

OMB Meeting
Definition of Solid Waste Rule

Regulation of Spent Catalyst
K171/K172

Promoting Sustainability
Through Safe and Environmentally
Protective Reuse of Spent Catalyst

July 28, 2008



Agenda

- I. Who Are We?
- II. The Unique Properties of Spent Catalyst
- III. Specific Regulatory Issues
 - A. VPRA Petition for Rulemaking
 - B. DSW Rule



Who are we?

**Vanadium Producers & Reclaimers
Association (VPRA)**

Gulf Chemical: Freeport, TX

Kevin Jones, President
Jay Jaffe, Vice President

Metallurg Vanadium: Cambridge, OH

Hoy Frakes, President
David White, Technical Director

STRATCOR: Danbury, CT

Hein Enslin, President

Vanadium Producers and Reclaimers Association

John Hilbert, President
Jim Allen, Legal Counsel
Dale Scherger, Consultant

VPRA members undertake nearly all of the recycling of spent catalyst done in the United States.



Vanadium as Critical Alloy

- 18 million lbs vanadium used in US each year
 - 50% from imports
 - 50% from domestic sources (all recycled)
- 70% of domestic supply of vanadium comes from catalyst reclamation
- 6 million lbs vanadium from catalyst recycling per year
- 1.2 billion lbs of waste to produce same amount of vanadium from virgin ore
- Recycling avoids total reliance on foreign imports of vanadium (Russia, China & South Africa)
- Major energy savings vs. mining
- Other metals recovered include molybdenum, alumina, nickel, and cobalt.



VPRA Encourages Responsible Recycling and Reuse

- VPRA members support safe, environmentally sound recycling of spent catalyst, currently RCRA listed hazardous wastes K171/K172.
- The existing RCRA listing potentially discourages recycling in certain metal markets
- The proposed DSW rulemaking would be under-protective
- Thus a rule specific to K171/K172 as proposed by VPRA and API is the appropriate middle ground.



Unique Catalyst Properties

- Catalyst is used to remove sulfur, nitrogen and metals from petroleum streams.
 - The active materials are metal compounds on a high surface area, high pore volume alumina carrier.
- Spent catalyst has unique properties, which must be taken into account to ensure management/ recycling/ reclamation is protective of the environment.
 - High Sulfide Content
 - ◆ Self-Heating
 - ◆ Pyrophoric
 - ◆ Reactive
 - High Oil Content
 - High Metals Content [Ni, Mo, Co, V]
 - High Polynuclear Aromatic Hydrocarbon (PAH) Content



Listing of K171/K172 Catalyst

- After extensive review in the 1990's, EPA found that spent catalyst has hazardous properties: toxicity (metals, benzene, PAH's), reactivity, ignitability (self-heating).
- Decision was made to specifically list spent catalyst from hydrotreating and hydrorefining as hazardous waste – K171 and K172.
- EPA denied a request during the rule making to exempt or conditionally exempt the recycling of the these spent catalysts from being a hazardous waste.
- Rationale was that the spent catalyst presented a danger to the environment due to the reactive nature of the material.
- Improved management due to the listing has significantly reduced a previous a history of fires and other environmental problems at refineries, recycling, and disposal facilities.



Spent Catalysts Must Be Properly Managed



VPRA

Mismanagement Prior to the Listing as Hazardous Waste



VPRA

Spent Catalyst Self Heating and Pyrophoric



VPRA

Metals Reclamation or Treatment

- EPA's intent:
To place vanadium treatment standards on the newly listed waste... "The Agency believes the vanadium UTS level can be achieved, therefore, through proper treatment which includes a reclamation step." (63 FR 42169)

"EPA considers the self-heating physical property of these spent catalysts to be very important in its decision to list these wastes" (63 FR 42157) and "EPA believes that the catalyst wastes present several risks beyond those necessarily associated with landfill disposal, including pyrophoric properties" (63 FR 42158).
- By Listing as a Hazardous Waste the RCRA Rules ensured proper handling and storage at the Refinery; proper transportation used to minimize spills; and proper handling, storage, and processing at the recycling or disposal facilities.



VPRA Petitions EPA to Fix the Listing Issues and Promote Recycling

- August 2, 2001 – VPRA petitioned EPA to make specific changes to the spent catalyst listing and LDR to ensure proper treatment and promote recycling.
- 2006 – Both API and VPRA suggest to EPA that spent catalyst reclamation be subject to a conditional exclusion with specific conditions for safe handling
- Conditional exemption is currently part of the pending EPA Rulemaking in response to the VPRA Petition



Why Should EPA Exclude Spent Catalyst from DSW

- EPA specifically evaluated the risk of spent catalyst management, and found that **strict regulation is needed to prevent safety and environmental problems.**
- Numerous examples (including RCRA permitted facilities) show that mismanagement can cause fires, release of toxic metals, and other damage.
- EPA's economic study shows that volatile metal prices are an incentive to mismanage recyclable materials.
- In low metal markets refiners treat spent catalyst as a waste, and discard it, often to landfills.
- In high metal markets inexperienced and incompetent operators are drawn to the industry, increasing the risk of environmental damage.



Why Should EPA Exclude Spent Catalyst from DSW

- VPRA has worked with EPA and together we have invested over ten years in discussions and planning on how to properly manage spent catalyst and encourage its recycling.
- A specific rule for spent catalyst is consistent with the most recent case from the DC Circuit on the subject of conditional exclusions for recycling-*Safe Food and Fertilizer v. EPA*-which approved EPA's approach tailoring an exclusion to the specific risks presented by an individual waste stream.

Spent Catalyst Should Be Handled Under Its Separate Listing

- EPA should include in the general rule a provision that any subsequently promulgated specific exclusion will prevail over a general exclusion, whenever adopted.
- Without knowing what refiners and reclaimers will or should do in response to a broad deregulation of spent catalyst reclamation, it would be irresponsible and arbitrary for EPA to remove RCRA restrictions proven to promote safe management.
- Certain features of the current scheme of regulation could be removed to reduce costs without significant increase in risk.
- EPA should continue down the path of a specific conditional exclusion that will remove certain unneeded regulatory burdens, such as a RCRA permit, yet keep in place enough detailed, enforceable rules to ensure that generators, reclaimers and state agencies know exactly what steps are needed for safe spent catalyst management.