Bevill wastes under the statutory language and the regulatory definition of beneficiation are beneficiation wastes and are Bevill exempt, regardless of any EPA analysis that such an operation might be preceded by a processing or manufacturing step.

Response 12-3: EPA evaluated all of the waste streams associated with the production of barium carbonate and concluded that none of them meet the criteria for hazardous waste listings under 40 CFR 261.11. Consequently, the Agency does not need to reach a final position on the applicability of the Bevill exemption to any of these wastes. The statement in the September, 2001 preamble to the proposed final rule is not a final Agency position on the Bevill exemption for barium carbonate wastes. The statement in the September, 2001 preamble to the proposed final rule was a tentative conclusion; the Agency is not taking in this rulemaking any final action on this issue. The issue concerning the applicability of the Bevill exemption to barium carbonate wastes remains open, and the commenter may raise its views again in any appropriate regulatory or judicial proceeding.

Comment 12-4: Tailings And Gangue From Kernite Ore Boric Acid Production Are Bevill-Exempt Wastes

Comment 12-4a: One method by which boric acid is produced is from sodium borate kernite ore. As EPA describes, it, the boric acid is produced "through a process of dissolution, classification, thickening, filtration, arid crystallization." With regard to the Bevill status of these materials, EPA states that "because we propose not to list these wastes, we did not review the facility's Bevill exemption claims." 65 FR 55712.

While NMA supports EPA's decision not to list these wastes, EPA should find that the tailings and gangue from kernite ore boric acid production are Bevill exempt. These wastes are generated from processes that fall within the definition of beneficiation at 40 CFR § 261.4(b)(7)(i). Accordingly, these wastes are Bevill-exempt.

Response 12-4a: Today's rule does not require that the Agency complete a Bevill opinion for wastes from the production of boric acid. Should NMA or the company wish to secure a Bevill

opinion on wastes from the production of boric acid, they may make a request for such an opinion to the authorized state or the EPA region.

Comment 12-5: EPA HAS INCORRECTLY EVALUATED THE STATUS OF VARIOUS MATERIALS UNDER THE RCRA REGULATORY DEFINITION OF SOLID WASTE

Comment 12-5(a): The Proposed Rule Fails to Recognize The Clear Requirements of the Statute and of the Relevant Case Law

The preamble to the proposed rule contains a section entitled "Evaluation of Secondary Materials" (65 FR 55693-94). That section discusses the agency's perception of its RCRA jurisdiction over secondary materials that are recycled, i.e., whether or not recyclable secondary materials are "solid wastes" subject to EPA's RCRA jurisdiction. This discussion provides a general EPA overview of the provisions of 40 CFR 261.2(e), "*Materials that are not solid waste when recycled*".

The agency then briefly discusses a line of court cases that, as EPA acknowledges, "hold that EPA lacks authority to regulate materials that are immediately reused in an ongoing manufacturing or industrial process." Id. at 55694. This line of cases began in 1987 with American Mining Congress v. EPA (824 F.2d 1177 (D.C.Cir.)) ("AMC I"), includes the D.C. Circuit's 1990 decision in American Mining Congress v. EPA (907 F.2d 1179) ("AMC II"), and reaches into 2000 with the two most recent D.C. Circuit decisions, Association of Battery Recyclers, Inc. v. EPA (208 F.3d 1047) ("ABR") and American Petroleum Institute v. EPA (216 F.3d 50).<sup>30</sup>

In the ABR case, NMA had challenged EPA's authority to impose RCRA Subtitle C waste management regulations on the storage of mineral processing secondary materials that were not discarded. These materials were reused in the industry's on-going production processes. The ABR Court emphasized that "Congress clearly and unambiguously expressed its intent that 'solid waste' (and therefore EPA's regulatory authority) be limited to materials that are 'discarded' by virtue of being disposed of, abandoned, or thrown away."<sup>31</sup>

In the Inorganics Listing Proposal, EPA describes the ABR decision as having "remanded a rule regulating the reuse of some closely related materials. EPA declares: "We are still evaluating the impacts of this decision. However, the remand does not affect this [inorganics listing] rule because we are not relying on the exemptions in the remanded rule." Id. This is a blatantly disingenuous statement.

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<sup>30</sup> EPA's preamble discussion omitted another decision in this line of cases, American Petroleum Institute v. EPA, 906 F.2d 729 (D.C.Cir. 1990)

<sup>31</sup> Id. at 1051, citing AMC I, 824 F. 2d at 1190

The ABR decision did not merely "remand" a rule regulating the reuse of some "closely related" materials. It did far more. The ABR court *vacated* those parts of the agency's mineral processing land disposal rule that impermissibly attempted to expand EPA's RCRA jurisdiction over mineral processing secondary materials that were not discarded. In striking down the agency's over-reaching conditional exemption, the ABR court confirmed the prior regulatory exclusions from the definition of "solid waste" for characteristic sludges and byproducts. The ABR court left in place the new exclusion (from the definition of solid waste) for spent materials, since that new exclusion represented a lessening of EPA's regulatory over-reach.

EPA's September 14 proposed inorganics listing rule deals in a number of instances with materials that are secondary materials in the primary mineral processing industry (e.g. baghouse filters and slags from antimony oxide; residues from barium carbonate). This is precisely the category of materials at issue in the ABR decision, i.e., "mineral processing secondary materials". To say that these are "closely related materials" is a considerable understatement, and makes it very difficult to understand why the agency, would ignore the ABR decision. Nonetheless, it would be as wrong to limit the holding of ABR to "closely related" materials as it would be wrong to ignore that court decision.<sup>32</sup>

Thus, it is difficult to understand what EPA means when it says in the Inorganics Listing Proposal preamble that the ABR decision "does not affect this [Inorganics] rule because we are not relying on the exemptions in the remanded rule". Since the ABR court spoke directly to the issue of EPA's RCRA jurisdiction over the category of mineral processing secondary materials, and rendered a clear decision limiting the agency's authority in that regard, the ABR case is directly applicable to other EPA rulemakings that address the recycling of secondary materials in the mineral processing sector.

Nonetheless, EPA dismisses ABR and its entire line of precedents stretching back to 1987. The agency ignores the ABR court's declaration, in no uncertain language, that EPA's view of that line of cases "misapprehends the law of the circuit"<sup>33</sup>, and that the agency's RCRA authority is "limited to materials that are 'discarded' by virtue of being disposed of, abandoned, or thrown away."<sup>34</sup>

Response 12-5(a): See our response to comment 8-4a and 22-3a-2.

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<sup>32</sup> EPA introduces a new regulatory concept in this proposal, i.e., "closely related" materials. NMA hopes that EPA is not pursuing yet another unlawful and ultimately futile attempt to elude the clear mandate of the D.C. Circuit in ABR and in AMC 1: that all secondary materials are solid wastes only if they are discarded, and that to be discarded those materials must be thrown away or abandoned.

<sup>33</sup> ABR, 208 F.3d 1047, 1052.

<sup>34</sup> *Id.* at 1051

We acknowledge your comments regarding current case law involving the definition of solid waste, including the Association of Battery Recyclers v. EPA decision. However, as discussed in the proposed rule, in the context of this rulemaking, we did not make site-specific or waste-specific determinations 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, in this rule, we are not listing specific wastes that are being recycled or reclaimed. Therefore, we do not believe that it is necessary for the purposes of this rulemaking to develop a final interpretation of the new case law, including the Association of Battery Recyclers decision. We do acknowledge that we erred when we said that the Court “remanded” the portions of the mineral processing rule that expanded our jurisdiction. You correctly point out that the Court “vacated” these portions of the rule.

Comment 12-5(b): EPA Again Mis-Apprehends the Law: Storage of a Product Prior to Sale Is Not "Discard" of a Waste

In the preamble's discussion of wastes from the production of titanium dioxide, the agency notes that one facility produces a product, ferric chloride. Ferric chloride is a product sold for use as a water and wastewater treatment reagent. In this particular facility's case, the ferric chloride is stored in a surface impoundment prior to sale. The preamble goes on to state: "EPA has often considered land-based units, and impoundments in particular, to be associated with the discard of wastes, rather than the storage of products, because of their potential for releases to the environment." 65 FR 55759. In footnote 56, EPA continues, stating that:

Material that is placed in a surface impoundment, where it is capable of posing a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of or otherwise managed, "by leaching into the ground, is 'discarded material' and hence a solid waste." (AMC II, 907 F.2d) Id.

Were they true, the import of these sweeping agency pronouncements would be to relegate all surface impoundments, including those that are part of a legitimate production process or are employed to store raw materials, intermediates, or finished products awaiting sale, to the status of waste management units. As authority for such a draconian and distorted view, the agency cites to the API and AMC II cases.

This EPA position was rejected in ABR. Had the agency not discarded the ABR opinion, it would have realized that EPA has been wrong in its long-held view that the API and AMC 11 cases limited the AMC I holding that, to be subject to EPA's RCRA authority, a material must be discarded.

In the ABR case, the agency advanced precisely the same view of API and AMC II that it proclaims in footnote 56 to the Inorganics Listing Proposal. After reviewing the facts and

holding in API, the ABR Court found that API did not limit AMC I. The ABR Court pointed out that, in API, the materials at issue had already been discarded; regulation of such discarded materials thus "is entirely consistent with AMC I."<sup>35</sup> Nor was EPA any more successful in arguing that AMC II had limited AMC I's holding on "discard". The ABR Court explicitly stated that AMC II "did not disturb AMC I's interpretation of 'discarded'." In AMC II the materials at issue were listed hazardous mineral processing wastes - sludges generated in the treatment of wastewaters in surface impoundments. EPA had argued to the ABR court that these AMC II sludges were entirely recycled, and were not stored in anticipation of recycling.

The ABR Court looked at the facts and holding in AMC II, declaring that "EPA is flatly wrong about this" [the quantities of recycled AMC II sludges].<sup>36</sup> Noting that AMC II was not at odds with AMC 1, the ABR Court then emphasized:

The point of AMC II, and for that matter API, is that once material qualifies as "solid waste" something derived from it retains that designation even if it might be reclaimed and reused at some future time. In contrast, the Phase IV rule [on mineral processing secondary materials] seeks to regulate materials that are not a by-product of solid waste, but a direct by-product of industrial processes.<sup>37</sup>

In relying on its mistaken views of API and AMC II, the agency continues to misapprehend the law of the D.C. Circuit, which is particularly surprising in the face of that Circuit's clear mandate in ABR. In ABR the materials at issue were being stored prior to beneficial reuse; in the Inorganics Listing Proposal, ferric chloride is stored prior to sale. The ABR Court bluntly rejected EPA's attempt to impose RCRA hazardous waste management requirements on the storage of secondary materials held for reuse: "[T]o say that when something is saved it is thrown away is an extraordinary distortion of the English language. Yet that is where EPA's definition leads."<sup>38</sup> It is a distortion of equal or greater magnitude to argue that storage of a product prior to sale amounts to "discard" of that product and its management as a "waste".

**Response 12-5(b):** See comment responses 22-3a-2, 8-4a, and 22-3a-2. EPA is not listing the ferric chloride sold as a product. Thus, EPA need not reach a conclusion about the storage issue that the commenter raised. If EPA had needed to determine whether the ferric chloride was a product rather than a waste, it might have considered storage in an unlined impoundment to be an indicator that the producer did not value this material highly. This could be a factor in determining

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<sup>35</sup> ABR at 1054

<sup>36</sup> Id. at 1055

<sup>37</sup> Id. at 1056

<sup>38</sup> ABR at 1053

whether the material was a waste, especially if other manufacturers of this material used more secure storage. EPA notes that it is listing solids that separate during ferric chloride storage onsite. The ferric chloride manufacturer, however, does not claim that these solids are products. Rather, it manages them as wastes.

Comment 12-5(c): The Proposed Rule Mistakenly Asserts RCRA Jurisdiction Over Off-site Reuse of Secondary Materials

Since the AMC I decision in 1987, the D.C. Circuit has consistently maintained that materials "*destined for beneficial reuse or recycling in a continuous process by the generating industry itself*" are not "solid wastes" subject to EPA's RCRA authority.<sup>39</sup> EPA's view of this case law, a view that is carried over to the Inorganics Listing Proposal, "misapprehends the law of the circuit."<sup>40</sup> Not only does the NPRM wrongly attempt to expand EPA's RCRA reach to materials that are not discarded, the NPRM also mistakenly tries to limit "recycling" to the reinsertion of a mineral processing secondary material into the process that generated the material originally.

In its discussion of "secondary materials" at 65 FR 55693-94, the preamble notes that the agency has evaluated risks for materials that are recycled on-site, including materials "inserted into separate manufacturing processes co-located on-site" with the process that originally generated the material. EPA also considered "the risks of materials recycled off site". 65 FR 55694. One specific example is that of antimony oxide residuals shipped off site to another smelter:

In one case involving antimony oxide residuals, we found that the residuals were sent off-site to another smelter producing antimony oxide. This smelter happens to be located outside of the country. We did not evaluate risks from its residuals, as we have no legal jurisdiction to regulate them. We have evaluated the production of antimony oxide within the U.S. in this rulemaking, so we have evaluated the risks that would be posed if this generator changed its practice and sent the materials to an antimony oxide smelter located within the U. S. Id.

Thinly disguised in the above agency approach is an attempt to expand EPA's regulatory reach to materials that are reused off-site, even when the reuse occurs as part of an on-going industrial process. Here, antimony oxide residuals are sent off-site to another antimony oxide facility so that the antimony values may be recovered. These materials are not wastes; they are precisely the kind of mineral processing secondary materials that the

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<sup>39</sup> Id., citing AMC I, 824 F. 2d 1186 (italics in original)

<sup>40</sup> Id. at 1052

ABR Court, following the line of cases beginning with AMC I, found were not "discarded" and thus were not "part of the waste disposal problem".<sup>41</sup>

To narrow the world of legitimate reuse options not only is unlawful, it is environmentally counter-productive. NMA endorses the comments submitted by the Doe Run Corporation on this point, as those comments go directly to the very practical need to recycle materials in units that can recover the sought-after values. Indeed, were the final Inorganics Listing Proposal to limit reuse options to reinsertion into the original generating unit, such an ill-founded rule would cause the loss of valuable, recoverable mineral resources by subjecting mineral processing secondary materials to a RCRA Subtitle C hazardous waste management regime, in direct contradiction of the statute's definition of "solid waste" and the AMC I -ABR line of cases confirming the statutory limits to EPA's RCRA authority.

Response 12-5(c): See comment responses 12-5(a), 22-3a-2, 8-4a, and 22-3a-2.

Comment 12-6: NMA SUPPORTS THE PROPOSED RULE'S USE OF THE TCLP AND SPLP TESTS

In the Inorganics Listing Proposal, EPA proposes to use results from either the Toxicity Characteristics Leaching Procedure (TCLP) or the Synthetic Precipitation Leaching Procedure (SPLP), depending on the disposition of the particular waste streams. Results of the TCLP will be employed where the waste is disposed of in a municipal solid waste (MSW) landfill; SPLP results will apply where disposal in an MSW landfill is not likely. EPA states in the preamble:

We believe the TCLP is the most appropriate leaching procedure to use for wastes in municipal landfills, because the leaching solution is similar to the type of leachate generated from the decomposition of municipal waste...The SPLP test uses a leach solution which mimics acid rain, while the TCLP uses a leach solution which mimics acids formed in municipal landfills ...For today's [Inorganics] rule ...we have specific data showing that some wastes do not go to municipal landfills and are unlikely to be disposed of in municipal landfills. We used the SPLP sampling results for wastes that were not likely to go to municipal landfills, and we used the TCLP results for wastes going to municipal landfills. 65 FR 55695

In its comments on EPA's 1997 proposed land disposal restrictions (LDR) rule,<sup>42</sup> NMA offered as an alternative approach to the blanket, indiscriminate use of the TCLP. In fact, NMA suggested precisely the approach that EPA proposes to take in the Inorganics Listing Proposal. Indeed, in that 1997 proposed LDR rule, the agency had not demonstrated that mineral processing wastes were "likely" to be disposed of in MSW landfills, only that there

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<sup>41</sup> AMC I, 824 F.2d 1186, cited in ABR at 1053

<sup>42</sup> 62 FR 26041 (May 12, 1997)



were some "possible" or "potential" cases of disposal in an MSW landfill. As NMA stated in its comments:

At most, the TCLP should be used in those cases (if any) where mineral processing wastes are actually co-disposed in MSW landfills. As discussed in detail in its comments on the January 25, 1996 Supplemental Phased IV proposal, NMA would support a contingent management approach in which the leaching test to be applied to a mineral processing waste would depend upon the type of landfill in which the waste is disposed.<sup>43</sup>

Although the agency has not heretofore responded to NMA's 1997 suggestion on the use of the TCLP and SPLP tests, we believe that the approach EPA proposes in the Inorganics Listing Proposal is well-founded and reasonable.

Response 12-6: EPA acknowledges NMA's support of the rule.

Comment 12-7: THE PROPOSED RULE TAKES AN INEFFICIENT AND COUNTERPRODUCTIVE APPROACH TO CONDUCTING RISK ASSESSMENTS

EPA announces in the September 14 preamble that, for almost all of the proposed rule's recycled inorganic chemical residuals, the agency has

decided not to attempt to determine whether the recycling practice is not subject to regulation under the court decisions [AMC I, AMC 11, API, ABR] and regulations described above. Such determinations can be very time-consuming ....Consequently, we decided that it would be more efficient to examine first the potential risks posed by the reported recycling practices ...If ..we found risks, we evaluate the recycling practice prior to making a listing decision. 65 FR 55694

In other words, instead of limiting its inquiry to materials that were truly discarded and thus within the agency's legitimate RCRA authority, EPA began by looking for risks in recycling practices. Then, if EPA found risks in the recycling practices, it would move on to consider whether or not the material in question was to be a listed hazardous waste.

It is unclear when, or how, the agency ever made clear determinations in this proposed rule as to the limits of its legitimate RCRA authority over various secondary materials. Nonetheless, the agency appears to have made such decisions at some point because, a few paragraphs after declaring that it would not make determinations on whether or not a

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<sup>43</sup> NMA incorporates herein by reference its comments of August 11, 1997, on EPA's May 12, 1997, Land Disposal Restrictions Phase IV Second Supplemental Proposal (62 FR 26041, Docket No. F-97-2P4P-FFFFF). NMA also incorporates by reference its April 24, 1996, comments on EPA's Land Disposal Restrictions Supplemental Proposal to Phase IV (61 FR 2338, January 25, 1996).

recycling practice was subject to agency RCRA jurisdiction, EPA then declared "[W]e felt we were evaluating all of the potential risks within our jurisdiction associated with the recycling of these materials." Id.

On the one hand, the agency has conducted numerous risk assessments on multiple materials without considering whether or not those materials were subject to legitimate RCRA jurisdiction. While the agency pleads that such determinations "can be very time-consuming", the agency chose to ignore the statute itself and relevant case law, both of which would have rendered such determinations considerably less time-consuming. On the other hand, the agency contradicts itself in the space of a few paragraphs when it declares that it believes it has evaluated all the "potential risks within our jurisdiction associated with the recycling of these materials."

Clearly the agency cannot have it both ways. It cannot ignore the mandate of ABR and AMC I on the limits of agency RCRA jurisdiction, yet declare that it has examined all the risks from practices within its jurisdiction. Until such time as the agency acknowledges the mandate of the statute and this line of cases, the Inorganics Listing Proposal will remain critically flawed.

Response 12-7: The parenthetical statement "within our jurisdiction" in column 2 on page 55694 that the commenter points out gives the wrong impression of EPA's approach to solid waste issues for this rule. As stated earlier in the preamble, EPA did not determine whether any particular recycling practice fell within its Subtitle C jurisdiction. Rather, EPA assumed, for purposes of evaluation, that all of the recycling practices might fall within its jurisdiction, and evaluated the risks presented. The phrase probably should have read "within the scope of the consent decree." See also comment responses 12-5(a), 22-3a-2, 8-4a, and 22-3a-2. See comment responses 12-5(a), 22-3a-2, 8-4a, and 22-3a-2.

Comment 12-8: EPA FAILS TO EXPLAIN ITS RELUCTANCE TO EMPLOY THE MINTEQA2 MODEL

In its discussion of the risk assessment and, in particular, for the groundwater pathway risk assessment, EPA announces that it is foregoing the use of a mathematical model that it had in the past employed when seeking to model contaminant concentrations in groundwater. The agency states that it has

used the MINTEQA2 equilibrium speciation model to estimate  $K_d$ 's for a variety of metals rather than relying solely on field measurements. However, recently a number of technical issues have been raised concerning the model and its application. EPA is in the process of evaluating the model to address those issues. Therefore, we have decided not to use the MINTEQA2 for today's proposed rule. 65 FR 55698

The agency offers no further explanation of its decision to abandon the MINTEQA2 in this instance. Nor does EPA identify even one of the "number of technical issues that have been

raised concerning the model and its application." This is hardly a fair way to inform the public of the basis for a very important and fundamental decision on groundwater risk assessment. The Agency's behavior does not afford the public any opportunity to assess the soundness of the reasons behind the agency's decision. This failure to provide a basis for reasonable public comment on a crucial aspect of the proposed rule constitutes a significant procedural deficiency in the Inorganics Listing Proposal, rendering at least this aspect of the Proposal arbitrary and capricious.

NMA notes that a paper critical of the MINTEQA2 model has appeared in several RCRA regulatory proceedings over the last 18 months. Prepared by Charles H. Norris and Christina E. Hubbard on behalf of the Environmental Defense Fund, Friends of the Earth, Hoosier Environmental Council, and the Mineral Policy Center, the paper is entitled "Use of MINTEQA2 and EPACMTP to Estimate Groundwater Pathway Risks from the Land Disposal of Metal-Bearing Wastes" (Final Report, June 1999)<sup>44</sup>. The Norris & Hubbard paper alleges that EPA has made a number of errors and faulty assumptions in using the MINTEQA2, and that these errors and faulty assumptions have caused the agency to underestimate metals mobility.

Because of EPA's failure to identify, much less explain, its reasons for not using the MINTEQA2 model, NMA can only assume that the Norris & Hubbard paper may be playing a role in that agency decision. Nevertheless, NMA points out that the Norris & Hubbard paper has itself been carefully analyzed and found seriously lacking in some very crucial respects. Gradient Corporation has conducted a very thoughtful evaluation of the Norris & Hubbard critique of the MINTEQA2 model.<sup>45</sup>

Entitled "Evaluation of the Norris and Hubbard Critique of the MINTEQA2 and EPACMTP Models", the Gradient Report concluded that Norris and Hubbard's claims:

- adopt a hydrous ferric oxide surface area, a key determinant of metal binding sites to soil or porous media, that is orders of magnitude lower than values supported by scientifically proven data;

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<sup>44</sup> Hereafter the "Norris & Hubbard paper". This paper has been submitted to EPA by the above groups in comments on the agency's then-pending Bevill Amendment regulatory determination on fossil fuel combustion by-products (Docket No. F-1999-FF2P-FFFFF). It also has appeared in the administrative record for the agency's efforts to develop a "Guide to Industrial Waste Management" (Docket No. F-1999-1DWA-FFFFF).

<sup>45</sup> A copy of the Gradient report is included with these comments. The Gradient Report was prepared at the request of the American Coal Ash Association, the American Forest & Paper Association, the Edison Electric Institute, the Lead Industries Association, and the National Mining Association.

- rely upon colloid transport mechanisms that are based on theoretical considerations and limited laboratory data, but remain inconclusive and lack field testing;
- yield elevated estimates of metal concentrations in groundwater that are contradicted by tens of thousands of actual field measurements; overstating their mobility and threat to human health and the environment.<sup>46</sup>

As a result of these errors in its revised assumptions, the Norris & Hubbard paper yielded "a very restrictive set of extreme conditions"<sup>47</sup> when the MINTEQA2 was run using those assumptions. The changes advocated by Norris & Hubbard paper "yield isotherm results that are implausible".<sup>48</sup> That paper adopted an unsupported value for iron chemistry, which then was used as a basis for the paper's colloid analysis, in itself a factor "does not appear to substantially affect metal mobility with the possible exception under conditions where metal concentrations are low, precisely those conditions where the threat to human health and the environment is low."<sup>49</sup> Gradient further concluded that the Norris & Hubbard paper had miscalculated the lead isotherm value by a factor of at least 100, and perhaps 10,000.<sup>50</sup>

Thus, to the extent that EPA has relied on factors identified in the Norris & Hubbard paper as reasons for deciding not to employ the MINTEQA2 model, that decision is not well founded.

Response 12-8: As noted by the commenter, EPA has received public comments on our use of MINTEQA2 equilibrium metals speciation model in previous rulemakings to estimate partition coefficients. These comments included the Norris and Hubbard paper referred to by the commenter<sup>51</sup>, as well as other comments. EPA is in the process of evaluating all of the comments received on MINTEQA2, including the Norris and Hubbard paper and has not reached any final conclusions. (EPA notes that the overall effect of the Norris and Hubbard suggestions would generally be to estimate lower partition coefficients.) However, as indicated in the preamble to the proposed rule, EPA is concerned enough about the comments received to warrant not using the model in the current rulemaking. The approach taken in the proposed rule that relies on empirical

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<sup>46</sup> Gradient Report at 2 (footnotes omitted)

<sup>47</sup> Id. at 3

<sup>48</sup> Id. at 18.

<sup>49</sup> Id. at 19

<sup>50</sup> Id.

<sup>51</sup>Norris, C.H. and C.E. Hubbard, "Use of MINTEQA2 and EPACMTP to Estimate Groundwater Pathway Risks from the Land Disposal of Metal-Bearing Wastes".

data for specifying soil-water distribution coefficients ( $K_d$ 's) is well accepted in the field of ground water transport modeling. Furthermore, all  $K_d$  values used for the proposed rule were fully documented in the risk assessment background document (see "*Risk Assessment for the Listing Determinations for Inorganic Chemical Manufacturing Wastes*," August, 2000). Therefore, EPA believes the information available to the public on the modeling approach that EPA chose was adequate for notice and comment purposes. EPA notes that the commenter did not submit any comments challenging any of the  $K_d$  values derived from empirical data. Nor did the commenter criticize the empirical data approach. Finally, EPA notes that the commenter has not explained how it was harmed—or could potentially be harmed by the decision to use  $K_d$ 's derived from empirical data rather than the MINTEQA2 model.

Comment 12-9: EPA's Risk Assessment for Manganese Is Very Seriously Flawed

Kerr-McGee Chemical, LLC, ("Kerr-McGee") has submitted to EPA very thoughtful and thorough comments concerning aspects of the Inorganics Listing Proposal dealing with manganese.<sup>52</sup> NMA endorses, and incorporates by reference, the Kerr-McGee comments.

Response 12-9: EPA refers the commenter to its responses to the Kerr-McGee comments (specifically, to response 8-6).

Conclusion

The Inorganics Listing Proposal has made fundamental errors regarding the Bevill Amendment. For instance, EPA should not, indeed, cannot, re-evaluate the Bevill Amendment status of chloride waste solids from titanium tetrachloride production; were it to do so, the agency is under a statutory obligation to conduct a study and regulatory determination pursuant to the Bevill Amendment.

Moreover, EPA's conclusion that waste streams from production of barium carbonate from barite ore are not Bevill-exempt wastes is unlawful. In addition, the Inorganics Listing Proposal fails to recognize that tailings and wastes from kernite ore production of boric acid are also Bevill-exempt wastes.

Despite the agency's claims that it is still evaluating the implications of the court's decision in Association of Battery Recyclers v. EPA, it appears from the Inorganics Listing Proposal that the agency is ignoring, not evaluating, that decision. The proposed rule ignores the statutory mandate, as confirmed in ABR and AMC I, that materials are solid wastes subject to EPA's RCRA jurisdiction only if those materials are discarded, i.e., thrown away or abandoned. To the extent that the Inorganics Listing Proposal pays any attention to the ABR decision, the

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<sup>52</sup>See "Comments on Proposals With Respect To Manganese" (November 10, 2000) submitted by Kerr-McGee Chemical, LLC, as part of Kerr-McGee's overall comments on the Inorganics Listing Proposal.

Proposal attempts to limit the court's holding to materials that are "closely related" to the materials at issue in the Inorganics Listing Proposal.

In addition, the agency continues to misapprehend the law by asserting in this proposed rule that surface impoundment storage of a product prior to sale equates to waste management subject to Subtitle C. Furthermore, the Inorganics Listing Proposal mistakenly asserts RCRA jurisdiction over off-site reuse of secondary materials.

NMA reiterates its support for the proposed uses of the TCLP and SPLP tests, as set forth in the Inorganics Listing Proposal.

The Inorganics Listing Proposal takes a wasteful and counterproductive approach when it insists on conducting risk assessments on recycling practices instead of first determining whether materials in question had been discarded by being abandoned or thrown away, and thus were truly within EPA's legitimate RCRA authority.

EPA's failure to identify, much less explain, its reasons for failing to employ the MINTEQA2 model have substantially deprived the public of any meaningful opportunity to comment on a crucial aspect of the proposed rule's groundwater risk assessment. To the extent that EPA, in making the decision to forego use of MINTEQA2, relied on factors set forth in the Norris & Hubbard paper, it must be remembered that the Norris & Hubbard paper has been shown (in the attached Gradient Corporation report) to be critically flawed. Thus, any decision based on the Norris & Hubbard paper also lacks a sound foundation.

The Inorganics Listing Proposal's risk assessment for manganese is very seriously flawed, as demonstrated in the comments filed by Kerr-McGee Chemical, LLC.

Finally, NMA regrets that EPA refused to extend the comment period on the Inorganics Listing Proposal. The lack of an adequate comment period, together with the agency's failure to identify or explain its rationale for not using the MINTEQA2 model, are two decisions that render this rulemaking arbitrary and capricious.

Response to Conclusion: See the responses to the individual issues raised in comments and responses 12- 1 through 12-8. Also note that we are deferring final action on all elements of our proposal that are specifically related to the waste constituent manganese. Please see section IV.B of the preamble to today's final rule for a further discussion of our decision to defer final action on manganese-related elements of the proposed rule.

